NTIA Report 89-253

Stand-Alone Terrestrial and Satellite Networks for Nationwide Interoperation of Broadband Networks

Martin Nesenbergs

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U.S. DEPARTMENT OF COMMERCE
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PREFACE

The Institute for Telecommunication Sciences (ITS) is conducting a series of projects concerned with the roles of advanced communication satellites in Integrated Services Digital Networks (ISDN) and the use of advanced satellite system technology to enhance rapid restoration of services provided by the Public Switched Network (PSN) following a natural or "manmade" disaster. Goals of this work are (1) to promote an effective integration of advanced satellite systems with future terrestrial broadband networks, (2) to perform studies that examine uses of advanced communication satellite systems to reduce national vulnerability to telecommunication outages, and (3) to identify and recommend interface and functional standards required for integrated services, such as ISDN, in a terrestrial-satellite broadband transmission and switching environment. The Institute is working with the National Communications System (NCS) and other Government and industry organizations to define and develop the necessary standards.

The purpose of the task addressed by this report has been to characterize separately the terrestrial and satellite networks. It is expected that this study will provide a foundation for subsequent studies that will explore the interoperation of terrestrial and satellite networks to reduce national vulnerabilities to telecommunication outages in case of a broad spectrum of threats, such as facility damage or traffic congestion.

Certain commercial systems, equipment, and software products are identified in this report to adequately describe the designs and conduct of research or experiment. In no case does such identification imply recommendation or endorsement by the National Telecommunications and Information Administration, nor does it imply that the material or equipment identified is necessarily the best available for the purpose.

The views, opinions, and/or findings contained in this report are those of the author. They do not represent an official position of the National Telecommunications and Information Administration or of the U.S. Department of Commerce.

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LIST OF ACRONYMS AND ABBREVIATIONS

ACC	Advanced Communications Corporation
ACTS	Advanced Communications Technology Satellite
AFSATCOM	Air Force Satellite Communications System
ANSI	American National Standards Institute
AO&M	administration, operation, and maintenance
ATD	asynchronous time division
ATM	asynchronous transfer mode
AT&T	American Telephone and Telegraph Company
B	bearer channel
BBP	baseband processor
BER	bit error rate *or* bit error ratio
BH	busy hour
BISDN	Broadband Integrated Services Digital Network
BOC	Bell Operating Company
BRI	basic rate interface
B8ZS	binary 8-zero substitution
CATV	community antenna television
CCC	clear channel capability
CCIR	International Radio Consultative Committee
CCIS	common channel interoffice signaling
CCITT	International Telegraph and Telephone Consultative Committee
CCS	common channel signaling
CCSA	common-control switching arrangement
CEP	communications electronics package

CEPT	European Conference of Post and Telecommunications Administrations
CNS	commercial network survivability
CONUS	continental United States
CPE	customer premises equipment
CPU	central processing unit
CSI	commercial SATCOM interconnectivity
D	data channel
DBS	direct broadcast satellite
DBSC	Direct Broadcast Satellite Corporation
DDS	dataphone digital service *or* digital data system
DNHR	dynamic nonhierarchical routing
DR	digital radio
DSCS	Defense Satellite Communications System
DS-N	digital signal of level N = 0, 1, 2, ...
DSX	digital cross-connect
ECSA	Exchange Carriers Standards Association
EIA	Electronic Industry Association
EIRP	effective isotopically radiated power
EMP	electromagnetic pulse
EO	end office
EOS	Earth Observation System
EOSAT	Earth Observation Satellite Company
EPSCS	Enhanced Private Switched Communications Service
ESA	European Space Agency
ESC	enhanced service complex
ESP	enhanced service provider

ESS	electronic switching system
FCC	Federal Communications Commission
FDMA	frequency-division multiple access
FEC	forward error correction
FO	fiber optics
FLTSATCOM	Fleet Satellite Communications System
FSS	Fixed Satellite Service
GOES	Geostationary Operational Environmental Satellite
GOS	grade of service
GSO	geostationary orbit
GTE	General Telephone and Electronics Corporation
H	high-speed channel
HBO	Home Box Office
HBR	high burst rate
HCDTS	High-Capacity Digital Transport Service
HEMP	high-altitude electromagnetic pulse
HPA	high-power amplifier
HSSDS	High-Speed Switched Digital Service
IAD	integrated access distributor
IEEE	Institute of Electrical and Electronics Engineers
IF	intermediate frequency
IFRB	International Frequency Registration Board
INMARSAT	International Maritime Satellite Organization
INTELSAT	International Telecommunications Satellite Organization
ISDN	Integrated Services Digital Network
ISO	International Organization for Standardization

ITT&C	interoperable tracking, telemetry and command
ITU	International Telecommunication Union
LAP	link access protocol
LATA	local access and transport area
LBR	low burst rate
LEASAT	Leased Satellite System
LNA	low noise amplifier
MCS	mobile communications subsystem (also master control station)
MW	microwave
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organization
NAVSTAR	Navigation Satellite Service
NCC	network control center (also National Coordinating Center)
NCP	network control point
NCS	National Communications System
NETS	National Emergency Telecommunications Service
NNP	nationwide numbering plan
NPC	north pacific cable
NOAA	National Oceanic and Atmospheric Administration
NSEP	National Security Emergency Preparedness
NT	network termination
NTCN	National Telecommunications Coordinating Network
NTN	National Telecommunications Network
OC	optical channel
ONA	Open Network Architecture
OSI	Open System Interconnection

PBX	private branch exchange
PRI	primary rate interface
PSK	phase shift keying
PSN	public switched network
PSTN	public switched telephone network
QAM	quadrature amplitude modulation
QPSK	quadrature phase shift keying
RBOC	Regional Bell Operating Company
RCC	regional coordinating center
RF	reference frequency
SATCOM	satellite communications
SBS	Satellite Business Systems
SCPC	single channel per carrier
SDN	software defined network
SMSK	serial minimum-shift keying
SONET	Synchronous Optical Network
SPACECOM	Space Communications Company
SPE	synchronous payload envelope
SSN	switched service network
SSS	Strategic Satellite System
STM	synchronous transfer mode
STP	signal transfer point
STS	synchronous transport signal
SXS	step-by-step switch
TA	terminal adaptor
TAT	transatlantic cable

TBD	to be determined
TDM	time-division multiplex
TDMA	time-division multiple access
TDRSS	Tracking and Data Relay Satellite System
TE	terminal equipment
TIROS	Television and Infrared Observation Satellite
TPC	transpacific cable
TSI	time slot interchange
TT&C	tracking, telemetry and control
T1	transmission link with DS-1 format and 1.544 Mb/s data rate
USSB	United States Satellite Broadcasting Company
VLSI	very large scale integration
VSAT	very small aperture terminal
WATS	Wide Area Telecommunications Service
WL	western longitude
WDM	wavelength division multiplex
XBAR	crossbar switch

STAND-ALONE TERRESTRIAL AND SATELLITE NETWORKS FOR NATIONWIDE INTEROPERATION OF BROADBAND NETWORKS

Martin Nesenbergs*

The current status of fiber optic and related broadband terrestrial networks is reviewed. That includes summaries of link and switch capabilities as well as present and future standards for broadband systems. In the domain of communication satellites, both existing and advanced future technologies are described. Advantages and disadvantages of both terrestrial and satellite stand-alone networks are discussed from the service survivability and restoral point of view. The presented material is largely technical. As a consequence, this report does not address such important nontechnical issues as economics, costs, policies, and the regulatory environment.

Key Words: advanced communications technology satellites (ACTS); fiber optics; satellite networks; terrestrial networks; vulnerability

1. INTRODUCTION

A recent article (Zorpette, 1989) highlights the efforts by the U.S. telephone companies to maintain nationwide service despite a variety of real and anticipated emergencies. The article was apparently a direct outgrowth of the so-called Hinsdale fire. That fire occurred on Sunday, May 8, 1988, at a major telephone switching center in Hinsdale, IL, a Chicago suburb.

The disaster that followed caused an unprecedented disruption of telecommunication service. According to the above article, some 35,000 residential and business customers had no service for over a month. Customers in other areas, served by some 120,000 disabled trunks, had to contend with no long-distance service. The Hinsdale switch, in addition to being a local central office, also served as an interexchange gateway hub, or a point of presence (POP), for all three major U.S. interexchange carriers: AT&T Communications, MCI Communications, and U.S. Sprint. Normally, Hinsdale concentrated and handled up to 3.5 million telephone calls per day. The accident removed this capability from the Public Switched Telephone Networks (PSTN), as well as from all attending private networks.

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The effect on end users was severe. O'Hare's air-traffic control, managed by FAA communications, came to a standstill and the airport had to operate at a very reduced level. Emergency 911 service disappeared, as did the regional cellular telephone service. Many businesses, from automatic teller machines, to stockbrokers, to point-of-sales terminals, and so on, had to cease operations. Total dollar estimates of lost business ranged from hundreds of millions to tens of billions.

Yet, as unlikely an event as a switching center fire may be, it is nevertheless just one of many perils that the nationwide network can encounter. The quoted article (Zorpette, 1989) illustrates some dozen man-made and natural causes that can have catastrophic consequences on the terrestrial network:

- Battery leaks in central offices can damage and disable equipment.
- Construction activity (i.e., backhoes) can sever optical fiber trunks.
- Earthquakes can demolish central offices and sever trunk lines.
- Fires in nearby industries (i.e., factories) can spread to central offices.
- Flooding can interrupt power to central offices.
- Hurricanes can topple satellite dishes, disabling transoceanic links.
- Marine activities (i.e., dredging, trolling) can damage transoceanic underwater trunks.
- Terrorist bombs at signal transfer points can knock out call-routing and nationwide data bases.
- Tornados can destroy most structures, especially microwave towers and repeaters.
- Truck accidents can release corrosive gases that interfere with central office equipment.
- Vandals can destroy microwave towers and do harm to manhole repeaters.

The above list, while relatively detailed, is nevertheless mainly focused on terrestrial hardware disasters. Recent events have shown that there exist new significant threats in terms of network software vulnerabilities (National Research Council, 1989). Several factors contribute to this vulnerability.

First, the modern networks have become increasingly dependent on software for control, signaling, and various administration, operation, and maintenance (AO&M) functions. Second, the Federal Communications Commission (FCC) has mandated that the Regional Bell Operating Companies (RBOC's) provide Open Network Architecture (ONA) access to nonnetwork-based service providers. Third, new network services are being introduced at a rapid pace, and many of them require user access to different parts of the software. Finally, there are the huge, centralized, computer-accessed data bases that serve the national and/or international information services (e.g., call answering, 800 services, electronic fund transfer, credit card verification, and broadcast news service).

Up to now, the threats to network software have come mainly from "hackers." (A notable exception was the recent penetration of the data base at the Lawrence Livermore Laboratory by foreign agents from West Germany.) Unfortunately, these hackers are becoming more numerous and more sophisticated as time passes. Their penetration and manipulation of software has created a family of such, more or less harmful, symptomatic terms as "viruses," "worms," and "time bombs." If unauthorized access is achieved by "hostile hackers," serious damage can be done to both stored information and executable codes. The consequences could be quite extensive. Large parts of the network could be disabled. Correspondingly large sectors of the user population could lose essential services, perhaps exceeding the losses caused by the hardware disasters listed earlier.

Another category of threats to network survivability is associated with military activities and events. Isolated events, such as the Cuban missile crisis or the invasion of Grenada, give rise to traffic congestion that may degrade the service by blocking certain call requests or by delaying others. More extensive wars can cause far more damage and service disruptions. A particularly disruptive example can be found in various high-altitude electromagnetic pulse (HEMP) effects on the software stored in integrated circuitry, such as VLSI.

Service can also be degraded on a completely undamaged network by traffic surges that exceed the design (also called the engineered load) levels. Caused by predictable events (e.g., Christmas or Mother's Day) or some totally unpredictable events (natural or man-made), traffic congestions can take considerable time to clear and to return the service to normal quality.

Faced with all the above threats to the survivability of the terrestrial public networks and their services, one is obliged to seek practical alternatives to reduce the risks to end-user services. There may be many potential solutions, such as extensive physical hardening and protection of exiting terrestrial facilities; addition of multihoming terrestrial lines and trunks, perhaps emphasizing lightwave (fiber optic) technologies; and introduction of additional nonterrestrial backup connectivity when and where such backup is needed.

It seems evident that satellite backup facilities can offer beneficial means for service outage prevention and, when outages occur, for accelerated disaster recovery. It is also clear that there are many complex alternatives for implementing such satellite backups. The resultant advantages and disadvantages, or recovery speed and capacity versus cost, can only be ascertained from an in-depth study of various realistic backup alternatives. First, however, it is necessary to identify and to characterize the main objects of the study--the terrestrial networks (present and future) and their counterparts, the present-day communications satellite networks.

The material of this report is organized as follows. Section 2 reviews the terrestrial networks, with emphasis on broadband facilities, such as the present and future fiber optics. Links, switches, and standardization issues are described. The relative advantages and disadvantages of the terrestrial plant are briefly summarized from the service survivability point of view.

Section 3 looks at the current status and future projections for the satellite communications technology. Again, the section concludes with a condensed survivability summary, that is, the relative advantages versus disadvantages of the U.S. communication satellite networks.

Section 4 is a brief conclusion, while Section 5 presents a list of references.

2. CURRENT STATUS OF FIBER OPTIC AND RELATED BROADBAND TERRESTRIAL NETWORKS

A network is typically represented as consisting of two major components: the links (also called channels, transmission paths, trunks, or lines) and the nodes (different types of switches, central offices, or exchanges). These components possess numerous distinctive and often complex hardware, software,

and functional characteristics. The existing stand-alone terrestrial networks are no exception. Their links, switching nodes, and other facilities have experiences a dramatic recent growth. The current status of these terrestrial network components is described in the next subsections.

2.1 Large Capacity Links

Following the Bell System divestiture of January 1, 1984, the U.S. telecommunications networks of AT&T, BOC's, independents, and other long distance carriers have continued to evolve. All together they constitute a large public and private investment in communications. Thus, while exact or constant numbers are hard to pin down, it is claimed that in the mideighties there were in excess of 20,000 switching offices and more than 1 billion miles of transmission paths interconnecting the switches (Falconer and Powers, 1983). A typical physical path carries more than a single voice frequency trunk. Thus, there are estimates of over six million telephony trunks and about the same number of special service, digital and analog, circuits. Almost a 100 million customer loops terminate at the switches. Between 70 and 80 percent of the total traffic is believed to be voice today. The network is engineered to handle more than 1/2 billion, and perhaps as high as 1 billion, calls every day.

Both in terms of equivalent Erlangs or the link bandwidth occupied, data traffic constitutes an ever increasing portion of the total offered traffic. In 1983, the relative data traffic volume was estimated to be close to 10 percent (Pagones and Reilly, 1983). By 1990 the data volume should exceed 30 percent.

The Digital Data System (DDS) was established in the midseventies. It provided public and private data service, called the Dataphone Digital Service (also DDS). The DDS data rates ranged from 2.4 to 56 kb/s, which was a substantial improvement over the previous 300 and 1200 b/s rates. Over the last 15 years, such data services have been multiplexed together with digitized voice in groups of 64 kb/s (DS-0) channels on the so-called T-carrier. The 56 kb/s service has been customarily carried on 64 kb/s channels. The difference of 8 kb/s has been useful for in-band signaling (e.g., on-hook/off-hook indication), framing, and related functions. The T-carrier has been widely transmitted over commercial analog microwave radio systems, such as the 4-GHz

system called TD and 6-GHz systems called TH and AR6A. In addition to voice and data, television broadcasts and other special services have also been transmitted by microwave radio. Twenty-four DS-0 channels constitute one DS-1, also known as the 1.544 Mb/s T1 line.

More than 10 years ago, customer requirements and economics indicated a need for much higher rates. The microwave radio industry response has been threefold. First, around 1980, there was the introduction of several digital radio systems such as the DR 6-30 at 6 GHz and the DR 11-40 at 11 GHz. Second, the digital rate hierarchy for radio has been extended far above T1 to 6.312 Mb/s (DS-2), 44.736 Mb/s (DS-3), and to several multiples thereof. And third, the service offerings have been extended past DDS to what were for a time called the High-Speed Switched Digital Service (HSSDS) and the High-Capacity Digital Transport Service (HCDTS). In addition to microwave, these systems employed satellite links. To emphasize the distinctions, the terrestrial HSSDS has been renamed the ACUNET T1.5 Service. The satellite HSSDS has been renamed the SKYNET 1.5 Service. As the names imply, these transmissions are carried on dedicated or reserved 1.544 Mb/s T1 lines. Voice, data, and video are transmitted between switching nodes.

The microwave repeater spacings vary, depending on terrain and related parameters. For DR 6-30 the spacings are between 20 and 35 miles; for DR 11-40, between 10 and 20 miles. Figure 1 shows the main transmission routes of the Bell System long distance network around 1980. The majority of these links can be assumed to have been microwave radio.

The modern digital microwave radio systems emphasize spectral efficiency by using such sophisticated tools as high-level Quadrature Amplitude Modulation (QAM), space and/or frequency diversity combining, transversal or decision feedback equalization, cross-polarization interference cancellation, predistortion-type linearizing, phase jitter recovery techniques, and forward-acting error correction (FEC) (Noguchi et al., 1986; Hart and Steinkamp, 1987; Meyers and Prabhu, 1987; Kohiyama and Kurita, 1987). The objective is to achieve a bit error rate (BER) of better than 10^{-10} in normal operation. Table 1 shows candidate systems from Europe and North America. Their typical channel bandwidths are either 20, 30, or 40 MHz. As decreed by FCC, the allowed data rates in North America would go from two DS-3's (roughly 90 Mb/s) to six DS-3's

Figure 1. The major prefiber transmission routes of the Bell System around 1980 [from Rey, 1984].

Table 1. Microwave Radio Systems of Europe and North America [from Noguchi et al., 1986]

	CHANNEL BW / BIT RATE	20 MHz	30 MHz	40 MHz
EUROPE	34 Mb/s	4-PSK	4-PSK	4-PSK
	68 Mb/s	16-QAM	8-PSK	4-PSK
	140 Mb/s	256-QAM	64-QAM	16-QAM
	280 Mb/s	- - - -	1024-QAM	256-QAM
NORTH AMERICA	45 Mb/s	* *	* *	* *
	90 Mb/s	64-QAM	16-QAM	8-PSK
	135 Mb/s	256-QAM	64-QAM	16-QAM
	180 Mb/s	1024-QAM	256-QAM	64-QAM
	270 Mb/s	- - - -	1024-QAM	256-QAM

** FCC requires a minimum of 78 Mb/s for common carriers

(270 Mb/s). To achieve the highest rates, the radios require N-ary modulations, denoted as N-QAM in the table, with N as high as 256 and even 1024.

To bring compatibility to the growing family of transmission rates both domestically and internationally, leading standards organizations such as the American National Standards Institute (ANSI) and the International Telegraph and Telephone Consultative Committee (CCITT) are introducing new and far-reaching standards for broadband networking. More about these present and future standards will be said in Section 2.3.

Before the advent of fiber optics, the only competition to microwave radio came from multiwire and coaxial cables. Neither was a major threat. The twisted wire pairs have their well known bandwidth/distance limitations. The coaxial cable, while capable of data rates well above 100 Mb/s (as seen in CATV systems), has economic drawbacks for long-haul applications.

Optic Fibers

Terrestrial systems took a large forward step in 1977, when the first full-service fiber optic system was demonstrated in Chicago. Called a "lightwave system" by AT&T, it combined voice, data, and video transmissions. In the intervening dozen years, many optic fiber systems have been installed and put to various short- and long-distance uses (Jacobs, 1986). Today glass fibers are replacing terrestrial and satellite microwave, coaxial cables, and twisted-pair copper wires in almost all kinds of transmission link installations. That includes the interexchange or long-haul network, the exchange network between intra-LATA switches, feeder lines to remote terminals, as well as to a lesser extent, local loops to individual offices and residences.

Trade literature reports that the United States currently has more than 2 million miles of optic fiber (Kaiser et al., 1987), which would be less than 1 percent of the total trunk mileage. Yet, that small fiber percentage is alleged to have more than doubled the capacity of the entire Public Switched Telephone Network (PSTN). Figure 2 shows a 1987 version of the nationwide fiber optic network in the continental United States. It consists of 11 long distance carriers, such as AT&T Communications, MCI, U.S. Sprint, etc., and the 8-member National Telecommunication Network Group (NTN). The fiber optic networks installed over the last decade have developed interconnect rules that are particular to different parts of the world. Thus, Table 2 summarizes the main

Figure 2. Existing and proposed fiber networks in the United States [from Kaiser et al., 1987].

Table 2. Digital Hierarchies of Existing Lightwave Systems

		North American	European (CEPT)	Japanese
Level 1	Bit Rate (Mb/s) Voice Circuits	1.544 24	2.048 30	1.544 24
Level 2	Bit Rate (Mb/s) Voice Circuits	6.312 96	8.448 120	6.312 96
Level 3	Bit Rate (Mb/s) Voice Circuits	44.736 672	34.368 480	32.064 480
Level 4	Bit Rate (Mb/s) Voice Circuits	274.176 4032	139.264 1920	97.728 1440
Level 5	Bit Rate (Mb/s) Voice Circuits	Not Defined	565.148 7680	397.20 5760

data rate differences between North America, Europe, and Japan. These rates are not identical with those for microwave radio (compare Tables 1 and 2).

Multiplexing and switching of long-haul optic trunks take place at standard digital cross-connects (DSX). In the United States, Level 3 cross-connects are called DSX-3. They employ the DS-3 rate (44.736 Mb/s), and their deployment is common. Europeans prefer cross-connection at their CEPT-4 level (139.264 Mb/s), while networks in Japan cross-connect at DSX-5 (397.20 Mb/s).

The initial fiber optic linkage of the U.S. mainland with Europe and Asia was achieved by 1988 (Higdon et al., 1986; Cochrane and Brain, 1988; Trischitta and Chen, 1989). The current status of the major transoceanic systems is summarized in Table 3 (Elliott, 1989). The first operational transatlantic system is called TAT-8. The first transpacific linkage joins HAW-4 and TPC-3 in Hawaii. Both employ single-mode fiber optic cables and promise a data rate in thousands of DS-0 or their equivalent channels. Other more advanced systems are being planned, as indicated in the table.

The widespread use of fiber optics is, of course, due to their extraordinarily high bandwidth plus associated economic benefits (Rogalski, 1987). A single-mode fiber with a repeater spacing of 30 km or less is said to have a potential terahertz bandwidth (Li and Linke, 1988; Acampora et al., 1987). Realistic fibers sell for around $200 per km if purchased in large quantities. Typical installation and terminal costs are a fraction of the fiber costs. The expected lifetime of the optical fiber is 30 years, which should allow for significant future technology upgrades of terminal facilities. The currently available terminal devices, such as single-mode lasers, semiconductor light-emitting diodes, semiconductor optical amplifiers, various detectors, modulators, demodulators, etc., are already quite efficient and affordable (Dixon and Dutta, 1987; Gartside et al., 1987; Kalish and Cohen, 1987). A new system called LAMBDANET (AT&T TM) is said to use 18 Wavelength Division Multiplex (WDM) channels of 1.5 Gb/s each (Wagner and Kobrinski, 1989). Its total data rate of 27 Gb/s is based on repeater spacing in excess of over 55 km. Reported research studies indicate that further advancements can be anticipated (Li, 1987; Stanley et al., 1987; Sanferrare, 1987; Cochrane and Brain, 1988; Mesiya, 1988).

Table 3. Transoceanic Digital Optical Fiber Systems of the United States

SYSTEM NAME	OVERSEAS CONNECTIVITY	NUMBER OF 64 kb/s CHANNELS	INITIAL YEAR OF SERVICE
TAT-8	CONUS to Europe	7,560	1989
PTAT-1	CONUS to Europe	15,120	1989
HAW-4	CONUS to Hawaii	7,560	1989
TPC-3	Hawaii to Guam/Japan/Asia	7,560	1989
NPC	CONUS/Alaska to Japan	17,010	1990
TAT-9	CONUS to Europe	15,120	1991

2.2 Switch Capabilities

Prior to divestiture and essentially just before the #5ESS made its entry into the market, the U.S. PSTN was dominated by three generic types of switching machines. They were different versions of the step-by-step (SXS), the crossbar (XBAR), and the Electronic Switching Systems (ESS) (Joel, 1982). At that time the biggest workhorses were the SXS switches. As Table 4 shows (Nesenbergs and McManamon, 1983), the SXS family made up 63 percent of the total switch count and served 47 percent of all the lines and trunks. One can surmise that the step-by-steps must have then carried nearly half of the total PSTN traffic.

Except for the #4ESS (the large toll switch) and the soon-to-appear #5ESS (the adaptable local switch), the exchanges of that era were all analog circuit switches. As such, they were poorly tailored to serve the future network requirements in benign and hostile environments (NCS, 1988). Driven by new technologies, service needs, and general market evolution, the then existing switching networks were in effect forced to modernize (Malek, 1988) by implementing such features as equal access requirements, new network architectures, new common-channel signaling systems, integration of digital switching and transmission, and dynamically rearrangeable private networks, as well as integration of voice, data, and other services. Next we comment briefly on these relatively new developments.

Equal Access

An individual user terminal, typically a telephone that receives either public or private network service, homes either on a local switch (also called the end office or EO) or on a private branch exchange (PBX). The EO usually belongs to the local telephone company. The PBX is either privately owned or shared between private networks. At the same time, the long-haul connectivity in the United States is offered by several interexchange carriers, such as AT&T Communications, MCI, U.S. Sprint, and so on. To enhance competition, a number of equal access rules and regulations have been implemented by the FCC and the Judiciary. The local switches are required to provide access to the so called Points of Presence of the long-haul carriers (if such exist locally). A uniform Nationwide Numbering Plan (NNP) is needed for the equal access to work effectively. A tariffed access fee is charged by the local telephone company for the additional access facilities, their usage, and related expenses. In the

Table 4. Percent Services Provided by the Big-Three Bell System Switch Families in 1980

SWITCHING MACHINE FAMILY	PERCENT NUMBER OF	
	SWITCHES THEMSELVES	LINES and TRUNKS SERVED
SXS	63%	47%
XBAR	16%	22%
ESS	21%	31%

future, equal access to enhanced services is planned by means of the Open Network Architecture (ONA).

Network Architecture

Prior to 1984, the Bell System's long-distance network had a rigid hierarchical architecture. Thus the switches or offices were classified as either Class 1, 2, 3, 4, or 5. At the same time, the first four classes were denoted as Regional, Sectional, Primary, and Toll Centers, or Points, respectively. The Class 5 consisted of local EO's and local tandem switches. The hierarchy defined fixed routing, including alternative routing, rules for the network. These rules were far from optimal when faced with the new integrated traffic demands. In the mideighties, a new two-level architecture was introduced (Cummings et al., 1987). The more advanced switches, such as mostly those from Classes 1 to 4, were combined into a single class that possesses the Dynamic Nonhierarchical Routing (DNHR) capability. The remainder, typically Class 5 EO's, stayed essentially unchanged and without the benefit of DNHR. DNHR relies on a separate high-speed signaling network to select routes for calls and messages. Only after the route has been selected and the terminals have been found not busy, is the connecting path switched through the interexchange network. To indicate the possible nature of future network architectures, Figure 3 illustrates a projection of the AT&T network for 1995. Note that in this concept, PRI stands for the primary ISDN channel (23B+D or 1.5 Mb/s). The EO's are part of Local Access Transport Areas (LATA), while private networks are allowed to be either inside or outside the AT&T switched network. The following additional acronyms are used:

- CCS - Common Channel Signaling
- CPE - Customer Premises Equipment
- EPSCS - Enhanced Private Switched Communications Service
- ESC - Enhanced Service Complex
- IAD - Integrated Access Distributor
- ISDN - Integrated Services Digital Network
- SDN - Software Defined Network.

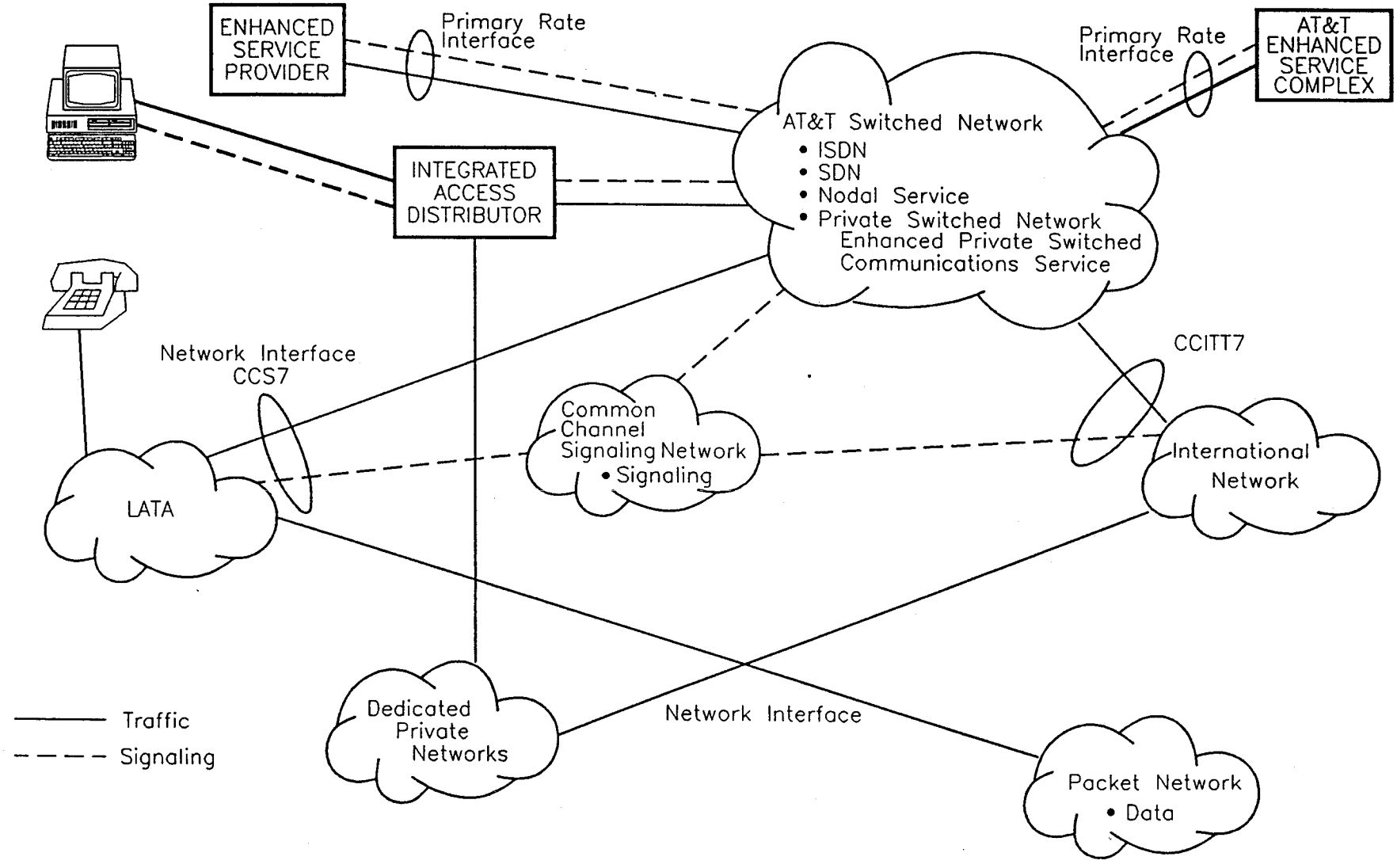

Figure 3. 1995 AT&T network architecture [from Cummings et al., 1987].

Signaling

Interoffice signaling has received considerable attention and major upgrades in the eighties. The basic developments started with the Common Channel Signaling (CCS) systems, where separate networks were assigned to carry, in common, control information for many circuit paths (or message transactions) on the interexchange network (Lawser and Oxley, 1987). AT&T has historically called their CCS version Common Channel Interoffice Signaling (CCIS). Either way, CCS or CCIS is essential for DNHR in the new two-level network architecture, the real-time management of private networks, and many of the service functions and features envisioned today. Separate CCS nodes, called the Signal Transfer Points (STP), receive, process, and distribute signaling messages that control the network. A few years ago there were 20 STP's in the United States, augmented by their dedicated CCS Network Control Point (NCP) and its associated data bases (DB). Of course, not all existing switches can benefit equally from the CCS networks. The older analog switches need upgrades, such as signal converters, buffers, and CPU's, to interact with CCS. It is the more recently introduced digital switches that benefit most. In the meanwhile, the signaling systems are themselves being improved. The domestic CCIS format, as well as the internationally more accepted Signaling System #6, are both gradually being supplanted by the new CCITT System #7. The key feature of System #7 seems to be its discretionary, user-assigned data field.

Integration of Digital Switching and Transmission

Today, many small and large digital (Time Division Multiplex or TDM) switches continue to be installed. Prominent among the existing systems may be the #5ESS of AT&T (Carney and Prell, 1986), but other machines, such as the GTD 5EAX of GTE, the DMS 100 of Northern Telecom, the NEAX 61E of NEC, the Siemens EWSD, and others, are also quite advanced digital circuit switchers and as such occupy a significant part of the U.S. market. Crucial elements of the TDM technology are the Time Slot Interchangers (TSI), the processor units (CPU), memories, high-speed data busses, and a general modular (expandable and remotable) structure (McDonald, 1983). Given line and trunk cards for format conversion, such digital switches can be extremely compatible with digital

transmission media, be they T-carrier microwave or any of the broadband fiber rates. That should enable a heretofore unrealized efficient integration of digital transmission and switching functions (Hui, 1989). However, to be fully effective at the foreseen high data rates, such digital integration is seen to require the same switching fabric to handle all varieties of offered traffic. The definition of this relatively new term, "switching fabric," is approximately the following. The fabric refers to the architecture of the switch; with added emphasis on the broadband structure of the switching matrix and associated transport functions. While specific choices have not been put into practice, a considerable amount of current research and development work is said to be devoted to finding the right fabric.

Adaptive Private Networks

A substantial fraction of interexchange carrier business is due to private networks. Long known by various names, such as Common Control Switching Arrangements (CCSA), Inward and Outward Wide Area Telecommunications Service (WATS), Switched Service Networks (SSN), Enhanced Private Switched Communication Service (EPSCS), plus others, they used to and still do provide telephone service to certain permanent user communities over fixed private lines. Now all that has undergone changes. Not only are there more new services, for instance, circuit switched and packet data, secure digitized voice, facsimile, facility restriction (e.g., elimination of specific radio or satellite hops, call screening, preemptive priorities), but the clients now may demand almost instantaneous reconfiguration of the entire network topology. This network service has been made available to the public by the relatively recent, tariffed, offering of the Software Defined Network (SDN). The topology and other characteristics of each SDN are stored in the SDN data base. Under instructions from an appropriate Network Control Center (NCC), the structure of the network can be modified at any time. Individual calls are processed by reference to the stored configuration. The SDN concept relies heavily on such modern switched network characteristics as CCS, DNHR, and the general coordination of digital facilities.

Integration of Voice, Data, and Other Services

Integration of telecommunication services at standardized user-network interfaces would obviate the need for dedicated (perhaps separate) facilities to transport arbitrary end-to-end transactions over different public and private networks (Chen and Messerschmitt, 1988; Habara, 1988). Unfortunately, however, the existing and especially the older network facilities are neither compatible nor adaptive when faced with an arbitrary mix of voice, data, and other services. Transmission lines may be optimized for certain transmissions. Likewise, switches are designed for a single service or, at most, for a specified traffic class (circuit switched voice, circuit switched data, message switched data, packet switched data, etc.). To handle all the services at once, in the existing type of networks, would require a number of specialized switches and subnetworks in parallel. Yet the goal of service integration seems worth pursuing. A large number of organizations have been actively researching the switching needs for the Integrated Services Digital Network (ISDN) concept (Anderson, 1987; Spears, 1987; Perucca et al., 1987; Malek, 1988). To date, definition and standardization work on ISDN has produced many results. More on ISDN and broadband ISDN will be discussed in Section 2.3.

2.3 Standards for Advanced Broadband Systems

The advancing technologies of broadband transmission and switching have created a real need for system interoperation and standardization. Like the technologies, standards also continue to evolve (Boehm et al., 1986). In the United States, the basis for standards activities is found in three organizations: the Electronics Industry Association (EIA), the Institute of Electrical and Electronics Engineers (IEEE), and the Exchange Carriers Standards Association (ECSA). Jointly, they sponsor the U.S. Standards Committee T1, which is concerned with telecommunications and proposes (i.e., drafts) telecommunication standards. All of the above groups are accredited by the American National Standards Institute (ANSI), which reviews their proposals. If a proposed standard is approved by ANSI, it becomes an American National Standard.

The actual work of T1 is done by its six technical subcommittees. The subcommittee names and areas of responsibility are

T1E1 - Carrier to Customer Installation Interfaces

T1M1 - Internetwork Operations, Maintenance, Administration, and Provisioning

T1Q1 - Performance

T1S1 - Services, Architecture, and Signaling

T1X1 - Digital Hierarchy and Synchronization

T1Y1 - Special Subjects

The topics of T1S1 and T1X1 appear to be most pertinent here.

International standards for terrestrial networks are developed by the International Telegraph and Telephone Consultative Committee for (CCITT). Committee T1 cooperates with U.S. CCITT representatives, such as those of Study Group C, to support the U.S. position on various issues. The work of the CCITT is performed by its own respective Study or Working Groups. Study Group XVIII deals with digital networks.

OSI

The CCITT, the International Standards Organization (ISO), and U.S. organizations concerned with standards, have for over 10 years now accepted the seven-layer Reference Model for Open System Interconnection (OSI). The OSI standard model simply forms the basis for most of the current and future advanced digital network standards being developed today. The application of the OSI model to analog (i.e., voice frequency) networks has been attempted, but with little or no reported success. It appears safe to say that OSI does not apply to analog networks. Figure 4 depicts the familiar OSI model (Tanenbaum, 1981). Starting with Layers 1, 2, 3, ... , a lot of work has gone in definition and standardization of the interfaces involved.

From the broadband network point of view, the three lowest layers that fall inside the communication subnet boundary of Figure 4 are of most significance. Those are the network-specific Physical Layer (#1), the Data Link Layer (#2), and the Network Layer (#3) itself. They all must have standard interlayer protocols, as well as pier protocols, that extend on the same level across all relevant network interfaces. Of most importance to this report seems to be the data rate hierarchies of broadband channels. They belong in Layer 1.

As an illustration of the role that OSI plays in standardization, consider the D channel protocols needed for ISDN (Roca, 1986).

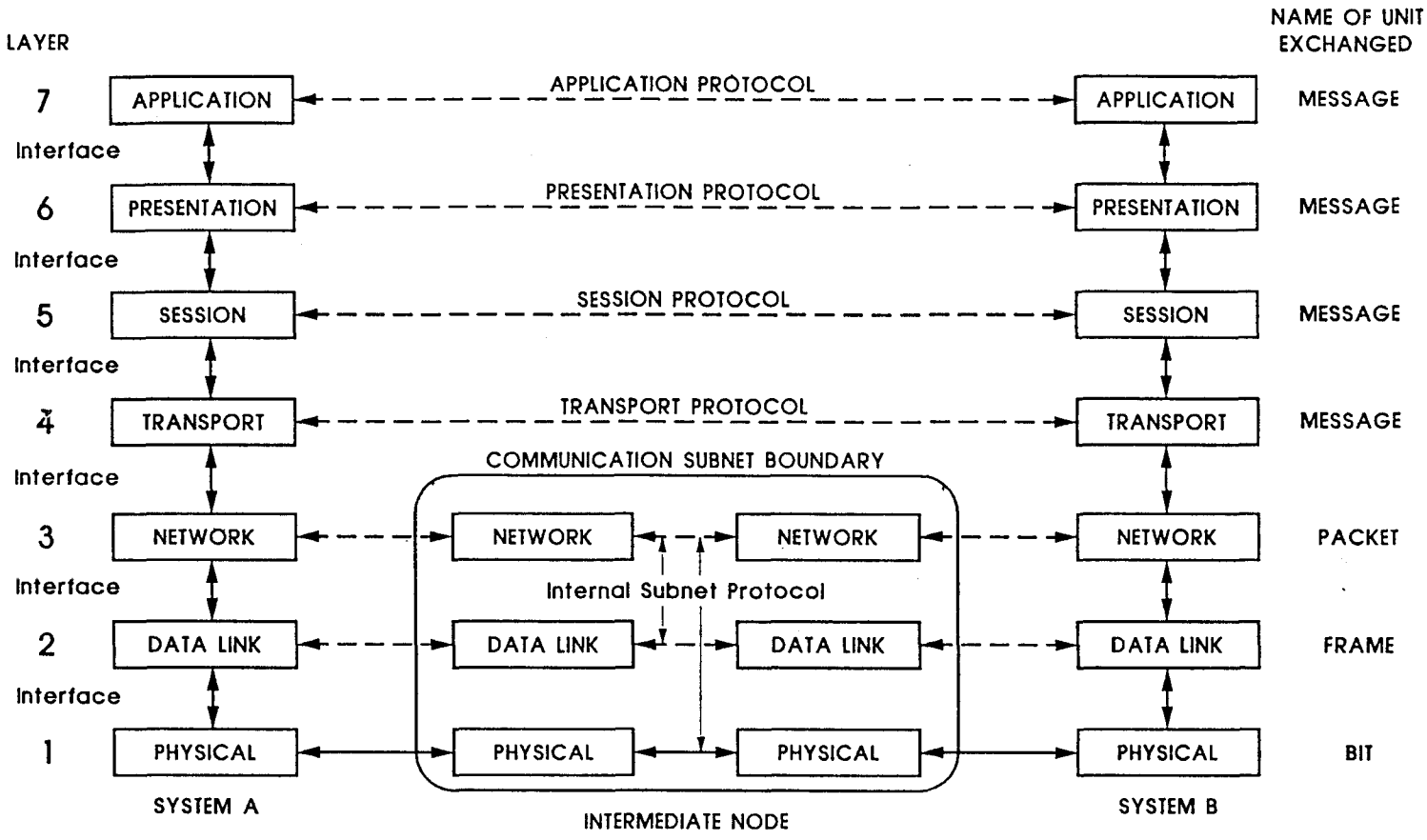

Figure 4. The classical seven-layer model for Open Systems Interconnection (OSI).

The Physical Layer, among other things, is responsible for bit transmission over physical media. The pertinent D-channel CCITT protocols are I.430 and I.431 for the basic and primary ISDN rates, respectively.

The Data Link Layer performs error control to assure error-free reception. Link Access Protocol D (LAPD) is represented by CCITT Standard Q.921.

Network Layer includes signaling and data (information) exchange between systems. The often discussed X.25 standard applies here, supported by Q.931 for signaling.

The remaining end-to-end layers, namely those from Transport to Application, view all networks as clear channels. They apply to end-user services and can be ignored in this network study.

ISDN and BISDN

In 1984, CCITT issued several Recommendations that defined the standard general-purpose interfaces of the Integrated Services Digital Network (ISDN). The intent of the first definitions was to concentrate on 64 kb/s channels. Today, that would be called narrowband ISDN or just ISDN (Roca, 1986; Aldermeshian, 1986; Higdon et al., 1986). In addition to digitized voice, the allowed services include circuit switched data, X.25 packets, facsimile, videotext, limited-motion video, and versions of voice/data integration. The standard ISDN interface, also called the Basic Access or Basic Rate Interface (BRI), is defined as a combination of two 64 kb/s Bearer (B) channels plus a 16 or 64 kb/s Data (D) channel. For a more complete listing of ISDN channel rates see Table 5. Note the Primary Rate Interface (PRI) that has a 23B+D structure, adding up to a T1 rate of 1.544 Mb/s. The High-Speed (H) hierarchy extends upward from H0, which is 6B or 384 kb/s. The H rates are multiples of H0. The B and H channels are transparent to the user. They are said to have Clear Channel Capability (CCC). The D channel is not CCC, as it must carry network signaling information (Roca, 1986).

The standard user/network interfaces of ISDN are indicated in Figure 5. There are four interfaces denoted alphabetically as R, S, T, and U. Interface U joins the network channel termination equipment, identified as Network Termination NT1, to the transmission line (perhaps 2B+D) that serves the ISDN switch. It is of most concern to the switched interexchange network. Interface T is between NT1 and NT2, where the latter could be the PBX trunk side

Table 5. Main ISDN Channels for the OSI Physical Access

CHANNEL	DATA RATE	SUPPORTED SERVICE
D	16 or 64 kb/s	Signaling or User Information
B	64 kb/s	Clear Channel Capability (CCC)
2B+D	144 kb/s	Basic Rate Interface (BRI) to Users
HO	384 kb/s	CCC
H11	1.536 Mb/s	CCC
23B+D*	1.544 Mb/s	Primary Rate Interface (PRI) for North America and Japan
H12	1.920 Mb/s	CCC
30B+D**	2.048 Mb/s	PRI for Europe
H4	135.168 Mb/s	CCC

* Equivalent to 4HO or 3HO+D

** Equivalent to 5HO

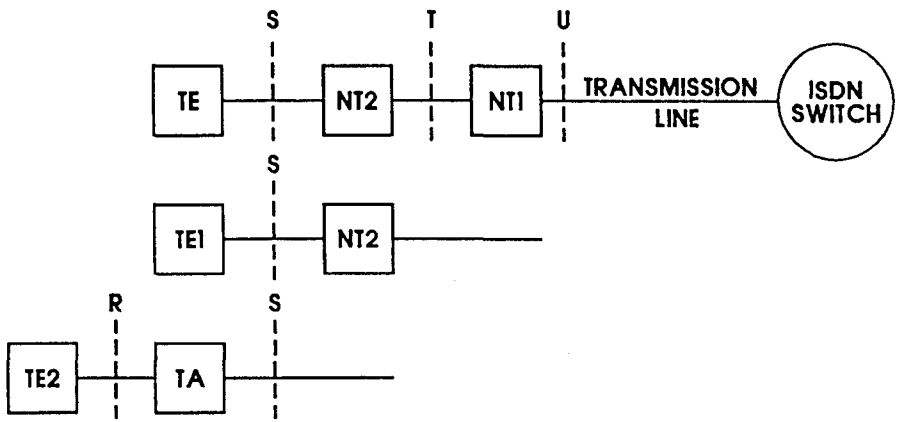

Figure 5. ISDN standard interfaces.

or a terminal controller. Interface S connects NT2 to either of several ISDN standard Terminal Equipments, TE or TE1, or to a Terminal Adaptor (TA). The TA is needed to provide ISDN services to non-ISDN Terminal Equipment (TE2).

As indicated in Figure 6, the ISDN switch needs four major functional elements that may or may not be separate physically. The four switch elements are a circuit switch, a channel switch, a packet switch, and a signaling switch (Minzer and Spears, 1989). On the network side these subswitches interface respectively with any number of circuit-switched subnetworks, private-line subnetworks, packet-switched subnetworks, and at least one signaling subnetwork with a dominant role for Signaling System #7. On the terminal side the switch faces the routing and signaling units. The routing unit interfaces with the Network Termination 1 (NT1), which performs all OSI Layer 1 functions. The dashed lines in this figure indicate the D channels. The solid lines denote the B or higher-rate H channels.

As seen from Table 5, the ISDN hierarchy allows for numerous high-rate channels. It has been noted in recent years that there is an increasing network trend toward the higher rates (Kraimeche and Schwartz, 1987). This activity, caused in part by optical fiber requirements, has long exceeded 100 Mb/s. Such capacities would accommodate the integration of all previous services plus such wideband signals as digital full-motion video. To distinguish it from the old ISDN, the expanded bandwidth network is called the Broadband ISDN (BISDN) (Haendel, 1989; Byrne et al., 1989). The BISDN systems are planned for joint, asynchronous and synchronous, multiplexing and switching functions. The Asynchronous Time Division (ATD) is performed in the Asynchronous Transfer Mode (ATM), which can be considered as an additional OSI Layer that straddles the top of Layer #1 and the bottom of Layer #2 (Haendel, 1989; Gechter and O'Reilly, 1989; Rider, 1989). ATM is responsible for bit transmission, as well as for packaging of bits into fixed size "cells," and appending them with labels and headers. In the ATM, cells are filled according to actual demand. That causes cells of a particular message exchange to exhibit an irregular arrival pattern. Channel rates for ATM are expected to be in the H2 to H4 range. The Synchronous Transfer Mode (STM) may be taken as sequentially filling all cells. It implies a circuit-switched operation, quite analogous to existing PSTN and narrowband

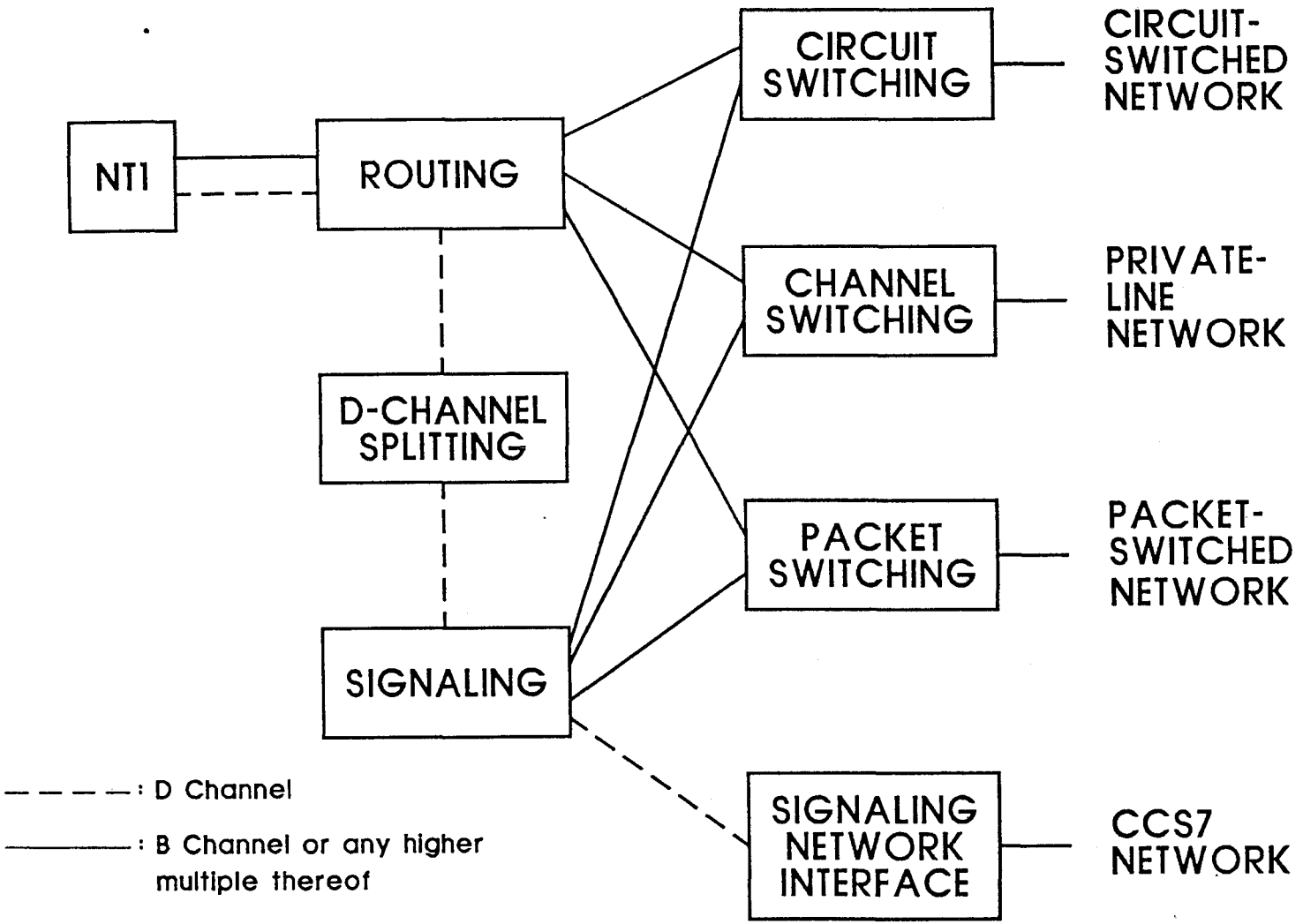

Figure 6. ISDN switch architecture.

ISDN. Much current work concerns BISDN, and it appears that ATM is succeeding by displacing STM as the main mode of the BISDN future.

SONET

The acronym SONET stands for Synchronous Optical Network. More significantly, it represents the newly adopted ANSI, CEPT, and CCITT standard for optical network interfaces (Boehm et al., 1986; Kaiser et al., 1987; Ballart and Ching, 1989). The SONET meets four key objectives:

- Because of the ever-increasing optical channel bit rates, such as from 100 to 1000 Mb/s and up, it provides a family of standard digital interfaces appropriate for these high rates.
- To accommodate the common DS-3 format of 44.736 Mb/s, SONET rate hierarchy is constructed on a base rate near 50 Mb/s.
- Since the current tendency of digital networks is a drift from asynchronous to plesiosynchronous, to synchronous operation, the SONET is intrinsically synchronous (e.g., in its internal multiplex), and yet it must be capable of working in a plesiosynchronous environment.
- Sufficient overhead capacity must be allocated for future controls plus Administration, Operations, and Maintenance (AO&M) functions.

Synchronization will be controlled by a Reference Frequency (RF), which in turn will be derived from several atomic clocks strategically located in the United States. The RF will keep SONET in phase, eliminating the need for bit stuffing and related complications. The necessary hardware and software for SONET facilities should appear by the 1990's.

The basic building block of the SONET rate hierarchy is called, at least in the United States, the Synchronous Transport Signal--Level 1 (STS-1). The line or Optical Carrier (OC) rate of STS-1 is 51.84 Mb/s. That rate is realized by repeating 8,000 times per second the STS-1 frame that consists of 9x90=810 8-bit bytes. The structure of the STS-1 frame is illustrated in Figure 7. Note that 27/810=1/30 of the total capacity is assigned to SONET Section and Line Overhead functions, definitions and details of which are still being studied. That leaves 783 bytes per frame for the Synchronous Payload Envelope (SPE). The SPE is further divided into 9 bytes for Path Layer Overhead and the remaining 774 bytes for actual clear channel capable (CCC) SONET payload. Observe that the 8,000-Hz frame rate agrees with DS format used here and abroad.

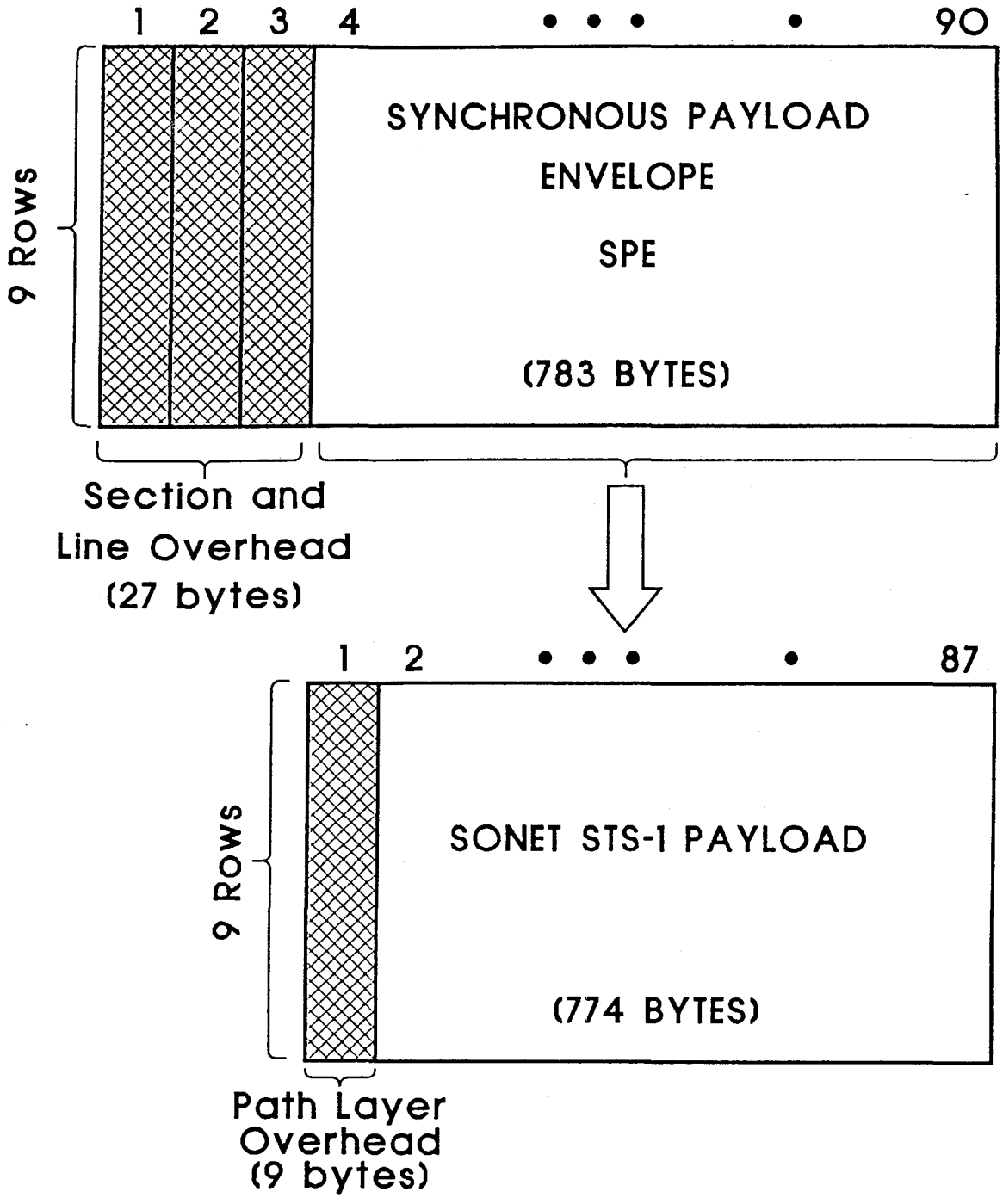

Figure 7. The STS-1 frame structure.

Table 6 lists the SONET data rate levels, starting with the basic STS-1. Its line rate of 51.84 Mb/s ensures a clear channel payload rate of almost 49.54 Mb/s, which suffices to transport the very common DS-3 rate of 44.736 Mb/s, as well as various combinations of DS-1 and DS-2. The next higher level, or STS-3, is constructed by byte-interleaving three STS-1's. The same procedure is repeated to generate STS-N's for all higher N values.

2.4 Characteristics and Tradeoffs

From the previous discussion (and other sources) it is evident that stand-alone terrestrial networks possess numerous characteristics and tradeoffs. In this section these tradeoffs are summarized in two parallel columns as "advantages versus disadvantages." To introduce some order in the procedure, the tradeoffs are grouped under specific network attributes, such as Topological Coverage, Traffic Capacity, and so forth.

Attribute: Topological Coverage

Advantages	Disadvantages
The widespread presence of the PSTN network offers almost nationwide connectivity for at least basic telecommunications services.	Single-homing leaves many regions vulnerable to node and link outages.
Fixed and well understood topology simplifies the functions of both manual and automated AO&M.	There are prohibitive costs associated with multihoming for a significant fraction of local exchanges.
	Large-scale reconstitution of in situ (hard wired) network topologies is too labor intensive, too expensive, and too slow.

Attribute: Traffic Capacity

Advantages	Disadvantages
Existing terrestrial networks have a sufficient overall capacity to handle most normal offered traffic loads.	Facility outages, traffic surges, and other calamities lead to network overloads.

Table 6. Selected SONET Signal Levels and Their Rates

LEVEL	OPTICAL CARRIER OC RATE (Mb/s)	CLEAR CHANNEL CCC RATE (Mb/s)
1	51.84	49.54
3	155.52	148.61
9	466.56	445.82
12	622.08	594.43
18	933.12	891.65
24	1,244.16	1,188.86
36	1,866.24	1,783.30
48	2,488.32	2,377.73
192	9,953.28	9,510.91

A great variety of traffic (i.e., service) mixes are routinely managed under normal circumstances.

The facilities have been engineered to operate during forecasted busy hours at nearly full capacity. The networks therefore are quite efficient and competitive.

The overloads typically degrade the end-user GOS, sometimes limiting their service access for extended periods of time.

Rapid traffic growth of wide-band services may exceed the terrestrial network capabilities in certain parts of the country.

Attribute: Internetworking of Different Transmission Media

Advantages

Different physical facilities (including transmission media), operated by different companies in different regions, represent a resilient technology with a broad technology base.

Interoperation of the different terrestrial networks has already given a rich blend of services to the end-users. More advantages are foreseen for the future.

Disadvantages

Interconnection as well as interfacing problems exist today between RBOC's, independents, and inter-LATA carriers.

Different media networks tend to require uniquely different protection and restoral measures for survivability under stress. Common or standard emergency strategies remain to be accepted and implemented.

Attribute: Different Types and Generations of Switches and Related Facilities

Advantages

Older switching machines represent a very mature, off-the-shelf technology. The capabilities and the economies of these switches are well known.

The still prevalent electro-mechanical switches are relatively immune to such hostile effects as HEMP.

Newer digital switches have more versatile controls, modular (remotable) design, much more speed, and traffic handling capability.

Disadvantages

There is incompatibility among older switches, as well as with the newer generations of switches.

Without CPU's (in some cases) or special add-on's, analog circuit switches cannot interface with the latest information and signaling systems, such as ISDN and Signaling System #7.

VLSI chips are very common design components of modern switches and their support (e.g., data base) systems. Unfortunately, VLSI's and especially their supporting software are vulnerable to HEMP effects.

Outage of one large-capacity switching node can create a very negative impact on the services provided by a terrestrial network. Example: the Hinsdale fire.

Attribute: Automated AO&M

Advantages

The relatively new trend to automated traffic management systems is based on claims of generally more efficient traffic handling, as well as on faster responses (routing, facility switchovers) in cases of sudden network malfunctions or overload.

AO&M automation depends on special software, which is becoming more powerful and more available.

Disadvantages

Automated controls, like the signaling systems, must be extremely reliable. If they were to fail, the burden of network restoration, administration, operation, and management would fall entirely on humans.

In the forecasted future there may be fewer manual-skills people around to rescue the huge failing network quickly enough.

There are serious concerns about control software security, given recent reports of computer viruses, worms, and other threats.

Fast, guaranteed restoration of automated AO&M seems quite expensive.

Attribute: Digital Cross-Connects (DSX)

Advantages

Recent introduction of broadband DSX devices enables an efficient handling (routing and concentration) of high-rate digital pipelines.

Future predictions indicate a more dominant role for DSX, with associated benefits for the terrestrial networks.

Certain customer controls are permitted in the DSX environment.

Disadvantages

Outage of any high-capacity pipe implies considerable amount of outages and blocking at node and terminal levels.

Automated standby protection switching is necessary.

Although theoretically that should not be a problem, timing and synchronization issues must be resolved for broadband DSX.

Attribute: Fiber Optic (FO) Systems

Advantages

Remarkable progress has been made in increasing the FO channel bandwidth and data rates, larger repeater spacing, and resultant low costs of FO systems per channel km.

The FO channel performance, such as BER, is quite good.

Fiber cables are easy to handle, compact, immune to EMI, and rugged enough for even the harshest of environments.

Effective means of physical interconnection (i.e., splicers, connectors, multiplexers, sources, detectors, etc.) have evolved for all kinds of fiber terminations.

Broadband standards, such as SONET, are being defined internationally. They will accommodate existing transmission rates and allow international cross connects at OC3 rate.

There are predictions of great future potential for photonics: integration of broadband digital transmission and switching, associated benefits for the next generation of long-haul networks.

Disadvantages

High channel concentration drives switches to larger sizes, more complexity, bigger unit investments.

When outages occur, the consequences are more serious. Note: The "BER>10^{-3}" outages have been observed to occur around .02 percent of the time.

Fiber cables are vulnerable to certain threats. Natural threats, such as gophers, lightning, or backhoes, can destroy the cable. Hostile threats, like nuclear radiation, lead to darkening and resultant transmission loss. The effects of HEMP can damage fiber cables with metal members.

FO systems require performance monitoring, protection switching, and standby facilities. Automation is essential.

Broadband standards need to evolve and change more rapidly for the FO technology to realize its full potential.

The impact of the predicted fully-integrated photonics may not reach practical systems before the next century.

Attribute: Microwave (MW) System Properties

Advantages

Including even the digital radios, the MW technology is relatively stable, mature, and available.

There are claims for potential future enhancements.

Disadvantages

Spectrum coordination problems are concerned with band congestion, antenna location, EMI, and regulations (FCC).

In certain geographic areas, MW systems require extra repeaters, space diversity, equalization, etc.

There are bandwidth efficient systems with 4 b/s/Hz and practical repeater spacing that yield BER not worse than 10^{-10} for most of the time.

BER outage thresholds of 10^{-3} are known to be exceeded around .02% of the time on both long- and short-haul circuits.

Due to rain and other fading effects, MW systems require performance monitoring and protection switching to spare channels, or some form of alternate routing.

3. CURRENT STATUS OF SATELLITE COMMUNICATIONS

In 1963, Syncom II was the initial communications satellite placed into a synchronous or Geostationary Orbit (GSO). Two years later, it was followed by the Early Bird, also known as INTELSAT I. Since that time, numerous other Intelsat, U.S. domestic, and international communication satellites have been launched. With relatively few exceptions, the majority of them are GSO.

3.1 Communications Satellite Technology

The launches, orbit assignments (equatorial E-W longitudes), and operations of the GSO satellites follow worldwide policies and regulations set by the International Telecommunication Union (ITU), or more specifically, by its subordinate International Radio Consultative Committee (CCIR) and the International Frequency Registration Board (IFRB). In the United States, the international coordination with IFRB, as well as the domestic authorizations and operational rules, are set by the FCC.

In this section, the emphasis is on U.S. domestic communications satellites. Being of the GSO type, the service provided by these satellites to fixed earth stations is also known as the Fixed Satellite Service (FSS).

Of course, not all satellite service is ordinary communications. We next briefly summarize all alleged U.S. satellites, followed by a more thorough review of the U.S. communication satellites.

Military

The U.S. Air Force Satellite Communications (AFSATCOM) system.

The Defense Meteorological Satellite Program (DMSP).

The Defense Satellite Communications System (DSCS), especially the DSCS II and III series of satellites.

The Fleet Satellite Communications (FLTSATCOM) system.

A satellite service called LEASAT, which is a Hughes Communications Service leased by the U.S. Army, Navy, and the Air Force.

The MILSTAR satellites.

The North Atlantic Treaty Organization (NATO) operates a multi-satellite GSO system, currently in its third or fourth generation.

The Satellite Communications (SATCOM) series. The SATCOM II system is the planned U.S. Navy replacement for FLTSATCOM and LEASAT systems.

Other Strategic Satellite Systems (SSS), such as those constituting the third phase of AFSATCOM.

Mobile

The International Maritime Satellite Organization (INMARSAT) provides maritime, ship-to-ship and ship-to-shore, mobile satellite services. The system leases space segments from INTELSAT, COMSAT, and the European Space Agency (ESA).

Maritime Satellite (MARISAT) system was a precursor to the INMARSAT, as well as an early support for the FLTSATCOM system.

Certain INTELSAT V satellites carry a Mobile Communications Subsystem (MCS). These MCS payloads are leased by INTELSAT to INMARSAT to provide international mobile satellite services under the label of INTELSAT V MCS.

Radiodetermination, Navigation and Tracking, and Data Relay

Radio location via Loran-C and digital message service is planned by the GEOSTAR system. Apparently, GEOSTAR will not launch its own satellites, but will be carried on the yet-to-be-launched SPACENET IIIR and GSTAR III.

A navigation satellite system, called NAVSTAR, is operated by the U.S. Air Force and provides position location services to the U.S. Government users.

STARFIND is a future system of five, or so, relatively small satellites. STARFIND will provide radiolocation services.

The Tracking and Data Relay Satellite System (TDRSS) is operated by the Space Communication Company (SPACECOM) for the National Aeronautics and Space Administration (NASA). The complete system will comprise two operational satellites plus an in-orbit spare. In addition to satellite, Shuttle, and Spacelab tracking support, TDRSS handles high data-rate relays required by space experiments and other activities.

TRANSIT is a U.S. Navy operated satellite system to offer navigation support for ships at sea.

Experimental Telecommunications

The Advanced Communication Technology Satellite (ACTS) is to be launched in the early 1990's. This experimental NASA satellite will operate in the Ka-band (30/20 GHz). It will feature fixed and movable spot beams, on-board switching, on-board remodulation, different burst rates, baseband processing, demand assigned TDMA networking, and associated controls. More about the ACTS technology and its implications will be presented in subsequent sections of this report.

Direct Broadcast

The U.S. Direct Broadcast Satellite (DBS) systems appear to be in a state of inactivity. Around 5 years ago, many companies competed for FCC authorization to offer video and other direct satellite broadcasts to residences and small user communities using, where appropriate, the Very Small Aperture Terminal (VSAT) earth station technology. FCC authorizations were given to four companies: The Advanced Communications Corporation (ACC); Dominion Video Satellite; Hughes Communications Galaxy, Inc.; and the United States Satellite Broadcasting Company (USSB). Several others, such as Direct Broadcast Satellite Corporation (DBSC); DIRECTSAT Corporation; Continental Satellite Corporation; Orbital Broadcasting Company; and Tempo Satellite, Inc., have either filed for or have received various design or construction permits. However, at this time due to many economic reasons, there is no operational DBS in service in the U.S., and none is expected in the near future.

Weather and Remote Sensing

The National Oceanic and Atmospheric Administration (NOAA) operates two different weather satellite systems. They are the Geostationary Operational Environmental Satellite (GOES) system and the Television and Infrared Observation Satellite (TIROS), which is in polar orbit. The familiar cloud-cover pictures in television weather broadcasts are typical products of GOES. TIROS data and photographs are generally used by meteorologists for weather analysis and forecasting.

Multispectral scanning and thermal mapping of the Earth is done by LANDSAT satellites. LANDSAT is a joint venture by the U.S. Department of Commerce (DOC) and the U.S. Earth Observation Company (EOSAT).

Earth Observation System (EOS) is run by the EOSAT.

Block 5D-2 satellite is formally part of DMSP, but its service is also available to the civilian community.

Communications Satellites

The geostationary (or FSS) communications satellites represent at least three stages of implementation. First, there are the operational satellites, which are in orbit and are currently being actively used. A subclass of these are ready spares, which are also in GSO, but are kept in reserve to serve as backup for one or more existing services. Second, there are the FCC authorized but unlaunched communication satellites. The nearly ready unlaunched or reserves, which for several reasons happen to be still on the ground, appear to fall in this category. Finally, the third group consists of so-called planned satellites. In this case the sponsoring companies or organizations have received FCC understanding or partial authorization to go ahead with planning, research, development, partial implemention, and testing on certain subsystems, but they have not been authorized to launch and operate.

Currently, nine U.S. companies operate domestic FSS satellites. In alphabetical order they are listed below:

Alascom, Inc. (Wholly owned subsidiary of Pacific Telecom, Inc., which in turn is a wholly owned subsidiary of Pacific Power & Light Co.)

American Telephone and Telegraph Co. (AT&T)

Communications Satellite Corporation (Comsat or Comsat General)

Contel Information Systems (Contel ASC)

GE American Communications (GE Americom)

General Telephone and Electronics Corp. (GTE)

Hughes Communications Galaxy, Inc. (Subsidiary of GM)

MCI Telecommunications Corporation

Satellite Transponder Leasing Corp. (STLC, a subsidiary of IBM).

A typical owner/operator from the above list operates one or more GSO satellites. Table 7 lists 30 operational satellites as cataloged at the end of 1988.

The first column gives the names of the satellites, such as ASC-1, AURORA I, COMSTAR D2, ..., WESTAR V, in alphabetical order. The second column repeats the above-mentioned organization that either owns or operates the satellite. The third column is the year of the launch. The fourth column gives in years the expected useful life for the satellite as planned at the time of the launch. Some satellites, such as COMSTAR D2, SBS-1, and Westar III, have already exceeded their initial life expectancy. However, due to the gradual depletion of fuel and other energy sources, their orbit-keeping and communication roles have diminished. For present and future planning, these over-aged satellites serve a limited, perhaps a standby or reserve, role.

The fifth column lists the uplink (earth-to-satellite) and downlink (satellite-to-earth) transmission frequencies in gigahertz (GHz). For the early GSO satellites, the common frequencies were in the C-band at 6/4 GHz. The authorized occupied bands extend from 5.925 to 6.425 GHz on the uplink and from 3.700 to 4.200 GHz on the downlink. Starting with the SBS series in the early 1980's, the 14/12 GHz frequencies in the Ku-band began to be exploited. In the Ku-band the allowed emissions are between 14.000 and 14.500 GHz on the uplink and between 11.700 and 12.200 GHz on the downlink.

The sixth column lists the number of channel transponders aboard the spacecraft. Not all of them need be active all the time. Some could be spares by design, others inactive due to business decisions. The seventh column shows the channel bandwidths of the transponders in MHz. The existing transponder bandwidths range from 36 to 72 MHz; however, the majority of the communication satellites tend to have 24 channels, each with a bandwidth of 36 MHz. A quick calculation shows that the total bandwidth of such 24 channels, including more than 10 percent guard-bands, must be around 1,000 MHz.

The way that satellite designers fit this 24-channel set into a 500-MHz allocation is by alternating adjacent-channel polarizations from vertical to horizontal. Or stated in another way, the guard-space between two channels of the same polarization is overlapped by the center frequency of the opposite polarization. Table 8 illustrates this polarization hopping for both uplink and

Table 7. Operational U.S. Domestic Fixed Satellite Service

NAME OF SATELLITE	OWNER/ OPERATOR	YEAR OF LAUNCH	EXPECTED LIFE AT LAUNCH (IN YEARS)	UP/DOWN FREQUENCIES (in GHz)	NUMBER OF TRANSPONDERS	TRANSPONDER BANDWIDTH (in MHz)	BEAM COVERAGE	TELECOMMUNICATION SERVICES
ASC-1	CONTEL	1985	9	6/4 6/4 14/12	12 6 6	36 72 72	All 50 States All 50 States 48 States	Voice, Data, Video and Private Network Service
AURORA I	ALASCOM	1982	10	6/4	24	36	All 50 States	Private Line, Message, Data and TV
COMSTAR D2 COMSTAR D4	COMSAT GENERAL	1976 1988	7 7	6/4 6/4	24 24	36 36	All 50 States and Puerto Rico	Transponder Service, DS-1 Level Restoral (SAFECOM) but NO Video
GALAXY I GALAXY II GALAXY III	HUGHES	1983 1983 1984	10 9 9	6/4 6/4 6/4	24 24 24	36 36 36	All 50 States	TV, Voice and Data on Video and Audio-subcarrier Channels
GE SATCOM K-1 GE SATCOM K-2	GE AMERICOM	1986 1985	10 10	14/12 14/12	16 16	54 54	48 States and Reigonal	Mostly TV, Some Voice, Data and Radio
GSTAR I GSTAR II GSTAR III•	GTE	1985 1986 1988	10 10 10	14/12 14/12 14/12	16 16 16	54 54 54	48 States and Regional	Voice, Data, Video (different period leases)
SATCOM IR SATCOM IIR SATCOM IIIR SATCOM IV	GE AMERICOM	1983 1983 1981 1982	10 8 9 10	6/4 6/4 6/4 6/4	24 24 24 24	34 34 34 34	48 States and Alaska	Mostly TV and Audio. Some Telephone, Telegraph and Data
SBS-I SBS-II SBS-III SBS-IV (STLC-1) SBS-V (STLC-2)	MCI TELECOM STLC	1980 1981 1982 1984 1988	7 7 7 7 10	14/12 14/12 14/12 14/12 14/12	10 10 10 10 14	43 43 43 43 43	48 States and Regional	TV, Telephone and Data TV, Digital Voice and Data
SPACENET I SPACENET II SPACENET III	GTE	1984 1984 1988	7 7 7	6/4 6/4 14/12 6/4 6/4 14/12 6/4 6/4 14/12	12 6 6 12 6 6 12 6 6	36 72 72 36 72 72 36 72 72	All 50 States All 50 States 48 States All 50 States All 50 States 48 States All 50 States All 50 States 48 States	Video, Audio, Telephone, Telegraph and Data All of the above plus Radio Determination
TELSTAR 301 TELSTAR 302 TELSTAR 303	AT&T	1983 1984 1985	10 10 10	6/4 6/4 6/4	24 24 24	36 36 36	All 50 States and Puerto Rico	Private Line Data (up to T1 rate), TV and Video Teleconferencing
WESTAR III WESTAR IV WESTAR V	HUGHES	1979 1982 1982	7 10 10	6/4 6/4 6/4	12 24 24	36 36 36	All 50 States	Voice, Data, Occasional TV TV, Voice and Data TV, Voice and Data

• Launched but perhaps not yet operational

Table 8. C-band Frequency Plan for Contel ASC-1

Channel or Transponder Number	Center Frequency (MHz)			
	Uplink		Downlink	
	V-Pol	H-Pol	V-Pol	H-Pol
36 MHz Transponders				
1	5945			3720
7		5965	3740	
2	5985			3760
8		6005	3780	
3	6025			3800
9		6045	3820	
4	6065			3840
10		6085	3860	
5	6105			3880
11		6125	3900	
6	6145			3920
12		6165	3940	
72 MHz Transponders				
13	6205			3980
16		6225	4000	
14	6285			4060
17		6305	4080	
15	6365			4140
18		6385	4160	

downlink C-band frequency plans of the Contel ASC-1 satellite. The example is somewhat atypical, in that it combines 36- and 72-MHz channels. Of course, with various modulation and multiplexing techniques available today, many analog and digital signal formats can be carried on these transponders. However, broadband signals (e.g., the SONET rates) do not fit the satellite channel hierarchies.

Beam coverage is very briefly indicated in column eight. All the domestic satellites cover the 48 continental adjacent states (CONUS), plus to various degree, some other areas. These other areas can include Alaska, Hawaii, Puerto Rico, and adjacent regions near the CONUS. The brief tabulated comment in regard to the extent of coverage area fails to reflect the fact that the Effective Isotropic Radiated Power (EIRP) spatial density varies over the geography of interest. Figure 8 illustrates a typical C-band EIRP contour over all 50 states. The satellite in this example is ASC-1, in GSO at 128° West Longitude (WL). Note that the 48-state CONUS can almost everywhere count on an EIRP of 34 dB or better. However, dependable reception in Alaska is somewhere between 30 and 33 dB, while Hawaii must be satisfied with an EIRP level slightly above 28 dB.

The Ku-band antenna footprints are normally narrower than those of the C-band. That means that the 14/12 GHz services have potential for more pronounced EIRP variations over the coverage geography. Figures 9, 10, and 11 depict typical Ku-band EIRP contours of the GSTAR I satellite, parked in orbit at 103° WL. Figure 9 shows the CONUS beam, which implies an EIRP of at least 37 dB for all 48 states. The beam also reveals three regional peaks. The highest of these is 45 dB, located near St. Louis, MO. Figure 10 shows the Ku-band east regional beam. In a region between Pittsburgh, PA, and Memphis, TN, nearly 47 dB may be realized. Finally, the Ku-band west regional beam of Figure 11 extends from Texas to the Pacific and from Mexico to Canada. In this large expanse, it offers an EIRP of at least 40 dB. In some localities, such as Southern California, Nevada, and Arizona, 45 dB appear possible.

The ninth and final column indicates the types of telecommunication services provided. Individually, transponders may be dedicated to a specific service class, such as circuit switched voice (telephony), one of many types of data, video (TV), private networking, etc. However, given the 36 or more transponders as a whole, a typical FSS satellite carries a mixture of said services.

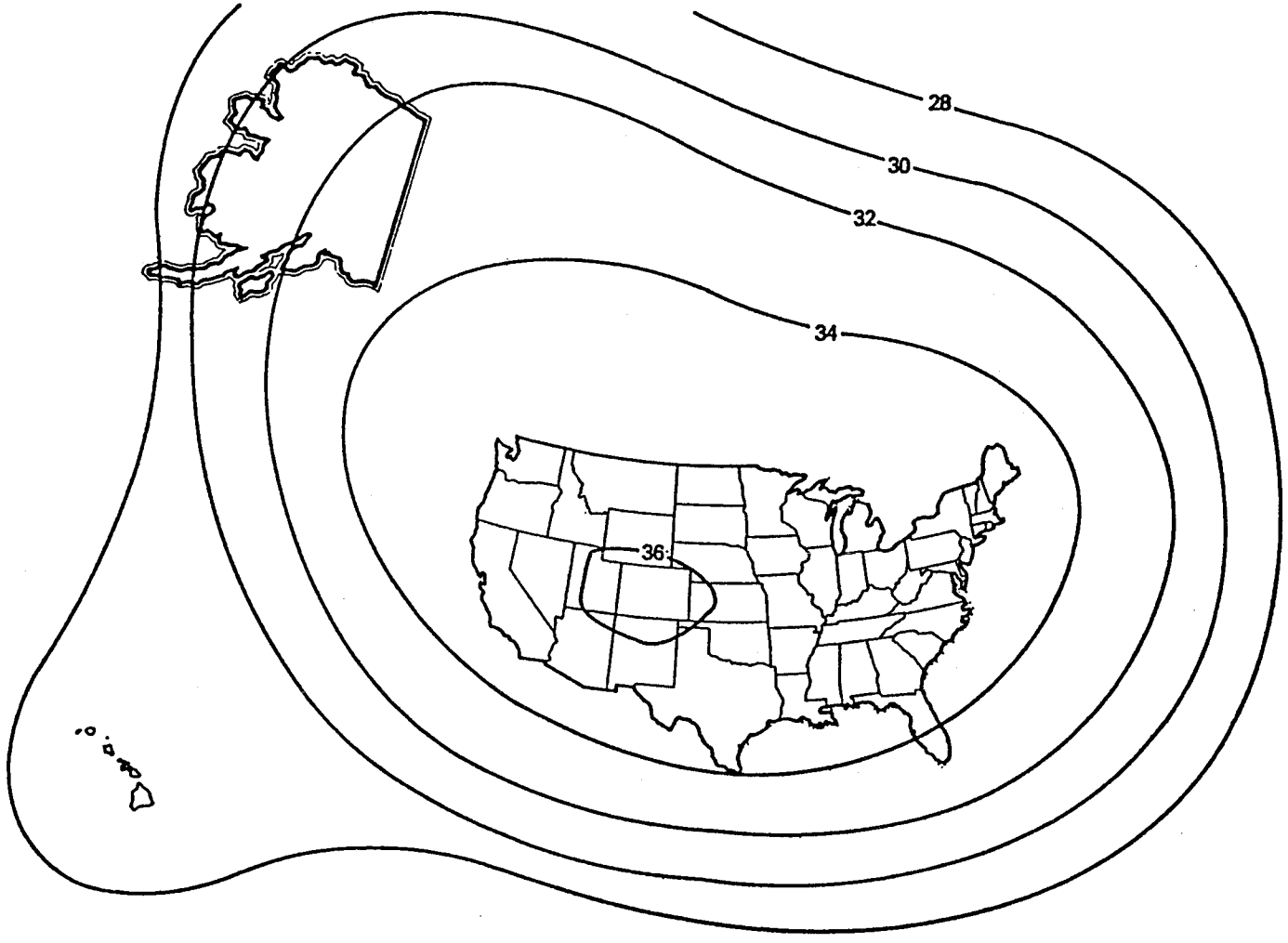

Figure 8. Typical C-band EIRP contour for ASC-1, 50-state beam, from 128° WL [from Phillips Publishing, 1987].

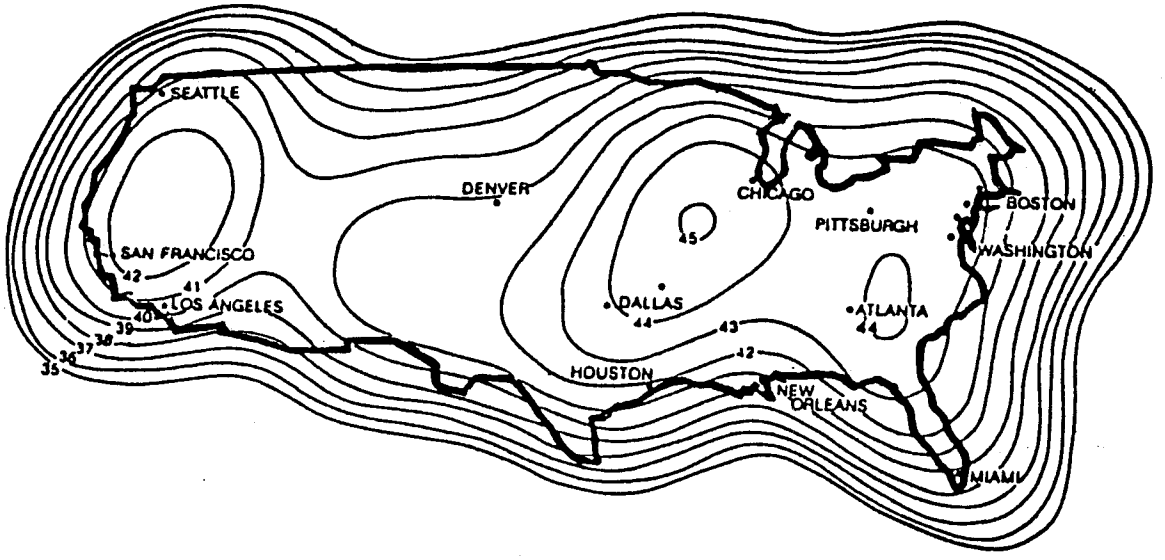

Figure 9. Typical Ku-band EIRP contour for GSTAR I, CONUS beam, from 103° WL [from Satellite Systems Engineering, 1989].

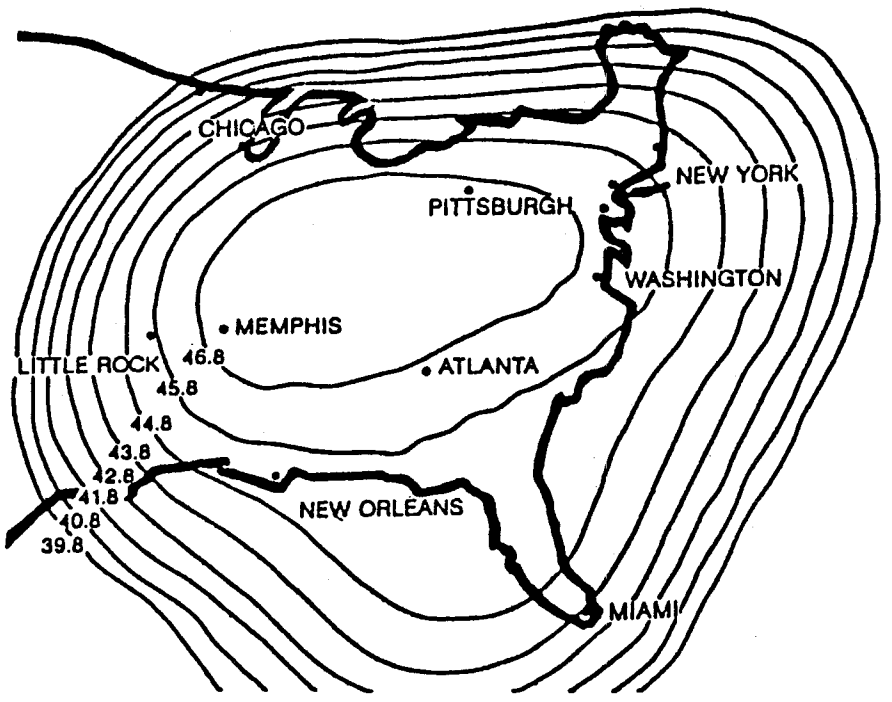

Figure 10. Typical Ku-band EIRP contour for GSTAR I, east regional beam, from 103° WL [from Satellite Systems Engineering, 1989].

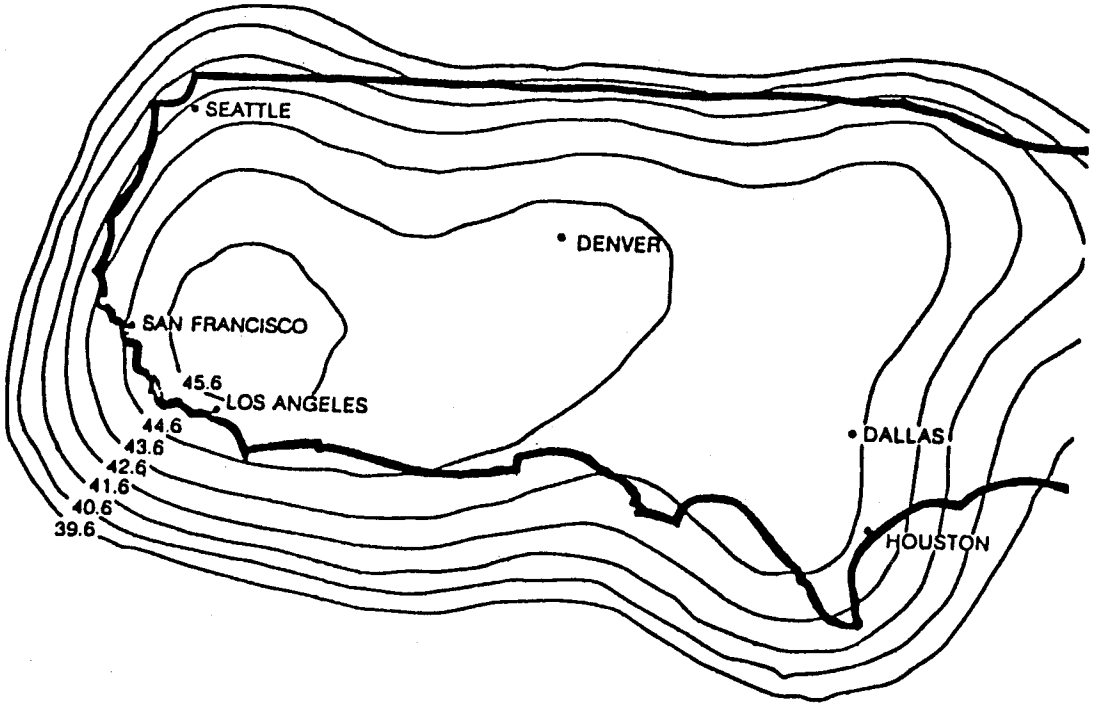

Figure 11. Typical Ku-band EIRP contour for GSTAR I, west regional beam, from 103° WL [from Satellite Systems Engineering, 1989].

As an example, the Telstar satellites of AT&T now offer the tariffed Skynet services, individually known as the Skynet Transponder Service, the Skynet Television Service, the Skynet Digital Service, and perhaps several others.

The Skynet Transponder Service provides 36 MHz channels for full-time, large bandwidth signals, such as rebroadcast television. Full-time transponders can be leased for periods that are as short as 1 month or as long as 10 years. Various degrees of outage and/or preemption protection are available. Partial and part-time transponder service is also offered, together with different usage options.

Skynet Television Service carries broadcast-type video plus audio. It is offered on full- or part-time basis. The service is two-way, but not necessarily simultaneously. For part-time use, several options are provided for transmit-receive sharing. Dedicated and shared earth-station facilities on customer premises are offered in such high-usage areas as California, Illinois, and New York. The Skynet Television Service may be combined with the Skynet Transponder Service to meet the requirements of exceptionally large volume customers.

Skynet Digital Service allows any transmit/receive mix of voice, data, and compressed video, with data rates ranging from 56 k/bs (partial DS-0) to 1.544 M/bs (DS-1), and multiples thereof. Compatible terrestrial interconnect with the T-carrier is possible at the ACUNET T1.5/SKYNET T1.5 level. Earth stations can be dedicated or shared. Service modes can vary from one-way, two-way, to multipoint broadcasts. The space segment is provided with spare transponders for outage and preemption protection.

On the future Ku-band satellites, Telstar may offer more advanced services. An example may be the Skynet Star Network Service. It will implement private, customer-designed, star-topology networks to provide such services as one-way, two-way (interactive), and one-to-many broadcast digital data, as well as broadcast video.

So far only the service menu for the Telstar satellites has been described. But, all the remaining operational satellites in Table 6 do appear to offer almost as many and as diverse service options as do the Telstars. To list and to describe them all here would require too much space in this report.

Five organizations have been authorized by the FCC to launch and to operate additional communication satellites. They are the previously mentioned Contel ASC, Hughes, GTE, STLC, and a joint venture between the former RCA (now GE) and the Home Box Office (HBO), called Crimson. Table 9 lists the eight so far authorized, but not yet launched, U.S. domestic satellites. The column format in this table is the same as that in Table 6. Note that, except for the two C-band Hughes satellites and the hybrid C-band plus Ku-band Contel ASC-2, the remaining five new satellites are all to be in the Ku-band. The beam coverage areas vary from all 50 states to 48-state CONUS, plus regional beams. The licensed telecommunication services are to be various mixes of voice, data, television, and provision of private networks.

At least six, and perhaps several more, organizations have additional systems in various planning or development stages. Generally, these systems have not yet been authorized by the FCC to either build, launch, or operate. The companies are Alascom, AT&T, Contel, GE Americom, Hughes, and the National Exchange, Inc. All together, they are working on at least 18 satellites. Table 10 lists these planned, not authorized to either build, launch, or operate, U.S. domestic FSS satellites. The interesting thing to note about these future communication satellites is the fact that CONTELSAT-2 proposes to be the first to venture into the Ka-band, namely at 30/20 GHz, and that SPOTNET-1 and SPOTNET-2 promise to offer spotbeams with transponder bandwidths as high as 167 and 250 MHz.

3.2 ACTS Satellite

The Advanced Communications Satellite (ACTS) is now under development and scheduled for launch in 1992. It is the main focus of NASA's communications research and development program. Key ACTS technologies include (Wright, 1986; Jirberg, 1989)

- antennas with high-powered electronically hopping multiple beams, plus others that include a fixed-beam antenna for CONUS-coverage
- onboard processing and switching. This boils down to onboard routing of traffic, instead of the traditional fixed "bent pipe" routes through other satellites
- Ka-band transmitters and receivers, instead of C-band or Ku-band

Table 9. Authorized (Not Launched) U.S. Domestic Fixed Satellite Service

NAME OF SATELLITE	OWNER/ OPERATOR	TENTATIVE		UP/DOWN FREQUENCIES (in GHz)	NUMBER OF TRANSPONDERS	TRANSPONDER BANDWIDTH (in MHz)	BEAM COVERAGE	TELECOMMUNICATION SERVICES
		YEAR OF LAUNCH	EXPECTED LIFE AT LAUNCH (IN YEARS)					
ASC-2	CONTEL	1991	8	6/4 6/4 14/12	12 6 6	36 72 72	All 50 States All 50 States 48 States	Voice, Data, Video and Private Network Service
GALAXY IV	HUGHES	1992	9	6/4	24	36	All 50 States	TV, Voice and Data
GE K-3	CRIMSON/GE+HBO	1989	10	14/12	16	54	48 States and Regional	TV, Voice, Data and Radio
GSTAR III GSTAR IV	GTE	1989 1990	10 10	14/12 14/12	16 16	54 54	48 States and Regional	Voice, Data and Video (different period leases)
SBS-5 (STLC-2) SBS-6 (STLC-3)	STLC	1989 1990	10 10	14/12 14/12	14 19	43 43	48 States and Regional	TV, Digital Voice and Data
WESTAR VI S	HUGHES	1989	10	6/4	24	36	All 50 States	TV, Voice and Data

Table 10. Planned (Not Authorized) U.S. Domestic Fixed Satellite Service

NAME OF SATELLITE	OWNER/ OPERATOR	TENTATIVE		UP/DOWN FREQUENCIES (in GHz)	NUMBER OF TRANSPONDERS	TRANSPONDER BANDWIDTH (in MHz)	BEAM COVERAGE	TELECOMMUNICATION SERVICES
		YEAR OF LAUNCH	EXPECTED LIFE AT LAUNCH (IN YEARS)					
AURORA II	ALASCOM	1991	10	6/4	24	36	All 50 States	Private Line, Message, Data and TV
CONTELSAT-1	CONTEL	> 1990	8	6/4 14/12	24 16	36 54	All 50 States 48 States	Voice, Data, Video and Private Network Services
CONTELSAT-2		> 1990	8	6/4 14/12 30/20	46	TBD*	TBD	
GALAXY IR	HUGHES	> 1990	10	6/4	24	36	All 50 States	TV, Voice and Data
GALAXY IIR		> 1990	10	6/4	24	36	All 50 States	
GALAXY IIIR		> 1990	10	6/4	24	36	All 50 States	
GALAXY V		> 1990	10	6/4	24	36	All 50 States	
GALAXY C		> 1990	TBD	14/12	8 16	52 26	TBD TBD	
GALAXY D		> 1990	TBD	14/12	8 16	52 26	TBD TBD	
GE K-4	GE AMERICOM	1990	10	14/12	16	27 AND 54	48 States and Regional	TV, Voice, Radio and Data
H-1	GE AMERICOM	> 1990	10	6/4 14/12	24 16	36 54	TBD TBD	TV, Voice, Data, Radio and Non-common Carrier Service
SPOTNET-1	NATIONAL EXCHANGE	> 1990	TBD	6/4 14/12	24 18	36 167 and 250	All 50 States Spot Beams	To Be Determined
SPOTNET-2		> 1990	TBD	6/4 14/12	24 18	36 167 and 250	All 50 States Spot Beams	
TELSTAR 401	AT&T	1993	TBD	6/4 14/12	24 24	36 36	50 States & P.R. TBD	Private Line, Data (up to T1 rate), TV and Video Teleconferencing
TELSTAR 402		1994	TBD	6/4 14/12	24 24	36 36	50 States & P.R. TBD	
TELSTAR 403		> 1994	TBD	6/4 14/12	24 24	36 36	50 States & P.R. TBD	
WESTAR IVR	HUGHES	> 1990	TBD	6/4	24	36	All 50 States	TV, Voice and Data
WESTAR VR		> 1990	TBD	6/4	24	36		

* TBD - To Be Determined

- time-division multiple access (TDMA) instead of the more familiar frequency-division multiple access (FDMA)
- serial minimum-shift keying (SMSK) as the standard ACTS modulation format
- rain fading protection and forward error correction (FEC) coding instead of plain power control
- high and low information rates, as well as high and low burst rates, for different link circumstances.

Key ACTS Characteristics

The ACTS antenna beams and their coverage areas are shown in Figure 12. As a set, these antennas can support at least several dozen earth stations in the United States. The hopping spot-beam antennas are polarized either vertically or horizontally. The fixed spot-beams can be polarized to fit local and satellite requirements. Two larger scan antennas cover regions denoted as east and west scan sectors, respectively. Together these scan sectors cover the area from the Eastern seaboard to Chicago, IL. Finally, the steerable antenna footprint (not explicitly shown in Figure 12) can be used to cover all the 50 states, from Maine to Hawaii and Alaska.

Figure 13 offers a tentative outline of the ACTS communications electronics package (CEP) onboard the satellite. There are two parallel switches to be noted: the high burst rate (HBR) microwave switching matrix and the low burst rate (LBR) baseband processor (BBP). Signals enter and exit these two switches through common loops of waveguide redundancy switches (also called the three-way microwave or "baseball" switches). The loops in turn provide direct ports to the previously discussed satellite antennas. The downconverted IF can be switched through either switch. The BBP has the capability to act as a switchboard in the sky, routing individual messages according to the hop cycles and providing low data rate (such as 64 kb/s) connectivity to end users.

The ACTS radio frequencies are in the Ka-band. That means that the uplink spectrum is near 30 GHz and the downlink spectrum is near 20 GHz. More precisely, as illustrated in Figure 14, the uplink spectrum extends from 27.5 to 30.0 GHz. Below the center of the band (the center being defined as 29.420 GHz) one finds either the narrow or wide channel LBR. The LBR spectrum can be generated either by FEC-coded or uncoded signals. The HBR band is centrally

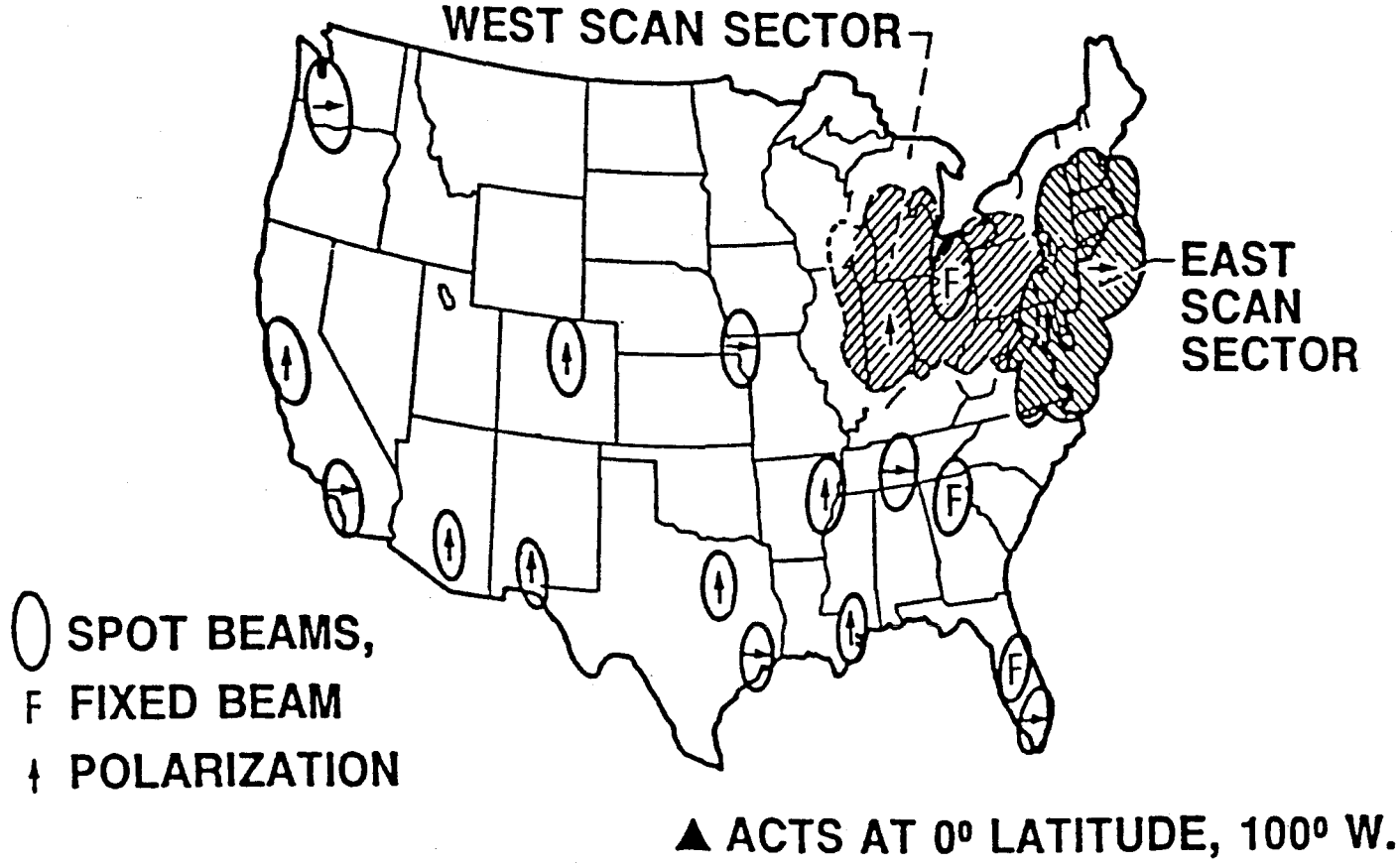

Figure 12. ACTS antenna coverage.

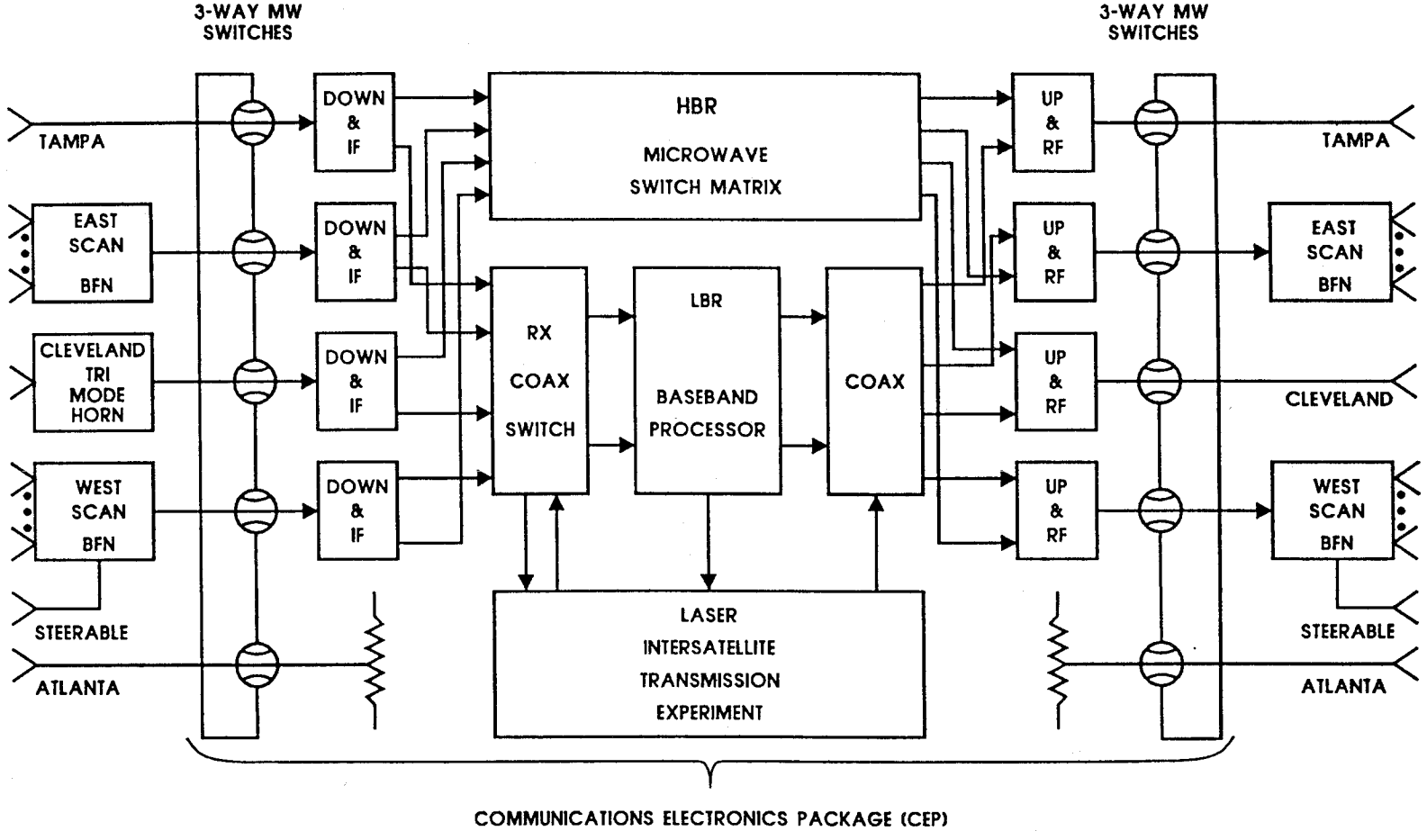

Figure 13. Onboard switching in the ACTS communications electronics package.

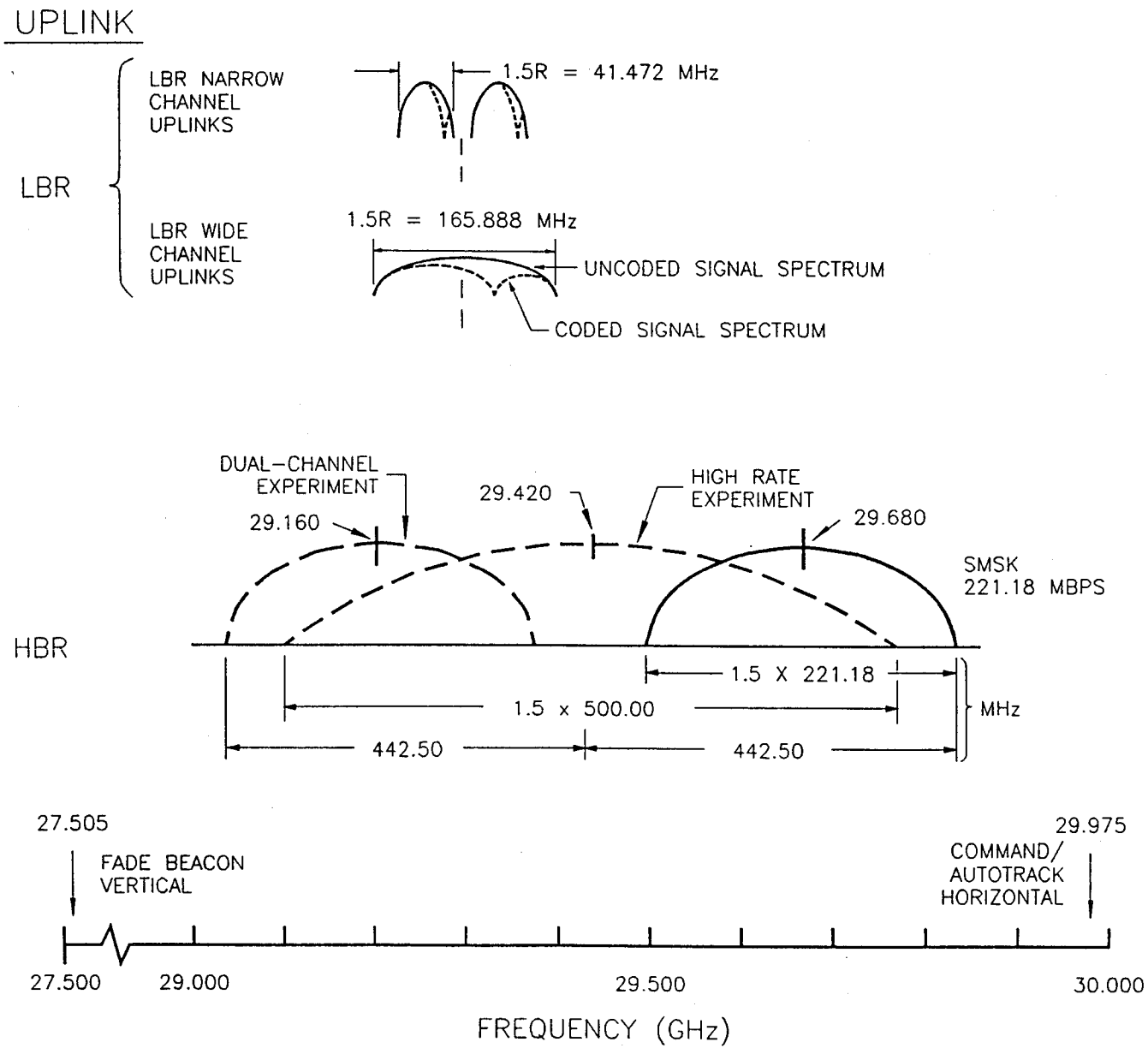

Figure 14. Uplink spectrum at 30 GHz.

located and 885 MHz wide. It has channel-space for planned ACTS communications experiments, plus the previously mentioned SMSK modulated data. Briefly, SMSK is a simplified phase-continuous version of both PSK and MSK. By using appropriate conversion filters and clock recovery circuits, SMSK is claimed to save nearly 50 percent of modem implementation costs (Jirberg, 1989). Yet it yields the same BER performance and a not insignificant improvement in spectral efficiency.

The downlink spectrum, see Figure 15, is very similar to the uplink spectrum. The center frequency is shifted down to 19.700 GHz and the HBR band is reduced slightly to 862 MHz. Downlink telemetry replaces uplink command/autotrack at the high frequency edge of the band. Fade beacons, necessary for FEC and channel data rate control, are moved to the other side of the band.

Data rate control deals with the channel burst rates and the end-user information rates. Table 11 summarizes their numerical values for the HBR, LBR-1 (wideband), LBR-2 (narrowband), and other tentative microwave transmissions. Note that information rate is specified in megabits per second (Mb/s), while depending on binary or quaternary phase modulation, the burst rate is expressed in mega-symbols per second (Ms/s). For binary modulation the two measures are indistinguishable. The FEC coding applies only to the LBR mode. It provides for a 2:1 reduction in the burst rates and a 4:1 reduction for information rates.

ACTS Network Concept

Figure 16 presents a simplified overview of the ACTS network concept. Note that different user terminals have different burst rate capabilities. The values shown represent the same modes, plus their more precise numbers, depicted earlier in Table 11. A very central role is played by the NASA Master Control Station (MCS). It controls many functions of the ACTS satellite. Included are the tasks of beam pointing/hopping, FEC and data rate coordination on fading channels, as well as TDMA traffic management. Traffic management pertains to all LBR and the HBR stations and terminals who attempt to use the ACTS network.

The following is a brief sketch of the traffic management process. First, a contending terminal transmits its service request via ACTS to the MCS. Second, the MCS processes the request and decides on further action, such as either

DOWNLINKS

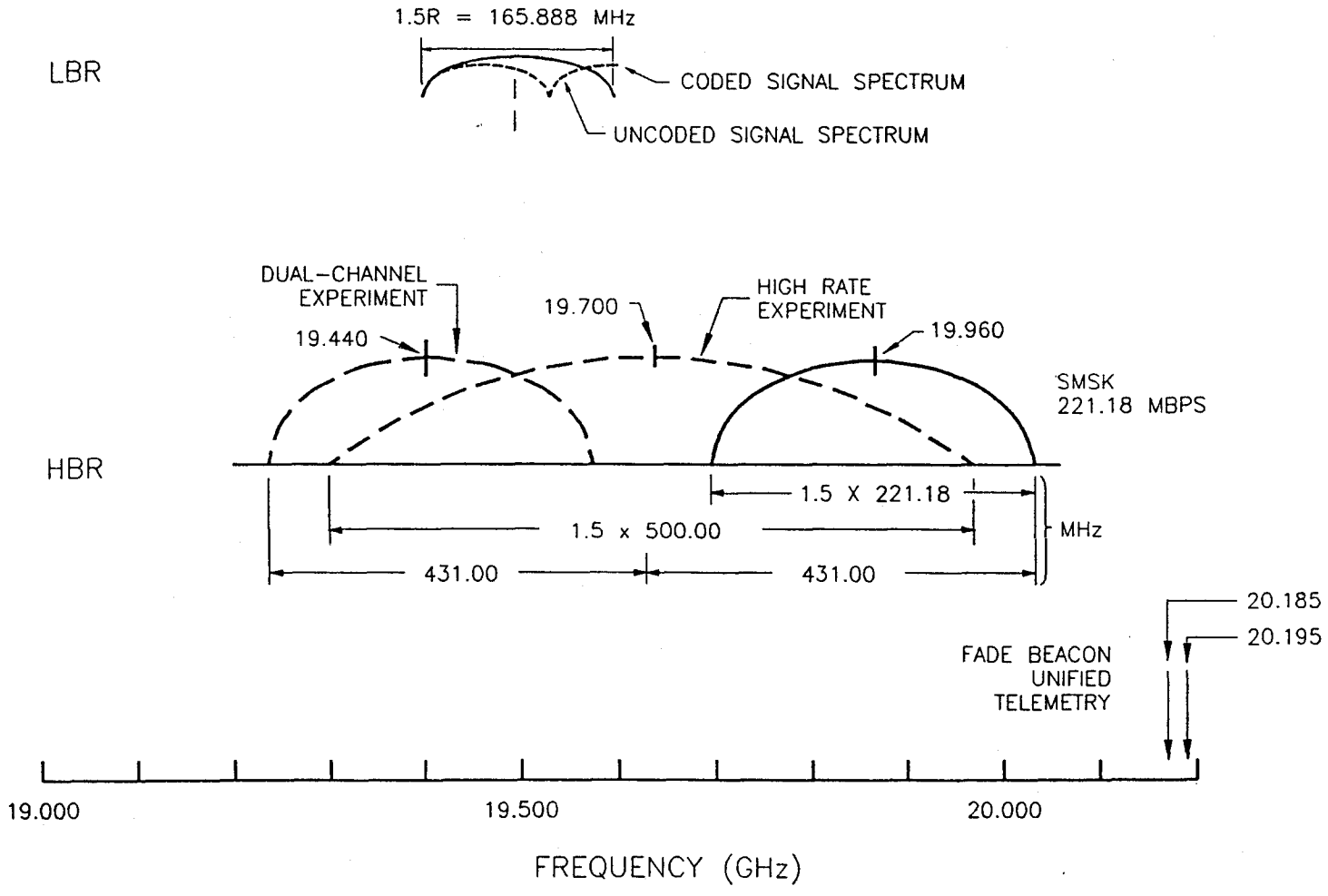

Figure 15. Downlink spectrum at 20 GHz.

Table 11. Channel Rates for the ACTS Experiments

	BURST RATES (Ms/s)		INFORMATION RATES (Mb/s)	
	UPLINK	DOWNLINK	UPLINK	DOWNLINK
HBR	221.184	221.184	221.184	221.184
LBR-1 (Uncoded)	110.592	110.592	110.592	110.592
(Coded)	55.296	55.296	27.648	27.648
LBR-2 (Uncoded)	27.648	110.592	27.648	110.592
(Coded)	13.824	55.296	6.912	27.648
MICRO-1	13.824	55.296	6.912	27.648
MICRO-2	TBD *	TBD	TBD	TBD

* To Be Determined

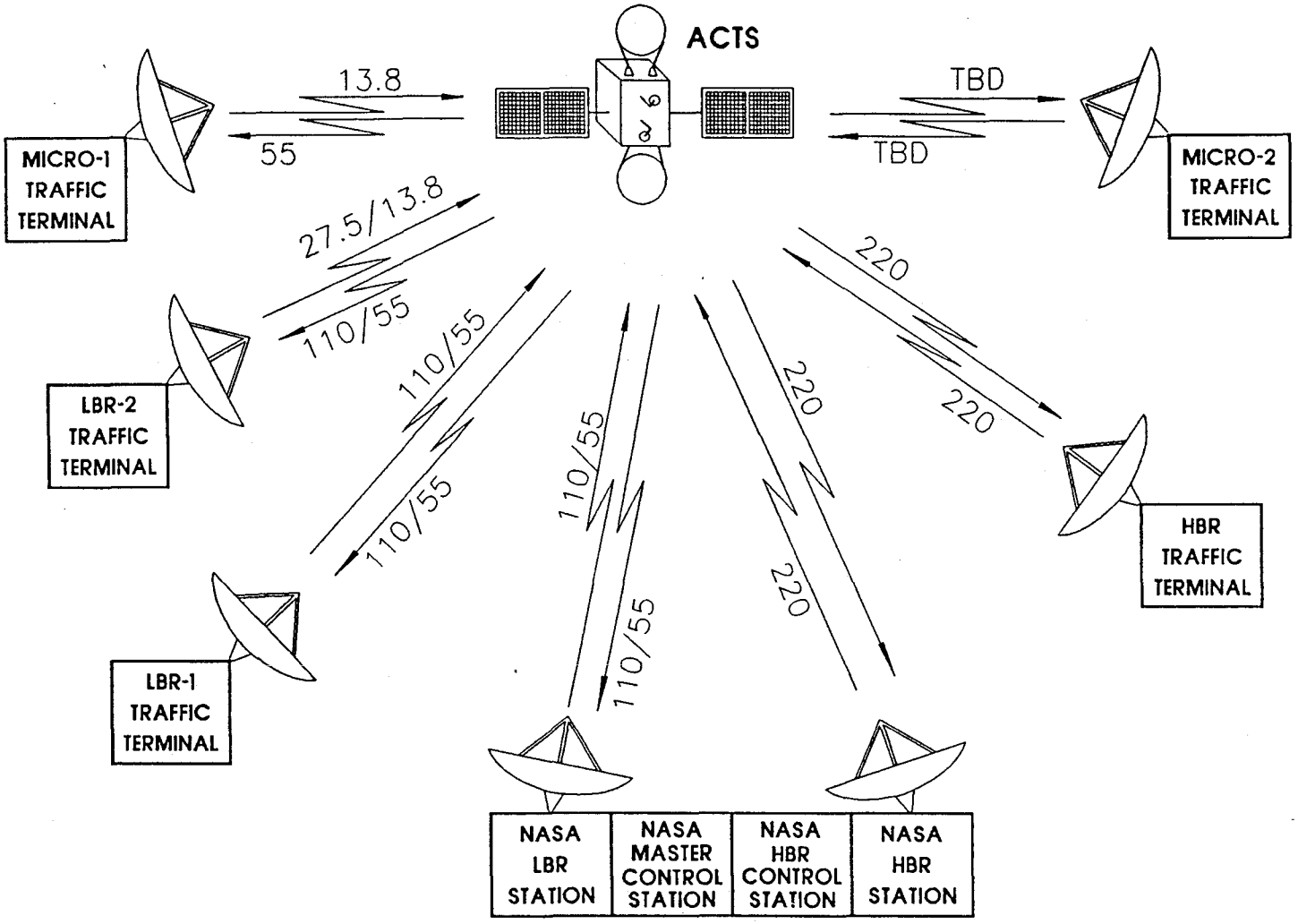

Figure 16. Conceptual plan of ACTS network and terminals.

giving address/routing for permitted calls or service denial for others. Third, the MCS passes relevant address instructions to the satellite switch, which sets up the TDMA connection and alerts the terminals involved. During a successful session, MCS plays a minimal role. However, when the communication session is over, MCS and the ACTS satellite cooperate in effect by clearing unused channels and making them available for next would-be users.

The final comment of this section concerns the compatibility of ACTS channel rates with those employed or planned elsewhere. A quick glance at microwave system rates (Table 1), existing lightwave hierarchies (Table 2), ISDN data rates (Table 5), and the recently standardized broadband SONET or STS rates (Table 6), reveals that they have little numerical agreement with the ACTS data rates of Table 11. If the rates remain as specified now, network interoperation would require rate conversion interfaces. In real-time operation lower rate channels must feed into equal or higher rate channels. Even when one is quite careful, unequal-rate trunking leads to network capacity inefficiencies and associated economic losses.

3.3 Characteristics and Tradeoffs

As was done earlier in Section 2.4 for terrestrial networks, this section summarizes the main characteristics, advantages and disadvantages, for the stand-alone satellite networks. As before, the listing is organized according to key system attributes.

Attribute: Topological Coverage

Advantages	Disadvantages
Existing satellite antennas with large-area beams provide nationwide broadcast, or point-to-multipoint, coverage.	Because of the low satellite broadcast EIRP, existing earth stations employ large antennas. Such earth stations are expensive, few in number, and they require long terrestrial tails (feeder lines) to connect many sections of the country.
New spot-beam antennas are well suited for point-to-point services, such as envisioned for VSAT. Spot and fan beams provide frequency reuse, higher EIRP, and given more sophisticated network management, load shifting and network restoral advantages.	Short terrestrial tails that avoid all vulnerable parts of the switched terrestrial network would require perhaps tens of thousands of VSAT-like terminals.

The network topologies are very flexible and adaptive. Terrestrial nodes with existing earth stations can be added or deleted from the topology, or their link capacities modified, as quickly as the automated controls will permit.

Orbital overcrowding and spectral congestion in the technically mature C-band makes one seek different satellite solutions, such as uses of Ku- and Ka-bands (with associated rain outages), "smarter" satellites with on-board switching, or limiting the access to critical, emergency type services.

Attribute: Traffic Capacity

Advantages

Today, the total U.S. satellite bandwidth available for communications traffic is estimated to be around 20 GHz.

The trend toward Ku- and Ka-bands, plus satellite technology advances, is expected to increase the total bandwidth to roughly 50 GHz in the 1990's.

Satellite traffic can be carried over a flexible, adaptively changing, network topology. The only constraint is that earth stations must exist at the network nodes in question.

Increased bandwidth and higher gain imply larger capacity trunking for Ku- and Ka-bands over the more traditional C-band.

Disadvantages

The round trip propagation delay (to and from satellite) for an information message is approximately 1/4 s.

Access control messages that go from user to NCC, and back to user, must at least double the delay.

Rain attenuation, especially at higher frequencies, degrades the satellite link capacity. If weather effects are severe enough, outages can occur.

Certain traffic types, such as voice, CCS, and interactive fast data, can suffer service degradations due to satellite propagation delays.

Due to orbit and spectrum congestion, the total U.S. satellite bandwidth is limited to the equivalent of one or two latest generation optical fibers. Thus, compared to the existing terrestrial network, the satellite network has a relatively thin traffic capability.

Attribute: Satellite System Features

Advantages

On-board switching of signal, be it at RF, IF, or baseband, can be used to implement a virtual "digital switch

Disadvantages

Satellite systems require one or more network control centers. These are Earth-bound facilities that are

in the sky." Automated network management leads to faster network restoral and a more versatile load shifting.

Switched or hopping satellite beams are part of a TDMA system that is controllable, adaptive, and with fast burst rate assignments.

Most, if not all, satellite carriers offer complete digital and analog compatibility within their transponder bandwidths.

Dual-power or dual-rate operation, as well as forward error correction can be used effectively for rain-fade compensation.

Phased-array antenna earth station technology offers flexible designs and smaller size elements, which are particularly suited for mobile services.

The VSAT systems have a thin-route, direct broadcast, potential that seems appropriate for network restoral.

Small VSAT terminals offer several favorable scales of economy, such as being cheap to manufacture, easy to transport, fast setup, etc.

Attribute: Unique Service Features

Advantages

Service connectivity to remote, terrestrially not connected, regions.

The siting of earth stations avoids right-of-way complications and expenses.

On-demand, high-capacity access to locations where the economics of everyday traffic can justify only a thin-route terrestrial linkage.

subject to all the normal terrestrial vulnerabilities.

Implementation of backup control centers may be both a software (i.e., parallel data processing) and an economic burden.

Because of the exposed RF waves, satellite signals are vulnerable to hostile interception, jamming, and manipulation. Encryption and related security measures appear necessary for control and at least for some of the information messages.

Other channel interference can be caused by satellite and terrestrial systems. The coordination of frequency assignments helps to reduce harmful interference, but one still faces a basic limitation on the permissible number of satellites in stationary orbit.

Disadvantages

While in orbit, a satellite is not accessible for technicians to repair or do physical maintenance work associated with any component failures or malfunctions.

Satellite failures can be due to many reasons, hostile or otherwise. Rather typical causes have been associated with weakened power supplies.

Comment on communications satellite reliability: There has never been a full INTELSAT service disruption.

Satellite networks have the inherent cost advantage for long distance links, as well as those routes with seldom occurring, unpredictable mix, traffic bursts.

Satellite operation can be insured, but the costs are considerable.

Short service life used to be a relative design concern, but the current trends toward quicker technological turnover everywhere tend to lessen this relative disadvantage.

4. CONCLUSIONS

This report has summarized the present status of stand-alone terrestrial and satellite networks. It is apparent that the current primary telecommunication workhorses are the public terrestrial networks, as they carry the bulk of the nationwide common carrier traffic. At the same time, the terrestrial networks and their services have become increasingly vulnerable to a variety of threats and disasters. Deplorably, these terrestrial network vulnerabilities appear only to be growing as time passes (National Research Council, 1989).

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The current status of fiber optic and related broadband terrestrial networks is reviewed. That includes summaries of link and switch capabilities as well as present and future standards for broadband systems. In the domain of communication satellites, both existing and advanced future technologies are described. Advantages and disadvantages of both terrestrial and satellite stand-alone networks are discussed from the service survivability and restoral point of view. The presented material is largely technical. As a consequence, this report does not address such important nontechnical issues as economics, costs, policies, and the regulatory environment.

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Distribution of the Daily foF2 About the Monthly Median

Mary W. Sowers
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U.S. DEPARTMENT OF COMMERCE
Robert A. Mosbacher, Secretary

Janice Obuchowski, Assistant Secretary
for Communications and Information

May 1990

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DISTRIBUTION OF THE DAILY foF2 ABOUT THE MONTHLY MEDIAN

Mary W. Sowers[1] and Margo PoKempner[2]

Data from 21 ionospheric sounding stations in the northern and southern hemispheres were used to characterize the day to day variation in the critical frequency of the F2 layer of the ionosphere. Variability in the critical frequencies are analyzed monthly and diurnally for quiet magnetic conditions during both low and high solar periods. In addition, variations in the F2 layer critical frequency are presented for active magnetic conditions during equinox periods. Tables of variabilities for each ten degree increment in magnetic latitude are also provided in this report. The dependence of variations in the critical frequency with the solar cycle index IG12 is also discussed.

Key Words: variability, F2 layer, critical frequency, magnetic latitude

1. INTRODUCTION

The F2 region is the most important part of the ionosphere for propagation of high frequency (HF) signals. The most important F2 layer characteristic is the critical frequency (foF2). Median values of this characteristic in part determine the F2 maximum usable frequency (MUF) for specific distances such that the probability of HF propagation for this frequency is 50%. Historically, the frequency that would have a 90% probability of propagating (FOT) has been assumed to be .85 of the median value of the MUF and the frequency having a 10% probability (HPF) has been assumed to be 1.15 of the median value.

The earliest methods of estimating the performance of

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ionospheric telecommunication circuits relied on manually constructed contour charts and nomograms to predict the relevant median ionospheric characteristics. In the early 60's, the development of numerical coefficients representing spatial and temporal variations in the ionosphere, and the availability of electronic computers made it possible to achieve significantly greater accuracy in the predictions of circuit performance.

Concurrent with the development of a computer model to predict the F2 layer MUF, R.M. Davis and N.L. Groome[3] examined the variability in the daily MUF's as a function of all relevant space and time parameters. The median, upper and lower decile F2 layer MUF's were computed from the measured foF2 and M(3000)F2 (see Piggott, 1972, p.15) for 13 U.S. and U.S.-supported vertical incidence (v.i.) ionosphere stations. A series of local hours in each month, for three years representing low (1954 or 55), medium (1961 or 62), and high (1957 or 58) level of solar activity were used. As ionospheric measurements are now available for at least two additional solar cycles, it seems appropriate to re-examine the seasonal, diurnal and latitudinal dependency of the variability of the daily foF2.

Although Davis and Groome determined the daily variability of the MUF(3000)F2, Rush et. al. (1974) concluded that the observed daily variability of foF2 is more important in terms of potential system degradation than the daily variability of the height of the maximum (hmF2). Therefore, it was considered efficacious to analyze only the daily variability of the observed foF2.

In the next section, the selection of the stations and statistical parameters used in the analysis are described. In the third section, the observed diurnal, seasonal, solar, magnetic and latitudinal trends of the statistical parameters are presented. In Section 4, the relationships between foF2 variability and solar activity are further discussed. In the last section, the general

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[3] Davis, R.M., and Groome, N.L. (1964), Variations of the 3000-Km MUF in time and space (U.S. Department of Commerce, National Bureau of Standards, Boulder, CO, Report 8498 November, 1964)

trends are summarized and plans for future analyses are presented.

2. DESCRIPTION OF THE DATA

The World Data Center A for Solar-Terrestrial Physics has acquired ionospheric data in digital format from ionospheric observing stations throughout the world. All ionospheric data measured at U.S. and U.S.-supported stations have been available in digital format since the International Geophysical Year (IGY). More recently, many foreign administrations and organizations have converted the tabulated ionospheric data from their network of v.i. stations to digital format. Some of the digital ionospheric data from non-U.S. v.i. stations have been made available to World Data Center A. In many cases, though, the data may represent only one solar cycle, usually solar cycle 21 (1964-76), or only a few years of this cycle. The main criteria for the selection of data for the analysis were the total number of years, and more important, the number of solar cycles for which digital data were available at World Data Center A for a given station. This eliminated the use of ionospheric data from many stations.

Initially, the analysis included ionospheric data for six U.S. or U.S.-supported v.i. stations and seven Australian v.i. stations. Until recently, none of the ionospheric data for the extensive Soviet network of v.i. ionosphere stations had been digitized. These data have been provided to World Data Center A and the ionospheric data for eight Soviet v.i. stations have been included in this analysis. The daily variability of the foF2 has been determined for each hour of every month for all available years for the 20 v.i. stations listed in Table 1.

In this report, the diurnal variability of the critical frequency of the F2 layer (foF2) is described for a given month for v.i. stations at high, mid, and low-latitude ranges. The stations used to represent these latitude zones are listed in Table 1, along with their geographic latitude and longitude as well as magnetic latitude (ML).

Table 1 also includes a list of the years of available data from each station. As can be seen, data covering two to three

Table 1. Station Locations and Years of Available Data

LATITUDE ZONE	STATION	GEOGRAPHIC LATITUDE & LONGITUDE		MAGNETIC LATITUDE	YEARS OF AVAILABLE DATA
HIGH	TOMSK, USSR	56.5	84.9	60.4	(31) 57-88
	LENINGRAD, USSR	59.9	30.4	58.4	(31) 57-87
	SVERDLOVSK, USSR	56.7	61.1	58.0	(31) 57-88
	HOBART, TASMANIA	-42.9	147.3	-58.2	(30) 57-59,61-88
MIDDLE	MOSCOW, USSR	55.5	37.3	54.4	(31) 57-87
	*WASHINGTON DC, USA	38.7	282.9	53.2	(26) 60,63-67
	WALLOPS IS VA, USA	37.8	284.5	52.0	(26) 68-87
	BOULDER, COLO. USA	40.0	254.7	50.7	(26) 60,62-86
	KHABAROVSK, USSR	48.5	135.1	45.1	(28) 59-87
	ALMA ATA, USSR	43.2	76.9	43.1	(31) 57-88
	TASHKENT, USSR	41.3	60.0	40.6	(27) 61-88
	ASHKABAD, USSR	39.9	58.3	36.2	(28) 57-85
	MUNDARING, W. AUSTRALIA	-32.0	116.3	-48.9	(30) 59-88
	CANBERRA, AUSTRALIA	-35.3	149.0	-48.4	(32) 57-88
	BRISBANE, AUSTRALIA	-27.5	152.9	-38.3	(30) 57-86
	NORFOLK ISLAND, AUS.	-29.0	168.0	-37.1	(25) 64-88
	TOWNSVILLE, AUSTRALIA	-19.6	146.8	-29.6	(31) 58-88
LOW	MAUI HAWAII, USA	20.8	203.5	21.6	(24) 60,63-64,66,68-87
	CONCEPCION, CHILE	-36.6	287.0	-20.1	(16) 60,63-64,66-67,69-79
	VANIMO, NEW GUINEA	-2.7	141.3	-11.3	(25) 64-88
EQUATORIAL	HUANCAYO, PERU	-12.0	284.7	0.5	(24),58,60,63-84

* Washington and Wallops are used as one station and are referred to as Washington throughout the report.

solar cycles were available for most of the stations. Studies of foF2 variability showed that the solar cycle dependency did not become statistically reliable unless at least two solar cycles (22 years) were included in the analysis.

Data from stations in North America, South America, Asia, and Australia were utilized, giving a wide range of geographic and magnetic latitudes in both the northern and southern hemispheres. The stations were chosen to isolate ionospheric variability effects that exhibit geographic as well as magnetic dependencies. Comparisons between the foF2 variabilities for stations at different geographic latitudes and longitudes but similar magnetic latitudes can highlight the dependency of these variabilities on geographic and magnetic latitude. Similarly, stations in the southern hemisphere can be compared to their northern hemisphere counterparts at the same magnetic latitudes, to determine if reciprocity with the southern hemisphere exists.

Longitudinal differences in stations may affect variability in foF2 but are not thoroughly explored in this report because of the limited longitudinal distribution of the available v.i. stations. Analysis of the variabilities indicated that they are more dependent upon the latitude range than longitudinal position.

The foF2 data from each station were analyzed for each month to determine seasonal effects. This report presents the diurnal variabilities for winter, summer and both equinox seasons. The diurnal variation in foF2 is summarized in the following sections.

Most of the discussions and analysis in this report are limited to quiet magnetic periods for both low and high solar activity years. The ionospherically-derived solar cycle index termed IG12 is used to characterize the solar cycle dependency of variability in foF2. Magnetically quiet periods are determined from the monthly average planetary index for magnetic activity, AP. Throughout this report, low solar activity periods refer to occasions where IG12 is less than 41 and high solar activity refers to periods where IG12 is greater than 109. Quiet magnetic periods refer to occasions where monthly AP is less than or equal to 15.

The percent standard deviation is calculated for all 24 hours

for each month for a given station as follows:

$$\% \text{ std dev} = (\text{std dev} / \text{median foF2}) \times 100.$$

The standard deviation is calculated around the monthly median for each hour in which 10 or more daily values are available. The median foF2 is the middle value of all ordered foF2 values for a given hour if the number of observations is odd, and the average of the two middle values if there is an even number of observations. All values of foF2 were used to determine the median with the exception of those values qualified by a D. Qualification by a D indicates that the actual value of foF2 is greater than the recorded value. Because of the uncertainty of the measurement, these values were excluded. The Russian data were checked separately for the presence of D qualifiers from paper records at the World Data Center A.

Upper and lower decile factors (see Section 3.2) are also tabulated for each hour of a given month for all stations. Percent standard deviation has been used in the analysis of variation in foF2 in order to gain insight into the relative changes in the ionospheric variability. This is accomplished without having to account for the differences in the magnitude of the ionization resulting from solar, diurnal or other changes. Percent standard deviation is called percent deviation or variability throughout this report.

3. RESULTS

3.1 Diurnal, Seasonal, and Solar Trends

During the period under consideration in this study--1957 to 1988--there were three solar maxima (1958, 1969 and 1980) and three minima (1964, 1976 and 85). There were 10 years of low solar activity (IG12 < 41) and 14 to 16 years of high solar activity (IG12 > 109) recorded during these years. Table 2 shows the years included in each month for low, mid and high solar ranges as well as all magnetic periods.

To characterize the solar activity effects on the foF2 monthly variability, all variabilities were averaged on an hourly basis for

TABLE 2. Years of Data Included in Each Solar Activity Range For Magnetically Quiet (AP $\leq$ 15), Medium (16 $\leq$ AP $\leq$ 19) and Active (AP $\geq$ 20) Periods for Each Month. Actual Year is Given with Both AP and IG12 in Parenthesis

	January	February	March	April	May	June	July	August	September	October	November	December
Low Solar	63(10,27) 64(12,15) 65(6,13) 66(7,28) 74(15,28) 76(13,12) 77(10,17) 86(14,15) 87(8,8) * 75(16,19) 85(16,15) *	63(9,26) 64(12,13) 65(9,14) 66(8,31) 77(11,19) 85(15,13) 87(10,12) * 74(16,28) 75(19,18) 76(16,11) * 86(27,8)	63,(8,25) 64(13,12) 65(8,15) 66(13,34) 77(11,21) 85(11,11) 86(13,8) 87(10,14) * * 74(23,26) 75(20,18) 76(22,10)	63(10,24) 64(13,12) 65(8,16) 66(7,37) 86(8,8) 87(7,15) * 75(16,18) 76(17,9) 77(16,23) * 74(21,26) 85(21,9)	62(7,40) 63(11,23) 64(10,10) 65(6,17) 66(9,40) 75(13,16) 76(14,9) 77(11,26) 85(9,9) 86(12,9) 87(8,17) * 74(18,26)	62(9,40) 63(11,22) 64(9,10) 65(10,17) 75(11,15) 76(10,8) 77(8,29) 85(11,9) 86(8,9) 87(7,19) * 74(17,27) *	62(11,40) 63(12,21) 64(9,10) 65(8,18) 73(12,38) 75(12,13) 76(9,9) 77(14,34) 85(14,9) 86(8,9) 87(11,22) * 84(16,39) * 74(24,27)	62(15,37) 63(13,20) 64(8,11) 65(9,19) 73(12,35) 75(10,12) 76(9,10) 77(13,39) 85(13,9) 86(12,8) 87(14,25) * 74(19,26) 84(16,36) *	64(11,11) 65(10,20) 73(14,32) 75(10,12) 76(13,12) 85(13,9) * 62(19,35) 86(17,8) 87(19,29) * 63(28,19) 74(23,25) 84(24,31)	63(15,19) 64(10,11) 65(7,21)) 75(12,12) 76(12,13) 85(14,26) 86(11,8) * 73(18,31) 87(16,33) * 62(20,32) 74(26,23) 84(23,26)	62(13,30) 63(12,18) 64(7,12) 65(6,23) 73(12,30) 76(9,13) 85(15,8) 86(13,9) 87(13,37) * 74(18,22) 75(18,13) * 84(21,21)	62(13,29) 63(11,16) 64(5,12) 65(7,25) 73(11,28) 74(15,20) 75(12,13) 76(10,15) 85(13,9) 86(8,10) * 84(18,18) *
Middle Solar	61(12,88) 62(7,49) 67(11,82) 68(11,109) 71(12,97) 72(13,73) 78(15,69) 84(13,61) 88(13,48) * 73(16,59) 83(16,99) *	62(10,46) 67(11,86) 71(12,92) 72(10,75) 88(15,55) * 61(16,85) 68(16,109) 78(16,75) 84(17,57) * 73(20,54) 83(27,97)	61(14,80) 62(8,43) 67(7,90) 68(13,109) 71(11,88) 72(12,78) 88(14,62) * 78(16,80) * 73(25,50) 83(23,94) 84(25,50)	61(14,73) 62(14,41) 67(9,95) 68(13,109) 71(15,82) 72(11,81) * 88(16,70) * 73(30,47) 78(23,86) 83(24,89) 84(25,50)	61(13,67) 68(13,109) 71(13,77) 72(10,82) 88(12,78) * 73(17,43) 84(17,46) * 67(25,99) 78(25,93) 83(22,84)	61(14,61) 66(6,44) 67(12,103) 71(9,74) 72(14,81) 84(15,43) 88(11,86) * 68(17,107) 73(17,40) 83(16,78) * 78(20,100	66(9,50) 67(8,105) 68(10,109) 71(8,71) 72(8,79) 78(13,107) 83(12,72) 88(10,94) * * 61(28,57)	61(11,54) 66(11,56) 67(9,108) 68(12,108) 71(9,69) 88(10,102) * 83(16,68) * 72(24,77)	61(13,54) 68(14,108) 71(13,69) 72(13,73) 83(14,67) 88(12,109) * 67(16,104) 77(16,44) * 60(20,108) 66(21,63)	66(10,70) 67(10,107) 71(12,70) 72(12,69) 77(13,51) * 61(16,53) 68(16,109) 82(18,106) 83(17,67) * 60(36,104)	61(10,52) 66(9,75) 67(10,106) 71(11,71) 72(14,66) 77(10,57) * * 60(32,98) 82(21,103) 83(21,66)	61(12,50) 66(11,79) 67(14,107) 70(9,101) 71(10,71) 72(10,63) 77(10,64) 83(15,64) 87(9,42) * * 60(21,93)) 82(21,100)
High Solar	58(15,174) 59(14,174) 60(15,137) 69(8,111) 70(7,118)) 80(10,159) 81(9,151) 82(12,143) * 57(17,159) 79(16,134) *	60(14,134) 69(15,112) 70(7,118) 79(15,138) 80(11,159) 81(14,150) * 57(17,161) * 58(27,174) 59(24,172) 82(33,140)	80(8,160) * 60(18,131) 69(17,113) 70(17,118) 79(19,141) 81(18,151) 82(18,136) * 57(26,162) 58(26,176) 59(24,169)	80(11,159) 69(14,112) * 59(17,165) 70(16,119) * 57(21,164) 58(20,178) 60(42,130) 79(25,145) 81(23,152) 82(22,132)	57(11,167) 70(9,120) 79(14,149) 80(10,157) * 58(17,178) 59(19,160) 69(17,111) 82(17,128) * 60(24,128) 81(20,154)	59(15,156) 69(9,111) 70(10,121) 79(12,154) 80(13,156) 81(12,154) * * 57(22,168) 58(24,179) 60(20,124) 82(22,125)	69(8,112) 79(12,154) 80(11,155) * 57(16,169) 70(19,119) 81(19,154) * 58(25,179) 59(32,154) 60(20,119) 82(30,122)	57(14,170) 69(8,113) 70(13,117) 80(10,155) 81(15,154) * 58(18,178) 78(17,112) 79(18,155) * 59(23,152) 60(20,113) 82(31,118)	69(15,114) 70(11,114) 79(14,155) 80(8,154) 81(12,153) * 78(18,119) * 57(49,171) 58(20,178) 59(28,150) 82(36,112)	57(14,172) 69(9,114) 70(12,110) 78(12,124) 79(12,155) 80(14,154) 88(13,116) * 58(16,176) 59(16,147) * 81(19,151)	58(8,175) 69(10,115) 70(12,110) 78(15,128) 79(10,156) 80(13,152) 81(15,149) 88(12,122) * 57(18,174) 68(17,110) * 59(22,143)	58(15,174) 68(9,111) 69(7,117) 78(13,131) 79(9,158) 80(13,152) 81(10,145) 88(13,128) * 57(18,175) 59(19,140) *

all low solar activity years and for all high solar activity years. Diurnal plots of the winter, summer, and spring foF2 variabilities are given in Figures 1 to 3 for stations representing mid, low and equatorial latitudes. All percent deviations for low solar and quiet magnetic periods are included in these figures. The percent deviations for each hour are averaged and an eight point smoothed curve (called the characteristic curve) is drawn through the averages. This characteristic curve allows us to discern large-scale effects in the percent deviation while minimizing exaggerations in the curve due to extremes in variability that last only a few hours such as those frequently occurring before sunrise.

A distinct diurnal pattern in the variability is seen in Figure 1 at Washington and Canberra. The variabilities are greatest during the night hours when the lowest ionization levels are observed. The lowest variabilities usually occur between 0800 and 1600 LT. Maui, a low-latitude station, exhibits generally higher variabilities with the lowest values occurring directly after sunrise. Similar trends are noted at other mid and low-latitude stations (Appendix A).

Equatorial region variabilities are represented by Huancayo in Figure 1. At Huancayo the foF2 variability decreases dramatically directly after sunrise with little day to day variation in foF2 during the remainder of the day. Because of this steep, step-like decrease in variability, an eight point smoothed curve for this station seemed inappropriate. Therefore, the actual averaged values for each hour are used to characterize the variability at this station.

In contrast to winter, summer variabilities during low solar periods are generally lower, as shown in Figure 2. The mid-latitude stations show particularly low variabilities with less extreme diurnal ranges in summer than winter. Maui has 4 to 6 percent lower variabilities from approximately 11-1800 LT during the summer. The equatorial region variabilities at Huancayo, also given in Figure 2, show similar trends to winter variabilities with somewhat higher daylight variabilities. Huancayo is an equatorial station magnetically but is geographically located at 12 degrees

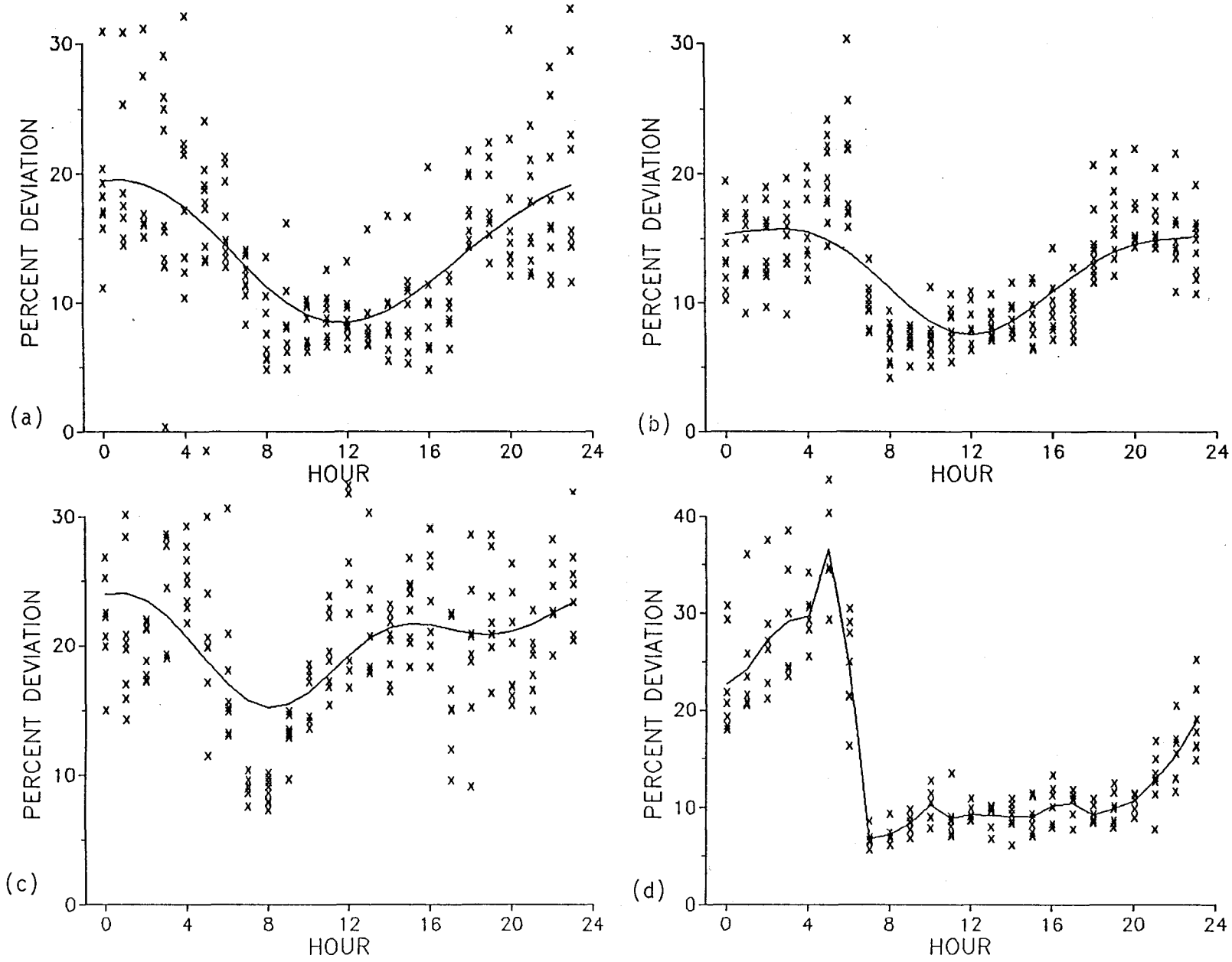

FIGURE 1. Diurnal variability during winter for quiet magnetic and low solar conditions at (a) Washington, (b) Canberra, (c) Maui and (d) Huancayo.

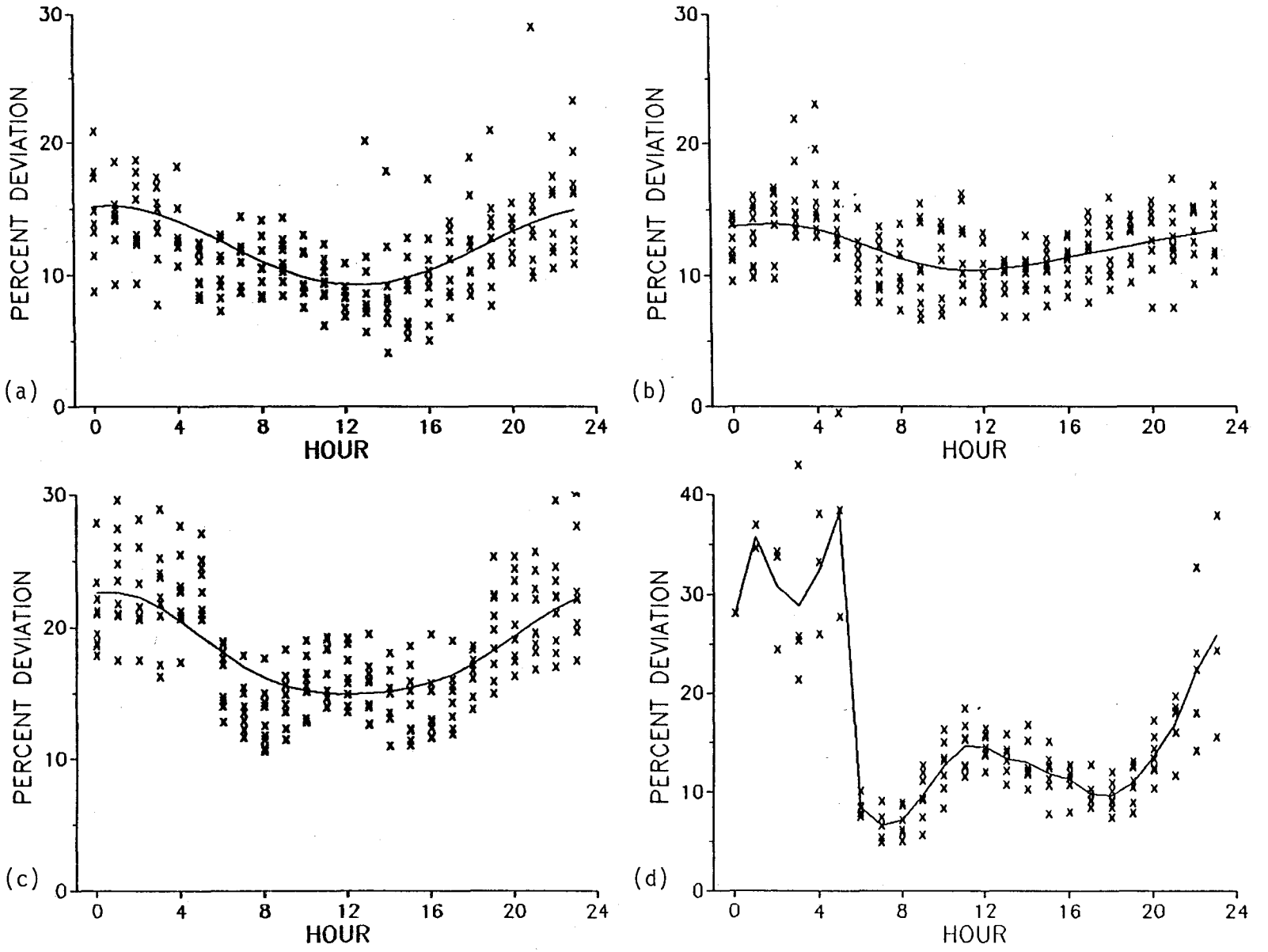

FIGURE 2. **Diurnal variability during summer for quiet magnetic and low solar conditions at (a) Washington, (b) Canberra,** (c) Maui and (d) Huancayo

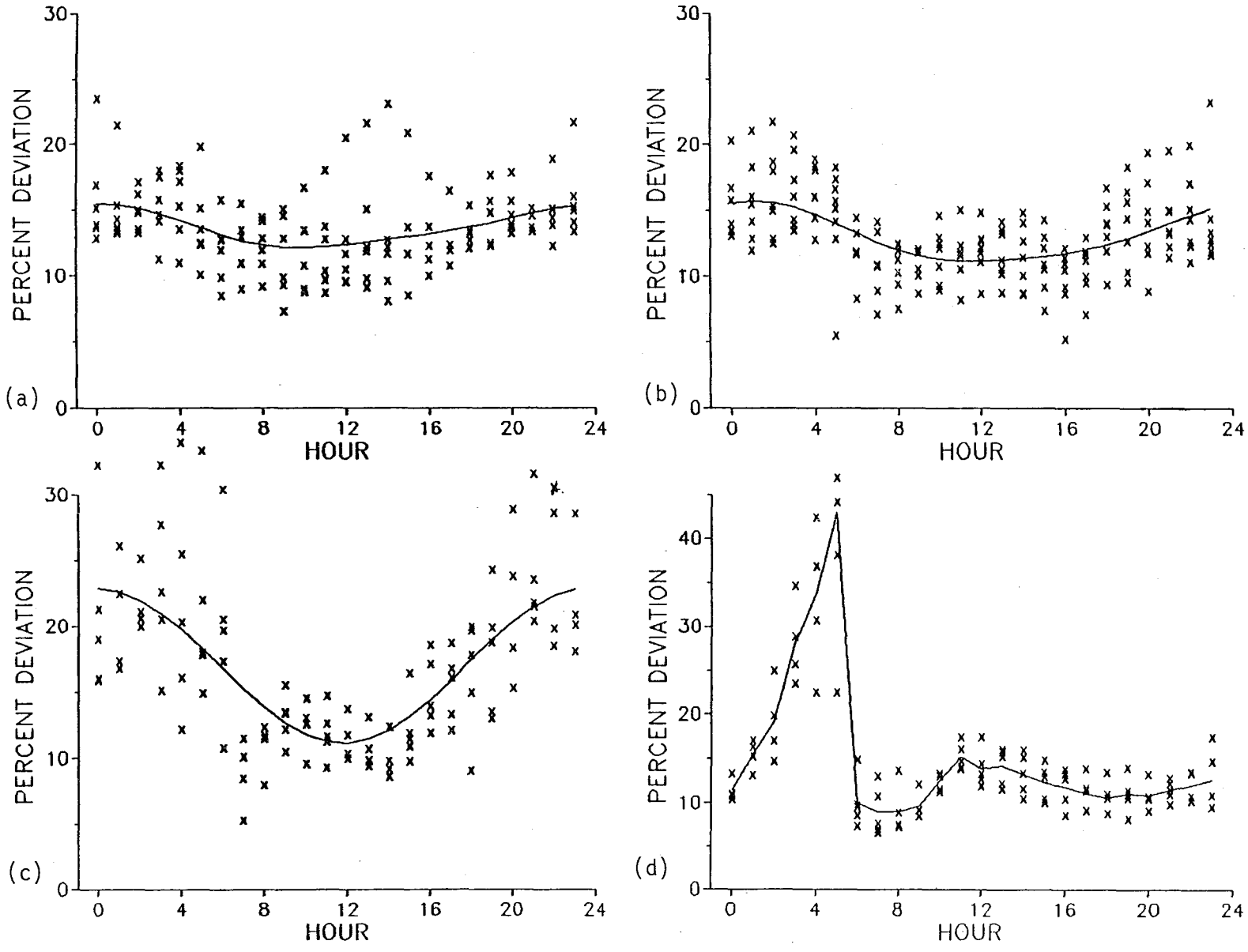

FIGURE 3. Diurnal variability during spring for quiet magnetic and low solar conditions at (a) Washington, (b) Canberra, (c) Maui and (D) Huancayo.

south and may therefore exhibit slight seasonal variations with geographic latitude.

During equinox periods, the mid-latitude stations have almost negligible diurnal spread in variability as shown in Figure 3. Similar to the summer period, the variabilities for mid-latitude stations range from 12 to 16 percent throughout the day. Maui has a more extreme diurnal range in variability than the mid-latitude stations. The lowest daytime variabilities are observed at Maui during equinox and low solar years. Huancayo has equinox variabilities that are quite similar to the winter patterns exhibited in Figure 1.

During low solar periods, the variabilities for mid and low-latitudes are generally inversely related to median foF2. During the day when critical frequencies increase, variabilities are the lowest. Likewise at night, when variabilities are highest the foF2 is also the lowest. In summer, less diurnal decrease in foF2 also correlates with little diurnal change in the variability.

Variabilities for high solar periods are given in Figures 4, 5, and 6 for winter, summer and spring. Again, Washington and Canberra represent the mid-latitude ranges, Maui the low-latitude, and Huancayo the equatorial latitudes.

In general, variabilities during periods of high solar activity are lower than those shown for periods of low solar activity. In contrast to low solar periods, the inverse relationship between the magnitude of the variability and the median foF2 is less obvious during the spring and summer at mid-latitude stations. During the day, when foF2 is higher, variability is also higher. Maui has significantly lower variabilities for all hours during the summer for high solar periods and an uncharacteristic flat diurnal curve. At Huancayo, variabilities are generally lower during high solar periods with a diurnal pattern similar to those noticed during low solar periods.

3.2 Lower Decile, Upper Decile and Standard Deviation

Since the lower bound of the foF2 will in part determine the frequency likely to propagate for 90 percent of the transmission

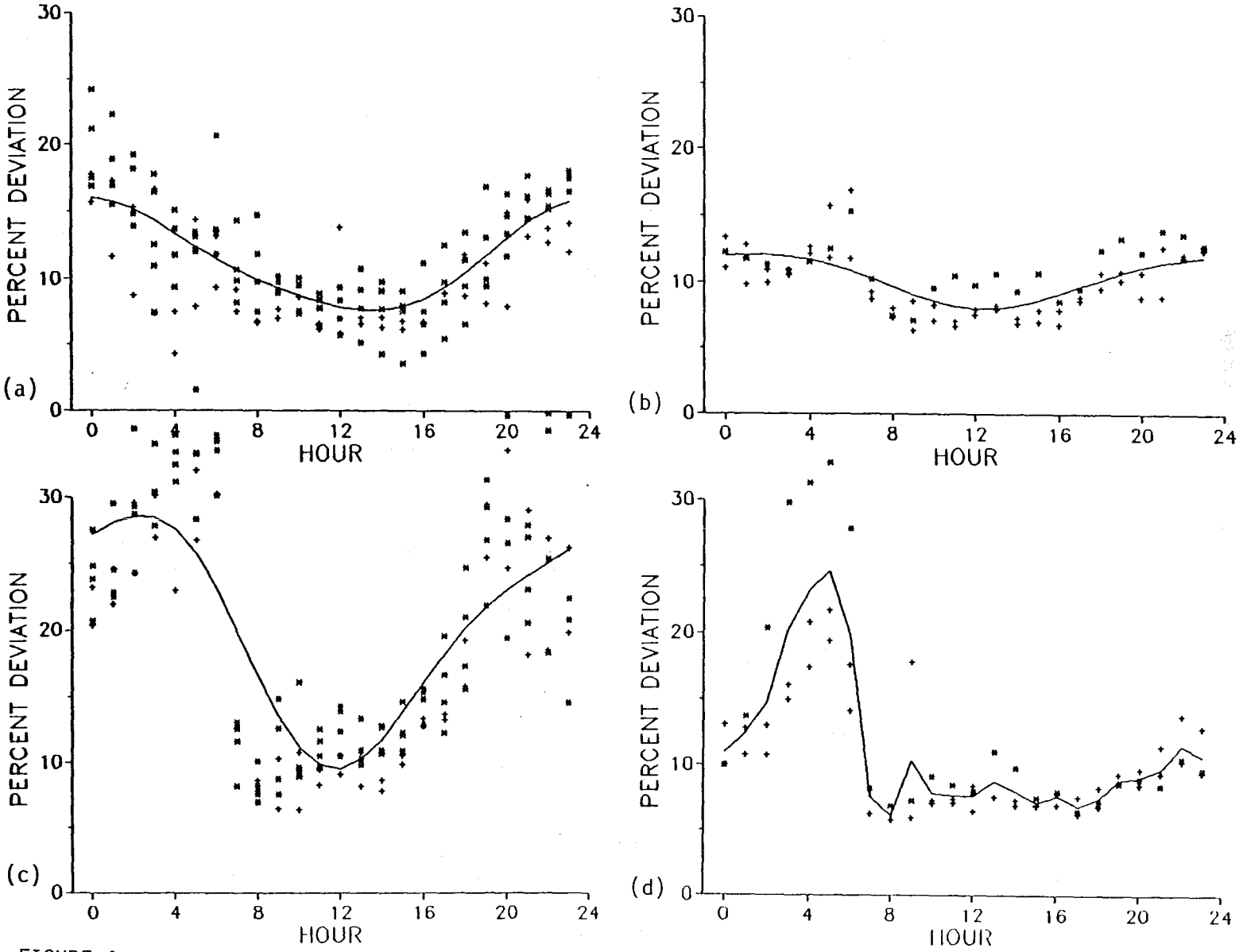

FIGURE 4. Diurnal variability during winter for quiet magnetic and high solar conditions at (a) Washington, (b) Canberra, (c) Maui, and (d) Huancayo.

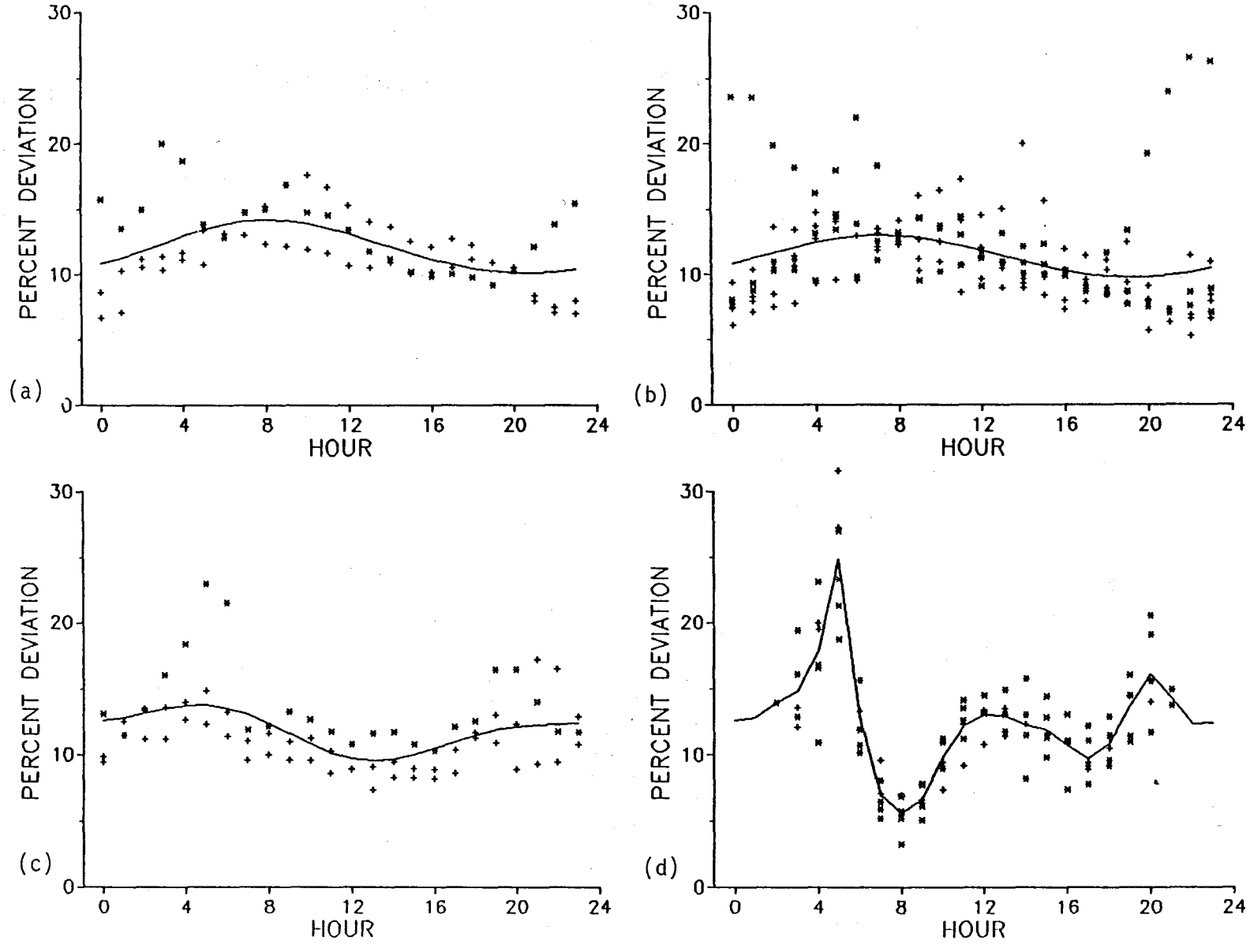

FIGURE 5. Diurnal variability during summer for quiet magnetic and high solar conditions at (a) Washington, (b) Canberra, (c) Maui and (d) Huancayo.

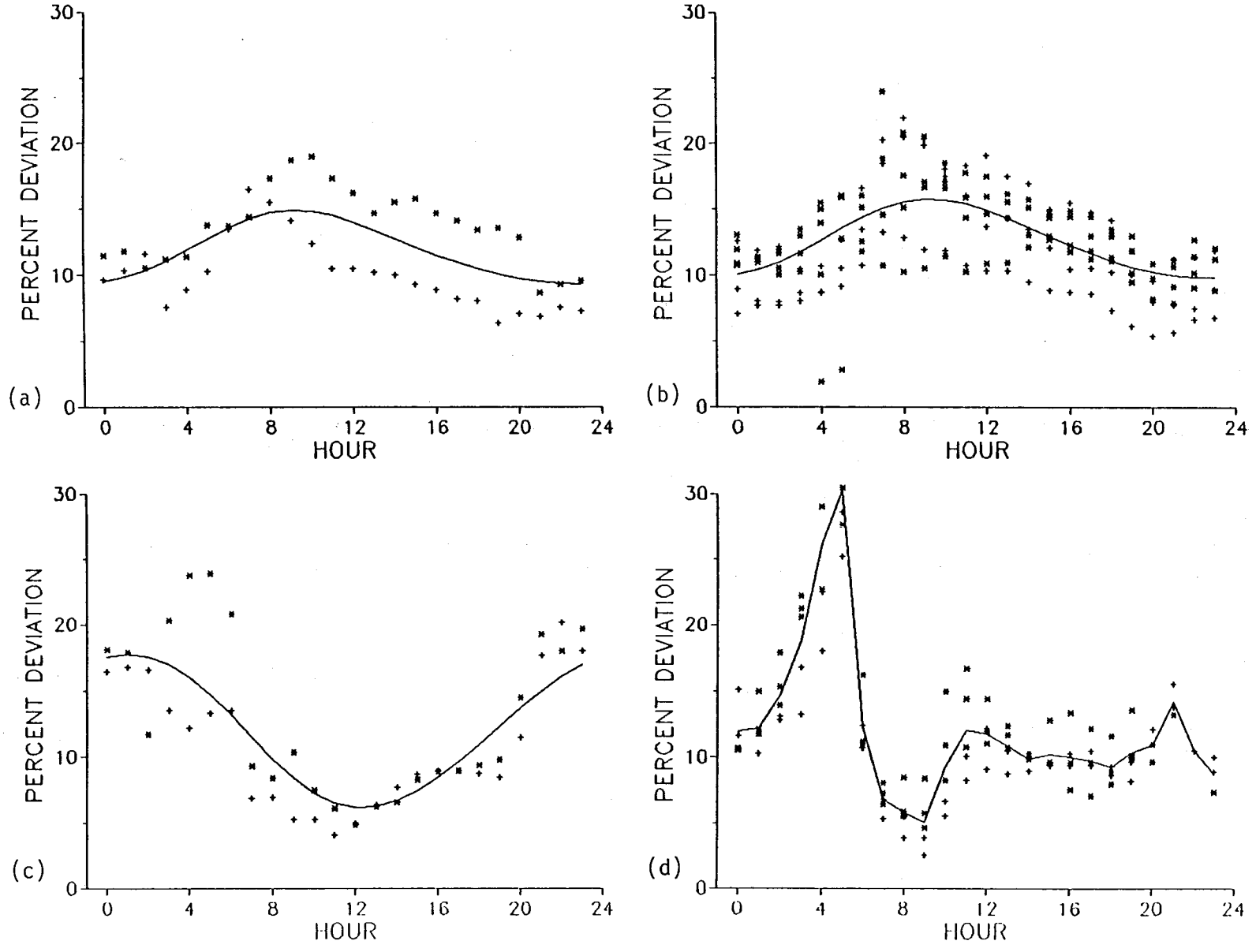

FIGURE 6. Diurnal variability during spring for quiet magnetic and high solar conditions at (a) Washington, (b) Canberra, (c) Maui and (d) Huancayo

period--as will the upper bound determine the 10 percent duration--the upper and lower decile factors were also analyzed to characterize the variability in foF2. The decile factor is the number by which the median is multiplied to obtain the actual 10 and 90 percent deciles for each hour. As with percent deviation, the decile factors for each hour in a given month were averaged, then smoothed to obtain the characteristic diurnal curve for both high and low solar ranges.

Plots of the characteristic curves of upper and lower decile factors are given in Figure 7 for low solar and quiet magnetic conditions during winter at Washington, Canberra, Maui, and Huancayo. Also included in this figure are both the upper and lower standard deviation factors (number by which the median is multiplied to obtain the actual decile value). Figure 7 shows that the differences between the lower decile factors and the lower bound of standard deviation is negligible. Large deviations, however, can be seen between the upper decile factor and the upper bound of standard deviation.

Magnetic activity may also affect the variability in foF2. A'lpert (1973) has shown that during magnetic storms, foF2 tends to decrease at mid and high-latitudes if the storm commencement is in the dark hours. Conversely, a positive storm (increase in foF2) is expected if the storm commences between 0800 and 1300 LT. Initially, the foF2 increases relative to the median for 2 to 3 hours during the onset, then decreases below the median for a period which may last as long as 2 to 3 days. Thus the negative portion (or decreased foF2 phase) of the storm will last longer when storm activity continues for more than a few hours. For this reason, the lower decile factor may become depressed as a result of prolonged magnetic storms.

Since most magnetic activity occurs during the equinox, only these periods have a sufficiently large number of high AP's (AP > 19) to study changes in variability with magnetic activity. Figure 8 shows the characteristic curves for high magnetic activity and high solar periods during the spring equinox at Leningrad, Hobart, Washington and Canberra. These curves show that significant

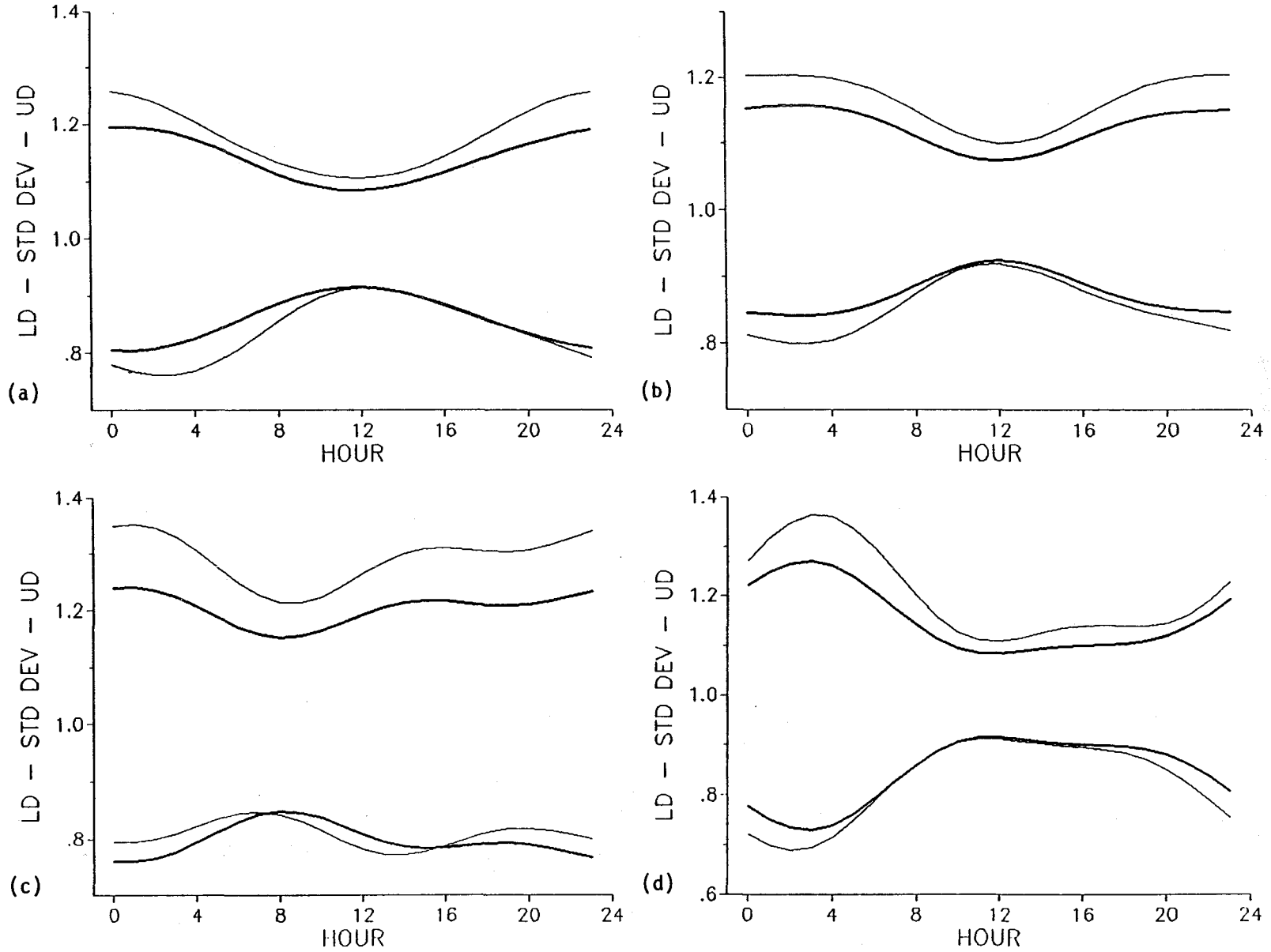

FIGURE 7. Characteristic curves of standard deviation factor (bold) and upper and lower decile for quiet magnetic and low solar conditions in winter at (a) Washington, (b) Canberra, (c) Maui and (d) Huancayo.

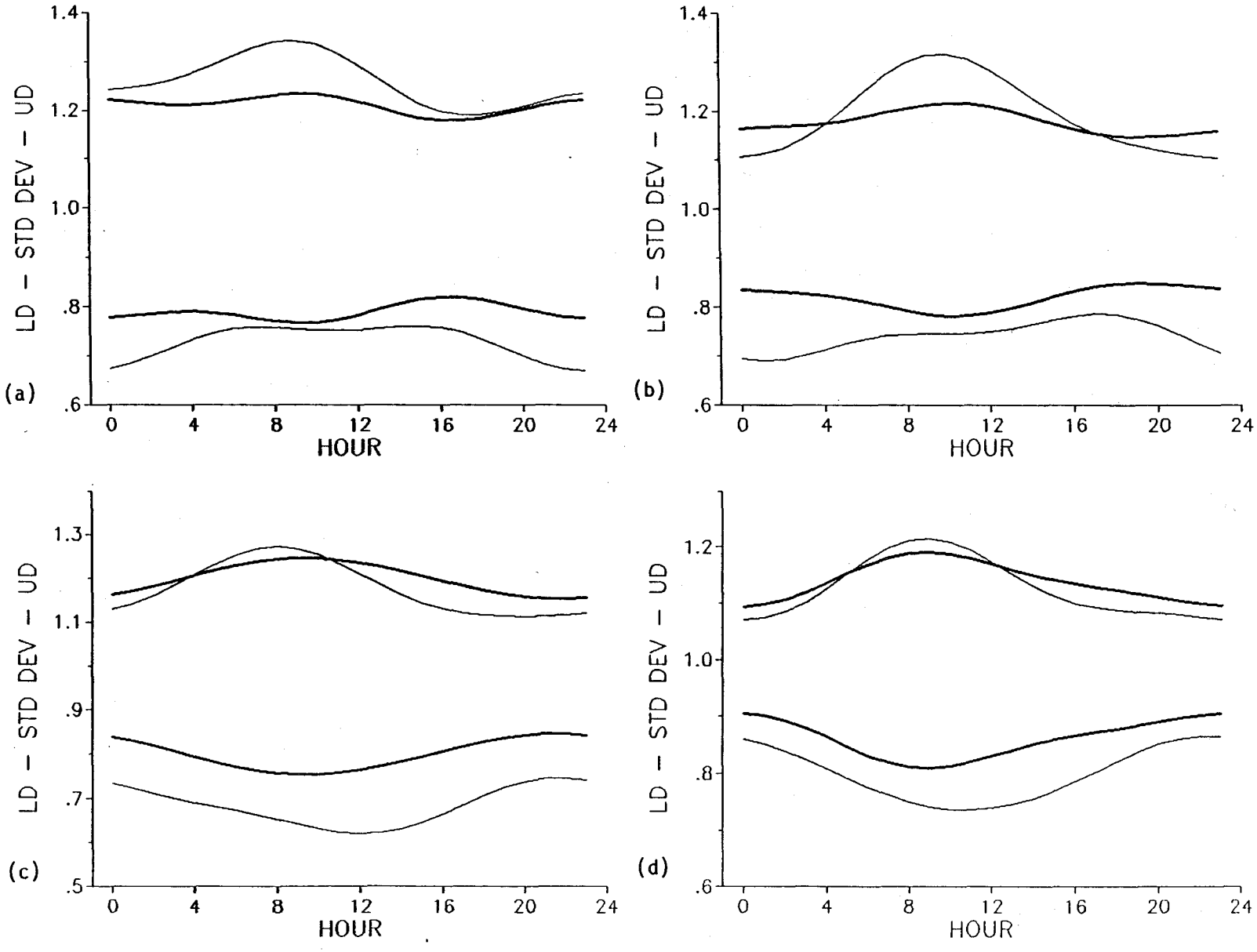

Figure 8. **Characteristic curves of standard deviation factor (bold) and upper and lower decile for active magnetic and high solar conditions in spring at (a) Leningrad, (b) Hobart, (c) Washington and (d) Canberra.**

differences occur between the lower decile and the lower bound of standard deviation during night hours at high-latitudes. At mid-latitude stations the lower decile is consistently lower than standard deviation for all hours.

The characteristic curves at all stations during equinox periods are given in Appendix B for both low and high solar periods. These plots show the lower decile factor does not deviate from the standard deviation curve as greatly during low solar periods.

Negative storms in mid and high-latitudes are accompanied by positive storms in lower (below ~40 degrees ML) and equatorial latitudes. The opposite relation is noted for positive storms in mid-latitudes. As can be seen in Appendix B, variabilities at lower magnetic latitude stations moderately increase relative to the median during both low and high solar periods.

3.3 Tabulated Results

A summary of the diurnal variability for each 10 degree increment in magnetic latitude is given in Table 3 for quiet magnetic and both low and high solar periods. Characteristic curves for all stations in each magnetic latitude range are averaged to produce the values shown in this table. For the equatorial range (± 5 degrees) Huancayo is the only representative station. For the 45 to 55 degree N latitude range, however, characteristic curves for Boulder, Washington, Moscow and Khabarovsk are all averaged to produce the values listed under this range. No data were available for the 5-15 or the 25-35 degree north magnetic latitude ranges. Missing data in mid-latitude ranges can be interpolated from points in surrounding latitudes. However the dynamic nature of low-latitude variabilities does not justify this type of interpolation. Data from the opposite hemisphere may be used in low-latitude ranges to fill in missing latitudes for a rough estimate of the variability. Substitution of southern hemisphere variabilities for northern low-latitudes is not suggested in practice, but are depicted in Figures 9 and 10 for reference only.

Table 3. Percent Deviation and Upper and Lower Decile Factors for all Hours in each Ten Degree Magnetic Latitude Increment for both Low and High Solar Periods.

********** QUIET MAGNETIC - LOW SOLAR **********

WINTER	00(LT)	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	17.45	17.61	17.76	17.80	17.63	17.14	16.30	15.13	13.75	12.33	11.08	10.19	9.78	9.92	10.56	11.58	12.81	14.07	15.17	16.04	16.64	16.99	17.19	17.31
	1.24	1.24	1.24	1.25	1.25	1.24	1.23	1.21	1.19	1.17	1.15	1.13	1.13	1.13	1.14	1.15	1.17	1.19	1.20	1.22	1.22	1.23	1.23	1.24
	.81	.81	.80	.81	.81	.81	.82	.83	.85	.86	.87	.88	.89	.89	.88	.87	.86	.84	.83	.83	.82	.82	.81	.81
45-55N	17.31	17.35	17.31	17.11	16.68	16.00	15.04	13.88	12.62	11.43	10.44	9.81	9.60	9.84	10.50	11.47	12.60	13.77	14.84	15.71	16.36	16.79	17.06	17.21
	1.24	1.24	1.24	1.23	1.22	1.22	1.20	1.19	1.17	1.16	1.14	1.13	1.13	1.13	1.14	1.15	1.17	1.18	1.20	1.22	1.23	1.23	1.24	1.24
	.81	.81	.80	.80	.81	.82	.83	.85	.86	.88	.89	.90	.90	.89	.89	.88	.87	.86	.85	.84	.84	.83	.83	.82
35-45N	13.45	13.38	13.52	13.80	14.10	14.27	14.21	13.84	13.20	12.40	11.58	10.90	10.52	10.51	10.91	11.62	12.52	13.43	14.17	14.62	14.73	14.53	14.15	13.75
	1.19	1.19	1.19	1.20	1.20	1.20	1.19	1.19	1.19	1.18	1.17	1.16	1.15	1.15	1.15	1.16	1.17	1.18	1.19	1.20	1.20	1.20	1.20	1.20
	.87	.87	.86	.86	.85	.85	.85	.85	.86	.87	.89	.89	.90	.90	.89	.88	.86	.85	.85	.85	.85	.86	.86	.87
25-35N																								
15-25N	23.94	24.02	23.47	22.28	20.60	18.72	16.99	15.74	15.20	15.45	16.38	17.76	19.23	20.50	21.34	21.67	21.57	21.23	20.90	20.80	21.06	21.67	22.51	23.34
	1.35	1.35	1.35	1.33	1.31	1.28	1.25	1.23	1.21	1.21	1.22	1.24	1.26	1.29	1.30	1.31	1.31	1.31	1.30	1.30	1.31	1.31	1.33	1.34
	.79	.79	.80	.81	.82	.83	.84	.85	.84	.83	.81	.80	.78	.77	.77	.78	.79	.80	.81	.82	.82	.81	.81	.80
5-15N																								
5N-5S	28.28	30.02	30.24	28.88	26.18	22.64	18.90	15.58	13.13	11.74	11.34	11.62	12.16	12.58	12.63	12.31	11.81	11.51	11.78	12.94	15.11	18.17	21.75	25.32
	1.37	1.40	1.41	1.40	1.37	1.32	1.26	1.21	1.17	1.15	1.14	1.15	1.16	1.17	1.17	1.16	1.15	1.14	1.14	1.15	1.17	1.21	1.26	1.32
	.65	.64	.65	.68	.72	.76	.80	.83	.85	.86	.86	.85	.85	.85	.85	.85	.85	.85	.84	.82	.79	.75	.71	.67
5-15S	36.97	37.53	36.45	33.85	30.12	25.85	21.72	18.31	16.02	14.95	14.94	15.63	16.59	17.47	18.06	18.41	18.70	19.28	20.46	22.43	25.20	28.52	31.95	34.95
	1.58	1.60	1.59	1.56	1.50	1.43	1.35	1.29	1.24	1.22	1.21	1.22	1.23	1.24	1.25	1.26	1.26	1.27	1.29	1.32	1.37	1.42	1.49	1.54
	.69	.70	.71	.74	.77	.80	.82	.84	.85	.85	.84	.83	.81	.81	.80	.80	.80	.79	.78	.77	.75	.73	.71	.70
15-25S	16.05	15.69	15.46	15.32	15.17	14.94	14.59	14.13	13.59	13.08	12.71	12.57	12.73	13.20	13.95	14.88	15.86	16.75	17.42	17.78	17.80	17.53	17.07	16.53
	1.24	1.23	1.22	1.22	1.21	1.21	1.20	1.19	1.19	1.18	1.18	1.18	1.18	1.19	1.20	1.21	1.23	1.24	1.25	1.26	1.26	1.26	1.25	1.25
	.85	.85	.85	.85	.85	.86	.86	.87	.88	.89	.89	.89	.89	.88	.87	.85	.84	.83	.83	.82	.83	.83	.84	.85
25-35S	13.71	14.12	14.45	14.59	14.43	13.94	13.17	12.23	11.26	10.44	9.88	9.66	9.79	10.22	10.83	11.51	12.13	12.61	12.90	13.03	13.04	13.05	13.14	13.36
	1.18	1.19	1.19	1.20	1.20	1.19	1.18	1.17	1.16	1.15	1.14	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.18	1.17	1.17	1.17	1.17	1.17
	.86	.85	.85	.84	.84	.84	.85	.86	.88	.89	.90	.90	.90	.90	.89	.88	.88	.87	.87	.87	.87	.87	.87	.87
35-45S	13.12	13.49	13.94	14.34	14.51	14.35	13.80	12.89	11.76	10.58	9.57	8.88	8.61	8.80	9.35	10.14	11.02	11.82	12.42	12.77	12.91	12.90	12.86	12.91
	1.18	1.18	1.19	1.19	1.20	1.20	1.20	1.18	1.17	1.15	1.14	1.12	1.12	1.12	1.13	1.14	1.16	1.17	1.18	1.18	1.19	1.18	1.18	1.18
	.86	.86	.85	.85	.84	.85	.86	.87	.88	.89	.90	.90	.91	.90	.89	.89	.88	.88	.87	.87	.87	.87	.87	.86
45-55S	15.62	15.60	15.59	15.51	15.24	14.69	13.83	12.68	11.36	10.06	8.96	8.24	7.99	8.27	9.02	10.14	11.44	12.77	13.94	14.85	15.44	15.71	15.76	15.70
	1.21	1.21	1.21	1.21	1.21	1.20	1.18	1.17	1.15	1.14	1.12	1.12	1.11	1.11	1.12	1.13	1.15	1.17	1.18	1.20	1.20	1.21	1.21	1.21
	.82	.82	.81	.81	.82	.83	.84	.85	.88	.88	.90	.91	.91	.90	.90	.88	.88	.87	.86	.85	.84	.83	.83	.83
55-65S	19.42	20.39	20.93	20.89	20.18	18.83	16.98	14.85	12.71	10.82	9.37	8.47	8.12	8.26	8.77	9.52	10.42	11.37	12.35	13.38	14.46	15.64	16.90	18.20
	1.29	1.31	1.32	1.33	1.31	1.29	1.26	1.22	1.18	1.15	1.12	1.11	1.10	1.10	1.11	1.12	1.14	1.15	1.17	1.19	1.20	1.23	1.25	1.27
	.84	.84	.84	.84	.85	.85	.86	.87	.88	.89	.89	.90	.90	.89	.89	.88	.88	.87	.87	.86	.86	.85	.85	.85

Table 3. (cont.)

SPRING	00(LT)	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	17.05	17.46	17.42	17.00	16.29	15.43	14.54	13.72	13.01	12.42	11.90	11.41	10.91	10.40	9.93	9.58	9.45	9.64	10.20	11.11	12.32	13.69	15.04	16.21
	1.19	1.20	1.20	1.20	1.20	1.19	1.18	1.17	1.16	1.15	1.15	1.14	1.13	1.12	1.11	1.11	1.11	1.10	1.11	1.12	1.13	1.14	1.16	1.17
	.76	.76	.77	.78	.79	.81	.82	.83	.84	.85	.85	.86	.87	.87	.88	.88	.88	.87	.86	.84	.83	.81	.79	.77
45-55N	14.19	14.25	14.19	14.04	13.80	13.51	13.18	12.84	12.49	12.15	11.82	11.51	11.25	11.06	10.97	11.00	11.15	11.43	11.83	12.31	12.81	13.29	13.70	14.00
	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.16	1.15	1.15	1.14	1.14	1.13	1.13	1.14	1.14	1.14	1.15	1.15	1.16	1.16	1.16
	.82	.81	.82	.83	.83	.83	.84	.84	.85	.85	.85	.86	.86	.86	.87	.87	.86	.86	.85	.85	.84	.83	.82	.81
35-45N	13.69	13.33	12.90	12.45	12.04	11.70	11.42	11.20	11.02	10.86	10.70	10.53	10.39	10.31	10.33	10.50	10.85	11.37	11.99	12.65	13.24	13.67	13.90	13.89
	1.16	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.13	1.13	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.17
	.81	.81	.82	.83	.84	.84	.85	.85	.86	.86	.87	.87	.88	.88	.88	.88	.87	.86	.84	.83	.81	.81	.80	.80
25-35N																								
15-25N	22.89	22.59	21.94	20.97	19.74	18.30	16.76	15.23	13.82	12.64	11.77	11.27	11.17	11.46	12.13	13.14	14.42	15.90	17.47	19.01	20.40	21.54	22.35	22.81
	1.33	1.33	1.32	1.30	1.28	1.26	1.23	1.21	1.18	1.17	1.15	1.15	1.15	1.15	1.16	1.17	1.19	1.21	1.23	1.26	1.28	1.30	1.32	1.33
	.78	.79	.79	.80	.80	.81	.82	.83	.84	.85	.86	.86	.86	.86	.85	.84	.83	.81	.80	.79	.78	.78	.78	.78
5-15N																								
5N-5S	18.77	21.11	22.84	23.58	23.17	21.68	19.38	16.72	14.18	12.13	10.83	10.29	10.35	10.73	11.16	11.40	11.37	11.12	10.84	10.77	11.18	12.22	13.95	16.22
	1.24	1.28	1.30	1.31	1.31	1.29	1.26	1.23	1.19	1.17	1.15	1.14	1.14	1.14	1.14	1.14	1.13	1.13	1.12	1.12	1.13	1.15	1.17	1.21
	.77	.74	.72	.71	.72	.74	.78	.81	.85	.88	.89	.90	.89	.89	.88	.87	.87	.87	.87	.87	.87	.85	.83	.80
5-15S	25.65	27.32	28.19	28.06	26.85	24.66	21.74	18.47	15.24	12.42	10.28	8.94	8.37	8.46	9.02	9.89	10.94	12.12	13.44	14.97	16.76	18.83	21.12	23.47
	1.35	1.39	1.42	1.43	1.42	1.39	1.35	1.29	1.24	1.18	1.14	1.11	1.09	1.09	1.10	1.11	1.12	1.14	1.15	1.17	1.19	1.22	1.26	1.30
	.70	.69	.69	.71	.73	.76	.79	.83	.85	.88	.89	.89	.89	.89	.88	.87	.85	.84	.82	.80	.78	.76	.74	.71
15-25S	23.23	23.36	23.16	22.56	21.57	20.25	18.77	17.30	16.03	15.14	14.69	14.71	15.13	15.84	16.72	17.65	18.54	19.34	20.04	20.66	21.23	21.80	22.35	22.85
	1.29	1.30	1.30	1.29	1.28	1.26	1.24	1.23	1.21	1.20	1.19	1.19	1.19	1.20	1.21	1.22	1.23	1.24	1.24	1.25	1.26	1.27	1.28	1.28
	.69	.69	.69	.70	.71	.74	.76	.79	.81	.82	.83	.82	.81	.79	.78	.76	.75	.75	.74	.74	.73	.72	.71	.70
25-35S	17.82	17.89	17.58	16.89	15.91	14.80	13.74	12.92	12.46	12.42	12.74	13.33	14.02	14.67	15.16	15.44	15.53	15.51	15.49	15.58	15.85	16.31	16.88	17.43
	1.23	1.23	1.23	1.22	1.21	1.20	1.19	1.18	1.17	1.17	1.17	1.17	1.18	1.20	1.21	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
	.79	.79	.80	.81	.82	.84	.85	.85	.86	.85	.84	.83	.82	.82	.82	.82	.82	.82	.83	.82	.82	.81	.80	.79
35-45S	14.46	14.76	14.93	14.92	14.70	14.28	13.69	13.04	12.41	11.91	11.57	11.42	11.45	11.63	11.89	12.18	12.45	12.71	12.93	13.12	13.31	13.53	13.81	14.12
	1.20	1.21	1.21	1.21	1.21	1.21	1.20	1.19	1.18	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.18	1.18	1.18	1.18	1.18	1.19	1.19	1.19
	.84	.84	.83	.84	.84	.84	.85	.86	.86	.87	.87	.87	.87	.87	.87	.86	.86	.86	.86	.85	.85	.85	.84	.84
45-55S	15.28	15.33	15.23	14.97	14.55	13.99	13.36	12.73	12.18	11.75	11.48	11.37	11.42	11.58	11.83	12.15	12.51	12.91	13.33	13.75	14.16	14.53	14.85	15.11
	1.20	1.20	1.20	1.20	1.19	1.18	1.17	1.16	1.15	1.15	1.14	1.14	1.14	1.15	1.15	1.16	1.16	1.17	1.18	1.19	1.19	1.19	1.20	1.20
	.83	.82	.82	.82	.82	.83	.84	.85	.85	.86	.86	.86	.86	.86	.86	.86	.85	.85	.85	.85	.84	.84	.84	.83
55-65S	20.38	20.35	19.78	18.76	17.47	16.10	14.82	13.75	12.95	12.40	12.05	11.80	11.59	11.40	11.27	11.28	11.52	12.10	13.05	14.33	15.84	17.39	18.79	19.83
	1.30	1.31	1.30	1.29	1.27	1.24	1.22	1.19	1.18	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.15	1.16	1.17	1.19	1.22	1.24	1.27	1.29
	.79	.80	.81	.82	.84	.85	.86	.86	.86	.86	.85	.85	.85	.86	.86	.86	.86	.85	.84	.83	.81	.80	.79	.79

Table 3. (cont.)

SUMMER	00(LT)	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	13.80	14.26	14.25	13.79	13.01	12.06	11.10	10.23	9.53	9.00	8.60	8.26	7.91	7.53	7.13	6.79	6.59	6.65	7.06	7.83	8.94	10.26	11.64	12.88
	1.16	1.17	1.17	1.17	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.10	1.10	1.09	1.09	1.08	1.08	1.09	1.10	1.11	1.12	1.13	1.15
	.81	.81	.81	.82	.84	.85	.87	.88	.89	.89	.89	.90	.90	.91	.91	.92	.93	.92	.92	.91	.89	.87	.85	.83
45-55N	13.98	14.01	13.82	13.43	12.93	12.39	11.84	11.33	10.89	10.49	10.12	9.77	9.44	9.18	9.00	8.97	9.12	9.49	10.06	10.79	11.61	12.43	13.15	13.68
	1.18	1.18	1.18	1.17	1.17	1.16	1.15	1.15	1.15	1.14	1.13	1.13	1.12	1.12	1.12	1.11	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.17
	.83	.83	.83	.84	.85	.86	.86	.87	.87	.88	.88	.88	.89	.89	.89	.90	.89	.89	.88	.87	.86	.85	.84	.83
35-45N	11.94	12.01	11.95	11.77	11.50	11.21	10.95	10.74	10.60	10.53	10.50	10.48	10.45	10.39	10.30	10.22	10.16	10.18	10.28	10.48	10.76	11.10	11.44	11.74
	1.16	1.16	1.16	1.15	1.15	1.15	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.14	1.14	1.14	1.14	1.14	1.15	1.15	1.15	1.16
	.86	.86	.86	.86	.87	.87	.88	.88	.88	.88	.89	.89	.90	.90	.91	.91	.91	.90	.90	.89	.88	.87	.87	.86
25-35N																								
15-25N	22.62	22.65	22.26	21.50	20.47	19.28	18.08	17.00	16.13	15.52	15.14	14.96	14.91	14.95	15.09	15.35	15.77	16.39	17.21	18.22	19.33	20.44	21.44	22.19
	1.33	1.33	1.32	1.31	1.29	1.28	1.26	1.24	1.23	1.22	1.22	1.21	1.20	1.19	1.19	1.18	1.18	1.19	1.21	1.23	1.25	1.28	1.30	1.32
	.77	.77	.78	.79	.80	.81	.82	.82	.83	.83	.83	.82	.82	.81	.80	.79	.79	.78	.78	.77	.77	.77	.77	.77
5-15N																								
5N-5S	22.25	24.84	26.52	26.95	26.00	23.80	20.70	17.22	13.91	11.22	9.41	8.53	8.42	8.78	9.30	9.74	10.00	10.13	10.34	10.87	11.97	13.78	16.27	19.21
	1.27	1.32	1.35	1.37	1.36	1.34	1.30	1.25	1.20	1.15	1.12	1.11	1.11	1.11	1.12	1.13	1.14	1.14	1.14	1.14	1.14	1.16	1.19	1.23
	.72	.70	.69	.70	.72	.75	.79	.83	.86	.89	.91	.91	.91	.91	.90	.90	.89	.89	.88	.87	.85	.82	.79	.76
5-15S	24.33	25.38	25.88	25.67	24.68	22.95	20.64	18.00	15.31	12.88	10.92	9.58	8.90	8.83	9.29	10.17	11.35	12.75	14.30	15.96	17.69	19.45	21.21	22.87
	1.35	1.37	1.39	1.39	1.37	1.34	1.30	1.26	1.21	1.17	1.14	1.12	1.11	1.11	1.11	1.12	1.14	1.15	1.17	1.19	1.22	1.25	1.28	1.32
	.72	.72	.73	.74	.75	.77	.79	.81	.83	.85	.87	.88	.88	.89	.88	.87	.86	.84	.82	.80	.77	.75	.74	.73
15-25S	16.67	16.24	16.04	16.10	16.36	16.74	17.12	17.44	17.63	17.68	17.62	17.53	17.48	17.54	17.74	18.08	18.50	18.90	19.19	19.25	19.06	18.61	17.98	17.29
	1.22	1.21	1.20	1.20	1.21	1.23	1.24	1.25	1.26	1.26	1.26	1.25	1.24	1.23	1.23	1.23	1.23	1.24	1.25	1.25	1.26	1.25	1.24	1.23
	.80	.79	.79	.79	.79	.80	.80	.81	.81	.81	.81	.80	.79	.78	.77	.76	.75	.75	.75	.76	.77	.78	.79	.79
25-35S	18.89	19.92	20.61	20.73	20.18	18.99	17.37	15.61	14.05	12.95	12.47	12.64	13.31	14.29	15.32	16.17	16.68	16.84	16.72	16.48	16.32	16.45	16.95	17.81
	1.27	1.28	1.30	1.30	1.29	1.28	1.25	1.22	1.20	1.18	1.16	1.16	1.17	1.18	1.19	1.21	1.22	1.22	1.22	1.22	1.22	1.22	1.23	1.25
	.78	.77	.77	.78	.79	.80	.82	.84	.85	.86	.86	.85	.84	.82	.81	.80	.80	.81	.81	.81	.82	.81	.80	.79
35-45S	16.59	16.85	16.82	16.47	15.84	15.05	14.21	13.50	13.00	12.80	12.88	13.18	13.58	13.97	14.26	14.42	14.44	14.40	14.36	14.44	14.67	15.06	15.58	16.12
	1.23	1.24	1.24	1.23	1.23	1.21	1.20	1.19	1.18	1.18	1.18	1.19	1.20	1.20	1.21	1.21	1.21	1.21	1.21	1.20	1.21	1.21	1.21	1.22
	.82	.82	.81	.82	.82	.83	.84	.85	.86	.86	.87	.87	.86	.86	.86	.86	.85	.85	.84	.84	.84	.83	.83	.82
45-55S	14.22	14.39	14.41	14.25	13.92	13.44	12.89	12.33	11.83	11.47	11.25	11.17	11.22	11.34	11.52	11.70	11.90	12.10	12.34	12.60	12.90	13.23	13.58	13.93
	1.19	1.19	1.20	1.19	1.19	1.18	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.18	1.18	1.18	1.19
	.83	.83	.83	.83	.84	.84	.85	.86	.86	.87	.87	.88	.88	.88	.87	.87	.87	.87	.86	.86	.85	.85	.84	.84
55-65S	16.55	17.03	16.99	16.45	15.54	14.42	13.29	12.31	11.55	11.03	10.72	10.52	10.34	10.14	9.89	9.66	9.52	9.58	9.94	10.64	11.68	12.97	14.34	15.60
	1.21	1.22	1.22	1.22	1.21	1.19	1.17	1.16	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.11	1.12	1.12	1.13	1.14	1.15	1.16	1.18	1.20
	.78	.78	.78	.79	.81	.82	.83	.84	.85	.85	.85	.85	.85	.85	.85	.86	.87	.87	.87	.87	.85	.83	.81	.80

Table 3. (cont.)

FALL	00(LT)	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	16.44	16.19	15.91	15.65	15.42	15.18	14.89	14.50	13.99	13.36	12.65	11.94	11.33	10.92	10.80	11.05	11.64	12.52	13.56	14.61	15.51	16.16	16.51	16.58
	1.22	1.21	1.21	1.20	1.20	1.20	1.19	1.19	1.18	1.17	1.16	1.15	1.14	1.14	1.13	1.14	1.15	1.17	1.18	1.20	1.21	1.22	1.22	1.22
	.81	.81	.81	.81	.82	.82	.82	.83	.84	.84	.85	.86	.87	.87	.87	.86	.86	.85	.84	.83	.82	.81	.81	.81
45-55N	15.23	15.10	14.98	14.86	14.72	14.50	14.18	13.76	13.27	12.76	12.28	11.92	11.72	11.73	11.96	12.40	12.98	13.64	14.28	14.83	15.21	15.41	15.44	15.36
	1.19	1.19	1.18	1.19	1.19	1.19	1.18	1.18	1.17	1.16	1.15	1.15	1.15	1.15	1.15	1.16	1.17	1.18	1.20	1.20	1.20	1.21	1.20	1.20
	.82	.82	.82	.82	.82	.82	.83	.83	.84	.85	.86	.86	.87	.87	.86	.86	.86	.85	.85	.84	.83	.83	.82	.82
35-45N	12.77	12.51	12.41	12.42	12.47	12.47	12.34	12.05	11.62	11.09	10.58	10.18	10.01	10.13	10.55	11.22	12.04	12.87	13.56	14.00	14.13	13.97	13.60	13.17
	1.18	1.18	1.18	1.18	1.18	1.17	1.17	1.17	1.16	1.15	1.15	1.14	1.14	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.20	1.20	1.20	1.19
	.87	.88	.87	.87	.87	.87	.87	.87	.87	.88	.88	.89	.89	.89	.88	.88	.86	.86	.85	.85	.85	.85	.86	.87
25-35N																								
15-25N	20.97	20.93	20.60	19.91	18.84	17.47	15.96	14.53	13.38	12.67	12.50	12.85	13.67	14.79	16.06	17.31	18.41	19.26	19.85	20.21	20.42	20.56	20.71	20.86
	1.29	1.29	1.29	1.28	1.27	1.25	1.22	1.20	1.18	1.16	1.15	1.15	1.17	1.18	1.20	1.23	1.25	1.27	1.28	1.28	1.29	1.29	1.29	1.29
	.80	.80	.80	.80	.81	.82	.83	.84	.85	.85	.85	.84	.83	.81	.80	.79	.79	.79	.79	.80	.80	.80	.80	.80
5-15N																								
5N-5S	16.87	19.58	21.81	23.12	23.23	22.15	20.14	17.65	15.21	13.28	12.11	11.75	11.99	12.53	13.01	13.16	12.85	12.15	11.26	10.52	10.24	10.71	12.05	14.19
	1.23	1.28	1.32	1.34	1.35	1.33	1.30	1.26	1.22	1.19	1.17	1.16	1.17	1.18	1.19	1.19	1.19	1.17	1.15	1.14	1.13	1.13	1.15	1.18
	.80	.79	.77	.77	.77	.78	.80	.82	.84	.85	.86	.87	.87	.87	.87	.87	.87	.87	.87	.86	.86	.85	.84	.82
5-15S	29.60	29.91	29.05	27.11	24.30	20.99	17.57	14.46	11.94	10.17	9.16	8.79	8.92	9.39	10.11	11.04	12.24	13.78	15.72	18.06	20.70	23.47	26.09	28.24
	1.43	1.46	1.47	1.45	1.41	1.35	1.28	1.22	1.16	1.12	1.10	1.10	1.11	1.12	1.14	1.15	1.16	1.17	1.19	1.21	1.25	1.29	1.34	1.39
	.69	.71	.74	.77	.80	.82	.84	.85	.86	.87	.87	.88	.88	.88	.87	.86	.83	.81	.78	.74	.71	.69	.68	.68
15-25S	17.74	17.85	17.86	17.68	17.27	16.64	15.89	15.16	14.59	14.32	14.39	14.80	15.45	16.22	16.97	17.59	18.00	18.18	18.17	18.02	17.82	17.66	17.59	17.62
	1.24	1.25	1.25	1.26	1.25	1.24	1.23	1.22	1.21	1.20	1.21	1.22	1.23	1.24	1.25	1.26	1.26	1.26	1.25	1.24	1.24	1.23	1.23	1.23
	.82	.82	.83	.83	.83	.83	.83	.84	.84	.84	.84	.83	.83	.83	.82	.82	.82	.81	.81	.81	.82	.82	.82	.82
25-35S	15.09	14.76	14.37	13.93	13.43	12.87	12.28	11.72	11.24	10.91	10.77	10.83	11.09	11.53	12.10	12.77	13.47	14.16	14.76	15.23	15.52	15.62	15.56	15.37
	1.20	1.19	1.19	1.18	1.18	1.17	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.21	1.21	1.21	1.21	1.20
	.84	.84	.84	.84	.85	.85	.86	.87	.87	.87	.87	.86	.86	.85	.85	.84	.84	.84	.84	.84	.84	.84	.84	.84
35-45S	12.76	12.62	12.61	12.68	12.71	12.64	12.41	12.03	11.57	11.12	10.79	10.68	10.82	11.24	11.87	12.61	13.35	13.97	14.36	14.48	14.32	13.96	13.51	13.08
	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.15	1.16	1.17	1.19	1.20	1.21	1.21	1.21	1.20	1.19	1.18
	.86	.86	.86	.85	.85	.85	.86	.86	.87	.87	.88	.88	.88	.88	.87	.87	.86	.85	.85	.85	.86	.86	.86	.86
45-55S	13.15	12.93	12.83	12.80	12.76	12.65	12.39	12.00	11.50	11.00	10.58	10.34	10.36	10.66	11.21	11.94	12.72	13.45	14.02	14.33	14.38	14.19	13.86	13.49
	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.15	1.14	1.13	1.13	1.13	1.13	1.13	1.15	1.16	1.17	1.19	1.19	1.19	1.19	1.18	1.17
	.85	.86	.86	.85	.85	.86	.86	.86	.87	.88	.88	.88	.88	.88	.87	.86	.85	.85	.84	.84	.83	.84	.84	.85
55-65S	19.14	19.60	19.83	19.74	19.23	18.28	16.95	15.34	13.65	12.06	10.75	9.86	9.45	9.52	10.03	10.87	11.92	13.08	14.23	15.30	16.26	17.11	17.87	18.54
	1.24	1.25	1.26	1.26	1.26	1.24	1.23	1.20	1.17	1.15	1.12	1.11	1.10	1.10	1.11	1.12	1.14	1.16	1.18	1.19	1.21	1.22	1.23	1.24
	.76	.76	.76	.76	.77	.79	.80	.82	.84	.86	.87	.88	.89	.89	.88	.87	.86	.84	.83	.81	.80	.78	.77	.77

Table 3. (cont.)

********** QUIET MAGNETIC - HIGH SOLAR **********

WINTER	00(LT)	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	17.95	17.82	17.89	18.06	18.15	17.98	17.38	16.29	14.80	13.08	11.41	10.07	9.33	9.33	10.09	11.48	13.25	15.12	16.76	17.99	18.66	18.83	18.63	18.27
	1.25	1.25	1.25	1.25	1.25	1.25	1.24	1.23	1.21	1.17	1.15	1.13	1.11	1.11	1.12	1.15	1.17	1.20	1.23	1.25	1.26	1.27	1.27	1.26
	.83	.83	.84	.84	.84	.84	.84	.85	.85	.86	.87	.87	.88	.88	.87	.86	.84	.82	.81	.80	.80	.80	.81	.82
45-55N	16.19	15.65	15.12	14.63	14.18	13.71	13.16	12.49	11.69	10.80	9.93	9.19	8.73	8.68	9.08	9.95	11.17	12.60	14.04	15.30	16.23	16.75	16.86	16.63
	1.23	1.22	1.21	1.20	1.19	1.18	1.17	1.16	1.15	1.13	1.13	1.11	1.11	1.11	1.11	1.13	1.15	1.16	1.19	1.21	1.23	1.23	1.24	1.23
	.82	.83	.83	.83	.84	.84	.84	.85	.86	.87	.88	.88	.89	.89	.89	.88	.86	.85	.84	.83	.82	.82	.82	.82
35-45N	15.25	14.93	14.68	14.49	14.29	13.98	13.49	12.78	11.85	10.82	9.81	9.00	8.54	8.52	8.99	9.89	11.10	12.45	13.74	14.79	15.50	15.83	15.83	15.59
	1.23	1.22	1.22	1.21	1.20	1.20	1.19	1.17	1.16	1.14	1.13	1.12	1.11	1.11	1.11	1.13	1.15	1.17	1.19	1.21	1.23	1.24	1.24	1.24
	.86	.87	.87	.86	.86	.86	.86	.86	.86	.87	.88	.89	.89	.90	.89	.88	.87	.86	.85	.84	.84	.85	.85	.86
25-35N																								
15-25N	27.13	28.01	28.55	28.47	27.56	25.72	23.07	19.88	16.54	13.52	11.20	9.85	9.57	10.29	11.80	13.83	16.07	18.25	20.19	21.79	23.09	24.16	25.14	26.13
	1.39	1.40	1.41	1.41	1.40	1.38	1.34	1.29	1.24	1.19	1.15	1.13	1.13	1.14	1.17	1.21	1.25	1.28	1.32	1.34	1.35	1.36	1.37	1.38
	.73	.72	.72	.73	.74	.76	.79	.82	.84	.86	.88	.88	.88	.87	.86	.85	.83	.82	.81	.79	.78	.77	.75	.74
5-15N																								
5N-5S	0.00	0.00	13.90	14.82	17.82	24.87	12.88	7.07	5.63	6.62	9.83	12.15	13.03	12.95	12.28	11.90	10.75	9.78	10.83	13.63	16.07	14.30	0.00	0.00
	0.00	0.00	1.19	1.16	1.18	1.31	1.19	1.09	1.07	1.07	1.09	1.14	1.19	1.20	1.17	1.19	1.16	1.13	1.13	1.18	1.21	1.24	0.00	0.00
	0.00	0.00	.81	.79	.75	.66	.85	.93	.93	.91	.84	.84	.86	.87	.87	.88	.87	.87	.85	.81	.80	.89	0.00	0.00
5-15S	14.53	17.68	20.48	22.45	23.26	22.82	21.28	19.00	16.43	13.99	11.97	10.52	9.61	9.13	8.90	8.80	8.76	8.80	9.00	9.49	10.39	11.75	13.57	15.74
	.91	1.02	1.13	1.23	1.28	1.30	1.29	1.26	1.21	1.17	1.14	1.13	1.12	1.12	1.11	1.11	1.10	1.10	1.10	1.10	1.11	1.12	1.14	1.17
	.56	.59	.63	.67	.71	.74	.76	.78	.80	.82	.84	.86	.87	.88	.88	.87	.87	.87	.86	.86	.85	.84	.82	.79
15-25S	16.10	16.07	15.86	15.44	14.83	14.09	13.30	12.56	11.98	11.61	11.49	11.60	11.90	12.33	12.81	13.29	13.74	14.14	14.51	14.84	15.16	15.47	15.75	15.97
	1.20	1.20	1.20	1.19	1.18	1.17	1.16	1.16	1.15	1.15	1.16	1.17	1.18	1.19	1.19	1.20	1.20	1.21	1.20	1.20	1.20	1.20	1.20	1.20
	.84	.84	.83	.83	.83	.83	.83	.84	.85	.86	.88	.88	.89	.88	.87	.86	.85	.84	.84	.83	.83	.83	.84	.84
25-35S	14.24	13.54	12.70	11.85	11.11	10.54	10.16	9.94	9.81	9.69	9.53	9.32	9.10	8.94	8.94	9.20	9.75	10.57	11.59	12.67	13.64	14.35	14.71	14.66
	1.19	1.18	1.17	1.15	1.14	1.13	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.11	1.11	1.12	1.13	1.14	1.15	1.17	1.18	1.19	1.20	1.20
	.84	.84	.85	.86	.86	.86	.87	.87	.87	.88	.88	.88	.89	.89	.89	.89	.88	.87	.86	.85	.84	.84	.83	.83
35-45S	12.57	12.45	12.26	12.00	11.69	11.37	11.03	10.70	10.35	10.03	9.70	9.44	9.22	9.11	9.11	9.26	9.55	9.98	10.51	11.07	11.60	12.06	12.38	12.55
	1.17	1.17	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.14	1.14	1.14	1.13	1.13	1.13	1.13	1.13	1.13	1.14	1.15	1.16	1.16	1.17	1.17
	.85	.85	.85	.85	.86	.87	.87	.88	.88	.89	.89	.89	.90	.90	.90	.89	.89	.89	.88	.88	.87	.86	.85	.85
45-55S	12.50	12.48	12.46	12.41	12.27	11.98	11.53	10.91	10.17	9.39	8.68	8.12	7.81	7.78	8.05	8.58	9.28	10.07	10.84	11.50	12.00	12.31	12.47	12.51
	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.11	1.12	1.12	1.14	1.15	1.16	1.17	1.18	1.18	1.17	1.17
	.85	.85	.85	.86	.86	.87	.87	.88	.89	.90	.91	.91	.91	.90	.90	.90	.89	.88	.87	.87	.86	.86	.86	.85
55-65S	15.82	16.43	16.64	16.39	15.71	14.67	13.41	12.09	10.85	9.81	9.04	8.55	8.30	8.25	8.34	8.55	8.86	9.29	9.88	10.64	11.58	12.66	13.80	14.90
	1.22	1.23	1.23	1.22	1.21	1.19	1.18	1.16	1.15	1.14	1.13	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.13	1.14	1.16	1.18	1.20	1.21
	.82	.81	.80	.80	.81	.82	.84	.86	.88	.89	.91	.91	.92	.91	.91	.90	.89	.89	.88	.88	.87	.86	.85	.83

Table 3. (cont.)

SPRING	00(LT)	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	14.78	15.45	15.97	16.36	16.62	16.78	16.83	16.78	16.60	16.29	15.83	15.22	14.49	13.68	12.87	12.12	11.54	11.17	11.08	11.28	11.74	12.40	13.18	14.01
	1.16	1.18	1.19	1.20	1.21	1.22	1.22	1.22	1.21	1.20	1.19	1.17	1.15	1.15	1.13	1.12	1.11	1.11	1.11	1.11	1.11	1.12	1.13	1.15
	.78	.78	.78	.79	.79	.79	.79	.79	.78	.78	.78	.78	.79	.80	.81	.83	.83	.84	.84	.83	.82	.81	.80	.79
45-55N	10.32	10.72	11.25	11.89	12.60	13.35	14.07	14.66	15.07	15.25	15.18	14.87	14.35	13.71	12.98	12.27	11.59	11.00	10.53	10.18	9.96	9.86	9.89	10.04
	1.10	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.16	1.17	1.16	1.16	1.15	1.14	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.10	1.10	1.10
	.86	.85	.84	.84	.83	.82	.80	.79	.78	.78	.78	.78	.78	.80	.81	.82	.83	.85	.86	.86	.87	.87	.87	.86
35-45N	9.23	9.50	9.72	9.91	10.04	10.14	10.16	10.10	9.93	9.64	9.25	8.79	8.29	7.82	7.41	7.11	6.95	6.95	7.09	7.36	7.72	8.13	8.53	8.90
	1.10	1.10	1.11	1.11	1.11	1.11	1.11	1.10	1.09	1.09	1.08	1.08	1.07	1.06	1.06	1.07	1.07	1.07	1.07	1.08	1.08	1.09	1.09	1.10
	.88	.88	.87	.87	.86	.86	.86	.87	.87	.88	.90	.91	.91	.92	.93	.93	.93	.93	.92	.92	.91	.91	.90	.89
25-35N																								
15-25N	17.54	17.74	17.56	16.98	16.01	14.71	13.16	11.49	9.85	8.40	7.26	6.52	6.20	6.29	6.73	7.48	8.47	9.65	10.96	12.33	13.70	14.99	16.10	16.97
	1.23	1.23	1.23	1.22	1.21	1.20	1.18	1.16	1.14	1.12	1.11	1.10	1.09	1.09	1.10	1.11	1.13	1.14	1.16	1.18	1.20	1.21	1.22	1.23
	.81	.81	.80	.80	.81	.82	.84	.86	.88	.90	.92	.93	.94	.94	.93	.92	.91	.90	.88	.87	.86	.84	.83	.82
5-15N																								
5N-5S	14.10	14.95	15.67	16.08	16.01	15.39	14.24	12.72	11.05	9.52	8.33	7.64	7.45	7.71	8.27	8.97	9.68	10.30	10.82	11.25	11.64	12.07	12.61	13.29
	1.19	1.20	1.20	1.21	1.21	1.20	1.18	1.16	1.14	1.12	1.11	1.10	1.10	1.11	1.12	1.13	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.18
	.82	.82	.81	.82	.82	.84	.86	.88	.90	.91	.92	.92	.92	.92	.91	.90	.89	.88	.88	.87	.86	.85	.84	.83
5-15S	14.96	16.40	17.35	17.63	17.20	16.08	14.42	12.44	10.41	8.56	7.05	5.98	5.32	5.03	4.99	5.13	5.39	5.80	6.38	7.21	8.33	9.76	11.44	13.23
	1.16	1.19	1.21	1.22	1.22	1.21	1.19	1.16	1.13	1.11	1.09	1.07	1.07	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.07	1.08	1.10	1.13
	.79	.78	.77	.77	.78	.80	.82	.84	.87	.89	.92	.93	.94	.95	.95	.95	.94	.93	.91	.89	.87	.85	.83	.81
15-25S	14.69	15.15	15.47	15.54	15.29	14.66	13.66	12.39	10.99	9.62	8.47	7.65	7.26	7.29	7.70	8.38	9.23	10.14	11.01	11.79	12.47	13.07	13.62	14.16
	1.19	1.20	1.20	1.20	1.19	1.19	1.17	1.16	1.14	1.12	1.11	1.10	1.09	1.09	1.10	1.11	1.12	1.14	1.15	1.16	1.17	1.18	1.19	1.19
	.83	.83	.82	.81	.81	.81	.82	.84	.86	.88	.90	.91	.91	.91	.90	.89	.88	.87	.86	.86	.86	.85	.85	.84
25-35S	10.30	10.81	11.22	11.50	11.63	11.59	11.41	11.12	10.74	10.33	9.90	9.48	9.08	8.72	8.39	8.13	7.96	7.88	7.91	8.07	8.35	8.74	9.22	9.75
	1.12	1.14	1.15	1.15	1.15	1.14	1.13	1.11	1.10	1.08	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.08	1.08	1.09	1.10	1.11
	.87	.87	.87	.87	.87	.86	.86	.86	.85	.85	.85	.86	.86	.87	.88	.88	.89	.89	.89	.89	.88	.88	.87	.87
35-45S	9.49	9.90	10.39	10.92	11.43	11.88	12.21	12.38	12.36	12.18	11.84	11.40	10.91	10.43	10.00	9.62	9.32	9.09	8.93	8.83	8.80	8.84	8.96	9.18
	1.11	1.12	1.12	1.13	1.13	1.13	1.13	1.12	1.11	1.10	1.09	1.09	1.09	1.09	1.09	1.09	1.10	1.10	1.10	1.10	1.10	1.09	1.10	1.10
	.89	.88	.88	.87	.85	.84	.84	.83	.82	.82	.83	.83	.84	.85	.86	.87	.88	.88	.89	.89	.90	.90	.89	.89
45-55S	11.12	11.33	11.67	12.14	12.74	13.42	14.10	14.70	15.15	15.38	15.37	15.14	14.73	14.18	13.59	13.01	12.49	12.05	11.69	11.43	11.23	11.10	11.03	11.03
	1.13	1.13	1.14	1.14	1.15	1.16	1.16	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.11	1.11	1.11	1.11	1.12	1.12	1.12	1.12	1.12
	.86	.86	.85	.85	.84	.83	.82	.80	.79	.77	.76	.76	.75	.76	.77	.78	.79	.81	.83	.84	.85	.86	.86	.86
55-65S	13.89	14.87	15.75	16.45	16.94	17.23	17.36	17.39	17.33	17.22	17.02	16.72	16.28	15.68	14.92	14.06	13.16	12.31	11.64	11.23	11.16	11.44	12.05	12.90
	1.14	1.15	1.16	1.17	1.18	1.20	1.21	1.23	1.24	1.24	1.24	1.23	1.22	1.20	1.18	1.16	1.14	1.13	1.12	1.12	1.12	1.13	1.13	1.14
	.82	.81	.79	.78	.77	.77	.78	.79	.79	.80	.80	.80	.79	.79	.79	.79	.80	.81	.83	.84	.85	.85	.85	.84

Table 3. (cont.)

SUMMER	00(LT)	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	11.49	12.59	13.55	14.27	14.71	14.85	14.73	14.39	13.91	13.33	12.69	12.01	11.31	10.58	9.85	9.15	8.51	8.00	7.70	7.65	7.91	8.48	9.32	10.36
	1.14	1.15	1.17	1.18	1.19	1.19	1.19	1.18	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.09	1.09	1.09	1.10	1.11	1.12
	.86	.84	.83	.83	.82	.82	.82	.82	.83	.84	.85	.86	.87	.88	.88	.89	.90	.90	.90	.90	.90	.89	.88	.87
45-55N	10.54	11.06	11.59	12.11	12.58	12.99	13.31	13.50	13.55	13.45	13.19	12.79	12.29	11.71	11.11	10.54	10.03	9.62	9.34	9.21	9.22	9.38	9.67	10.06
	1.14	1.15	1.15	1.16	1.17	1.18	1.18	1.18	1.18	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.11	1.12	1.12	1.13
	.88	.87	.87	.86	.86	.85	.84	.84	.84	.84	.84	.84	.84	.85	.85	.86	.87	.87	.88	.88	.88	.88	.88	.88
35-45N	9.59	10.09	10.62	11.18	11.72	12.19	12.52	12.68	12.63	12.37	11.93	11.34	10.67	9.99	9.36	8.83	8.43	8.18	8.08	8.11	8.26	8.48	8.79	9.16
	1.12	1.13	1.14	1.15	1.15	1.15	1.15	1.15	1.14	1.13	1.13	1.12	1.11	1.11	1.11	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.11	1.11
	.88	.88	.88	.87	.86	.85	.84	.83	.82	.82	.83	.84	.85	.86	.87	.88	.89	.89	.89	.89	.89	.89	.88	.88
25-35N																								
15-25N	12.57	12.84	13.18	13.50	13.72	13.75	13.53	13.06	12.38	11.60	10.83	10.18	9.75	9.59	9.70	10.04	10.51	11.03	11.51	11.88	12.11	12.24	12.31	12.40
	1.17	1.17	1.17	1.18	1.18	1.18	1.18	1.16	1.15	1.13	1.12	1.10	1.10	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.16	1.16	1.16
	.85	.85	.85	.84	.84	.84	.85	.85	.86	.87	.88	.89	.89	.89	.89	.88	.88	.87	.87	.86	.86	.86	.86	.86
5-15N																								
5N-5S	13.44	15.18	16.66	17.60	17.79	17.16	15.81	13.98	11.98	10.13	8.67	7.74	7.33	7.33	7.55	7.85	8.07	8.20	8.25	8.36	8.65	9.27	10.30	11.73
	1.17	1.19	1.20	1.21	1.21	1.21	1.19	1.17	1.15	1.13	1.11	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.11	1.11	1.13	1.14
	.83	.80	.79	.78	.78	.79	.81	.84	.87	.89	.91	.92	.92	.91	.91	.90	.90	.90	.90	.89	.89	.88	.87	.85
5-15S	14.15	15.79	17.07	17.74	17.67	16.86	15.41	13.55	11.57	9.73	8.26	7.26	6.71	6.54	6.59	6.76	6.94	7.13	7.37	7.76	8.41	9.40	10.75	12.38
	1.17	1.19	1.22	1.24	1.24	1.24	1.22	1.19	1.16	1.12	1.10	1.08	1.07	1.06	1.07	1.07	1.08	1.08	1.08	1.09	1.09	1.10	1.12	1.14
	.81	.80	.79	.79	.80	.82	.84	.87	.89	.90	.91	.91	.92	.92	.92	.92	.93	.93	.92	.92	.90	.88	.86	.84
15-25S	11.24	11.85	12.47	12.95	13.13	12.92	12.31	11.39	10.32	9.28	8.47	8.02	7.98	8.31	8.89	9.56	10.17	10.60	10.79	10.78	10.65	10.54	10.55	10.78
	1.14	1.14	1.15	1.16	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.10	1.11	1.11	1.12	1.13	1.14	1.14	1.14	1.14	1.13	1.13	1.13
	.87	.86	.86	.85	.85	.85	.85	.86	.87	.88	.89	.89	.89	.89	.88	.88	.87	.87	.87	.87	.87	.87	.87	.87
25-35S	10.16	10.75	11.37	11.93	12.30	12.43	12.29	11.89	11.31	10.65	10.02	9.51	9.17	9.03	9.05	9.17	9.31	9.41	9.43	9.39	9.32	9.30	9.41	9.70
	1.12	1.13	1.14	1.15	1.16	1.16	1.16	1.15	1.13	1.12	1.10	1.09	1.08	1.08	1.08	1.08	1.09	1.10	1.10	1.10	1.10	1.11	1.11	1.11
	.87	.87	.86	.86	.85	.85	.85	.85	.85	.86	.86	.87	.87	.87	.87	.87	.87	.86	.86	.87	.87	.87	.87	.87
35-45S	9.06	9.55	10.15	10.82	11.49	12.09	12.59	12.91	13.03	12.93	12.67	12.25	11.73	11.17	10.61	10.08	9.60	9.20	8.87	8.60	8.44	8.39	8.47	8.69
	1.12	1.13	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.15	1.14	1.13	1.13	1.12	1.12	1.12	1.12	1.11	1.11	1.11	1.11	1.11	1.11	1.11
	.89	.88	.88	.87	.86	.85	.84	.83	.82	.82	.82	.82	.83	.84	.85	.86	.87	.88	.88	.89	.89	.89	.89	.89
45-55S	10.35	10.71	11.15	11.61	12.05	12.42	12.69	12.85	12.88	12.78	12.60	12.33	12.01	11.67	11.32	10.98	10.66	10.37	10.14	9.96	9.86	9.83	9.90	10.07
	1.12	1.13	1.13	1.14	1.15	1.16	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.14	1.13	1.13	1.13	1.12	1.12	1.12	1.11	1.11	1.11	1.11
	.86	.85	.85	.85	.84	.84	.84	.84	.83	.83	.83	.83	.84	.84	.85	.86	.86	.86	.87	.87	.87	.87	.86	.86
55-65S	11.15	12.06	12.81	13.32	13.56	13.55	13.35	13.04	12.69	12.35	12.04	11.73	11.39	11.00	10.52	9.98	9.40	8.86	8.45	8.25	8.32	8.69	9.34	10.19
	1.12	1.13	1.14	1.14	1.15	1.15	1.16	1.16	1.16	1.16	1.16	1.15	1.15	1.14	1.13	1.13	1.12	1.11	1.11	1.10	1.10	1.10	1.11	1.11
	.84	.83	.82	.81	.81	.81	.82	.83	.84	.84	.85	.86	.86	.87	.87	.88	.88	.89	.89	.89	.89	.88	.87	.85

Table 3. (cont.)

FALL	00(LT)	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	16.36	16.71	16.87	16.87	16.76	16.57	16.33	16.09	15.82	15.53	15.17	14.73	14.23	13.70	13.18	12.76	12.51	12.49	12.70	13.14	13.76	14.47	15.19	15.84
	1.18	1.19	1.20	1.20	1.20	1.20	1.19	1.19	1.18	1.17	1.17	1.16	1.15	1.14	1.14	1.14	1.14	1.14	1.15	1.15	1.16	1.16	1.17	1.18
	.78	.77	.78	.78	.78	.78	.78	.78	.77	.77	.78	.78	.79	.80	.81	.82	.83	.84	.83	.83	.82	.81	.79	.79
45-55N	12.60	12.91	13.18	13.40	13.57	13.70	13.75	13.70	13.55	13.26	12.85	12.34	11.77	11.21	10.71	10.33	10.13	10.10	10.26	10.55	10.94	11.38	11.82	12.23
	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.15	1.14	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.11	1.11	1.12	1.13	1.14	1.14	1.15	1.15
	.84	.84	.84	.83	.82	.82	.82	.81	.81	.81	.81	.82	.82	.84	.85	.85	.86	.87	.86	.86	.86	.86	.86	.85
35-45N	11.24	11.26	11.19	11.05	10.84	10.57	10.20	9.73	9.15	8.49	7.79	7.11	6.54	6.15	6.00	6.13	6.52	7.15	7.92	8.75	9.55	10.24	10.76	11.08
	1.15	1.15	1.15	1.15	1.14	1.14	1.13	1.12	1.11	1.10	1.09	1.08	1.08	1.08	1.07	1.08	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15
	.88	.87	.87	.87	.87	.87	.87	.87	.88	.88	.89	.90	.91	.92	.92	.92	.91	.91	.90	.89	.88	.87	.87	.87
25-35N																								
15-25N	25.46	27.25	28.18	27.98	26.60	24.15	20.94	17.41	14.01	11.14	9.04	7.80	7.35	7.53	8.14	9.00	10.03	11.19	12.51	14.07	15.94	18.13	20.58	23.10
	1.37	1.40	1.41	1.41	1.39	1.35	1.30	1.25	1.19	1.15	1.11	1.09	1.08	1.09	1.10	1.11	1.13	1.15	1.17	1.19	1.22	1.26	1.30	1.33
	.74	.74	.74	.76	.78	.81	.83	.86	.88	.89	.90	.91	.91	.91	.90	.90	.89	.88	.86	.84	.82	.80	.77	.75
5-15N																								
5N-5S	13.89	15.51	16.85	17.58	17.53	16.66	15.15	13.31	11.50	10.05	9.18	8.92	9.18	9.73	10.32	10.76	10.91	10.78	10.46	10.14	10.02	10.29	11.06	12.30
	1.21	1.23	1.24	1.25	1.25	1.23	1.21	1.18	1.16	1.14	1.13	1.13	1.14	1.15	1.16	1.17	1.18	1.18	1.17	1.17	1.16	1.17	1.18	1.19
	.86	.84	.82	.81	.81	.81	.83	.85	.87	.89	.90	.91	.91	.91	.90	.90	.90	.90	.90	.91	.91	.90	.89	.88
5-15S	0.00	0.00	0.00	15.20	20.00	21.90	21.10	10.25	8.70	10.20	5.50	5.70	6.20	4.80	0.00	3.00	4.70	2.40	3.80	3.50	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	1.16	1.18	1.16	1.31	1.16	1.13	1.07	1.07	1.09	1.10	1.07	0.00	1.04	1.06	1.02	1.02	1.03	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	.81	.76	.71	.77	.95	.86	.83	.95	.94	.91	.92	0.00	.97	.95	.96	.93	.93	0.00	0.00	0.00	0.00
15-25S	23.14	22.67	21.98	21.03	19.81	18.34	16.70	15.02	13.45	12.17	11.31	10.98	11.23	12.02	13.30	14.92	16.72	18.52	20.16	21.52	22.51	23.12	23.40	23.39
	1.34	1.34	1.33	1.32	1.30	1.28	1.25	1.21	1.18	1.15	1.13	1.13	1.14	1.15	1.18	1.22	1.26	1.29	1.32	1.33	1.34	1.35	1.35	1.34
	.78	.77	.78	.78	.79	.80	.81	.82	.83	.84	.84	.84	.84	.84	.84	.84	.84	.84	.83	.82	.81	.80	.79	.78
25-35S	13.24	14.63	15.69	16.22	16.10	15.28	13.86	12.02	10.03	8.16	6.64	5.60	5.06	4.96	5.17	5.54	5.96	6.38	6.83	7.37	8.10	9.07	10.29	11.72
	1.17	1.19	1.20	1.21	1.21	1.21	1.19	1.17	1.15	1.12	1.10	1.08	1.07	1.06	1.06	1.07	1.07	1.08	1.09	1.09	1.11	1.12	1.14	1.15
	.83	.81	.81	.81	.82	.83	.85	.88	.90	.92	.93	.94	.94	.94	.94	.93	.93	.92	.92	.91	.90	.88	.87	.85
35-45S	10.70	11.30	11.77	12.08	12.12	11.86	11.31	10.48	9.46	8.39	7.38	6.53	5.94	5.61	5.57	5.73	6.08	6.52	7.04	7.60	8.18	8.79	9.42	10.07
	1.14	1.15	1.16	1.17	1.17	1.17	1.17	1.16	1.14	1.13	1.11	1.10	1.09	1.08	1.08	1.08	1.08	1.08	1.09	1.10	1.11	1.12	1.12	1.13
	.86	.85	.85	.86	.86	.87	.88	.88	.90	.91	.92	.93	.94	.94	.94	.93	.93	.92	.91	.90	.89	.88	.88	.87
45-55S	11.69	11.91	12.22	12.52	12.72	12.68	12.30	11.53	10.44	9.15	7.86	6.74	5.99	5.69	5.88	6.49	7.40	8.45	9.45	10.29	10.89	11.26	11.44	11.56
	1.18	1.18	1.19	1.19	1.19	1.19	1.17	1.15	1.13	1.11	1.09	1.07	1.05	1.05	1.05	1.06	1.07	1.09	1.11	1.12	1.14	1.15	1.16	1.17
	.87	.87	.87	.87	.87	.87	.88	.88	.89	.90	.91	.93	.93	.94	.93	.92	.91	.89	.88	.88	.87	.87	.87	.87
55-65S	11.88	12.63	13.27	13.77	14.07	14.15	14.02	13.69	13.21	12.62	11.96	11.29	10.63	10.02	9.48	9.06	8.76	8.61	8.63	8.83	9.19	9.72	10.37	11.11
	1.16	1.16	1.17	1.17	1.17	1.17	1.16	1.14	1.13	1.11	1.10	1.09	1.08	1.08	1.07	1.08	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15
	.87	.86	.85	.84	.83	.81	.80	.80	.80	.80	.81	.82	.83	.85	.86	.87	.88	.89	.89	.89	.88	.88	.88	.87

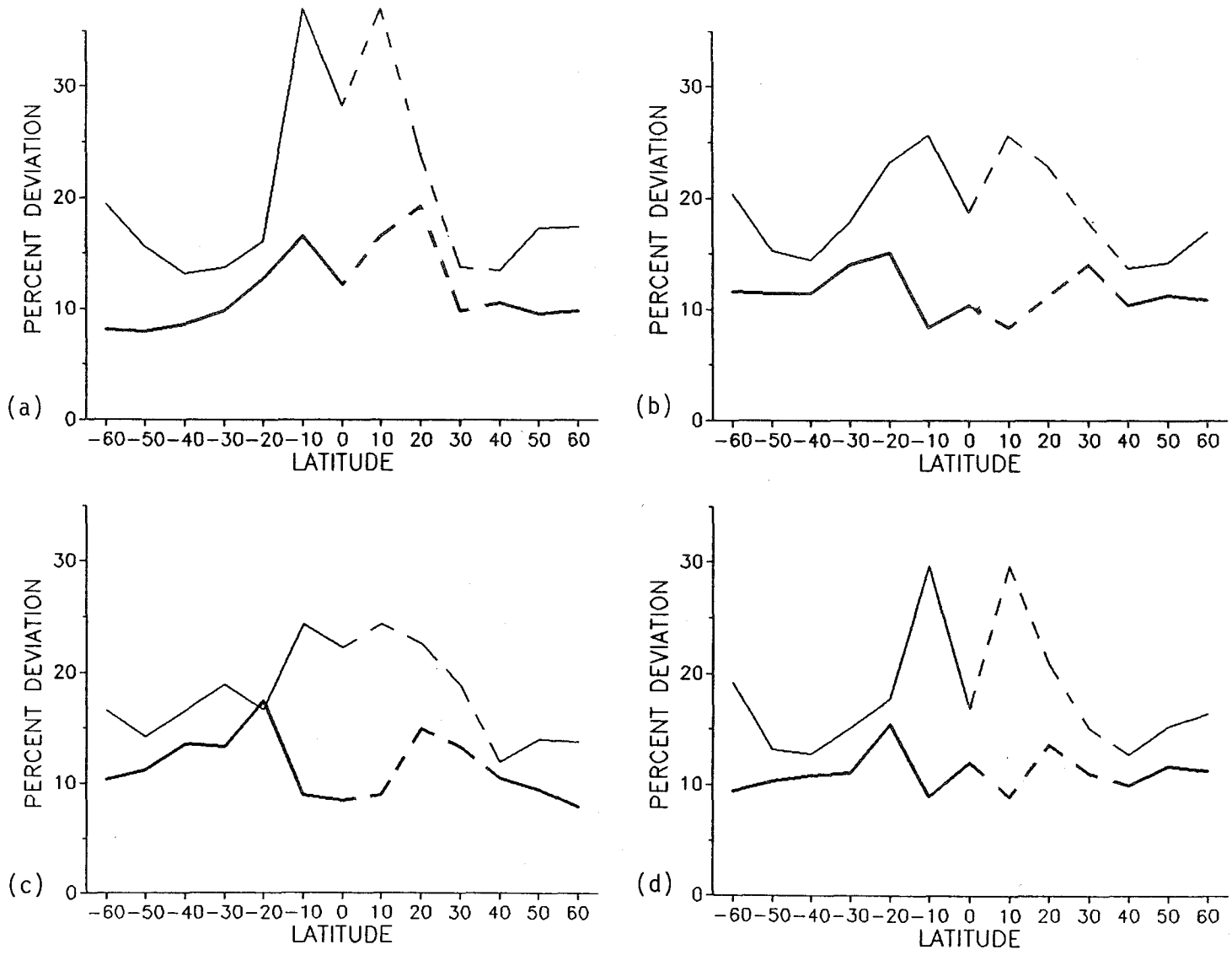

Figure 9. Latitudinal variabilities for noon (bold) and midnight for quiet magnetic and low solar conditions during (a) winter, (b) spring, (c) summer and (d) fall.

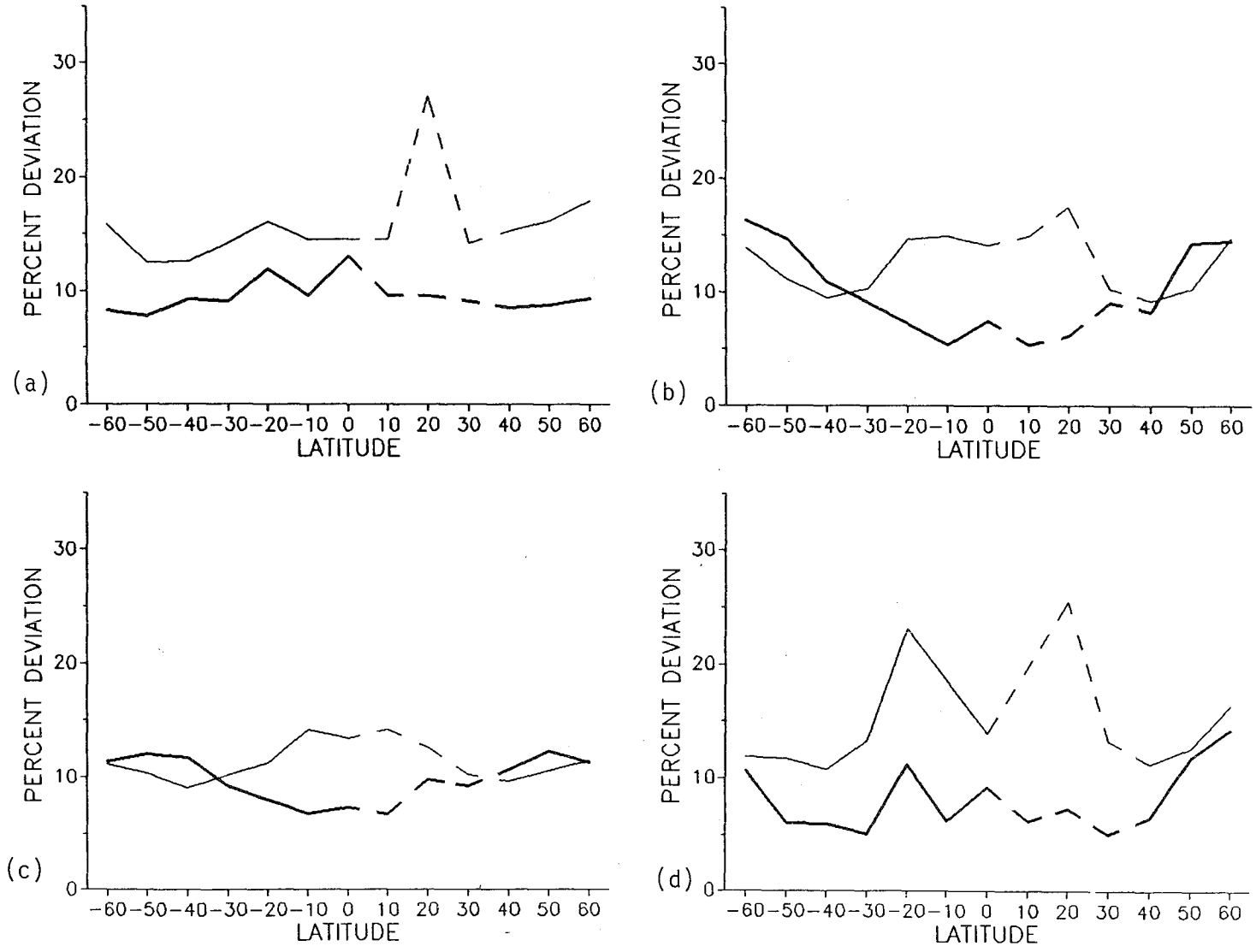

Figure 10. Latitudinal variabilities for noon (bold) and midnight for quiet magnetic and high solar conditions during (a) winter, (b) spring, (c) summer and (d) fall.

Figures 9 and 10 are the noon and midnight variabilities plotted for each magnetic latitude range for quiet magnetic periods and low and high solar ranges respectively. In general, high-latitude variabilities are somewhat greater than mid-latitude variabilities for both noon and midnight during high solar periods, and at midnight for low solar periods. As noted in Section 3.1, variabilities decrease from low solar to high solar periods. A symmetry between the northern and southern hemispheres can also be seen at mid-latitudes in these figures.

At low and equatorial latitudes, variabilities associated with locations corresponding to the crest of the equatorial anomaly can be much higher than at mid-latitudes. The equatorial anomaly occurs in low-latitudes and is centered around the magnetic equator (Rush et.al., 1969). The anomaly varies in latitude range from just a few degrees magnetic latitude, to over 20 degrees ML as a function of solar activity, season, and time of day. Large values of variability can be seen in low-latitudes at night during low solar periods. These variabilities may be particularly large during winter and fall nights for both low and high solar periods. At noon, slightly higher variabilities can occur around 20 to 30 degrees magnetic latitude during low solar periods. Equatorial variabilities are generally lower than those noticed at surrounding latitudes at night.

Tables of the diurnal variabilities, upper deciles and lower deciles for all months and latitude ranges are given in Appendix C. Included in this appendix are the variabilities for low ($IG12 \leq 40$), medium ($40 < IG12 > 110$) and high ($IG12 \geq 110$) solar ranges. Variabilities for the middle solar ranges are included in this appendix. During certain periods, a straight line interpolation from low to high solar periods does not sufficiently represent the variabilities calculated from the data. Because of the general increase in magnetic activity during equinox periods, Appendix C also contains variabilities for active magnetic periods ($AP > 19$) in March, April, September, and October. Also because of an increase in the level of magnetic activity during equinox periods, AP less than 20 is more representative of the average level of

activity. Therefore, variabilities were also calculated for AP less than 20 for the equinox periods and are also included in Appendix C.

4. REGRESSION

The plots summarized in Section 3 indicate a solar cycle dependency of the variability. This dependency is further examined by calculating the first order regression of variability with IG12. The slope of the regression line is given in Table 4 for each hour and month for all stations. Only magnetically quiet variabilities were included in the slopes of the regression lines given in Table 4. The hours where the gradient of the regression lines were deemed to be significant (3 percent or larger) are underlined in this table, and the negative slopes are highlighted with a dot.

Table 4 shows that many of the highlighted slopes are negative, indicating a decrease in variability with increasing solar activity. For the mid to high-latitude stations, a negative correlation with solar activity occurs during summer night and winter early evening and late morning hours. Positive correlations with IG12 occur mainly during summer daylight hours. In the southern hemisphere, where the seasons are reversed, the patterns exhibited in this table are also reversed.

Variabilities at low-latitudes are more dependent on solar cycle than high-latitude stations. At Maui, Concepcion, and Vanimo more then 70 percent of the hours show significant negative solar cycle dependency. At the magnetic equator, Huancayo shows mostly negative solar cycle dependency between 2300 and 0700 LT.

Although the regression coefficients for the slopes summarized in Table 4 do not always indicate significance, the patterns that are shown are quite consistent. The low-latitude stations--Maui, Vanimo, and Concepcion--show the greatest solar cycle dependency in variability. In general, the mid-latitude stations show somewhat less solar cycle dependency than low-latitude stations, however, the patterns illustrating which hours and months have positive and negative solar dependencies are consistent among these stations.

A few examples of the regression lines are shown in Figures 11

Table 4. Slopes of the Regression Lines with IG12 during Quiet Magnetic Periods.

TOMS	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
JAN	.036	-.024	-.023	-.014	-.012	.004	-.010	.029	-.014	-.002	.000	-.008	-.012	-.010	-.008	-.005	-.001	.028	-.021	.019	.032	.005	.025	.041
FEB	-.017	.025	.036	.029	.029	.029	.031	-.024	-.009	.007	-.004	-.012	-.019	-.015	-.016	-.011	-.016	.025	.052	.064	.077	.045	-.020	-.011
MAR	-.013	-.019	-.014	-.019	-.023	-.016	.003	.011	.013	.015	.003	-.010	-.017	-.021	-.014	-.010	-.007	-.005	-.019	.045	.038	.052	.034	-.016
APR	-.017	-.005	-.003	-.007	-.006	-.007	.030	.044	.053	.056	.053	.037	.027	.019	.024	.024	.025	.032	.018	.010	-.011	.029	.030	.026
MAY	.064	.063	.062	.045	.027	.001	.022	.031	.044	.046	.045	.043	.045	.037	.041	.039	.042	.034	.029	.019	.006	-.010	.032	.052
JUN	-.009	-.013	-.013	-.001	.018	.025	.030	.035	.042	.046	.041	.043	.037	.039	.033	.031	.026	.025	.014	.019	.015	-.002	-.006	-.007
JUL	.041	.037	-.019	-.005	.009	.018	.022	.029	.035	.027	.029	.026	.023	.023	.025	.016	.014	.010	.006	.002	-.006	-.011	-.013	-.031
AUG	.034	.038	.032	-.014	.002	.012	.025	.025	.030	.029	.026	.025	.030	.027	.023	.021	.021	.020	.010	.003	-.009	-.009	.029	.039
SEP	.042	.042	.035	.028	-.019	-.020	-.014	.007	.030	.022	.032	.026	.016	.020	.020	.021	.013	.021	.004	.035	.043	.043	.045	.037
OCT	-.013	-.012	-.019	-.014	-.012	-.005	-.020	-.006	.016	.027	.009	.001	.003	-.002	.007	.008	.005	.003	.027	.037	.052	.036	-.021	-.012
NOV	.034	.015	.008	-.000	.004	-.013	-.020	.051	.008	.004	-.013	.027	.038	.032	.025	-.017	-.007	-.032	-.041	-.010	.046	.077	.046	.038
DEC	-.013	.005	.005	-.010	-.004	-.015	-.023	.000	.008	.010	.006	-.008	-.004	-.004	-.001	-.008	-.007	-.010	.023	.048	.057	.017	-.006	-.010
LENI																								
JAN	.048	.047	.030	.032	.049	.076	.101	.058	-.014	.002	.004	.000	.004	.005	.011	.017	.003	.005	.044	.057	.066	.060	.063	.067
FEB	.080	.061	.063	.069	.048	.042	.046	-.012	.007	.043	.039	.039	.029	.028	.019	.015	.006	-.003	.031	.069	.051	.003	.034	.050
MAR	.016	.022	.058	.060	.064	.045	.026	-.010	.024	.021	.013	.014	.004	.004	.003	.011	.022	-.000	-.016	.025	.072	.078	.065	-.012
APR	-.020	-.003	.010	.026	.002	.013	.018	.017	.032	.026	.029	.033	.043	.043	.037	.036	.030	.023	.017	.004	-.012	-.015	-.012	-.018
MAY	.065	.071	.064	.039	.001	.016	.031	.041	.046	.046	.049	.039	.042	.050	.053	.052	.042	.036	.033	.028	.010	-.004	-.020	.058
JUN	.029	.023	.003	.020	.024	.035	.037	.040	.041	.029	.025	.025	.026	.028	.024	.027	.030	.020	.021	.024	.016	-.000	-.015	-.014
JUL	.047	-.023	-.003	.019	.035	.031	.034	.038	.038	.039	.037	.030	.030	.030	.024	.023	.017	.018	.015	.012	-.004	-.009	.025	.035
AUG	.042	-.012	.006	.018	.016	.005	.029	.031	.030	.032	.036	.032	.031	.029	.026	.019	.022	.021	.017	.012	-.003	.030	.033	.046
SEP	.031	-.007	.001	.018	.000	-.002	.009	.013	.021	.035	.030	.040	.046	.050	.049	.043	.043	.035	.027	-.011	.030	.049	.058	.054
OCT	.032	.046	.049	.059	.064	.034	-.006	.020	.039	.042	.031	.027	.024	.023	.026	.026	.031	.030	.018	-.002	-.021	-.019	-.012	-.002
NOV	.067	.029	.078	.028	.056	.073	.069	.007	.032	.049	.029	.004	-.007	-.018	-.018	-.016	.039	.041	-.021	-.009	.047	.040	.078	.059
DEC	.042	.057	.044	-.006	-.010	-.001	.039	.062	.015	.009	.011	.000	.007	-.006	.006	.019	.019	.021	.043	.111	.058	.050	.020	.010
SVER																								
JAN	-.006	-.004	-.000	.012	.008	-.005	.001	-.001	.013	.005	.009	.002	-.003	-.013	-.007	.003	-.010	-.024	.009	.047	.056	.022	-.002	-.010
FEB	.010	.005	.008	.003	-.004	-.019	-.035	-.002	.002	.019	.014	.002	-.007	-.007	.000	-.007	-.013	.027	.063	.080	.046	-.015	-.001	.017
MAR	.004	.015	.002	.002	-.006	.004	.014	.011	.021	.007	.002	-.007	-.008	-.001	-.002	.001	.001	.005	-.017	.030	.043	.029	-.007	-.013
APR	.025	-.021	.038	-.015	.003	.011	.030	.044	.056	.052	.046	.036	.029	.032	.035	.040	.035	.035	.034	.010	-.000	-.010	-.019	-.015
MAY	.068	.076	.057	.042	-.017	.002	.023	.036	.038	.041	.042	.037	.038	.038	.042	.044	.041	.037	.028	.019	.000	-.003	.025	.055
JUN	-.014	-.009	-.011	.004	.001	.022	.026	.043	.028	.042	.036	.035	.027	.022	.024	.021	.014	.026	.020	.014	.007	.003	-.006	-.016
JUL	-.019	.031	-.015	.007	.024	.018	.035	.045	.044	.039	.035	.031	.032	.025	.019	.013	.009	.006	.005	.006	.002	-.010	-.024	.031
AUG	.031	.026	-.019	-.014	.004	.016	.016	.031	.033	.045	.044	.043	.044	.035	.033	.031	.026	.023	.014	.016	.001	-.012	-.018	.035
SEP	.033	.038	.041	.035	.032	-.024	-.008	.003	.016	.019	.013	.011	.012	.017	.015	.024	.028	.018	-.006	.032	.040	.028	.029	.034
OCT	-.015	.003	.005	-.005	-.006	-.018	.057	.018	.038	.035	.021	.020	.016	.015	.025	.028	.023	-.000	.025	.026	.038	.036	.024	.030
NOV	.029	.023	.005	-.001	-.006	.026	.026	.013	.020	.008	-.013	-.024	-.026	-.021	-.024	-.012	.025	.034	.038	-.000	.048	.051	.044	.028
DEC	.006	.000	-.006	-.009	-.019	.034	.027	-.021	.002	.012	.007	-.003	-.003	-.005	.008	-.000	-.010	.001	.041	.074	.043	.008	.010	.004
MOSC																								
JAN	-.003	-.003	-.005	-.003	.045	.054	.030	.002	.012	.003	.002	-.007	.036	-.007	-.003	.003	-.015	-.013	.028	.040	.038	.007	.025	.012
FEB	.040	.020	.039	.023	.021	-.003	-.005	-.010	.023	.028	.020	.011	.018	.024	.002	-.000	.006	-.022	.037	.043	.028	-.011	.025	.027
MAR	.030	.027	.027	.032	.027	.027	-.004	.011	.015	.000	-.007	-.008	-.015	-.010	-.008	-.001	.007	-.014	.038	.042	.061	.066	.044	.035
APR	.028	.033	-.011	-.008	.011	.013	.020	.031	.034	.025	.022	.026	.036	.037	.031	.034	.019	.029	.002	-.015	-.009	.030	.025	.026
MAY	.074	.052	.050	.039	-.004	.010	.030	.039	.048	.043	.039	.038	.038	.040	.037	.040	.032	.019	.016	.005	-.014	.053	.067	.080
JUN	-.024	-.011	-.010	.015	.028	.031	.034	.038	.039	.030	.013	.028	.027	.026	.028	.021	.025	.023	.011	.015	.006	-.001	-.014	-.016
JUL	-.024	-.013	-.003	.009	.032	.027	.032	.037	.033	.041	.039	.030	.026	.027	.017	.014	.015	.010	.008	.006	-.004	-.010	-.020	-.028
AUG	-.024	-.014	.025	-.014	-.003	.016	.028	.040	.051	.035	.055	.034	.036	.034	.028	.032	.022	.023	.012	.007	-.001	.028	-.014	.027
SEP	.025	.031	.031	.032	.028	.027	.009	.027	.035	.029	.038	.034	.035	.035	.035	.030	.028	.031	-.003	-.022	.029	.040	.046	.034
OCT	-.015	-.007	-.010	-.010	.031	.054	-.009	.024	.030	.026	.022	.017	.011	.011	.018	.015	.002	-.012	-.021	.034	.042	.033	.035	.035
NOV	.021	-.001	-.011	-.022	.055	.042	.034	.024	.016	-.004	-.020	-.023	.025	.027	.027	-.015	.032	.050	.041	-.016	.024	.028	.031	.044
DEC	.008	.012	.011	-.010	.038	.047	.039	-.007	.010	.004	.004	.000	.003	.004	.006	.018	.000	.012	.040	.034	.033	.029	.021	.009

Table 4. (cont.)

BRIS

JAN	.072	.067	.057	.058	.061	-.022	.008	.017	.027	.015	-.002	-.016	-.023	.047	.044	.037	.031	.041	.042	.064	.052	.050	.052	.073
FEB	.050	.039	.033	.049	.059	.049	.013	.036	.045	.011	-.001	-.001	-.021	.032	.035	-.021	-.016	.026	.033	.037	.044	.055	.045	.038
MAR	.026	.038	.044	.025	.042	.049	-.020	.010	-.017	-.017	.036	.067	.065	.058	.066	.067	.066	.058	.051	.067	.065	.056	.045	.041
APR	.011	.007	.012	-.022	-.024	-.016	-.000	-.013	.025	.031	.045	.045	.044	.055	.057	.037	.056	.069	.119	.078	.054	-.020	-.031	.011
MAY	.030	.026	.004	-.015	.035	.038	-.004	.007	-.016	-.017	.031	.048	.035	.043	.053	.042	.036	.029	.054	.045	-.016	-.013	-.012	.008
JUN	-.003	-.009	-.016	.037	.054	.045	-.017	-.003	-.006	-.012	-.001	.014	-.006	-.014	-.007	-.011	-.013	-.023	-.021	-.017	-.001	-.017	-.013	-.004
JUL	-.011	-.020	-.004	-.020	.035	.056	.026	.004	.005	.001	.006	.003	.004	.003	-.001	-.006	-.007	.000	.034	.039	.003	.002	.008	.010
AUG	.012	.018	-.016	-.024	.026	.035	-.010	.017	.003	-.007	.003	-.013	-.015	.006	-.005	-.010	-.003	-.006	.029	.027	.003	.020	.035	.030
SEP	-.017	-.020	-.021	.028	-.018	-.020	.021	-.004	-.009	.029	.033	.038	.031	-.027	-.018	-.013	-.014	.027	.046	.041	.044	.032	.025	-.005
OCT	.030	.031	.041	.053	.044	.039	.002	.024	.022	.006	.002	-.012	-.018	-.013	-.011	-.018	-.020	.026	.043	.050	.043	.043	.040	.034
NOV	.039	.032	.049	.078	.076	.031	.009	.028	.013	.012	.008	-.004	-.007	-.012	-.015	-.010	-.011	-.019	-.008	-.020	-.023	.029	.030	.039
DEC	.043	-.024	.039	.043	.045	.015	.043	.040	.032	.019	.014	.005	.001	-.001	-.010	-.011	-.012	-.013	-.018	-.016	-.023	.037	.040	.046

CANB

JAN	-.019	-.016	-.023	-.027	-.024	.007	.026	.024	.019	.018	.019	.000	.008	.007	-.002	-.002	-.014	-.021	-.018	-.026	-.028	-.020	-.028	-.021
FEB	.040	.037	.052	.059	.045	-.020	.026	.035	.046	.055	.062	.046	.041	.046	.034	.027	.016	.011	-.006	-.016	.027	.034	.039	.046
MAR	.030	.036	.040	.059	.071	.071	-.009	.013	.029	.028	.026	.014	.005	-.008	-.011	-.010	-.014	-.021	-.019	.034	.052	.053	.053	-.038
APR	-.001	.012	.005	-.004	-.011	-.008	-.002	-.005	.007	.003	-.008	.028	.033	.044	.044	.035	.036	.044	.080	.096	.046	-.024	-.018	-.008
MAY	-.004	-.004	-.013	-.021	.033	.046	.043	-.003	-.013	-.022	-.022	.032	.036	.037	.035	.036	.040	.044	.064	.052	.029	-.007	-.019	-.006
JUN	-.013	-.011	-.019	-.014	-.019	.034	.025	-.002	-.004	.009	.010	-.002	-.002	-.003	-.008	-.010	-.007	-.011	-.031	-.016	-.019	-.015	-.008	-.007
JUL	-.005	-.014	-.018	-.020	-.023	.046	.043	-.001	.009	.004	.008	-.002	.001	.008	.001	.006	-.010	-.002	-.023	.038	.036	.030	-.008	-.004
AUG	.000	-.008	-.012	.025	.047	.048	.048	.016	.008	.007	.003	.006	-.007	-.004	-.010	-.018	-.007	-.013	.027	.030	-.013	.012	.012	.004
SEP	-.024	.037	.028	.046	.037	.032	.013	.019	.018	.010	.007	-.002	-.015	-.018	-.011	-.013	-.009	-.012	-.022	.053	.052	.036	.032	-.020
OCT	.036	.038	.045	.047	.042	.025	.014	.048	.054	.048	.036	.025	.019	.021	.020	.014	.021	.011	-.017	.028	.043	.042	.041	.036
NOV	.042	.036	.028	.049	.045	-.004	.014	.028	.037	.039	.038	.026	.021	.017	.012	.009	-.006	-.008	-.009	-.017	.030	.042	.044	.044
DEC	-.017	-.015	.026	.031	.027	.020	.037	.041	.033	.036	.010	.029	.008	.017	.012	.004	-.004	-.010	-.009	-.014	-.013	.033	.038	.030

MUND

JAN	.041	.029	.031	.045	.025	-.015	.016	.016	.022	.022	.022	.016	.023	.006	.011	-.002	.003	-.011	-.015	-.010	-.023	.048	.025	.031
FEB	-.023	.004	.003	.016	.005	-.011	.003	.016	.030	.027	.031	.006	.015	.001	-.007	.015	.012	.008	-.005	.010	-.003	.030	.027	-.020
MAR	-.002	.000	.001	.030	.027	.039	.039	.014	.029	.028	.066	.051	.022	.014	.016	.021	.042	.022	.028	.038	-.024	.029	-.004	.003
APR	-.012	.004	.011	.003	.003	.005	-.001	.011	.016	-.016	.038	.032	.038	.045	.054	.058	.042	.008	-.023	-.023	.036	.016	.033	.058
MAY	-.007	-.021	-.027	-.017	.036	.053	.051	-.019	-.010	-.011	-.022	.039	.033	.034	.039	.045	.032	-.015	-.020	.030	.031	.003	-.021	-.016
JUN	-.024	.034	.032	-.018	-.026	-.022	-.022	-.002	-.006	-.006	-.012	-.006	-.008	-.010	-.004	-.017	-.030	-.012	.028	-.024	-.006	-.014	-.022	.031
JUL	-.001	-.012	-.009	.030	.028	.032	-.024	-.010	.008	.003	.008	-.017	-.008	-.007	-.010	-.024	-.012	-.007	.036	-.022	-.014	.068	-.011	-.010
AUG	-.011	.002	-.001	.003	-.014	-.022	-.019	.011	-.002	-.009	-.004	-.007	.001	-.015	-.010	-.019	-.024	-.018	-.016	-.008	.029	-.006	-.011	-.010
SEP	-.005	-.004	-.019	.026	.032	-.021	.006	.016	.017	.012	.013	.002	-.010	-.014	-.021	-.019	-.020	-.023	.026	.026	.040	.052	-.008	.032
OCT	-.011	-.001	-.022	.063	-.024	.030	-.001	.015	.036	.039	.038	.024	.006	.002	-.003	.001	-.002	.004	-.004	.062	.074	.051	-.018	.025
NOV	.050	.060	.046	.051	.043	.000	-.000	.021	.013	.030	.027	.026	.017	-.000	-.005	-.010	-.014	-.016	.028	-.001	.007	.038	.065	.053
DEC	.027	-.021	-.024	-.012	-.021	.017	.020	.023	.023	.025	.022	.021	-.003	-.011	-.007	-.008	-.008	-.007	-.005	.001	-.010	.035	.068	.033

HOBA

JAN	.063	.049	.050	.035	-.001	-.001	.021	.011	.003	.009	.010	.011	.010	.007	-.002	-.003	-.001	-.008	-.011	-.013	-.022	.030	.044	.066
FEB	.037	.032	.061	-.024	-.001	.005	.021	.030	.056	.041	.061	.039	.049	.049	.041	.040	.034	.036	.017	.006	.003	-.018	.039	.038
MAR	.063	.050	.035	.032	.029	-.005	.013	.008	.019	.044	.045	.039	.040	.024	.026	.024	.031	.019	.004	-.015	.052	.083	.053	.055
APR	.048	.035	.045	.029	.033	-.005	-.023	.002	.024	.024	.038	.019	.006	-.001	.018	-.013	-.017	-.006	.069	.097	.082	.066	.057	.043
MAY	.034	.029	.015	.038	.068	.081	.041	.002	.001	-.006	-.003	-.009	-.021	.031	-.021	.029	.037	.050	.056	.064	.052	.036	.048	.048
JUN	-.013	-.017	-.004	-.018	.053	.058	.027	-.007	.002	-.000	-.002	-.000	-.003	-.004	-.003	-.011	-.013	-.005	-.012	.001	-.003	-.000	-.003	.019
JUL	.006	.035	.027	.057	.054	.037	.005	.004	-.007	.000	.001	.005	.003	.002	.006	.004	.004	-.004	-.019	-.022	-.014	-.036	-.008	-.006
AUG	.014	-.002	.016	.010	.000	.009	.035	.018	.025	.014	.007	.003	-.002	-.001	-.005	-.001	-.004	.005	-.006	.039	-.023	-.016	.009	.020
SEP	.048	.048	-.021	.008	.004	.043	.010	.019	.020	.034	.032	.030	.016	.019	.012	.008	.004	.002	-.007	.050	.054	.062	.054	.046
OCT	.066	.038	.043	-.017	.010	.040	.029	.046	.048	.052	.050	.041	.026	.034	.023	.024	.021	.014	-.001	.030	.055	.075	.066	.069
NOV	.095	.068	.067	.066	.038	.004	.016	.021	.032	.033	.024	.026	.031	.028	.027	.017	.006	-.003	.000	-.012	-.021	.035	.061	.075
DEC	-.022	.031	.034	.026	-.005	.027	.042	.037	.038	.032	.029	.035	.027	.029	.011	.006	.009	.010	-.005	-.014	-.009	-.015	-.011	.026

Table 4. (cont.)

WASH																						
JAN	-.011	-.023	.035	.028	.031	.032	-.015	-.017	.014	.009	.009	-.012	-.001	-.006	-.010	-.015	-.015	-.001	.049	.048	-.017	-.004	-.015	.031
FEB	-.000	-.007	-.024	.026	-.024	.003	-.021	-.020	-.014	.006	.004	-.007	-.010	-.022	.031	.039	.029	-.020	.045	.050	.046	.047	.038	-.009
MAR	.050	.046	-.024	-.021	-.017	-.011	-.008	.006	.008	.012	.006	-.003	-.001	-.009	-.010	-.006	-.012	-.011	.026	.063	.070	.071	.052	.042
APR	.048	.035	.025	.042	-.021	.002	.014	.035	.038	.047	.038	.026	.016	.005	.006	.004	.002	-.012	-.013	.036	.049	.052	.051	.057
MAY	.048	.038	.035	-.011	-.007	.016	.029	.037	.045	.042	.056	.049	.056	.048	.038	.035	.017	-.009	-.022	.028	.030	.031	.043	.042
JUN	.036	.033	-.016	-.009	-.004	.029	.017	.024	.027	.039	.040	.034	.035	.024	.022	.020	.015	-.003	.026	-.014	-.017	.027	.046	.047
JUL	.050	.035	-.022	-.005	.096	.022	.023	.031	.037	.031	.035	.033	.039	.015	.025	.027	.011	.005	-.007	-.014	.028	.058	.054	.052
AUG	.035	.030	-.023	-.102	-.020	.017	.024	.026	.028	.035	.032	.032	.036	.029	.024	.015	.012	-.002	-.017	.033	.031	.048	.046	.050
SEP	.048	.043	.052	.039	.040	.042	.005	.019	.021	.025	.011	.016	.021	.018	.013	.009	.004	-.002	.025	.061	.100	.090	.046	.067
OCT	-.016	-.009	-.006	-.005	.026	-.004	-.005	-.005	-.001	-.006	.003	-.004	-.009	.029	.034	.040	.044	.045	.071	.091	.069	.055	.035	.029
NOV	.068	.136	.036	-.021	.044	.039	-.014	.005	.008	-.007	-.020	.003	.032	.036	.040	.032	.033	.056	.079	.079	.038	-.015	-.032	-.046
DEC	.028	-.024	.026	.038	.038	-.022	.045	-.020	-.000	-.002	-.010	-.017	-.016	-.019	-.018	-.010	-.015	-.019	.062	.045	.006	.013	.006	-.010
BOUL																								
JAN	-.007	-.010	-.011	-.008	-.020	-.023	-.013	.027	.003	.022	.003	-.011	-.024	-.023	-.017	-.004	-.006	.025	.068	.044	.038	.061	.013	-.001
FEB	.002	.016	-.000	-.008	.000	.010	.007	-.003	-.016	-.016	-.012	.029	.039	.058	.049	-.023	-.012	-.008	.041	.061	.028	-.001	.012	.007
MAR	-.005	.003	.001	-.001	-.012	-.012	.006	-.012	-.015	-.017	-.000	-.011	-.020	-.024	.028	.025	-.016	-.017	-.022	.070	.102	.070	.041	-.005
APR	.036	.028	-.024	-.005	-.006	-.014	.005	.016	.027	.046	.046	.051	.045	.038	.035	.034	.038	.036	.027	-.010	.055	.043	.041	.031
MAY	.061	.046	.042	.031	.030	-.002	.010	.013	.006	.028	.036	.037	.038	.038	.031	.039	.028	.029	.014	-.004	-.022	.052	.078	.065
JUN	.044	.029	.026	-.013	-.008	.006	.017	.028	.032	.025	.023	.025	.032	.028	.025	.029	.019	.014	.011	-.013	-.012	.040	.064	.057
JUL	.046	-.018	-.009	-.020	.025	-.004	.002	.010	.017	.019	.028	.031	.017	.028	.022	.016	.020	.012	.010	-.006	-.022	.036	.048	.059
AUG	-.008	-.008	-.012	-.021	.000	.017	.020	.027	.030	.044	.045	.051	.043	.033	.021	.022	.012	.008	.004	-.005	-.009	-.018	.029	-.024
SEP	.026	.040	.046	.027	.044	.048	-.006	.011	.021	.039	.030	.028	.018	.015	.015	.011	.026	.019	.001	.044	.095	.077	.056	.042
OCT	.027	-.023	.025	-.022	-.021	.026	.027	-.005	.001	.006	.011	.001	-.022	.036	.029	-.023	.027	-.024	.044	.048	.035	.041	.034	.045
NOV	.018	.016	.012	.008	.006	-.019	-.003	-.003	-.007	-.006	-.019	.032	.041	.038	.031	.044	.051	.069	.006	.044	.010	.040	.021	.027
DEC	-.004	-.003	.001	-.014	-.021	-.017	-.024	-.004	.003	.010	.003	-.011	-.009	-.021	-.021	.007	.006	-.011	.044	-.012	.047	.055	.021	.013
KHAB																								
JAN	-.014	-.019	.025	-.003	.000	-.021	.035	.055	.011	-.016	-.008	-.009	-.008	.000	-.002	-.006	-.002	-.020	.003	.020	.023	.006	.007	-.005
FEB	.042	-.003	.008	.020	-.001	-.001	.038	-.001	.010	-.002	-.012	-.016	-.017	.035	.027	-.009	-.002	.037	.057	.043	-.022	.020	.009	.014
MAR	.018	.019	-.003	.002	.032	.027	.039	.040	.019	.008	-.012	.031	-.018	-.009	.029	-.009	-.000	.007	-.021	.029	.040	-.019	.002	.013
APR	-.006	-.009	-.009	-.016	-.056	-.026	.008	.035	.050	.051	.043	.032	.028	.012	.011	.016	-.006	-.005	.026	.033	-.022	-.011	-.011	-.012
MAY	.044	.033	.030	.039	-.010	-.002	.002	.016	.045	.060	.037	.034	.034	.020	.017	.019	.010	-.006	-.008	-.016	-.001	.031	.050	.053
JUN	.042	.046	.043	-.022	-.011	.011	.006	.019	.046	.028	.025	.021	.011	.024	.019	.003	-.014	-.014	-.002	-.011	.030	.026	-.017	.036
JUL	.036	.035	.034	-.019	-.019	.010	.016	.012	.030	.022	.016	.012	.021	.018	.016	.012	.001	-.014	.002	-.017	.036	.026	.025	.029
AUG	-.015	-.002	-.001	-.014	-.001	.009	.027	.024	.031	.044	.034	.021	.021	.024	.013	.021	-.008	.002	-.004	-.010	-.014	-.004	-.023	.028
SEP	.026	-.008	-.007	.004	-.017	-.014	.010	.017	.038	.030	.031	.043	.036	.043	.035	.032	.027	.023	.001	-.010	-.014	-.023	.026	-.019
OCT	-.002	.002	.001	-.012	-.007	-.023	.005	.026	.021	.029	.014	-.001	-.005	.003	.020	.008	.013	-.005	.049	.066	.046	.030	-.019	-.017
NOV	.001	-.004	-.018	-.011	.035	.038	.030	.026	.003	.032	.037	.044	.031	-.017	-.010	-.019	.027	.037	.029	.035	-.007	.019	.017	.013
DEC	-.019	-.014	.026	.028	-.023	.034	.048	-.023	.007	.026	-.009	-.020	-.005	-.016	-.020	-.007	.028	.037	-.023	-.017	-.022	-.018	-.012	-.016
ALMA																								
JAN	.022	.009	.012	.022	.000	-.011	.027	-.018	.021	-.005	.037	-.019	-.014	-.003	-.004	-.005	-.001	-.013	.034	-.004	.027	.045	.028	.027
FEB	.013	.017	.002	-.013	.031	.036	-.000	.001	-.024	.029	.042	.055	.042	.035	-.018	-.016	-.012	.038	.041	.031	.002	.025	.023	.014
MAR	-.000	-.011	-.014	.029	.038	.037	-.005	.012	-.008	-.012	-.030	-.031	-.037	-.028	-.005	.006	.005	-.001	-.016	.041	.042	.043	-.008	-.002
APR	-.022	-.024	-.016	-.015	-.021	-.023	.012	.015	.019	.009	.008	-.003	-.022	.027	-.024	-.021	-.020	-.007	-.017	.047	.066	.054	.047	.025
MAY	-.023	-.022	-.024	-.021	-.017	.004	.020	.013	.010	.002	-.003	-.007	-.016	-.019	-.015	-.010	.002	-.002	-.011	.031	.024	.023	.028	.032
JUN	-.018	-.014	-.007	-.019	-.006	.020	.030	.030	.019	.023	.017	.012	.013	.016	-.001	.004	.006	.006	-.012	-.009	-.005	-.015	.029	-.022
JUL	-.023	.030	-.024	-.018	-.006	.020	.027	.031	.029	.009	.000	.002	.006	-.008	-.012	-.017	-.012	-.012	.028	-.024	-.019	-.023	-.011	-.008
AUG	-.011	-.016	-.019	-.016	-.024	-.001	.005	.012	.014	.008	.003	-.006	-.015	-.004	-.002	-.001	-.002	-.008	-.019	.028	.025	-.022	.028	-.016
SEP	.033	.041	.050	.053	.050	.033	-.015	-.001	-.005	-.007	-.002	-.012	-.020	-.019	-.022	-.010	-.007	-.012	.033	.056	.051	.050	.036	.033
OCT	-.004	-.008	-.014	-.016	-.022	.025	-.008	-.001	-.009	-.021	.031	.030	.031	.030	-.024	-.022	.030	.044	.086	.043	.042	-.013	-.007	.006
NOV	.026	.012	.006	-.003	-.007	-.003	.014	.025	.003	.025	.025	.037	.033	-.024	-.016	-.010	-.001	.031	-.013	.007	.048	.060	.044	.043
DEC	.002	-.005	-.009	-.023	-.021	-.004	-.014	-.020	.005	-.010	.025	.026	-.010	-.015	-.012	-.011	-.003	-.021	.012	.019	.028	.012	.017	-.001

Table 4. (cont.)

TASH

JAN	.022	.009	-.002	.004	.003	.008	-.008	-.015	.014	.011	●.025	●.034	-.014	-.006	-.002	-.004	.004	-.006	-.019	-.017	-.002	.014	.026	.012
FEB	.027	.020	.006	.009	.007	-.014	-.022	-.024	-.007	-.010	-.024	●.034	●.032	●.043	●.030	●.028	-.005	●.027	●.032	-.021	.010	.044	.028	.017
MAR	.030	.010	-.004	-.003	●.032	●.039	●.026	.014	-.006	●.039	●.048	●.055	●.058	●.062	●.031	-.018	-.021	-.013	-.018	●.052	●.056	●.056	.004	.037
APR	-.024	-.016	-.010	-.012	-.016	-.020	-.009	.019	.002	-.014	-.011	-.013	●.025	-.023	-.022	-.019	-.021	-.013	-.020	●.042	●.059	●.061	●.043	●.033
MAY	-.018	●.026	-.016	-.014	-.014	-.006	.004	.015	.002	-.003	-.011	-.014	-.017	●.030	●.030	●.032	-.013	-.011	-.008	-.023	●.036	●.030	●.029	-.024
JUN	-.020	-.015	-.018	-.020	●.028	.007	.018	.021	-.013	.014	.010	.005	.010	-.000	.002	-.005	-.002	.011	-.008	-.006	-.003	-.019	●.027	●.025
JUL	-.019	●.034	●.028	●.033	-.013	.014	.024	.032	.030	.011	.000	.010	.007	-.001	-.005	-.010	-.008	-.020	-.019	-.024	●.035	●.026	-.010	-.019
AUG	-.012	-.015	●.026	-.008	-.015	-.013	.019	.013	.015	.012	.000	-.011	-.011	-.008	-.004	-.003	-.004	-.014	-.016	-.023	●.035	●.026	-.016	-.010
SEP	●.032	●.028	●.029	●.029	●.031	●.034	●.025	-.014	-.013	-.008	-.017	●.026	●.027	●.030	●.033	-.024	-.024	-.016	-.023	●.037	●.054	●.043	●.046	●.038
OCT	-.005	-.011	-.012	●.027	-.022	-.018	●.039	.002	-.006	-.024	●.044	●.045	●.046	●.041	●.043	●.035	●.035	●.032	●.080	●.083	●.037	-.015	-.014	-.002
NOV	.025	.018	.012	.001	-.003	-.013	-.007	.025	.002	●.025	●.025	●.034	●.046	●.038	-.024	●.028	-.017	●.025	●.027	-.010	.027	.065	.049	.050
DEC	.007	-.004	.003	-.004	-.012	-.016	-.002	-.023	-.004	-.009	-.027	-.035	-.015	-.015	-.015	-.011	-.014	.070	-.002	.014	.034	.031	.008	.009

ASHK

JAN	.023	.019	.003	-.016	-.017	-.024	-.015	-.016	.012	.003	●.039	●.043	-.018	-.015	●.025	-.022	-.021	-.019	●.030	●.040	.025	.027	.023	.015
FEB	.046	.024	.028	.021	.009	.009	.010	●.033	-.015	●.036	●.044	●.050	●.052	●.049	●.044	-.018	-.012	-.014	●.045	●.054	.009	.007	.007	.017
MAR	.016	.011	.009	.002	-.002	-.008	-.003	.001	-.018	●.031	●.047	●.052	●.057	●.050	●.047	●.038	-.023	●.027	●.044	●.084	●.081	●.050	-.004	.021
APR	●.049	●.029	-.018	●.029	●.040	●.040	-.007	-.000	-.001	-.004	●.026	●.036	●.035	●.046	●.044	●.035	-.018	-.017	●.053	●.058	●.068	●.071	●.067	●.053
MAY	●.034	●.026	-.019	●.025	-.021	-.015	.011	.008	-.011	-.009	-.018	-.015	●.036	●.038	●.034	●.031	●.025	-.012	-.021	-.024	●.038	●.027	●.040	●.042
JUN	●.031	.010	-.018	.007	.002	.027	.029	.015	.026	.016	.023	.016	.010	.007	.001	.008	.008	.010	.006	.002	.012	.007	-.018	-.004
JUL	●.036	●.033	-.017	-.010	-.004	.002	.021	.037	.012	-.011	.009	.003	-.013	-.008	-.021	●.027	-.022	-.017	-.014	-.019	-.006	-.013	-.023	●.036
AUG	●.029	-.016	-.024	-.023	-.032	-.016	.015	.015	.016	.011	-.011	-.012	-.018	-.012	-.019	-.024	-.011	-.015	-.016	-.017	-.009	-.018	-.023	●.027
SEP	●.053	●.046	●.044	●.048	●.042	●.057	●.032	-.006	-.006	-.015	-.020	●.035	●.036	●.026	●.031	●.028	-.017	●.025	●.043	●.036	●.071	●.076	●.076	●.072
OCT	-.001	-.011	-.015	-.024	●.035	●.032	-.023	-.001	-.014	-.011	-.005	●.034	●.040	●.036	●.036	●.037	●.038	●.035	●.101	●.091	●.062	●.039	●.041	-.023
NOV	.071	.056	.053	.048	.032	.003	.037	.005	-.005	-.015	●.031	●.030	●.035	●.038	●.037	-.020	-.013	-.019	-.032	-.008	.016	.036	.060	.064
DEC	.001	-.008	-.014	-.000	●.027	●.053	●.047	●.043	-.013	-.014	-.015	●.037	-.008	-.008	-.008	-.014	●.028	-.011	.001	.002	.030	.026	.014	.009

MAUI

JAN	-.008	.042	.093	.068	.077	.091	.131	.023	.003	-.022	●.047	●.076	●.101	●.097	●.090	●.098	●.087	-.020	.008	.052	.088	.047	.011	.033
FEB	.067	.065	.086	.077	.122	.131	.101	.011	-.005	-.013	●.044	●.068	●.069	●.069	●.066	●.085	●.100	●.078	●.049	-.008	.082	.075	.101	.100
MAR	.087	.117	.123	.132	.085	.073	.080	.037	-.009	-.021	●.039	●.036	●.042	●.057	●.062	●.048	●.075	●.106	●.118	●.154	●.091	-.024	.019	.054
APR	●.033	-.011	●.053	●.050	-.016	-.007	-.010	-.005	-.023	●.052	●.056	●.059	●.054	●.037	●.030	●.036	●.057	●.060	●.074	●.082	●.081	●.046	●.053	●.043
MAY	●.047	●.044	●.079	●.082	●.075	●.066	-.016	.003	-.023	●.042	●.049	●.033	●.027	-.021	-.022	●.023	●.034	●.041	●.044	●.050	●.045	●.032	●.025	●.033
JUN	-.023	●.047	●.045	●.031	●.033	●.033	-.006	-.011	-.010	-.021	●.042	●.037	●.031	-.023	-.015	-.012	-.011	-.013	-.016	●.032	●.040	-.022	-.021	-.021
JUL	●.077	●.090	●.082	●.071	●.056	●.059	-.001	-.014	-.009	●.027	●.038	●.053	●.057	●.054	●.044	●.039	●.031	●.032	●.036	●.052	●.067	●.058	●.073	●.081
AUG	●.026	●.035	●.034	●.063	●.037	-.002	.007	.003	-.022	-.020	●.035	●.045	●.044	●.034	●.036	●.033	-.022	●.031	●.050	●.073	●.068	●.032	-.000	-.014
SEP	●.024	-.012	.004	-.007	●.032	-.005	.023	-.003	-.014	-.020	●.055	●.057	●.055	●.047	●.043	●.042	●.040	●.057	●.070	●.109	●.058	●.047	●.025	-.002
OCT	.002	.049	.015	.087	.110	.089	.031	-.013	-.003	-.021	●.027	●.041	●.055	●.061	●.069	●.065	●.071	●.102	●.104	●.071	●.029	-.022	.019	.024
NOV	.048	.058	.053	.036	.055	.102	.030	.003	-.029	●.041	●.039	●.053	●.077	●.082	●.106	●.113	●.141	●.118	●.097	●.075	-.021	●.026	.019	.039
DEC	.058	.042	.038	.025	.009	.024	.060	.020	.004	●.034	●.056	●.073	●.117	●.135	●.115	●.119	●.107	●.041	.009	.022	.044	.058	.033	.020

HUAN

JAN		●.161	●.086	●.118	●.124	●.095	.043	.008	-.009	-.023	-.019	-.018	-.015	-.007	-.002	.002	.000	.002	.012	.029	.027	●.030	.063	.134
FEB	.072	-.005	●.094	●.091	●.143	●.108	.071	.020	.004	-.012	-.022	●.039	-.015	-.007	-.018	-.010	-.002	.005	.013	.006	.014	.006	●.038	
MAR	-.008	●.036	●.068	●.096	●.065	●.058	.086	.029	-.006	-.022	●.032	●.025	●.027	●.029	●.034	-.021	-.005	.000	.008	.022	.020	.140	.004	-.004
APR	●.030	●.048	●.063	●.087	●.107	●.074	.031	.005	-.009	●.028	●.034	●.026	-.019	-.024	-.013	-.007	-.014	●.030	-.002	.002	.005	.009	.005	-.011
MAY	●.059	●.085	●.095	●.079	●.064	●.090	●.032	●.027	-.021	-.022	-.035	-.024	-.010	-.001	.000	-.002	.003	.009	.011	-.005	-.004	-.012	●.025	●.047
JUN	●.091	●.103	●.105	●.079	●.075	●.058	.002	-.001	-.018	-.015	-.009	-.005	-.003	-.009	-.014	-.012	-.017	-.016	-.007	.008	-.009	-.016	●.044	●.068
JUL	●.098	●.098	●.104	●.089	●.061	●.104	●.030	.007	-.007	.014	-.021	-.006	-.011	-.008	-.010	-.012	-.021	●.028	-.015	-.008	-.011	●.028	●.040	●.073
AUG	●.094	●.109	●.116	●.087	●.075	●.059	-.008	-.001	-.014	-.008	-.001	.002	-.009	-.016	-.021	●.029	●.028	-.016	-.024	-.006	-.011	●.030	●.045	●.080
SEP	●.044	●.044	●.072	●.061	●.036	-.022	.000	.005	-.007	-.014	-.007	.003	.009	.007	.001	-.004	-.007	-.016	.001	.003	.022	.022	-.005	-.011
OCT	.013	●.027	●.048	●.095	●.060	●.073	.021	-.012	-.019	●.035	●.031	●.032	●.026	-.024	-.024	-.015	-.022	-.008	-.012	-.009	.005	.017	-.005	-.019
NOV			●.109	●.080	●.066	●.031	.005	-.015	-.024	●.039	●.037	●.026	-.011	-.013	-.013	-.009	-.004	.005	.010	.008	.017	.017		
DEC					-.022	●.047	.003	-.004	-.015	-.024	●.025	-.023	-.015	-.003	-.000	.003	.006	.015	.017	.009	.001	-.018	-.407	

Table 4. (cont.)

VANI

JAN	.090	.079	.084	.074	.096	.111	-.003	.001	-.023	-.038	-.021	-.012	-.021	-.009	-.003	-.013	.028	.037	.061	.071	.105	.126	.117	.077
FEB	.091	.116	.089	.064	.064	.051	.045	.051	-.024	-.013	-.024	-.012	.000	-.004	-.006	-.005	-.016	.026	.032	.074	.047	.058	-.012	.082
MAR	.131	.148	.173	.234	.140	.088	.035	.038	-.007	-.015	.033	.049	.037	.029	.053	.066	.066	.090	.109	.122	.174	.167	.125	.075
APR	.144	.164	.197	.157	.050	.034	.207	.005	.028	.026	-.016	-.026	-.016	.039	.039	.052	.053	.088	.115	.130	.170	.265	.276	.215
MAY	.177	.207	.170	.140	.118	.062	.011	.020	.041	.051	.066	.063	.077	.109	.103	.104	.093	.102	.093	.082	.126	.159	.278	.160
JUN	.147	.101	.035	.056	.026	.011	.049	.038	.004	-.020	.029	.046	.052	.071	.043	.053	.063	.071	.084	.109	.152	.239	.198	.225
JUL	.132	.177	.191	.095	.065	-.000	.080	.021	-.009	.027	.033	.065	.072	.078	.083	.071	.087	.086	.063	.096	.121	.084	.110	.025
AUG	.179	.093	.139	.096	-.008	.018	.105	.031	-.010	.051	.046	.059	.046	.042	.069	.081	.080	.087	.083	.076	.101	.137	.226	.172
SEP	.145	.193	.223	.056	.050	-.005	-.003	.027	.028	.050	-.017	.032	-.020	.027	.041	.068	.086	.101	.117	.087	.060	.115	.087	.140
OCT	.099	.109	.128	.136	.109	.109	.067	.009	-.024	.043	.036	.041	-.015	-.018	-.014	.031	.067	.066	.082	.079	.073	.088	.155	.115
NOV	.143	.118	.098	.090	.051	.053	-.010	-.002	-.018	.029	-.018	-.011	-.017	.038	.025	.036	.059	.063	.056	.055	.069	.077	.052	.086
DEC	.048	.071	.108	.082	.055	.080	-.007	.014	-.004	-.009	-.015	-.014	.000	-.005	.002	-.013	-.012	-.009	.029	.043	.041	.044	.025	.068

CONC

JAN	.063	-.017	.001	.048	.032	-.009	.006	.041	.097	.129	.142	.118	.110	.105	.081	.059	.086	.080	.069	.077	.091	.114	.105	.115
FEB	.057	.050	.042	.051	.035	.043	-.004	.046	.028	.052	.081	.100	.112	.082	.076	.054	.063	.087	.078	.070	.068	.067	.061	.043
MAR	.060	.109	.107	-.011	.055	-.017	.098	.032	-.003	.025	.073	.083	.108	.100	.099	.073	.064	.034	.065	.095	.094	.092	.103	.091
APR	.045	.055	.073	.033	.029	.024	.055	.023	.000	-.011	.058	.059	.069	.052	.086	.065	-.001	.018	.032	.062	.125	.086	.014	.039
MAY	.007	-.001	.007	-.016	.025	.052	.038	.004	.035	-.007	.050	.064	.058	.035	.061	.053	.048	-.005	.040	.006	-.020	.032	.025	.007
JUN	.049	.058	.012	.019	.019	.026	.042	.031	.037	.040	.011	-.014	.005	.003	-.009	.010	-.008	.041	.021	.014	-.017	-.002	.010	.015
JUL	.045	.047	.033	.032	-.002	-.011	-.005	-.017	.006	.010	-.004	-.020	.006	.000	.000	.005	-.018	.026	.039	-.019	.028	-.009	.009	.025
AUG	.009	-.009	.026	.015	.010	.058	.047	.027	.033	.018	.004	-.008	.007	.032	.051	.039	-.013	-.018	.005	.006	.035	.012	.043	.039
SEP	.047	.037	.034	-.011	.016	.051	.061	.049	.016	.000	.045	.079	.118	.137	.120	.076	.048	.068	.035	-.011	.021	.049	.070	.087
OCT	.071	.072	.109	.071	.070	.073	.027	-.016	.053	.067	.053	.068	.058	.048	.073	.082	.051	.080	.094	.086	.095	.072	.077	.087
NOV	.028	-.024	.053	.053	.061	.037	.037	.046	.057	.052	.056	.055	.056	.045	.053	.053	.054	.062	.063	.052	.056	-.005	-.023	-.020
DEC	.052	.055	.060	.077	.086	.034	.052	.080	.090	.074	.072	.064	.052	.069	.054	.047	.033	.059	.061	.076	.075	.063	.054	.057

TOWN

JAN	.060	.074	.081	.097	.104	.096	-.007	.023	.018	-.001	-.024	.033	.033	-.033	.052	.041	.051	.062	.061	.068	.059	.060	.048	.068
FEB	.047	.045	.040	.040	.084	.063	.001	.023	.028	.004	-.028	-.023	-.024	-.023	.035	.035	.035	.034	.046	.038	.035	.040	.042	.039
MAR	.031	.034	.029	.027	.030	.031	-.007	.014	-.006	.025	.041	.051	.060	.057	.056	.070	.062	.041	.055	.072	.056	.070	.063	.053
APR	.012	.041	.031	.005	.012	.022	.069	.013	-.017	.032	.043	.065	.064	.052	.038	.061	.059	.054	.055	.095	.103	.058	-.022	.015
MAY	.056	.049	.029	-.012	-.017	-.012	-.004	-.002	-.017	.025	.039	.041	.047	.036	.050	.040	.057	.039	.062	.046	.037	.013	.027	.003
JUN	.008	.021	-.013	-.022	.036	-.018	.006	.004	-.015	-.004	-.010	-.005	-.010	-.010	-.014	.032	-.016	-.005	.025	-.021	.001	.013	.020	.021
JUL	.024	.004	-.022	.037	.053	.035	.032	-.007	.002	.003	-.014	-.004	.003	-.003	-.021	-.009	-.012	-.011	.026	-.018	.009	.028	.023	.035
AUG	.044	.047	.037	-.016	-.016	-.001	-.010	.013	.004	-.015	.035	.038	.030	.025	-.006	-.023	-.004	-.002	-.011	-.009	-.007	.047	.048	.044
SEP	.059	.054	.034	-.007	.051	.051	.061	.009	.026	.044	.065	.053	.061	.038	.035	.042	.032	.036	.056	.045	.051	.051	.046	.041
OCT	.065	.061	.058	.040	.032	-.021	-.007	-.011	-.006	-.020	.001	-.017	.029	.031	.022	.025	.035	.048	.022	.037	.048	.062	.070	.065
NOV	.060	.077	.113	.097	.090	.105	-.023	-.014	.028	.048	.047	.051	.042	.042	.048	.056	.051	.058	.058	.042	.035	.047	.049	.053
DEC	.067	.059	.067	.093	.096	.076	.022	.015	.013	.004	-.010	-.002	-.010	-.007	-.004	-.016	-.024	.035	.042	.041	.033	.039	.042	.072

NORF

JAN	.072	.067	.057	.045	.048	.053	-.019	.012	.016	.011	.003	-.009	-.027	-.039	-.024	.036	.039	.036	.035	.045	.062	.061	.060	.067
FEB	-.022	.034	-.022	.066	.040	.037	.031	.009	.024	.021	.017	.002	-.012	-.018	-.022	-.026	-.004	-.023	.031	.046	.035	.030	.035	.033
MAR	-.021	.029	-.006	.024	-.019	-.019	.025	-.008	-.009	-.001	-.020	-.023	.037	.051	.040	.040	.052	.029	.036	.060	.078	.075	.048	.045
APR	-.003	.002	.006	-.022	-.011	.039	.011	.043	.015	.029	.026	.037	-.024	.062	.049	.049	.035	.050	.064	.091	.090	.056	.032	.042
MAY	.002	.004	-.007	-.015	.029	.053	.073	.027	.014	.001	-.011	.003	-.008	-.009	-.016	.031	.026	.027	.036	.048	.036	-.010	.009	-.006
JUN	-.008	.001	-.020	-.014	.030	.053	.056	-.015	.008	.006	.003	.010	-.001	.001	-.009	-.008	-.013	-.005	-.024	-.023	.025	.010	-.013	-.015
JUL	.017	-.001	.007	.027	-.008	.053	.050	-.023	.010	.001	.012	-.005	.002	-.001	-.004	-.009	-.012	-.002	-.017	-.016	-.014	.006	.015	.004
AUG	.042	.021	.003	-.007	.030	.048	.026	-.006	.016	.016	.004	.000	-.001	.001	.005	.002	.003	.001	-.010	.041	.026	.009	.038	.030
SEP	-.004	-.007	-.013	.032	.040	-.023	-.008	.016	.014	-.010	-.023	-.014	.025	.025	.027	-.009	-.016	-.011	-.017	.042	.048	.031	-.017	-.000
OCT	-.020	.031	.035	.044	.055	.040	-.024	.011	.023	.008	.006	-.007	-.023	-.011	-.016	-.011	-.017	.032	.032	.045	.052	.047	.046	.039
NOV	-.013	-.010	.031	.045	.043	.047	-.024	.010	.009	.007	.003	-.014	-.025	-.020	-.018	-.019	-.014	-.010	-.015	-.009	-.019	-.022	.031	-.016
DEC	.028	-.022	.035	.042	.048	.056	.007	.026	.020	.004	-.014	-.014	-.002	-.015	-.021	.028	.035	.041	-.022	.034	-.021	.031	.037	.043

and 12. Noon and midnight variabilities are plotted against IG12 during the month of April for Tomsk, Boulder, Maui and Brisbane. Although variabilities for all years are shown on these plots, the regression line shown is calculated including only magnetically quiet data points (indicated by a plus in the figures).

As can be seen in these figures, most of the variabilities associated with high AP (AP > 19, and indicated by an 0 in the figures) are higher than the regression line at both noon and midnight at Boulder and Tomsk. At Maui and Brisbane however, the magnetically active variabilities do not deviate as drastically from the quiet variability regression line. Since Maui is a low-latitude station, and Brisbane is more than 12 degrees ML lower than either Boulder or Tomsk, magnetic activity may have less effect on variability at lower latitudes.

5. SUMMARY

This report characterizes the variability in the F2 layer critical frequency of the ionosphere. Based on initial studies of the variability, foF2 is characterized on a seasonal, solar and diurnal basis for magnetically inactive periods. Upper and lower deciles of foF2 were also determined for purposes of comparison to the standard deviation factor. The difference between the decile factors and the standard deviation factor is negligible when magnetic activity is not considered.

Magnetic activity, however, will affect the variability in foF2. Due to the complicated nature of the interaction of magnetic activity with foF2, magnetic influences were not investigated extensively in this report. Examples of variability for magnetically active conditions during equinox periods are, however, given in this report. These examples show that during magnetically active, high solar periods, the lower decile of the foF2 may become depressed. Low solar and active magnetic periods do not show this depression in the lower decile factor, though marked deviations between the upper decile and standard deviation are noticed.

For most communications applications, the frequency which will propagate for 90 percent of the transmission period is required.

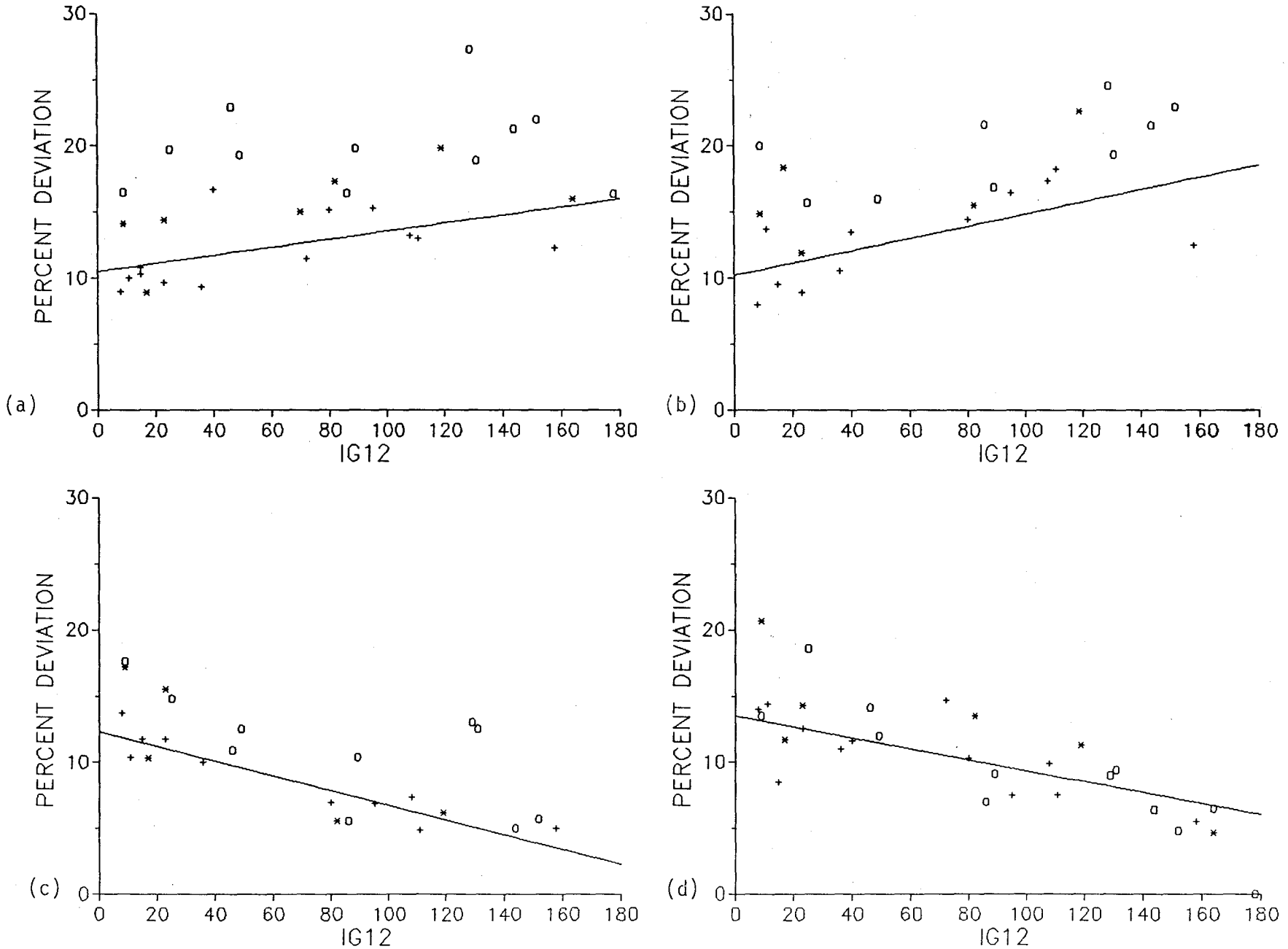

FIGURE 11. Regression line with IG12 for quiet variabilities (indicated by a +) in April for noon at (a) Tomsk, (b) Boulder, (c) Maui, and (d) Brisbane. Active variabilities are indicated by an* (for AP range 16 to 19) and O (for AP ≤ 19).

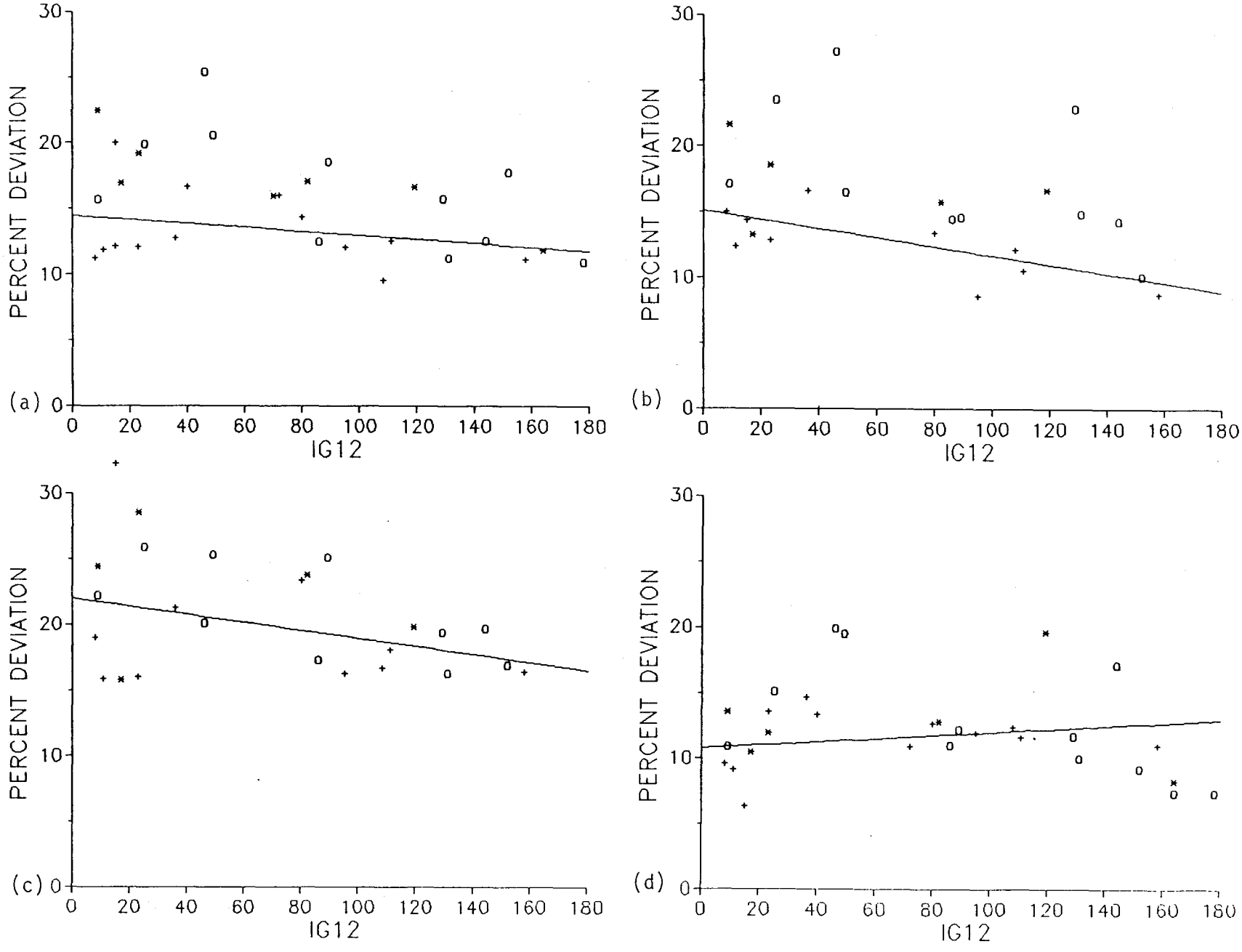

FIGURE 12. Regression line with IG12 for quiet variabilities (indicated by a +) in April for midnight at (a) Tomsk, (b) Boulder, (c) Maui, and (d) Brisbane. Active variabilities are indicated by an* (for AP range 19 to 19) and 0 (for AP $\leq$ 19).

The distribution of the foF2 will limit this frequency as will the lower decile of the 3000 km transmission factor (M(3000)F2). In magnetically active periods, it may be better to use the lower decile factor. During quiet magnetic periods, the difference between the lower decile and standard deviation characterizations of the distribution are not significant, and either characterization will yield similar frequencies projected to propagate 90 percent of time.

For prediction purposes, the tables presented in Section 3.3 and Appendix C, can easily be incorporated into a computerized format to enhance the prediction of F2 layer parameters. Given a monthly median foF2, these tables could then be used to describe the distribution of the daily foF2's around the median for high, medium and low solar activity as well as for active magnetic equinox periods.

Although this report summarizes the daily variation in foF2 for quiet periods and certain active magnetic periods, extreme variations in foF2 may occur during magnetic storms. Because of the complicated nature of the interactions between foF2 and magnetic activity, a description of this phenomenon requires more detailed study.

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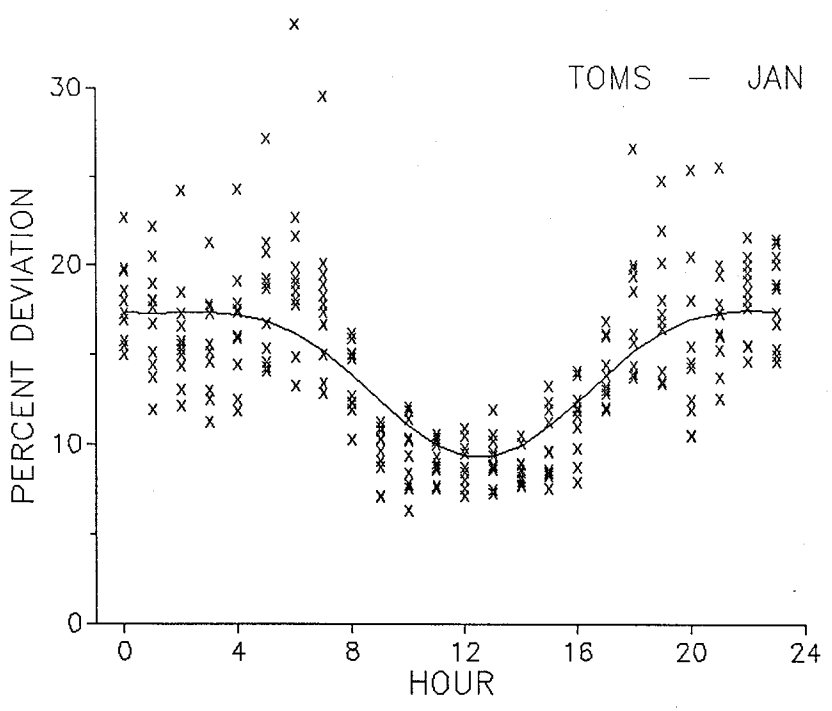
APPENDIX A

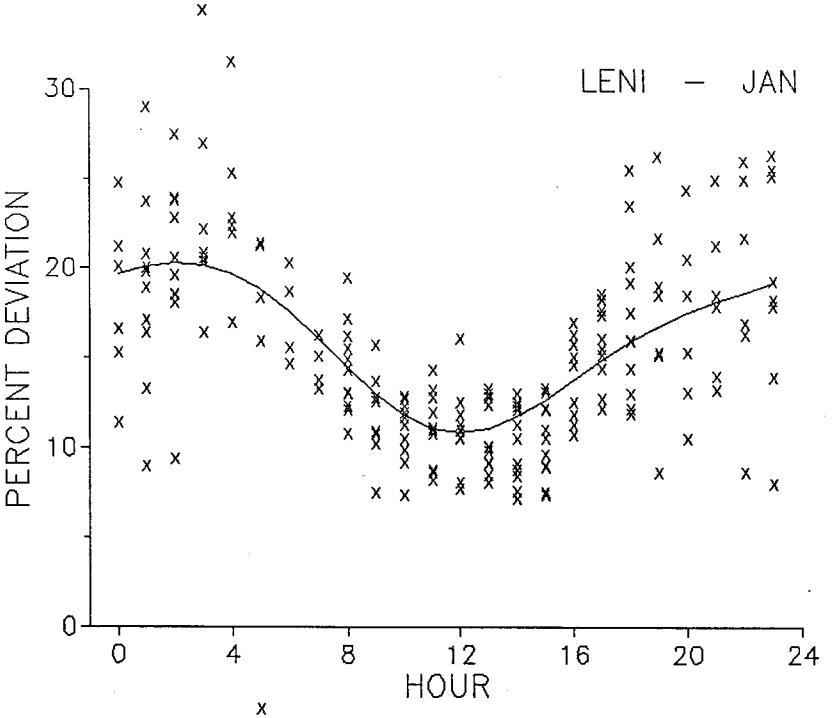
PERCENT DEVIATION PLOTS FOR ALL STATIONS DURING QUIET MAGNETIC, AND LOW AND HIGH SOLAR PERIODS FOR WINTER, SPRING, SUMMER, AND FALL SEASONS

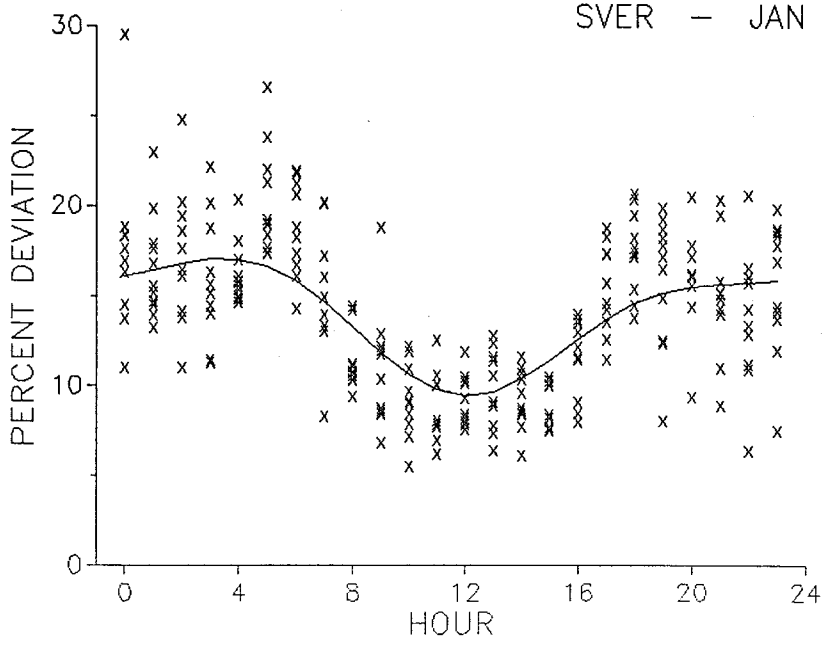
LOW SOLAR	WINTER	SPRING	SUMMER	FALL
TOMSK, LENINGRAD SVERDLOVSK, MOSCOW	42	47	52	57
WASHINGTON, BOULDER KHABAROVSK, ALMA ATA	43	48	53	58
TASHKENT, ASHKABAD MAUI, HUANCAYO	44	49	54	59
VANIMO, CONCEPCION TOWNSVILLE, NORFOLK	45	50	55	60
BRISBANE, CANBERRA MUNDARING, HOBART	46	51	56	61

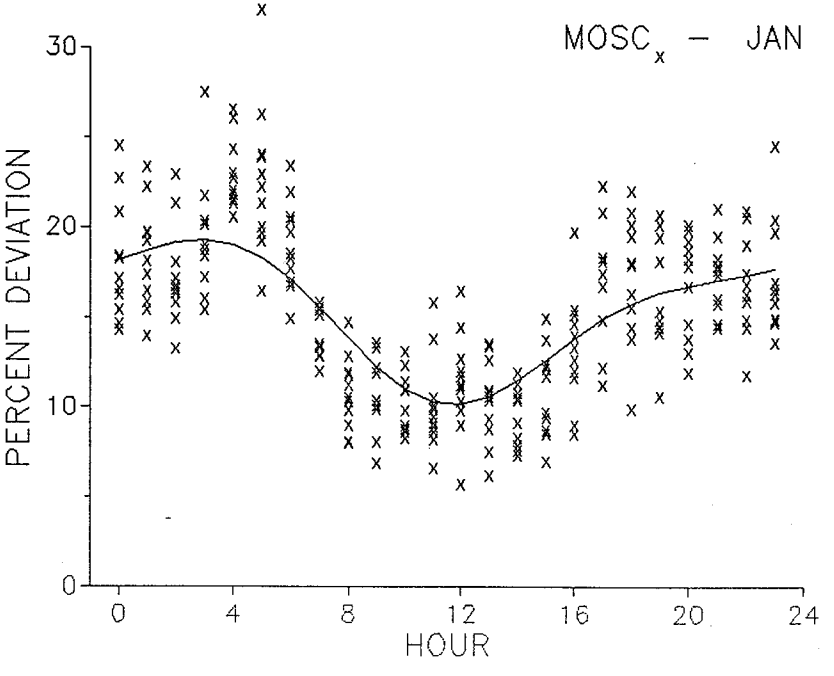
HIGH SOLAR	WINTER	SPRING	SUMMER	FALL
TOMSK, LENINGRAD SVERDLOVSK, MOSCOW	62	67	72	77
WASHINGTON, BOULDER KHABAROVSK, ALMA ATA	63	68	73	78
TASHKENT, ASHKABAD MAUI, HUANCAYO	64	69	74	79
VANIMO, CONCEPCION TOWNSVILLE, NORFOLK	65	70	75	80
BRISBANE, CANBERRA MUNDARING, HOBART	66	71	76	81

QUIET MAGNETIC -- LOW SSN









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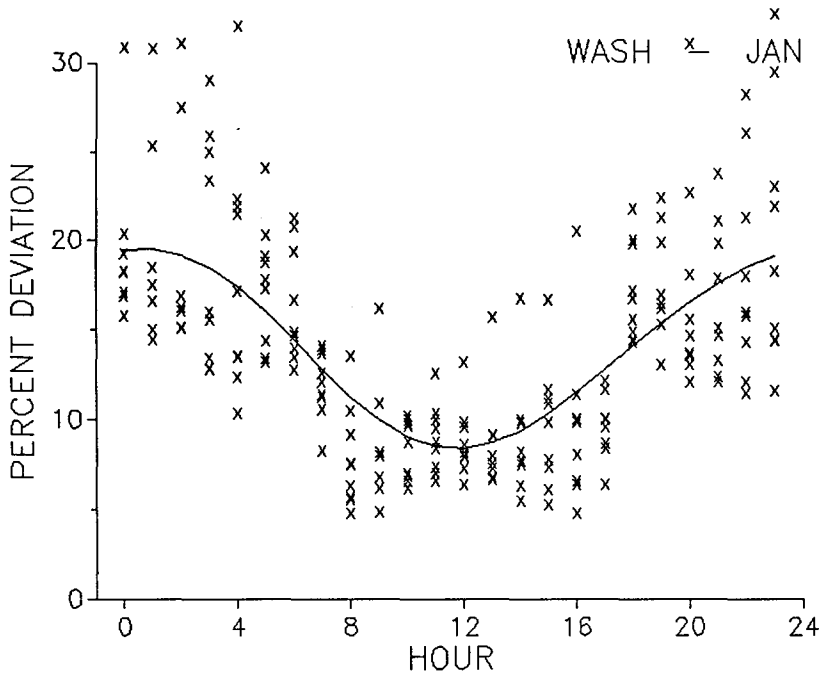

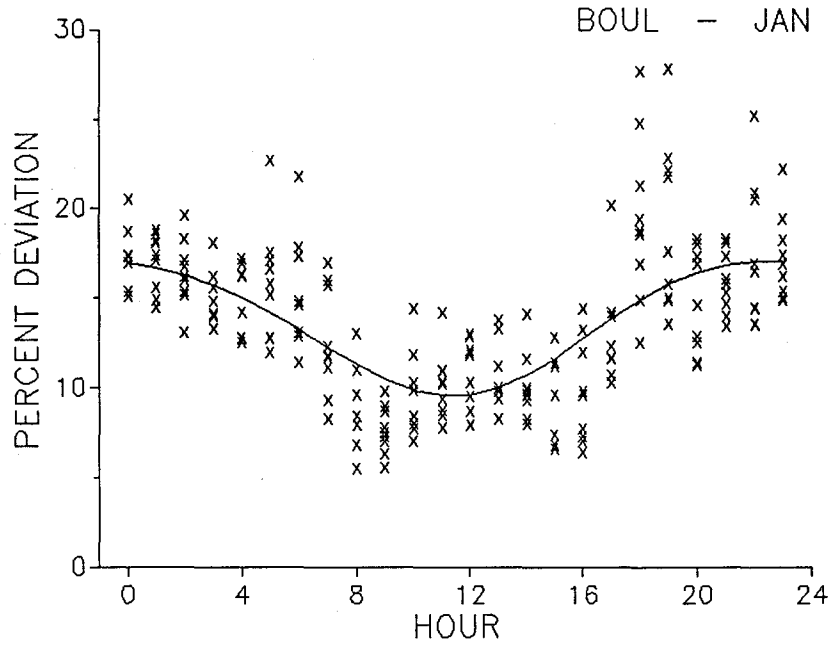

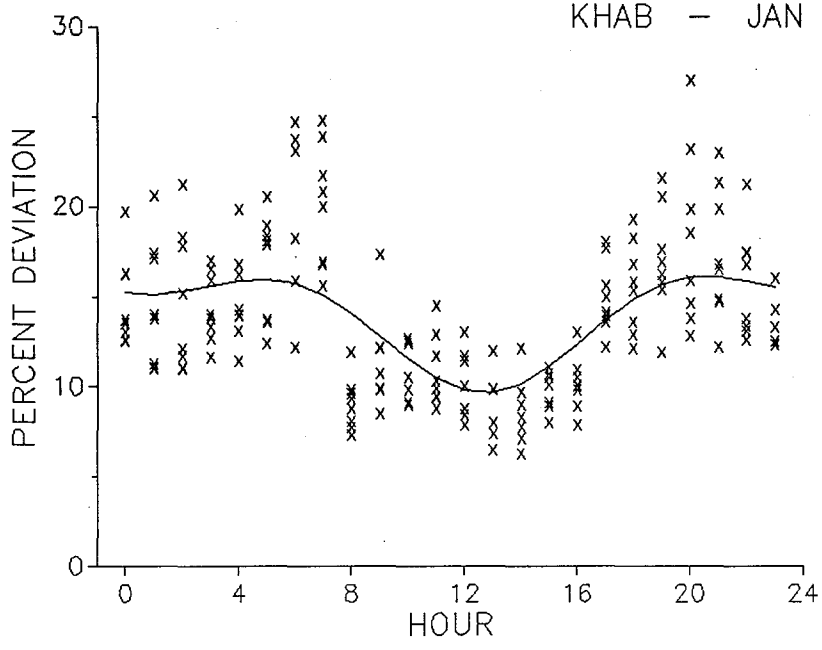

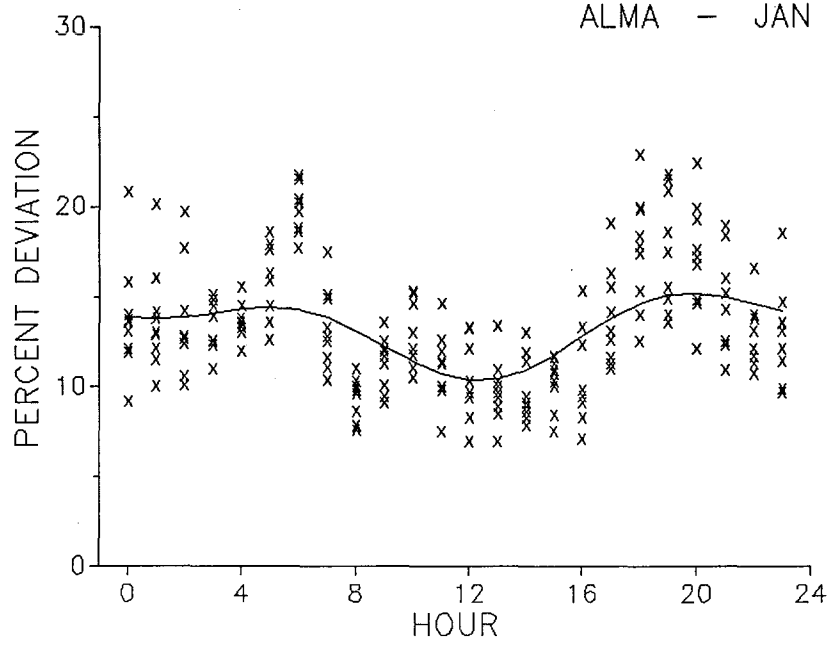

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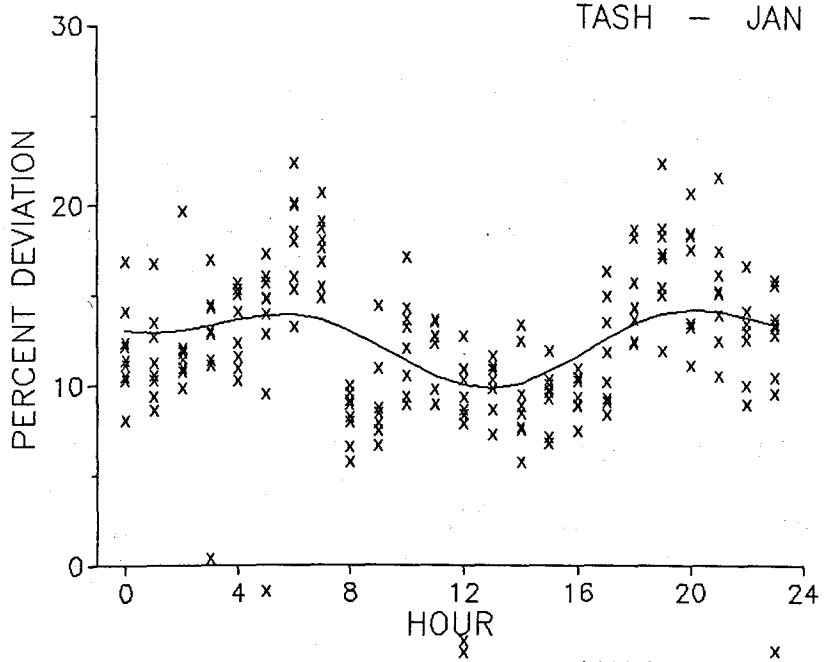

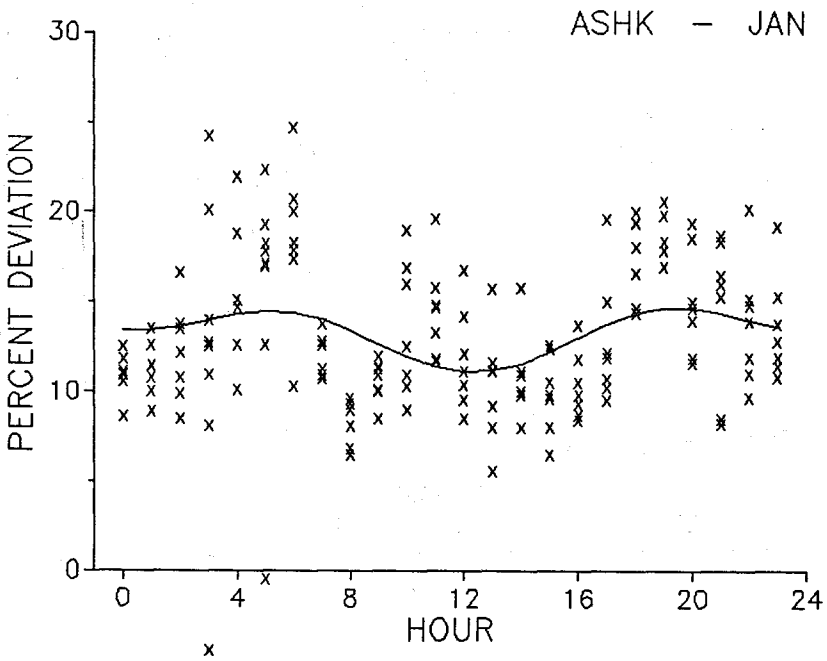

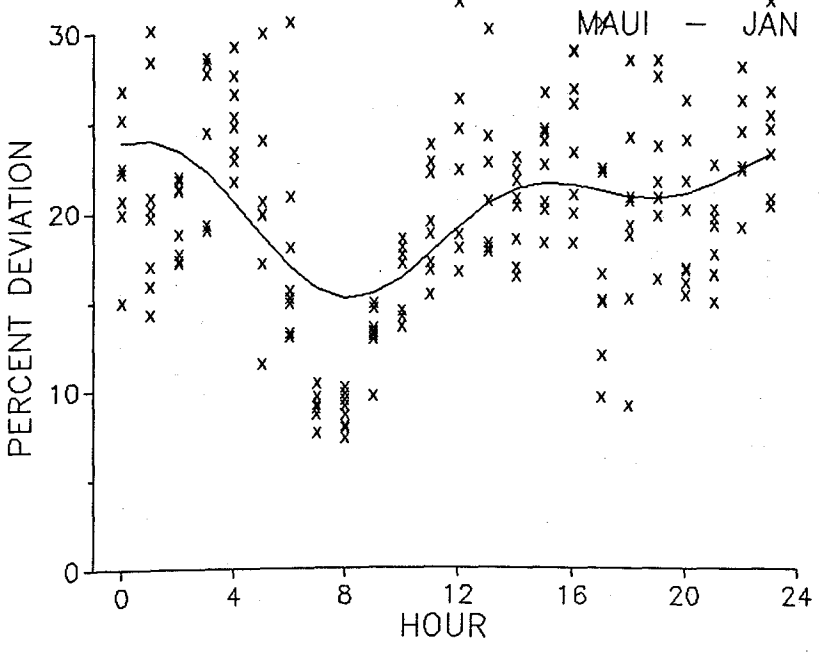

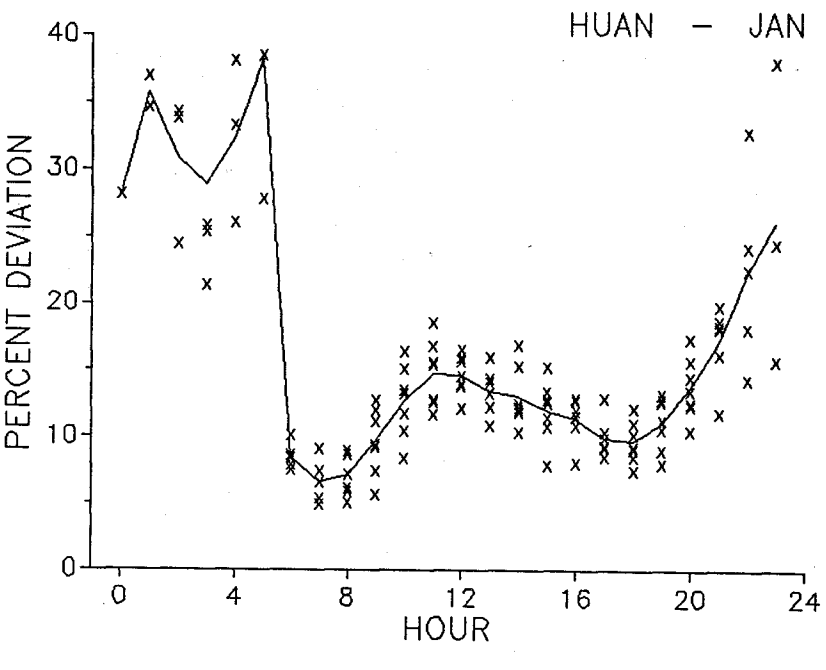

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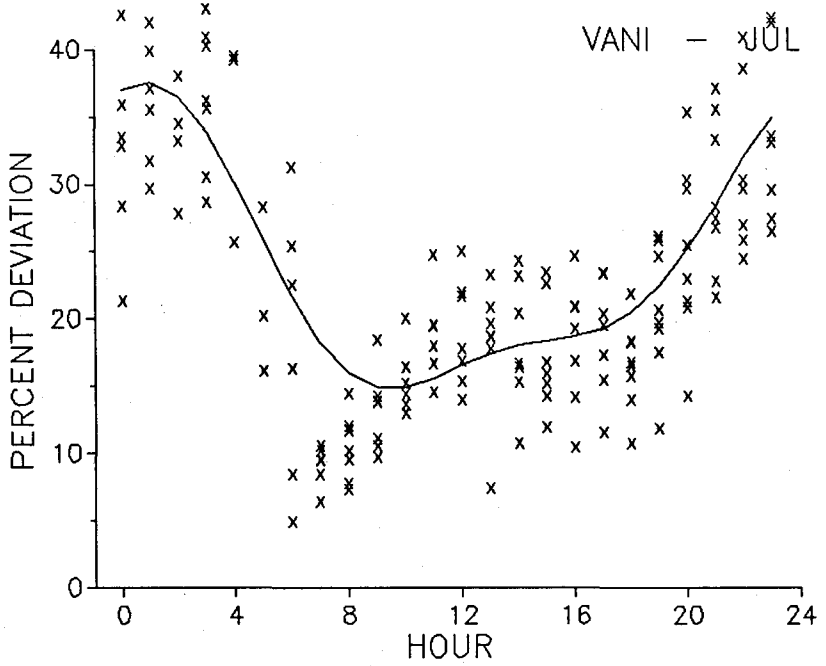

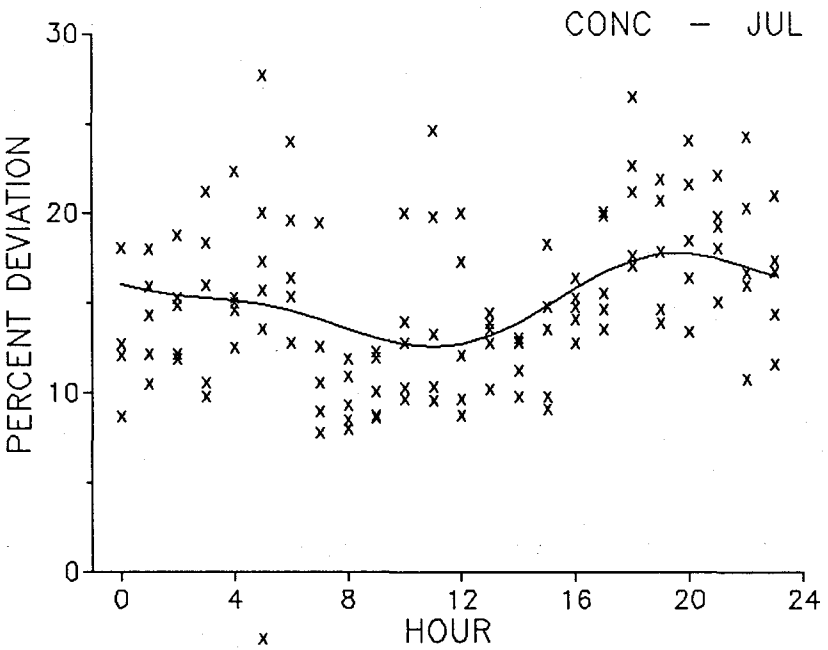

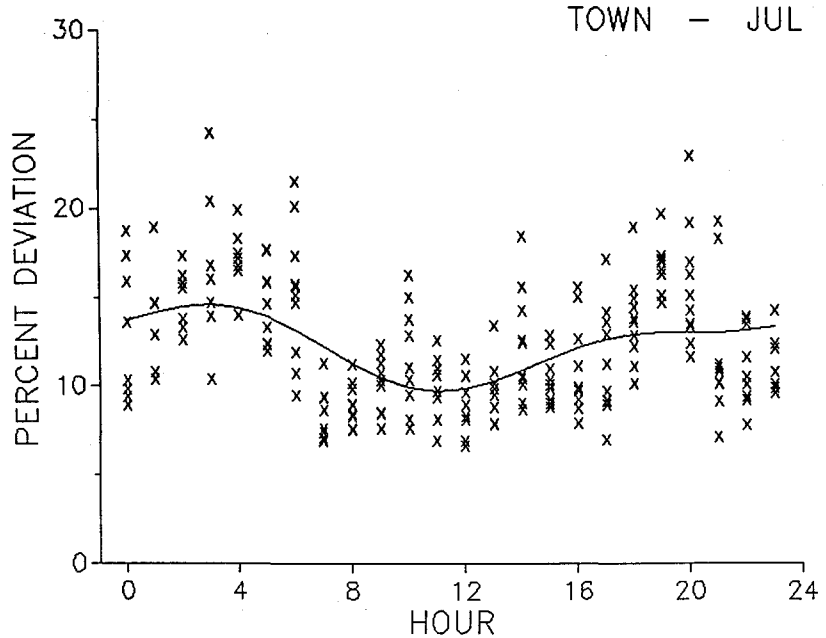

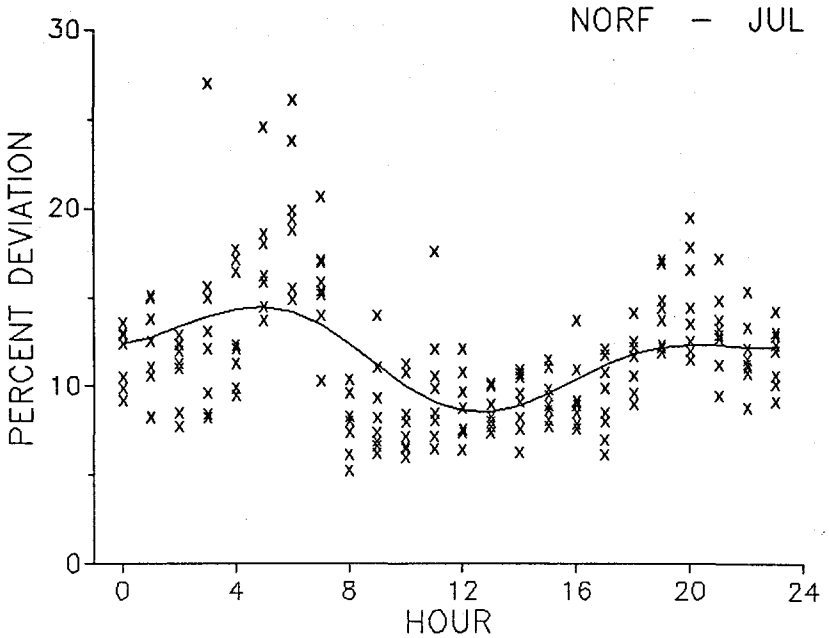

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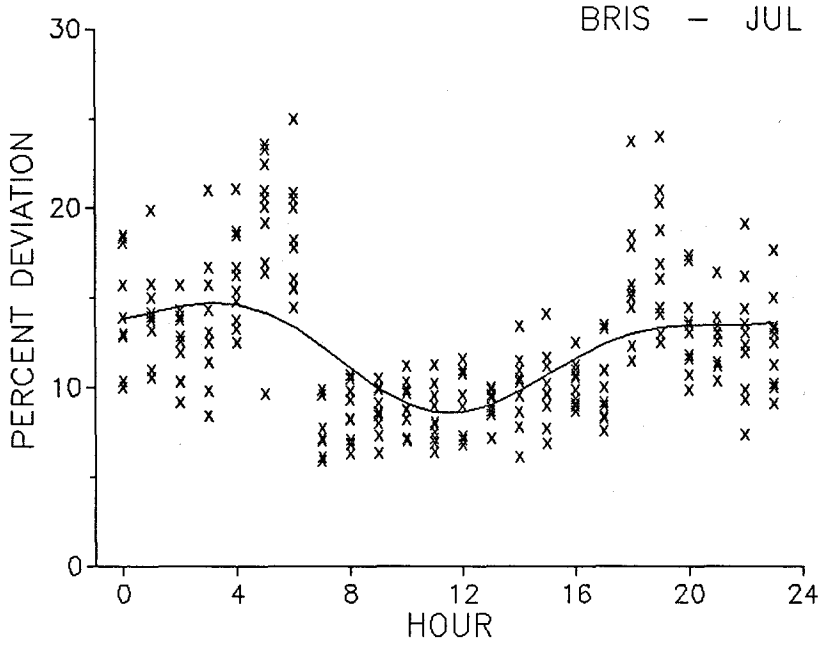

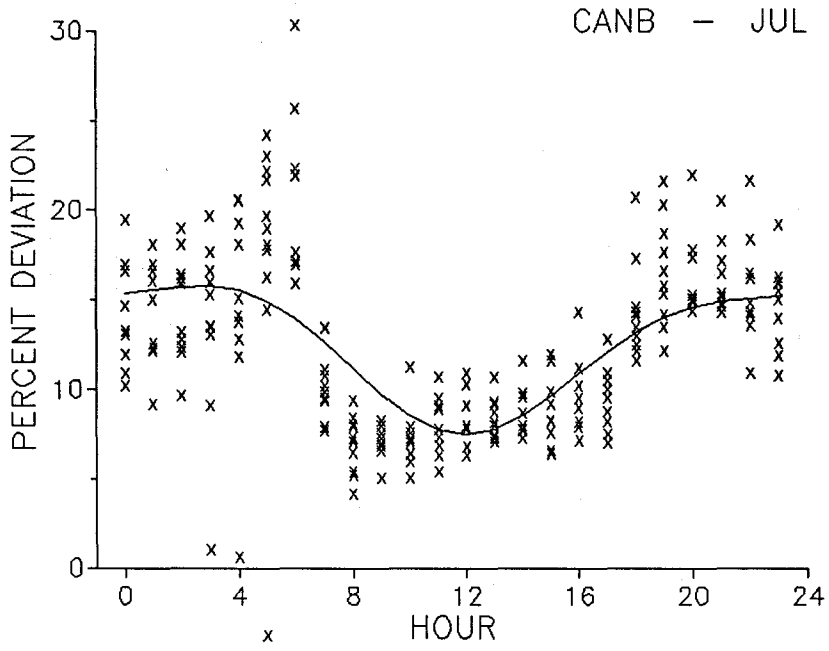

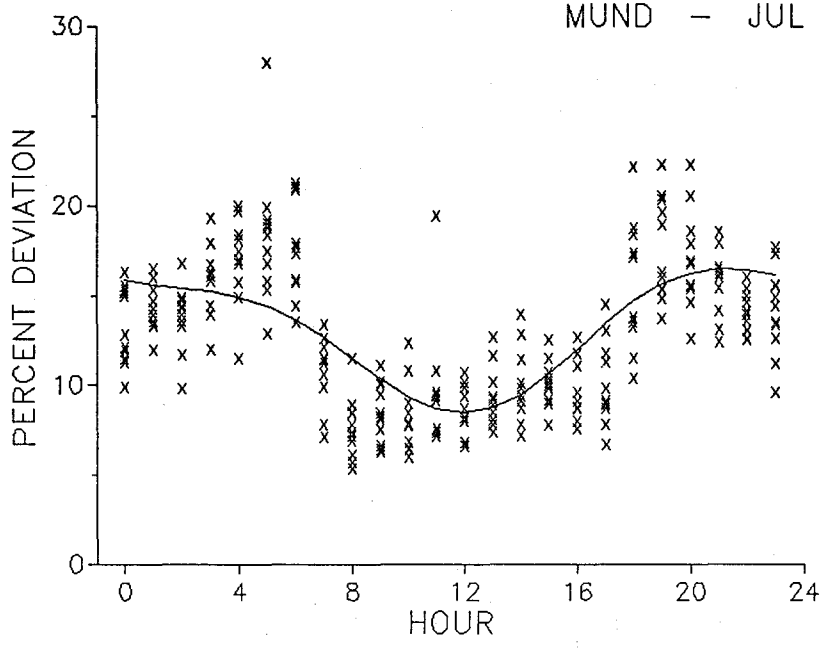

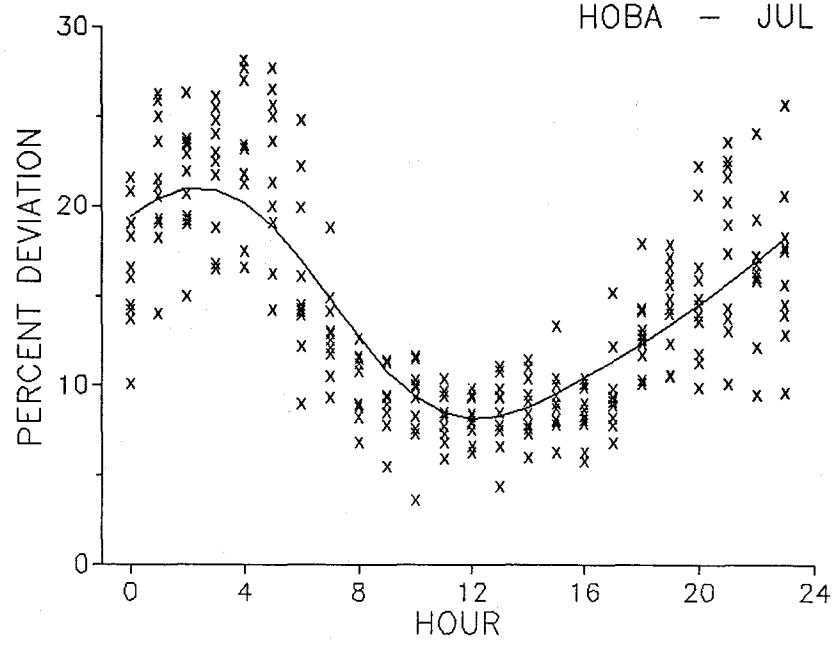

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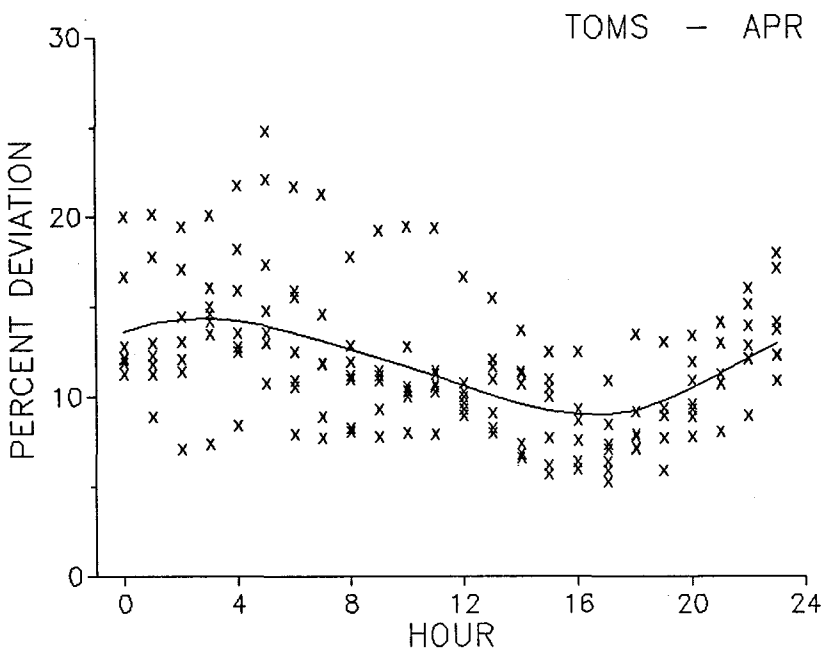

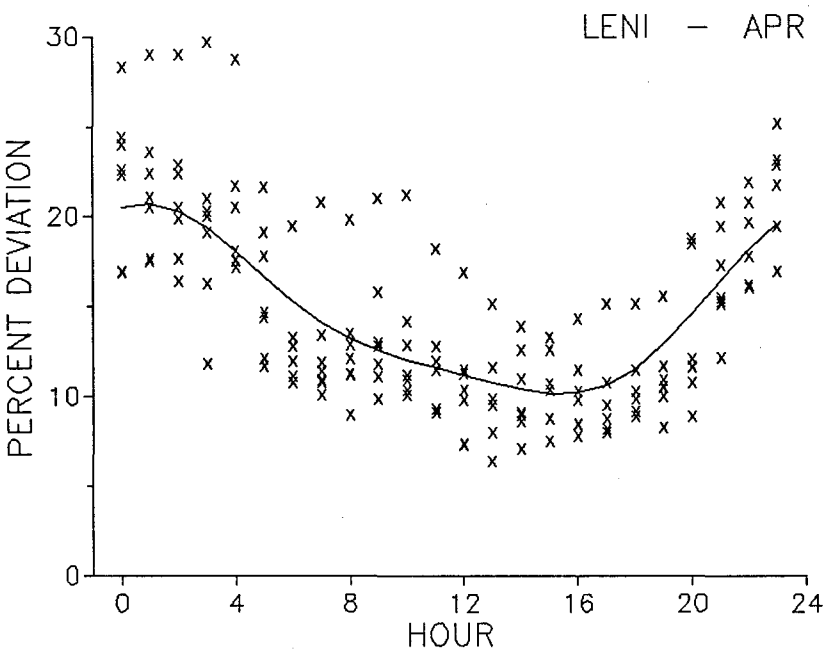

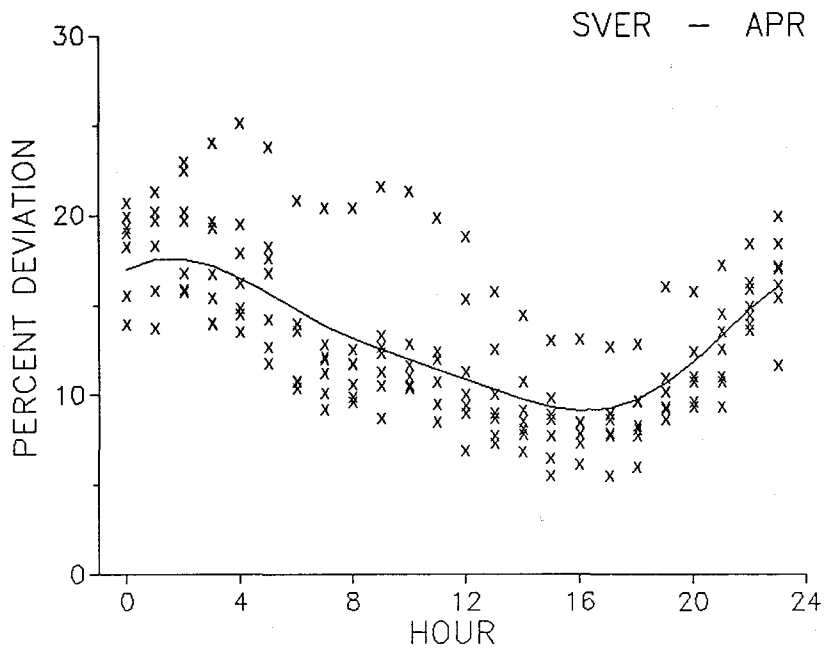

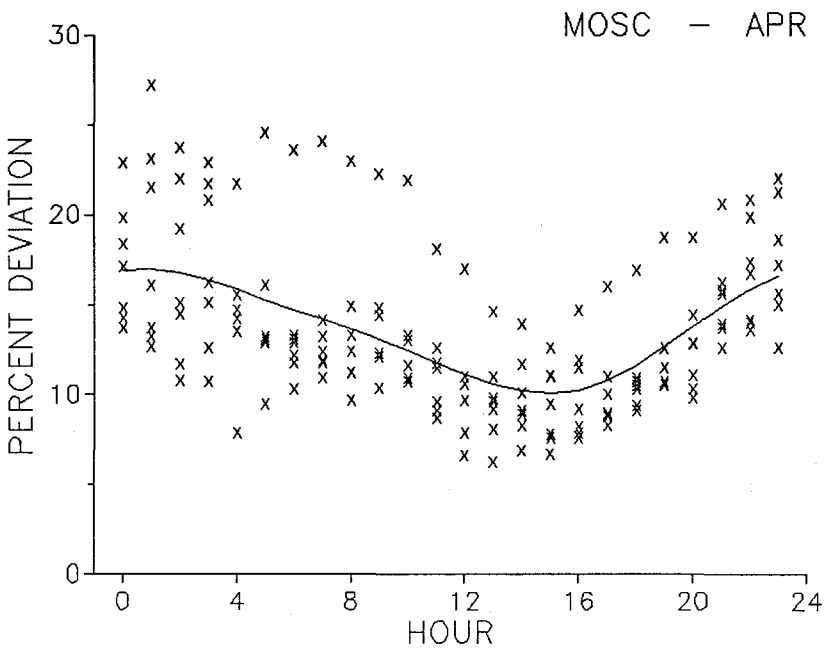

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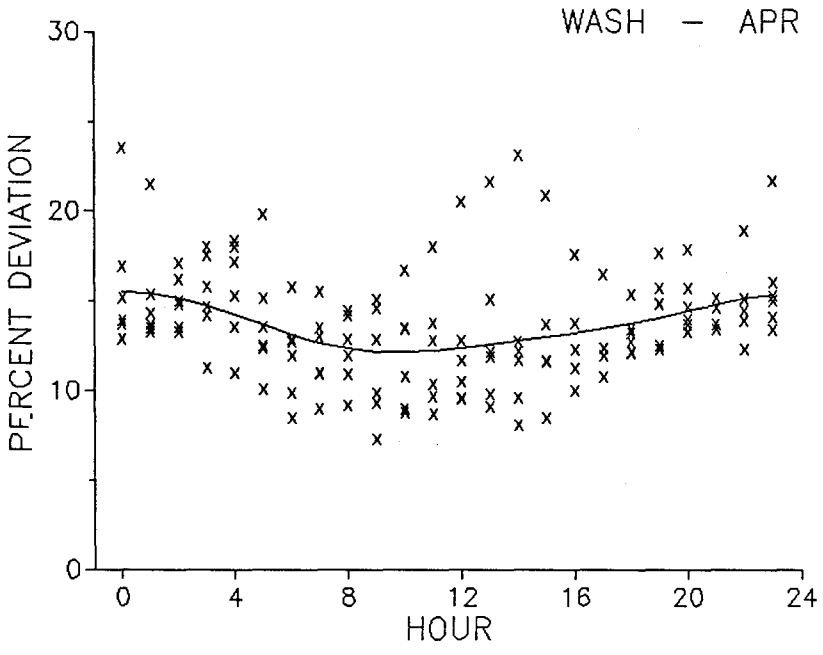

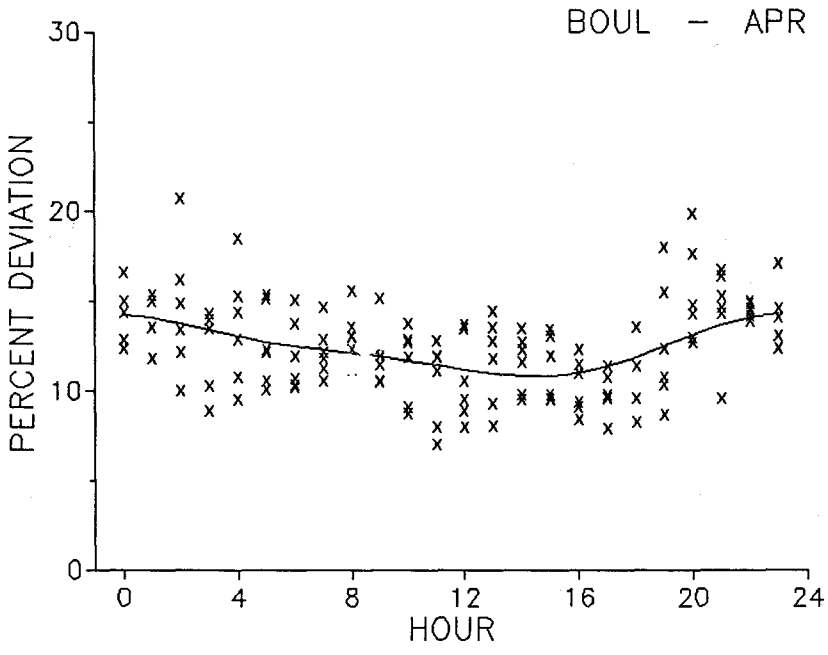

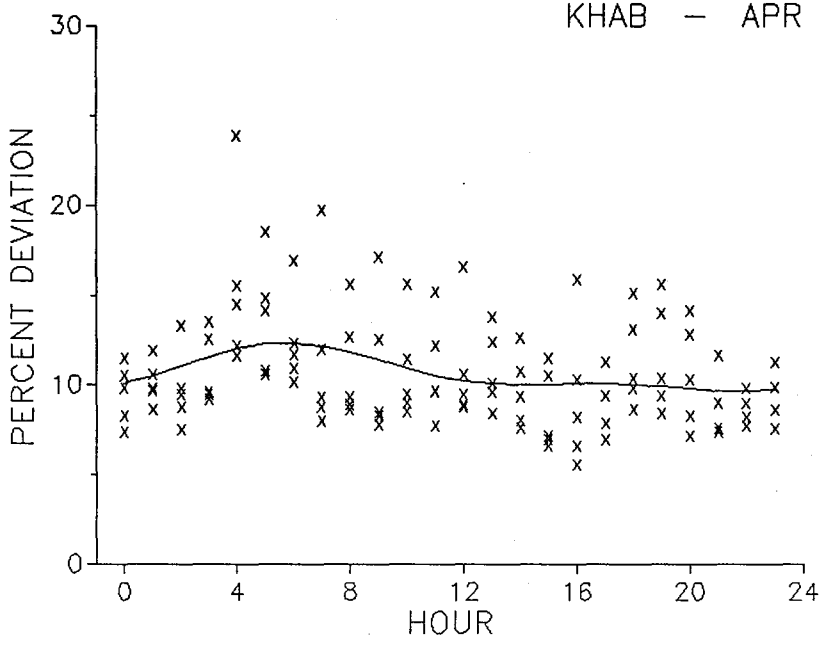

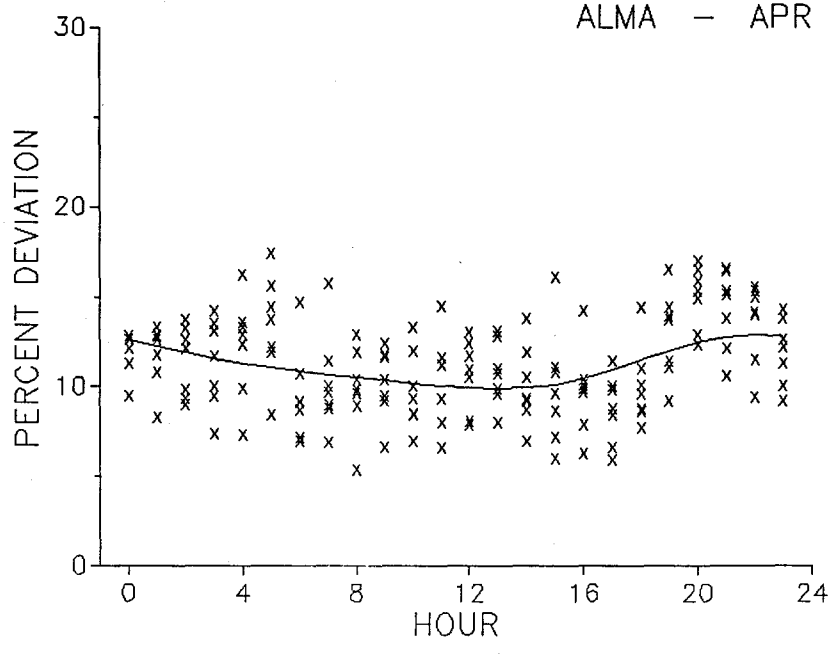

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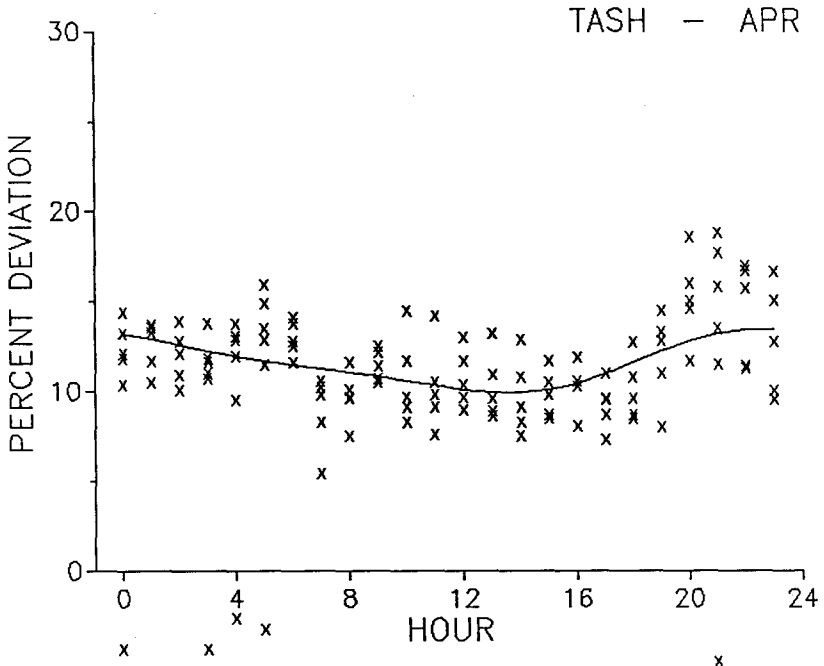
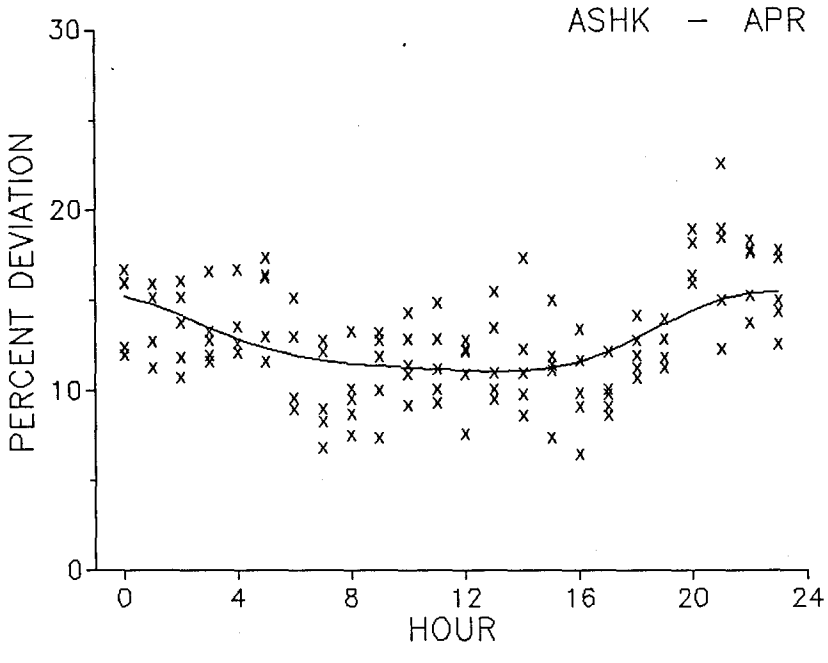
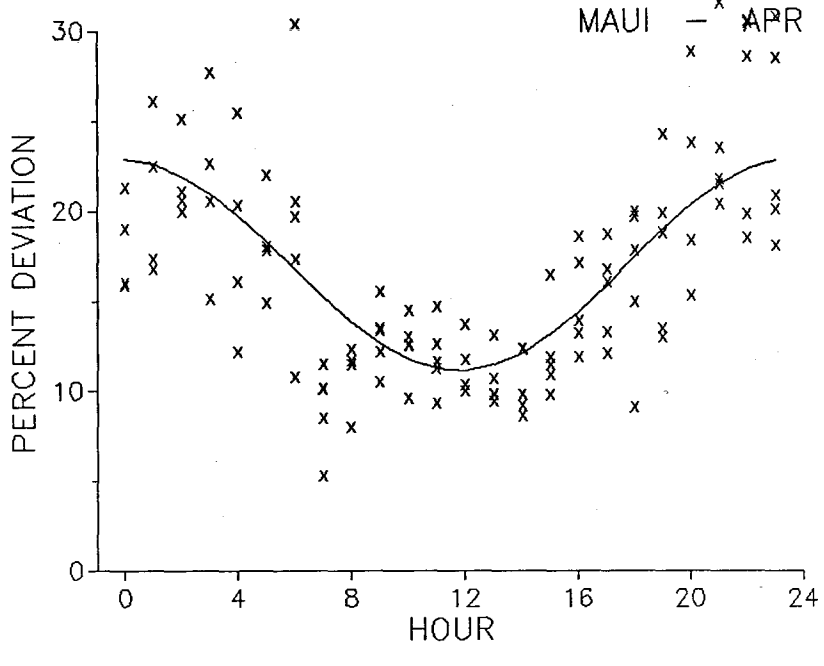
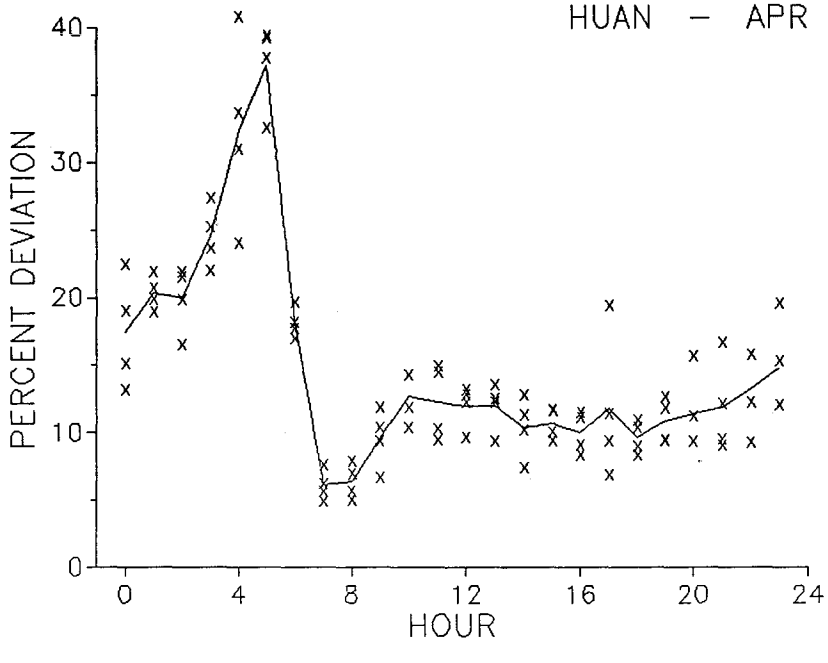
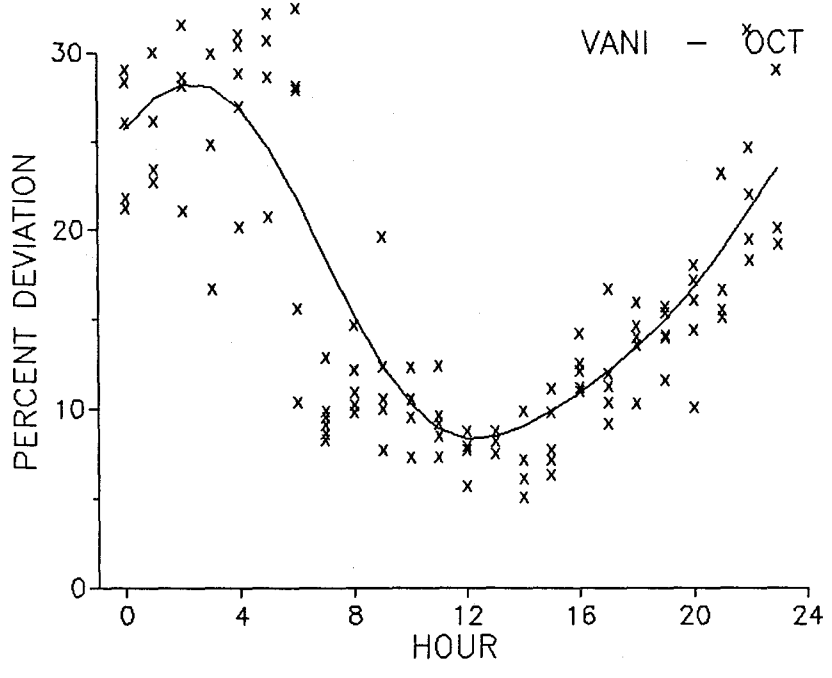


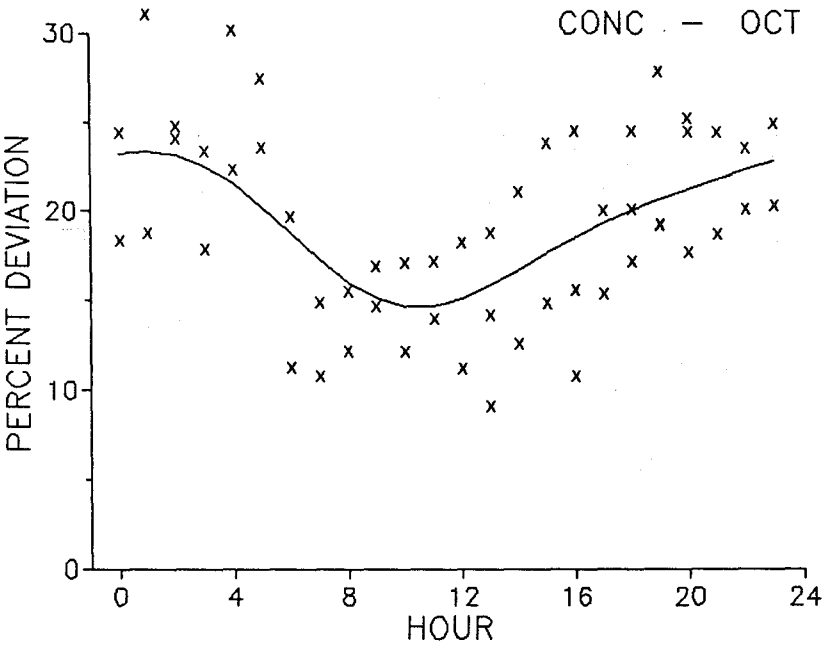


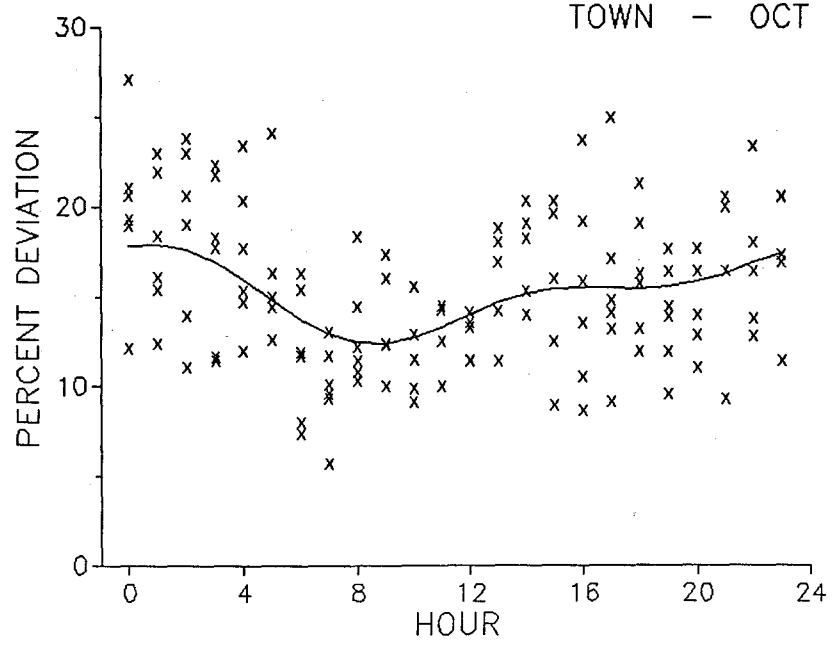


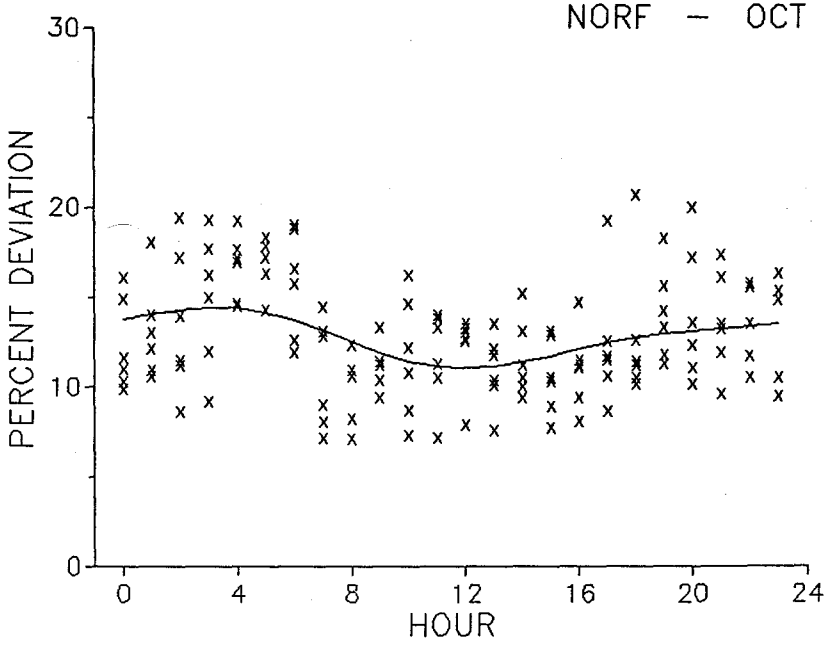


QUIET MAGNETIC -- LOW SSN

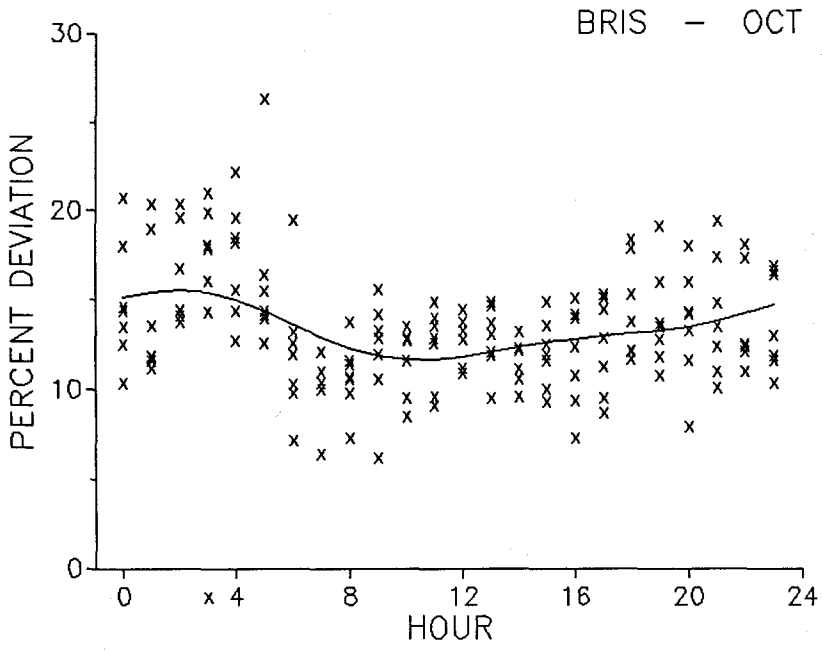


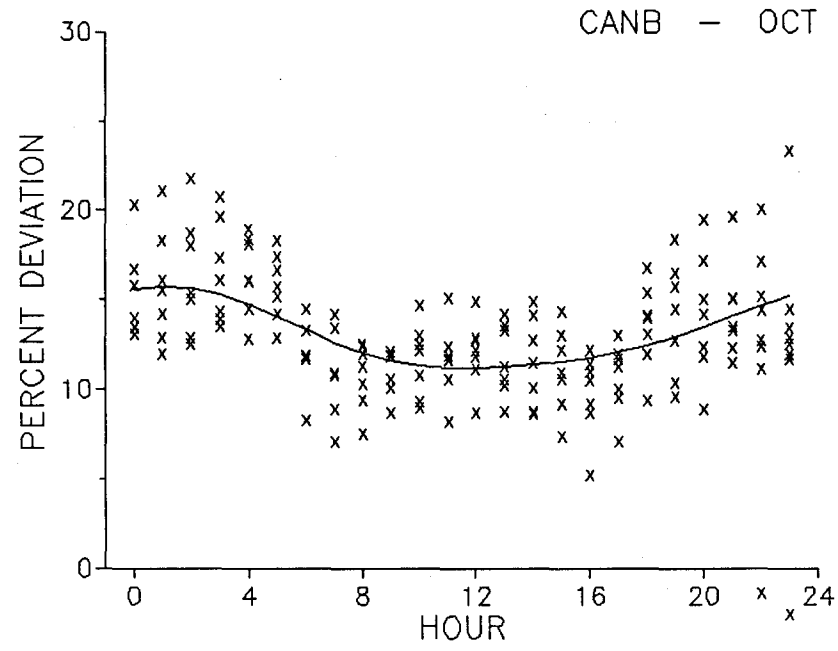


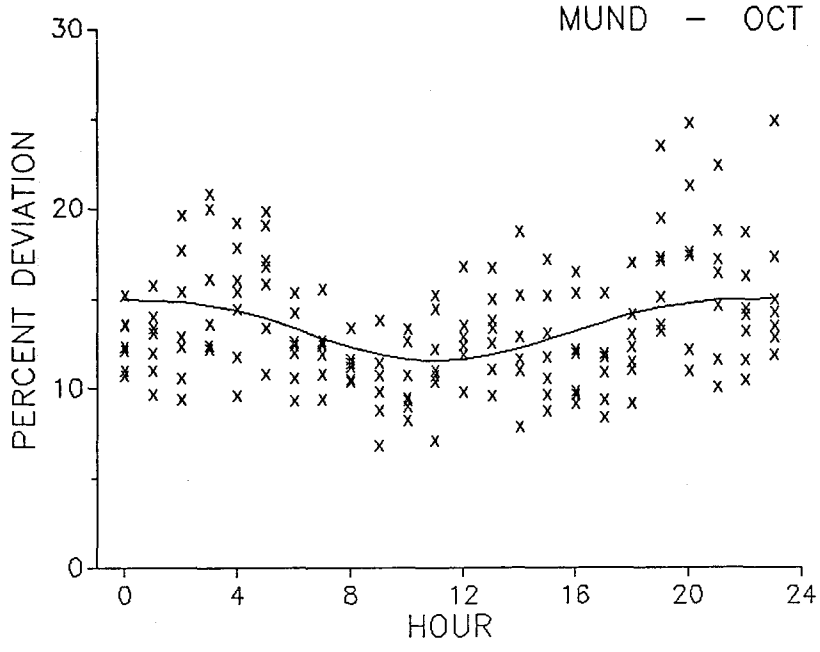


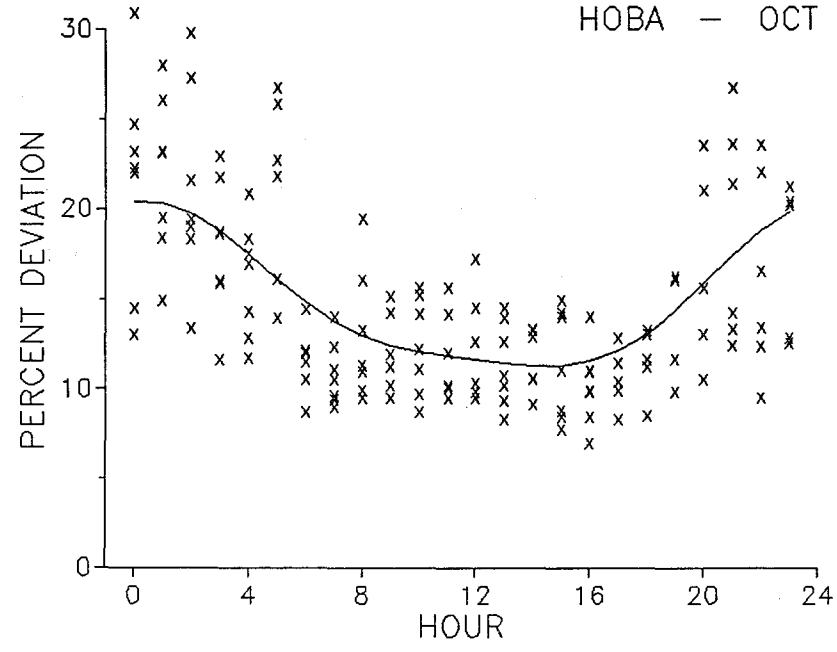


QUIET MAGNETIC -- LOW SSN









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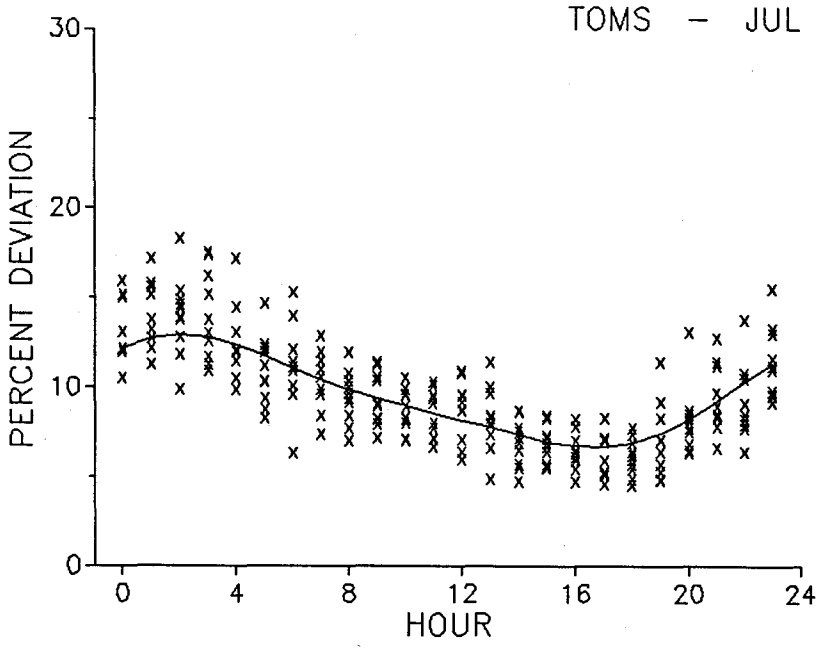

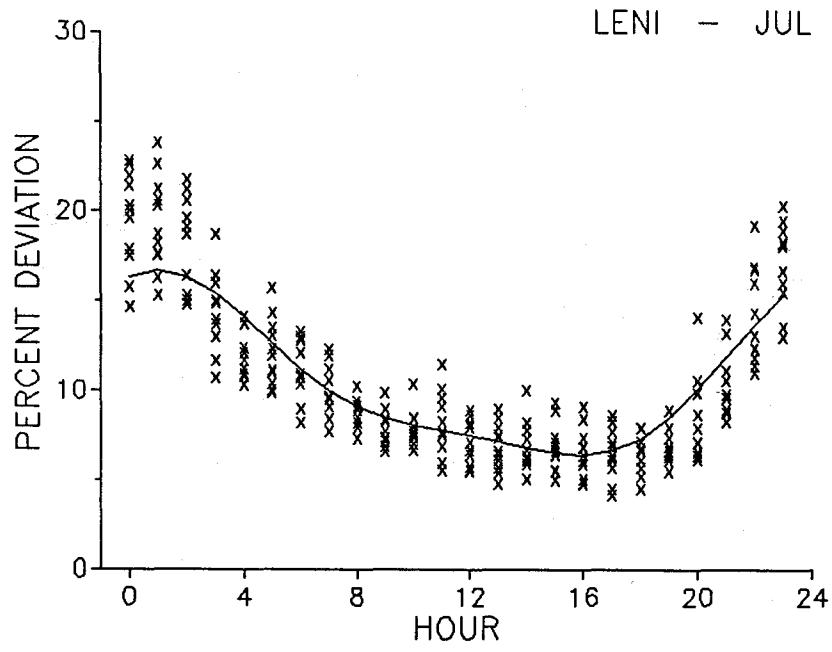

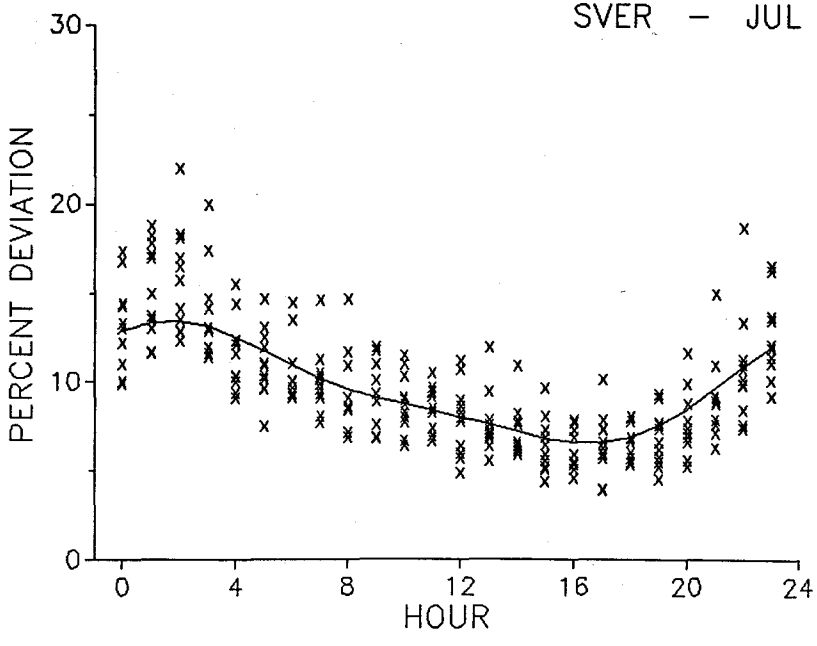

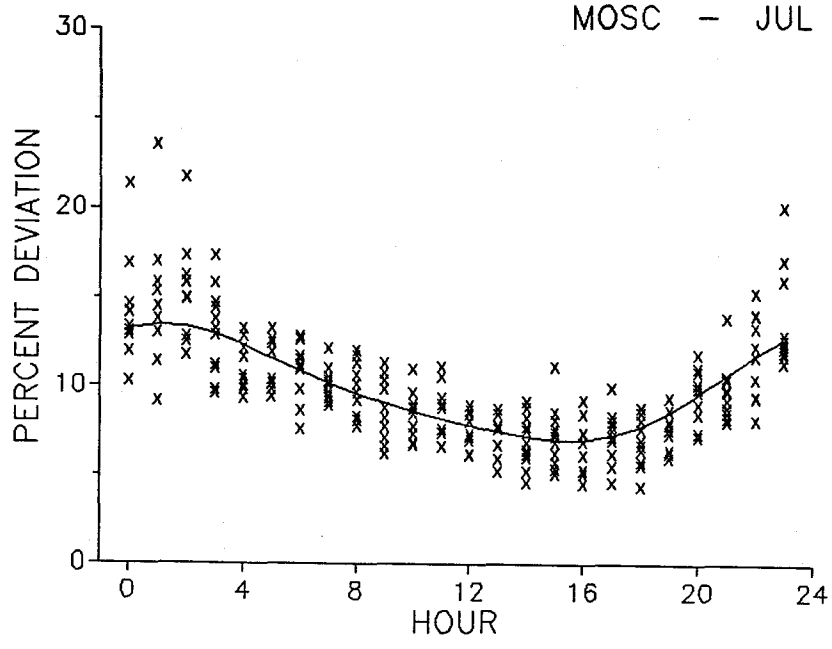

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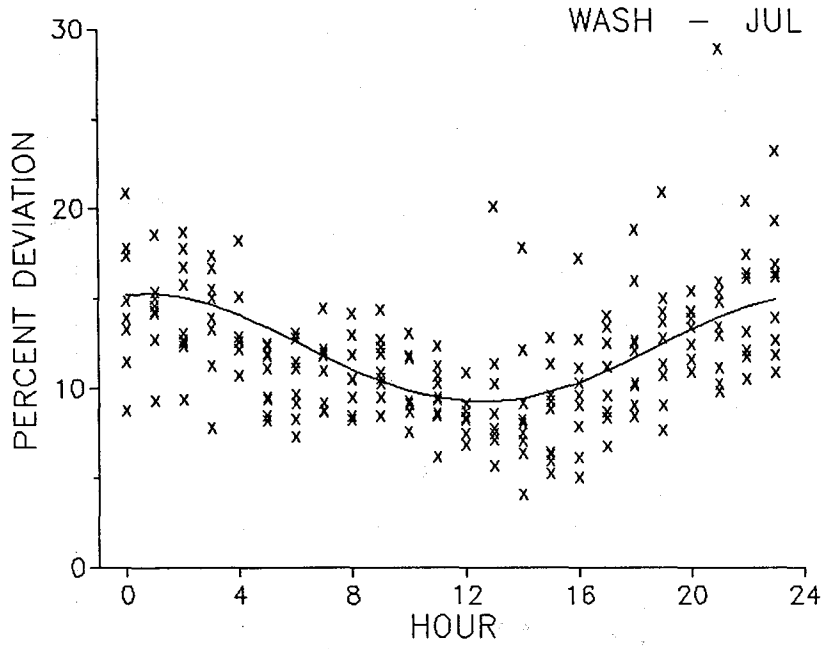

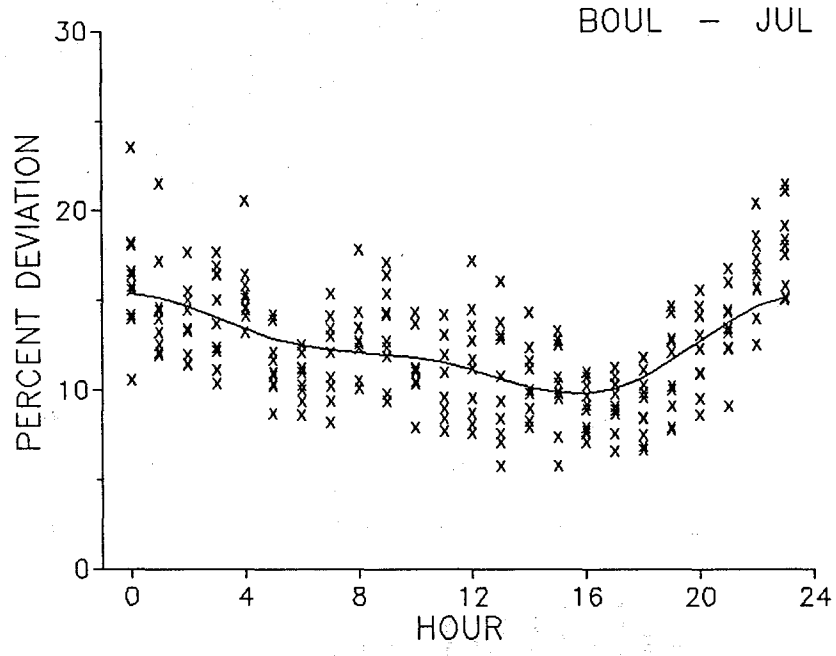

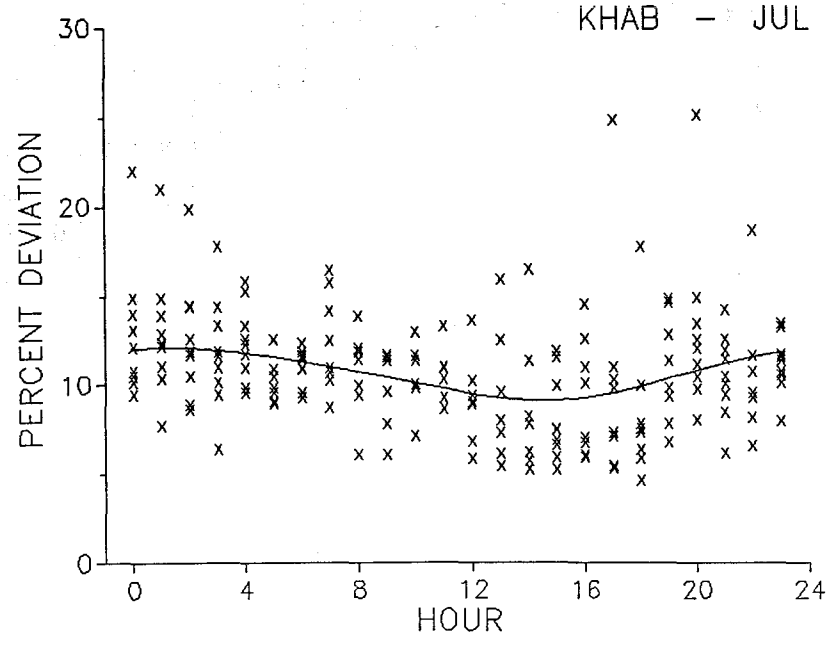

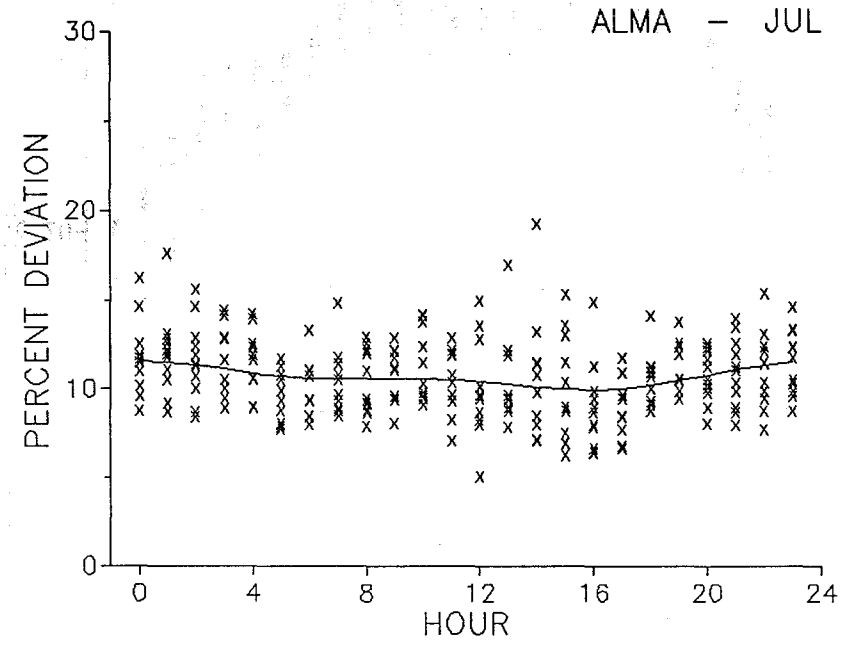

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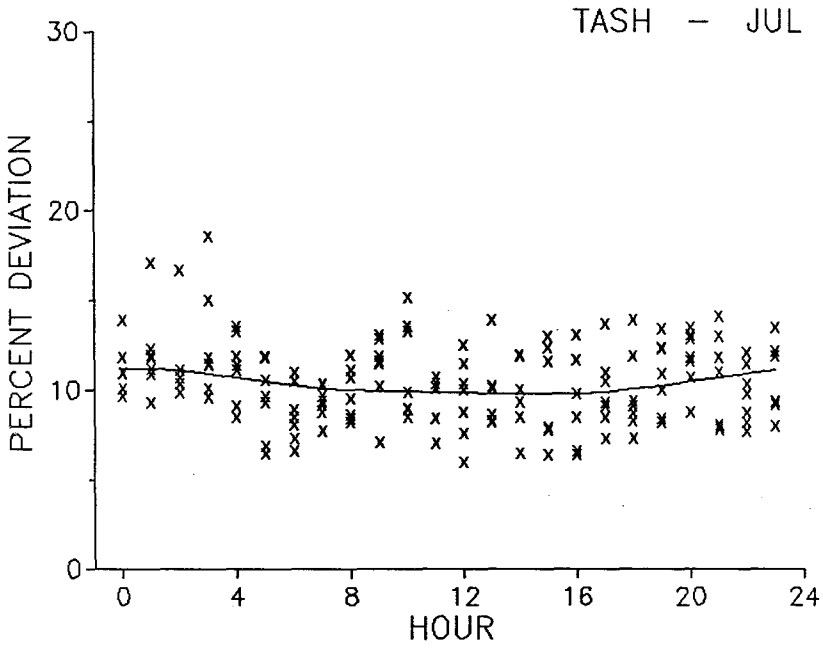
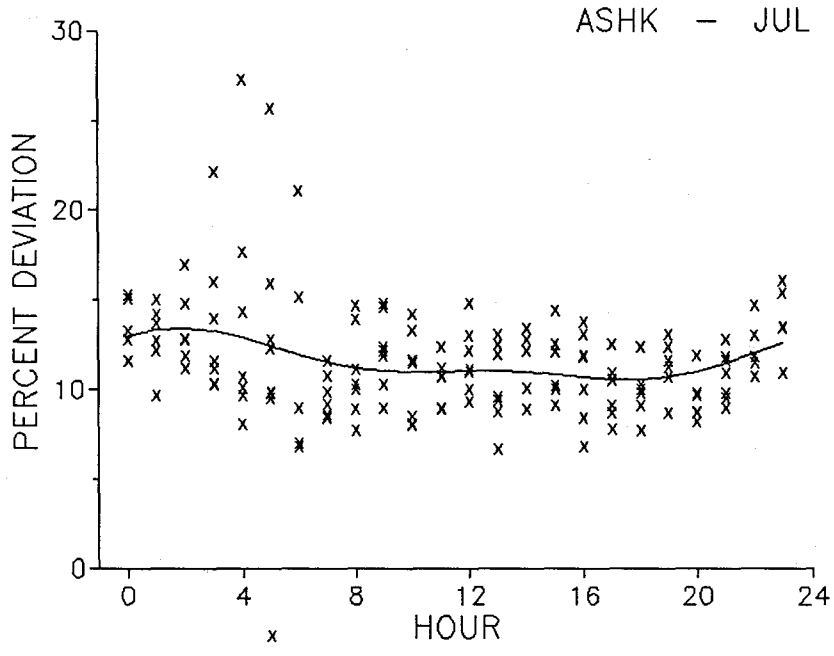
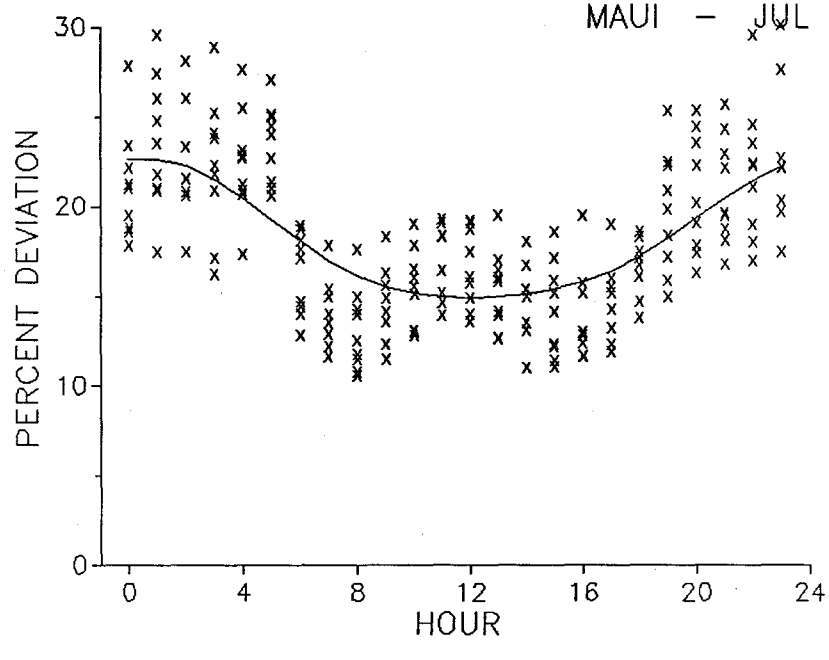
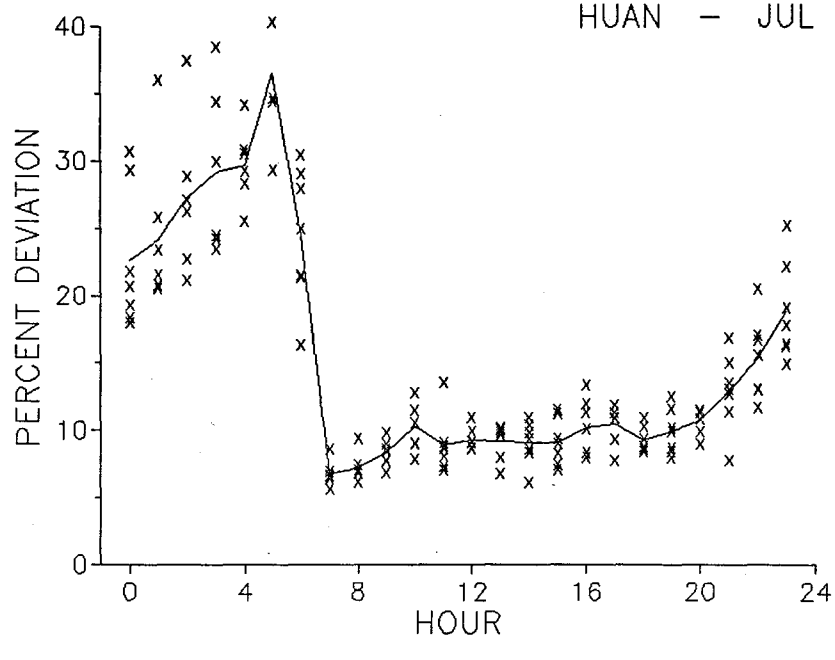
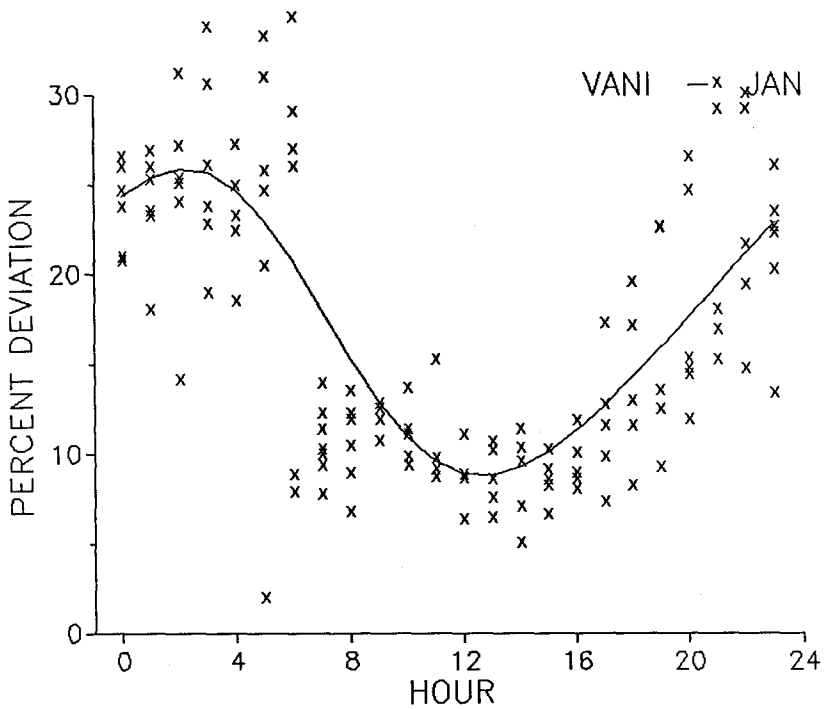


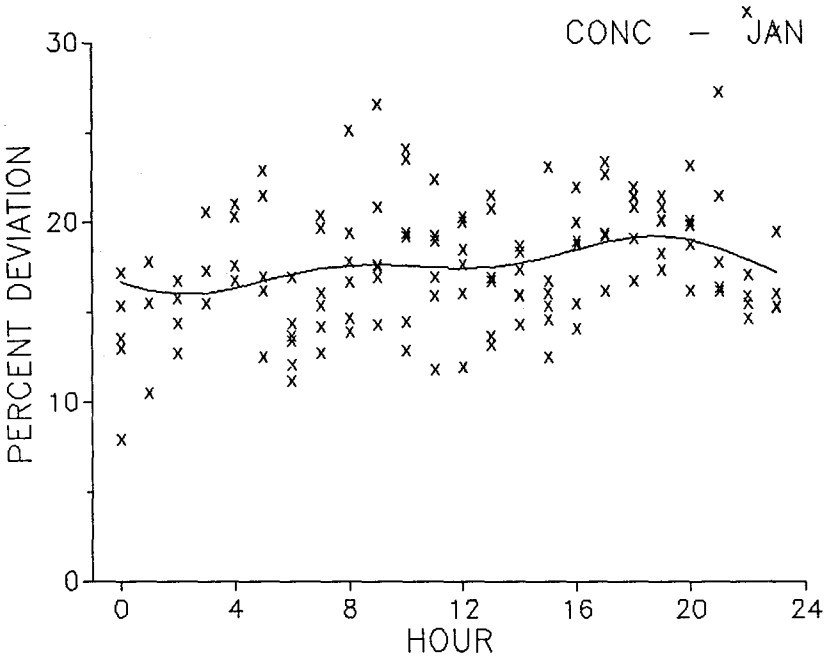


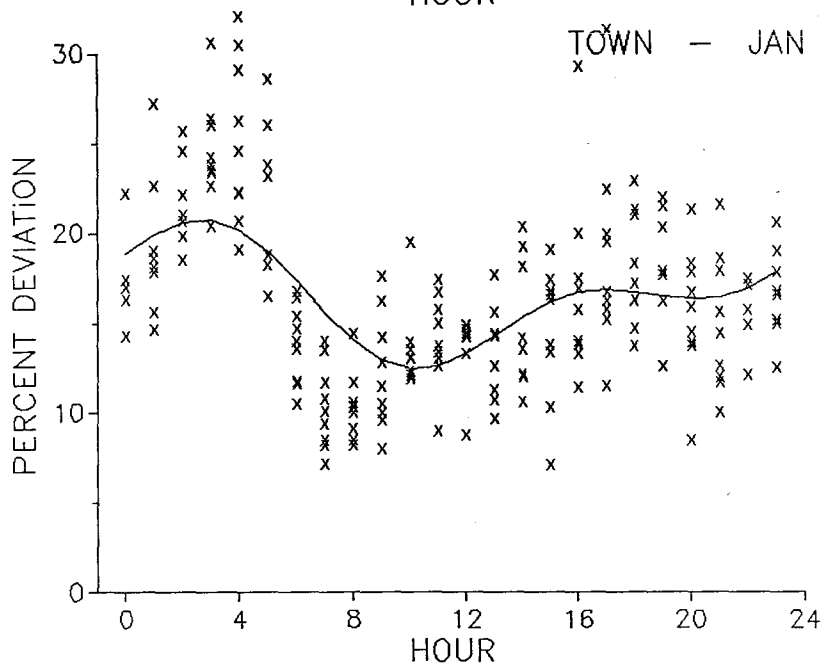


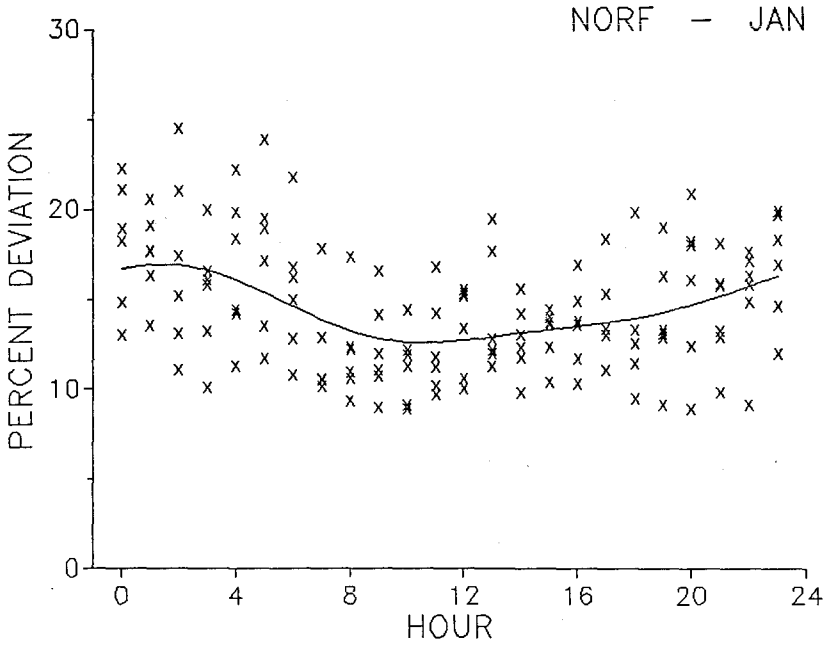


QUIET MAGNETIC -- LOW SSN









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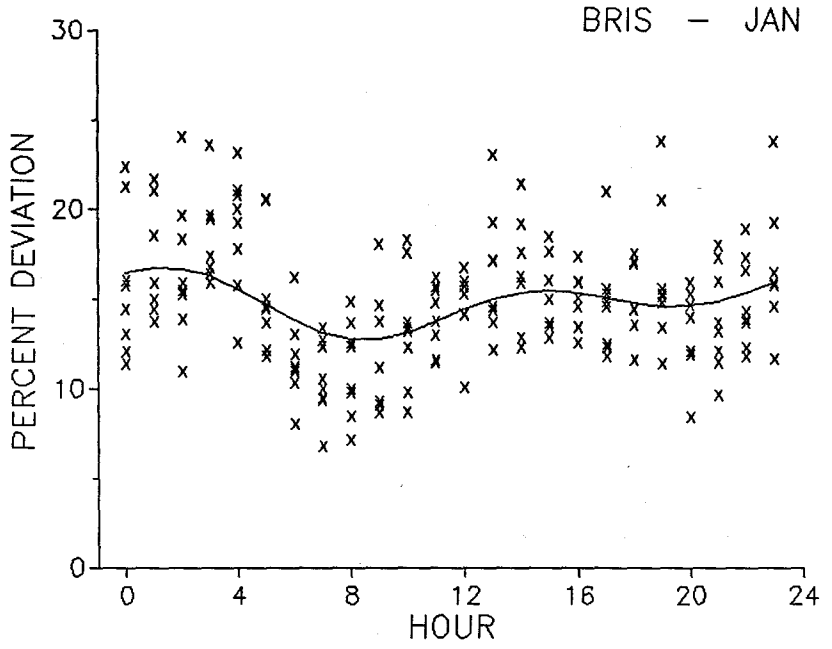
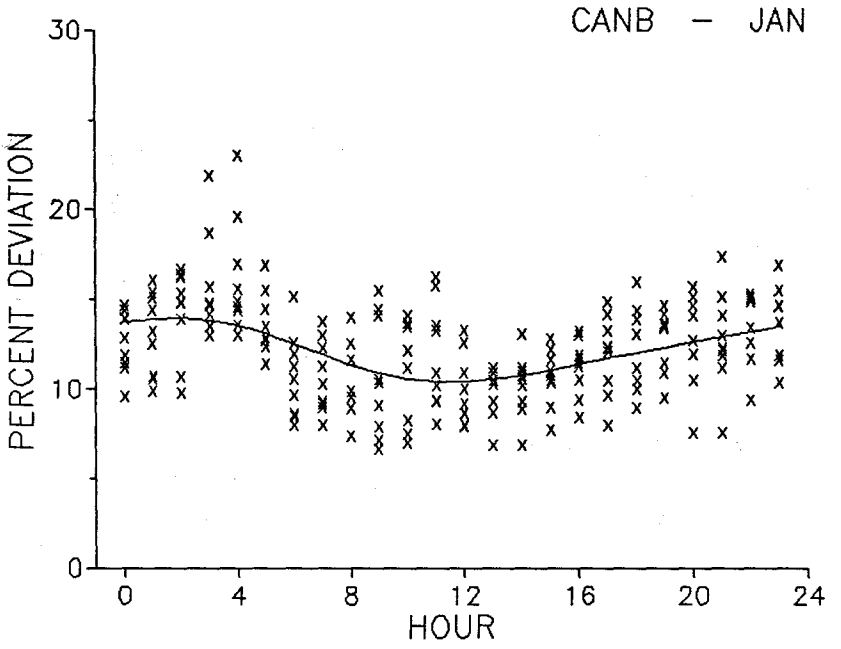
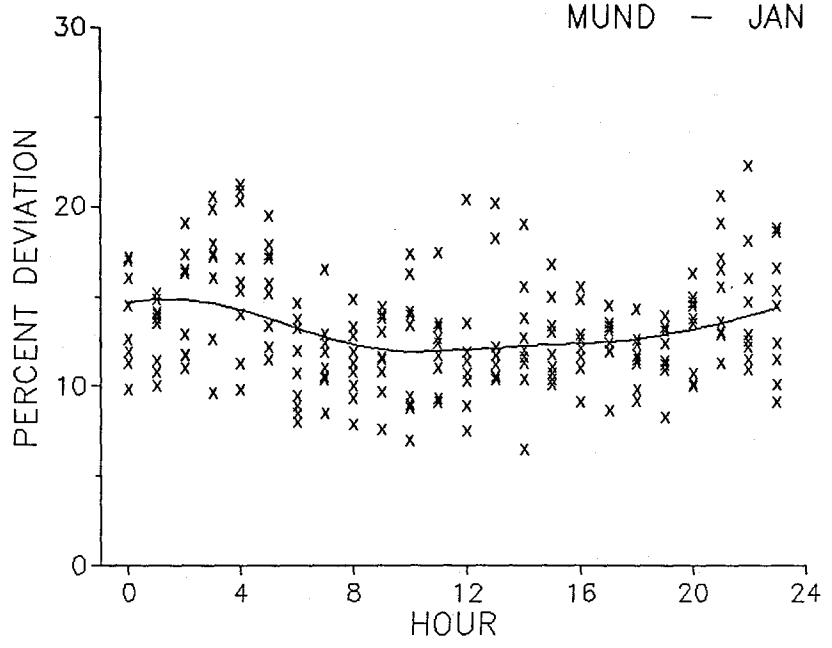
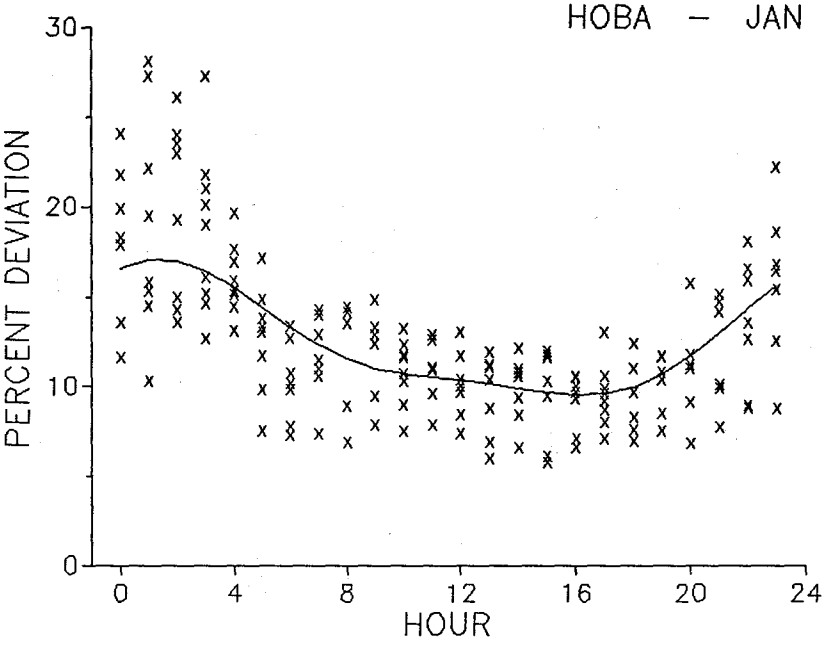
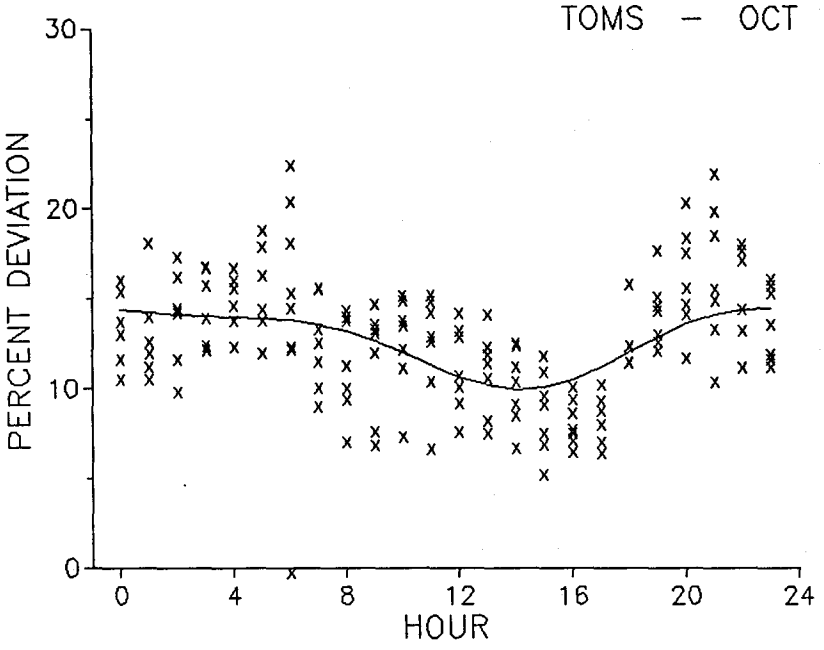


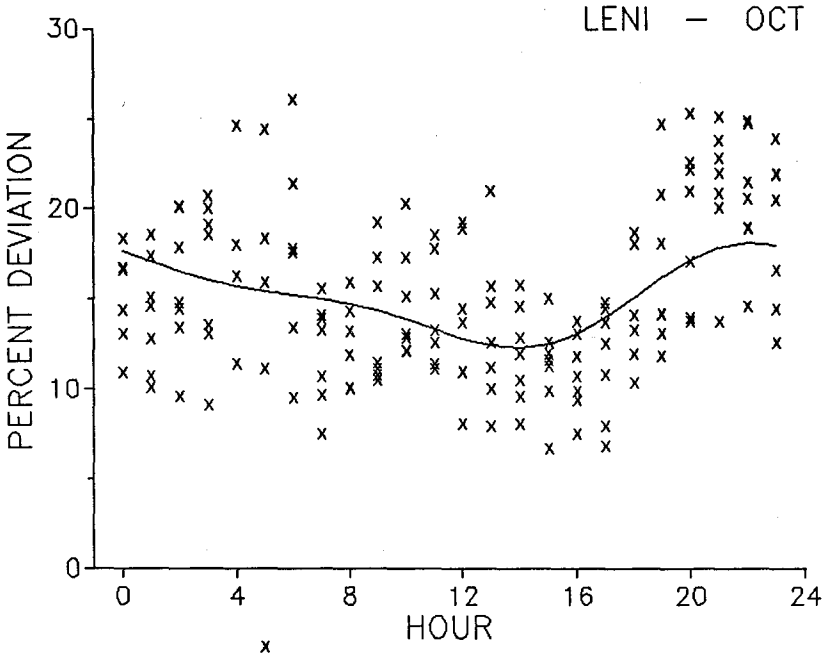


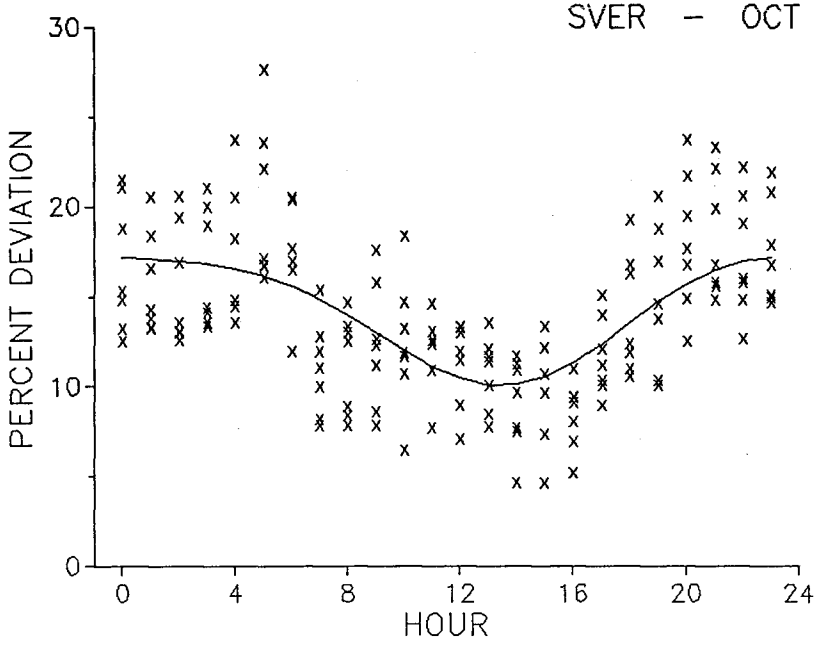


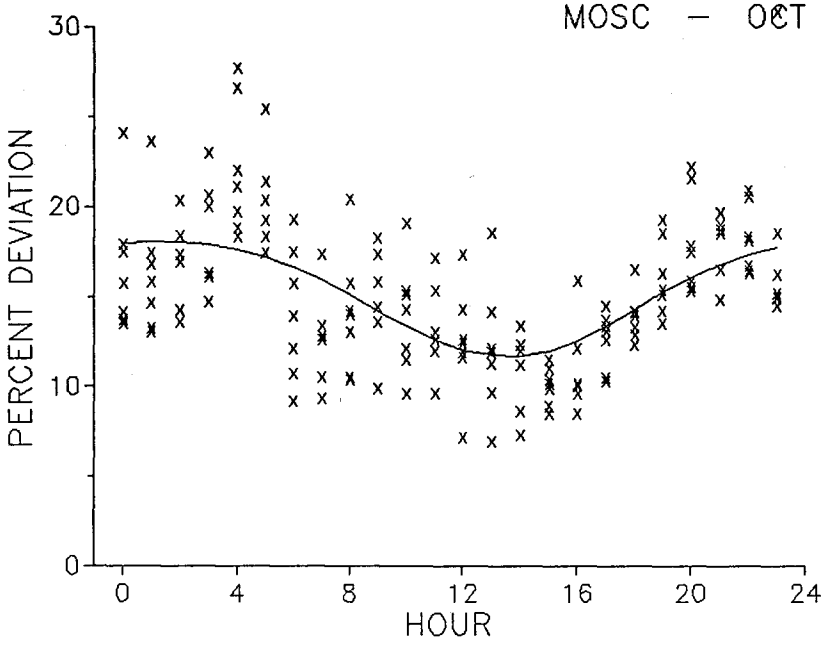


QUIET MAGNETIC -- LOW SSN









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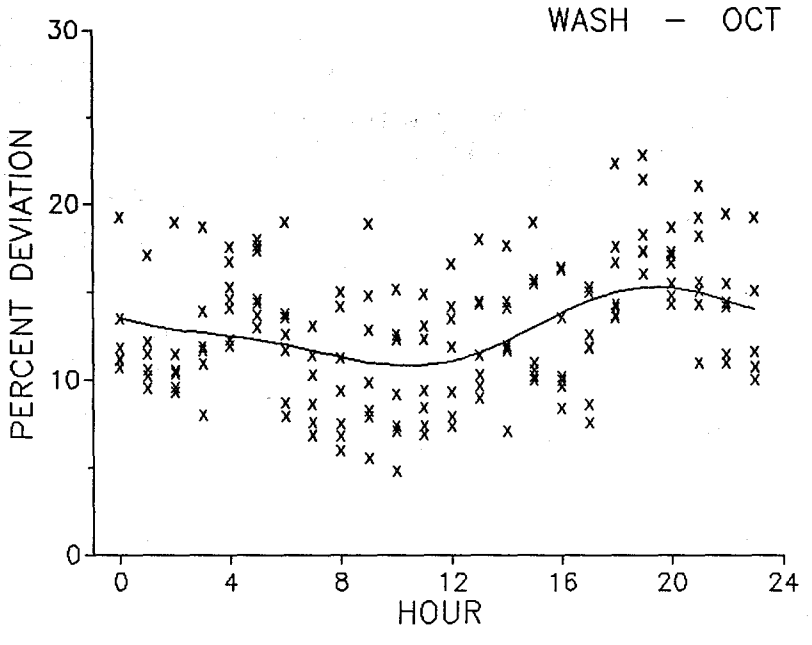
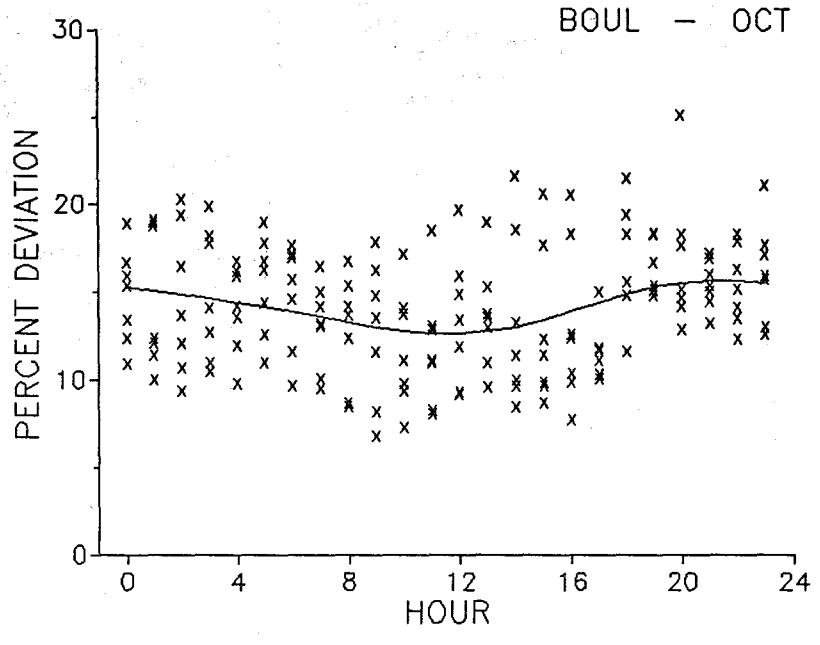
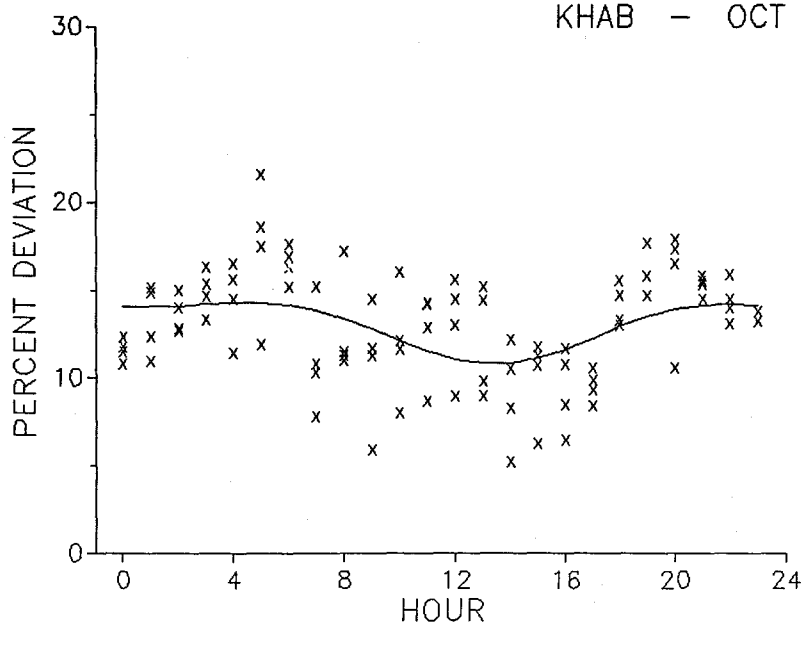
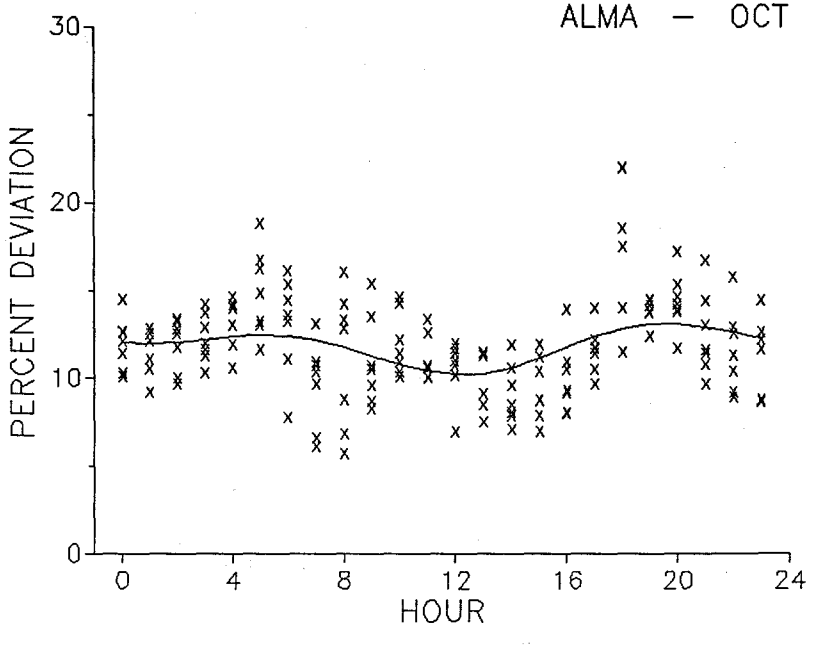
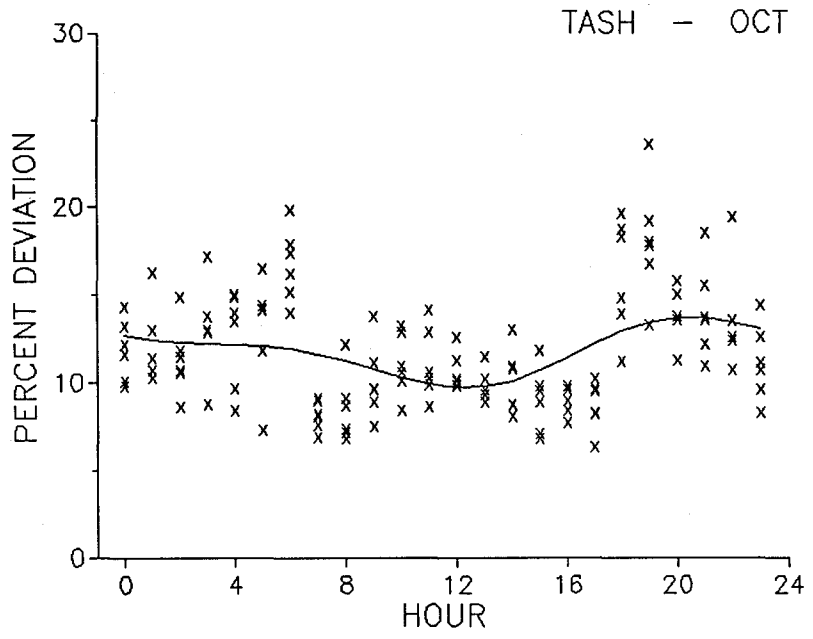


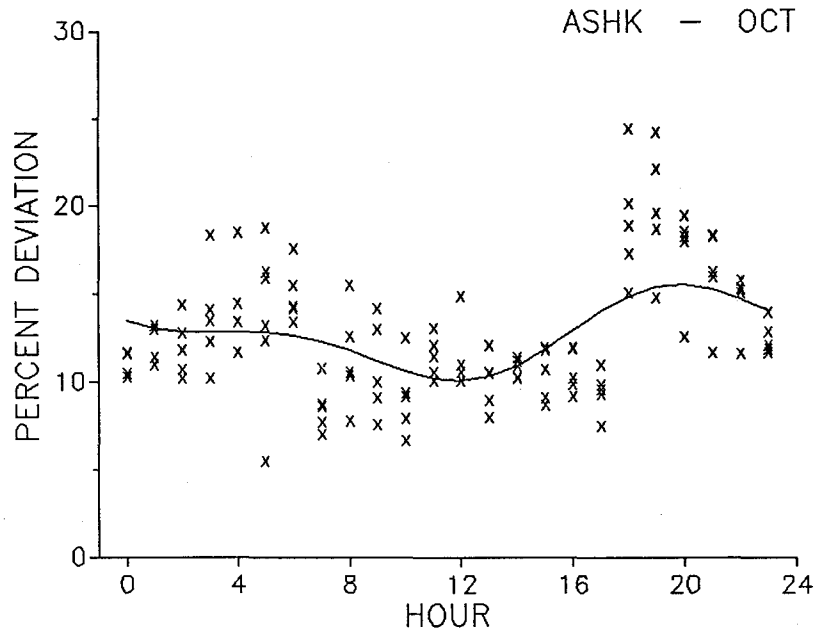


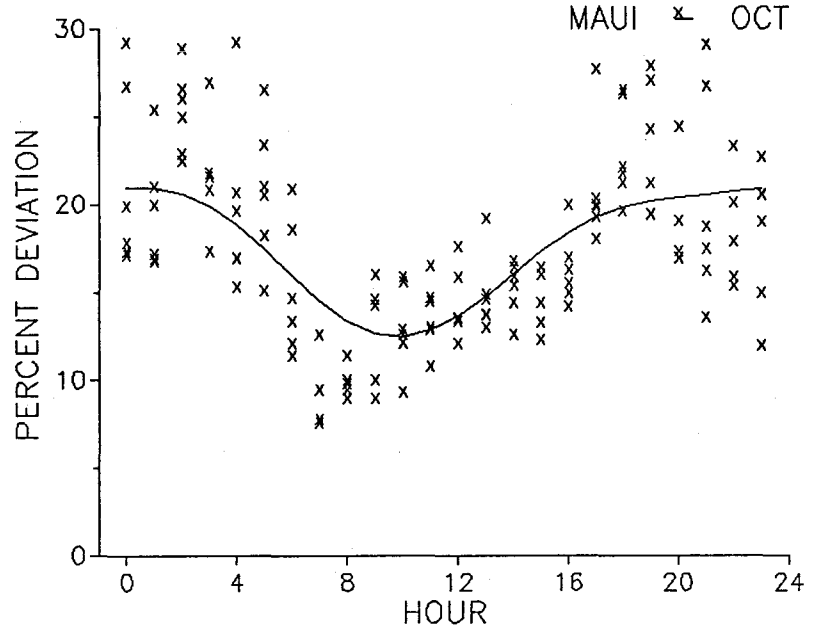


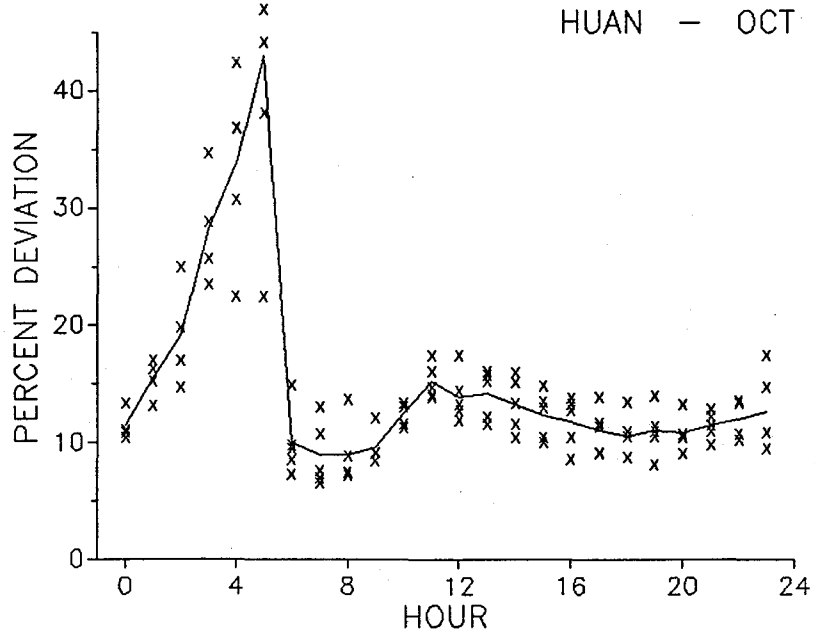


QUIET MAGNETIC -- LOW SSN









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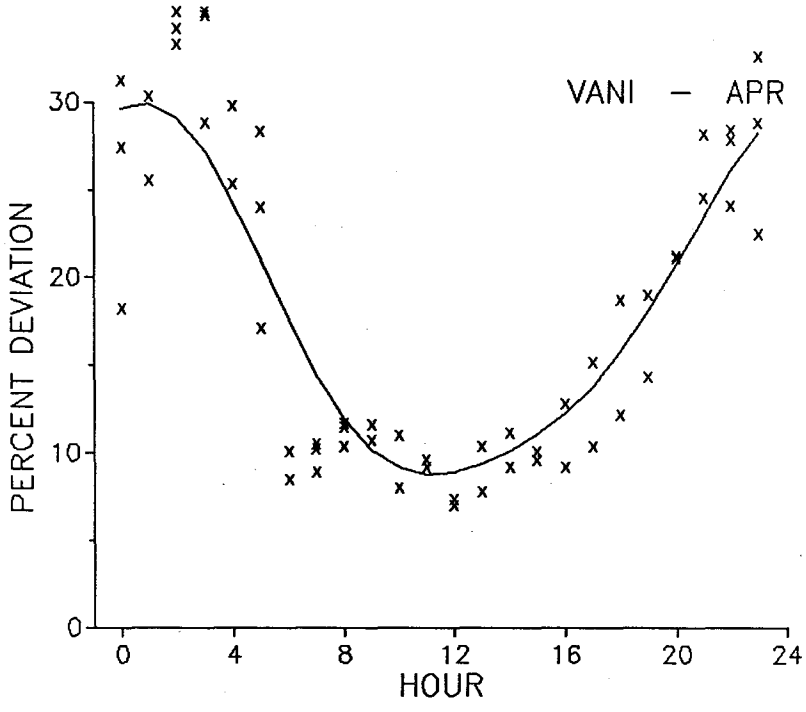
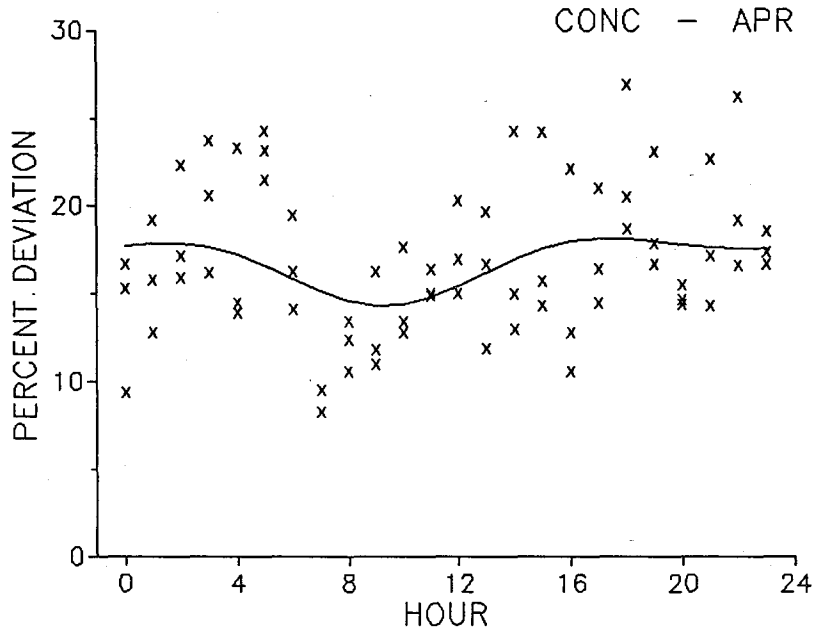
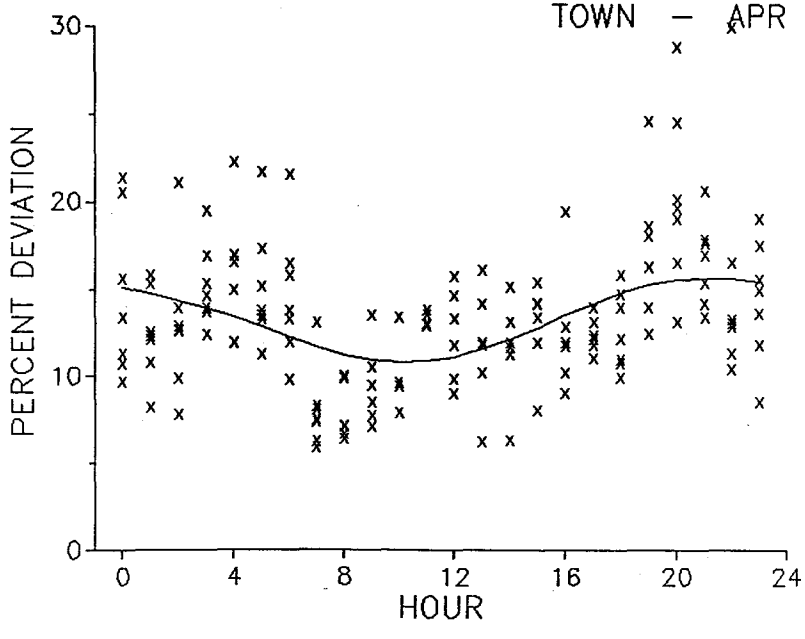
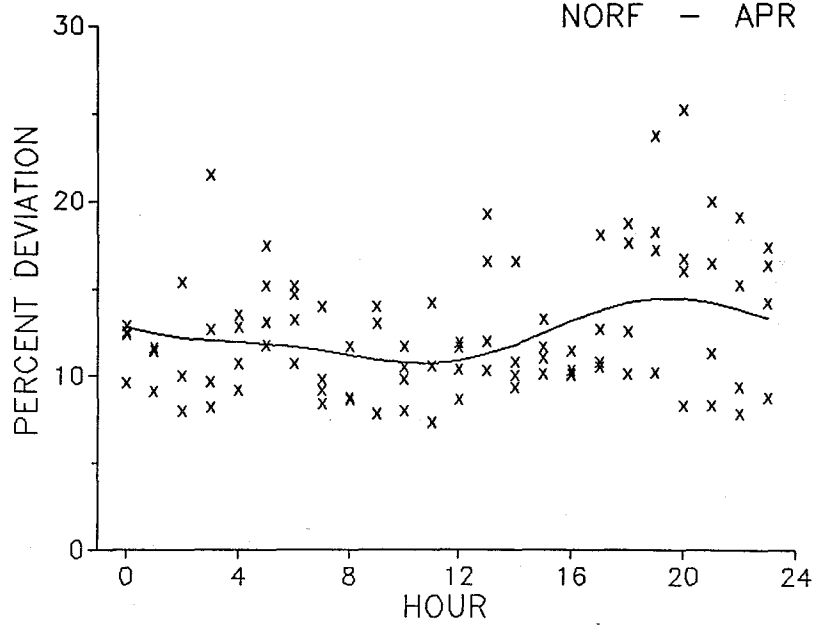
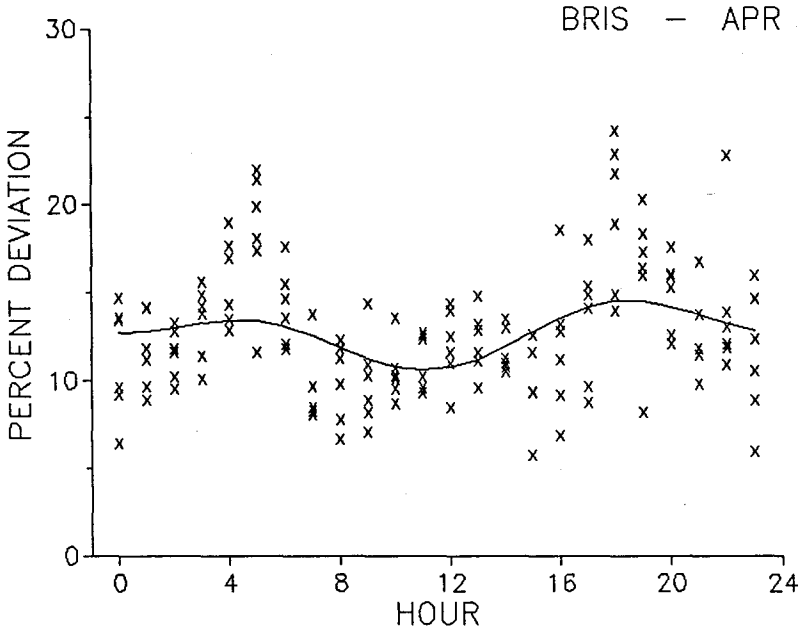


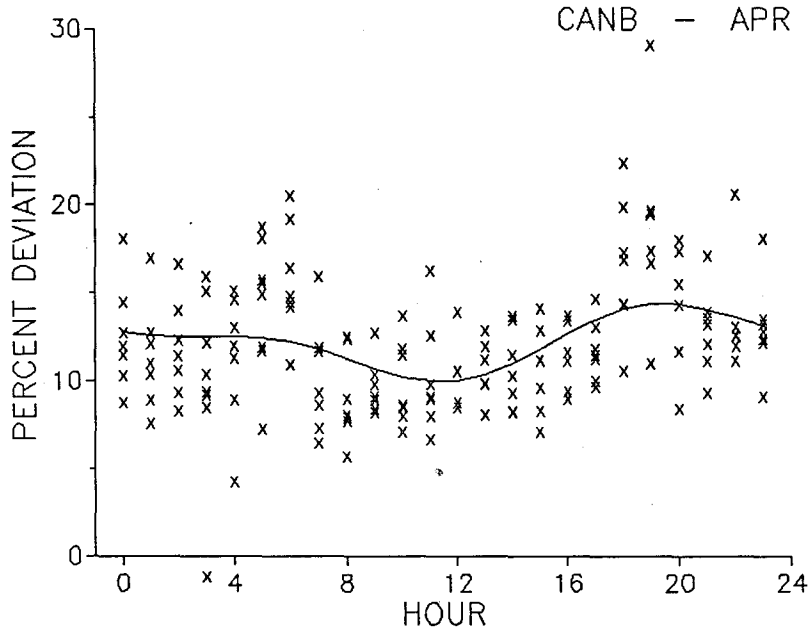


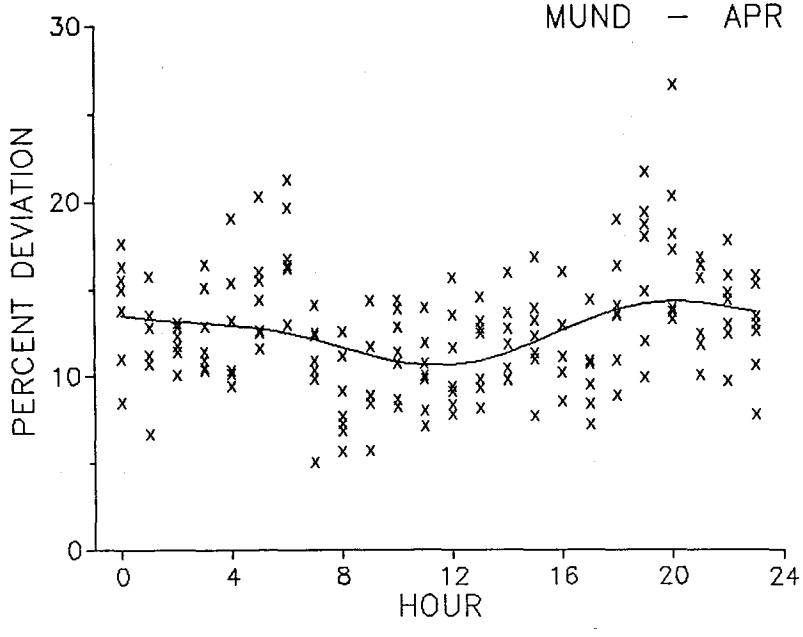


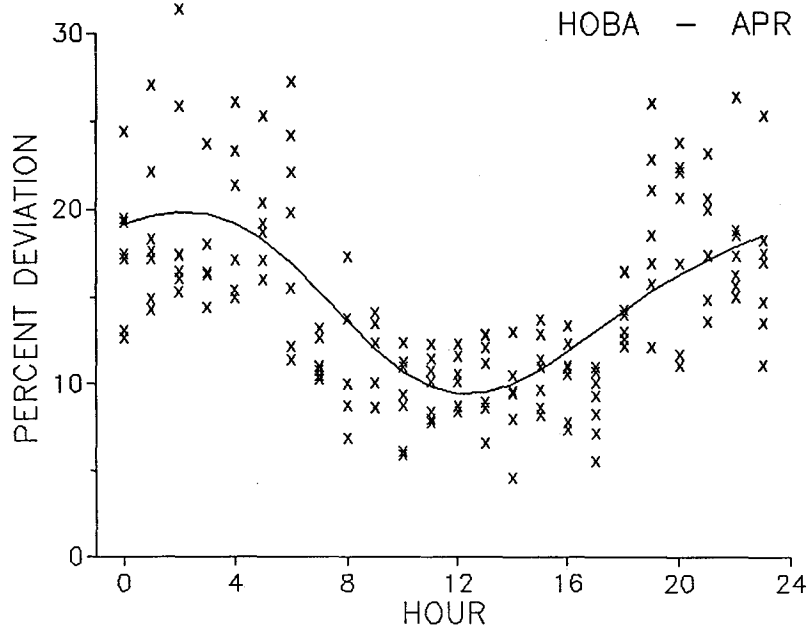


QUIET MAGNETIC -- LOW SSN

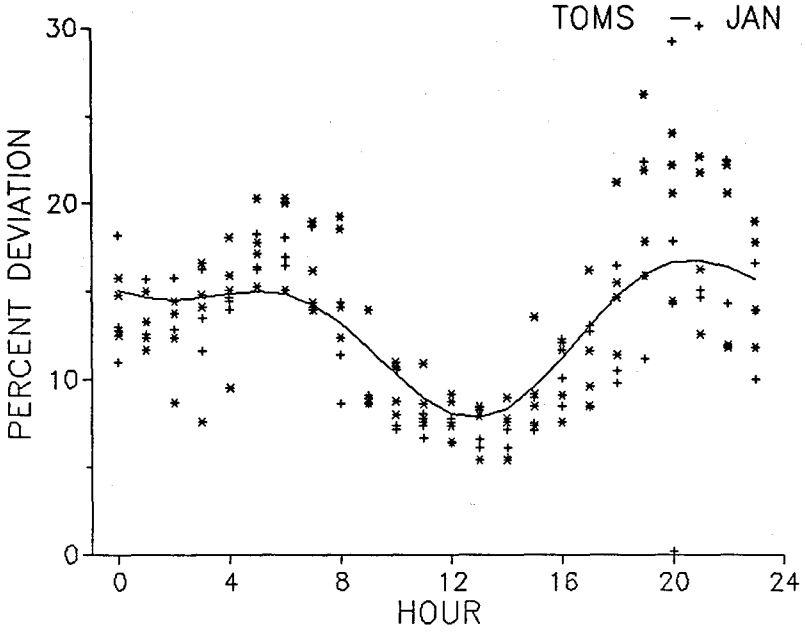


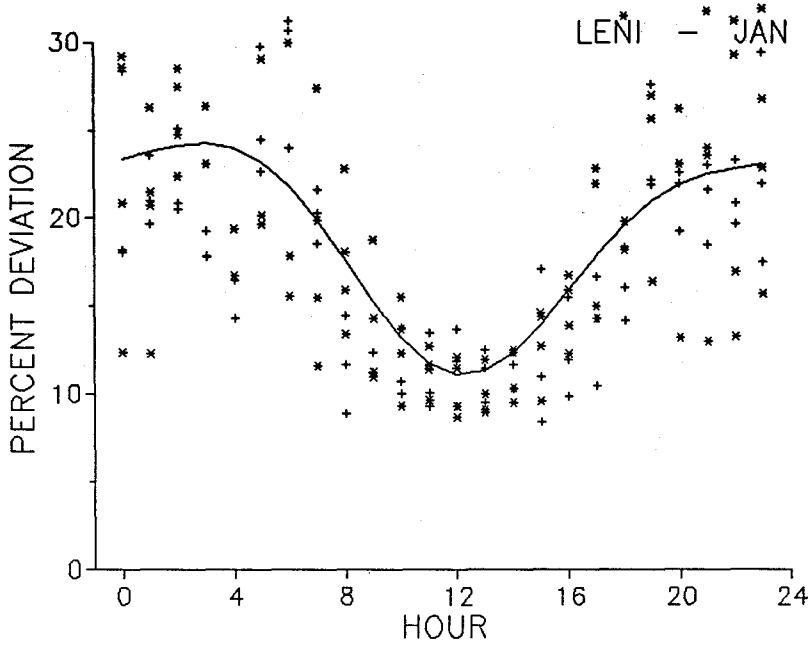


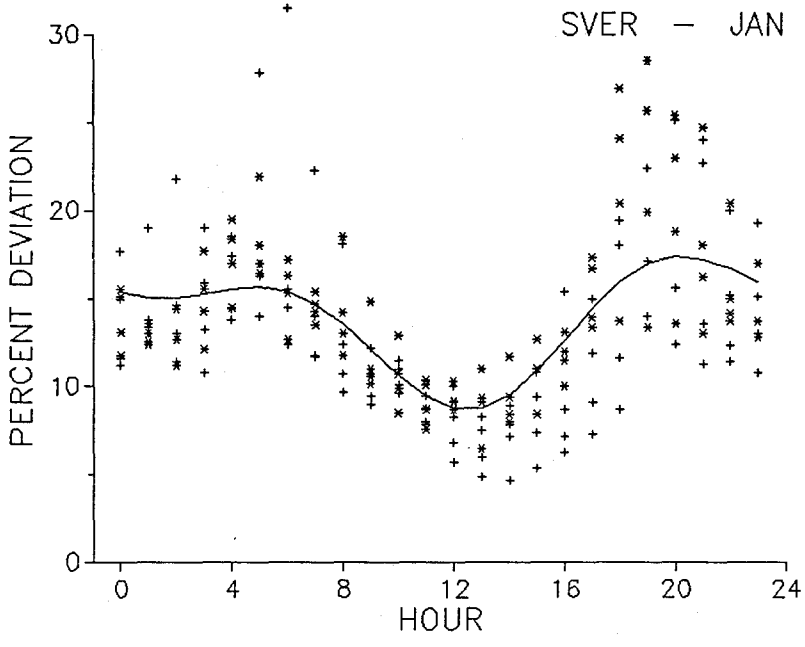


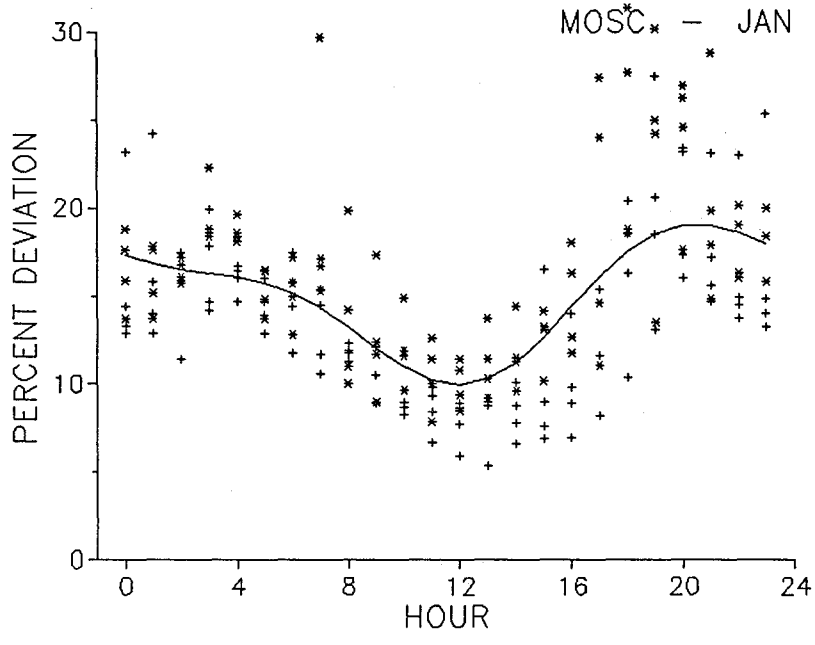


QUIET MAGNETIC -- HIGH SSN

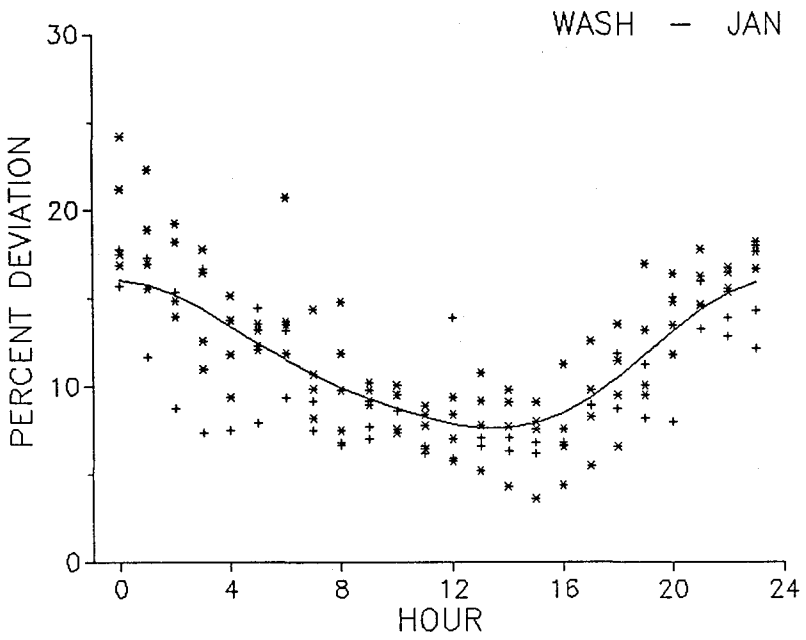


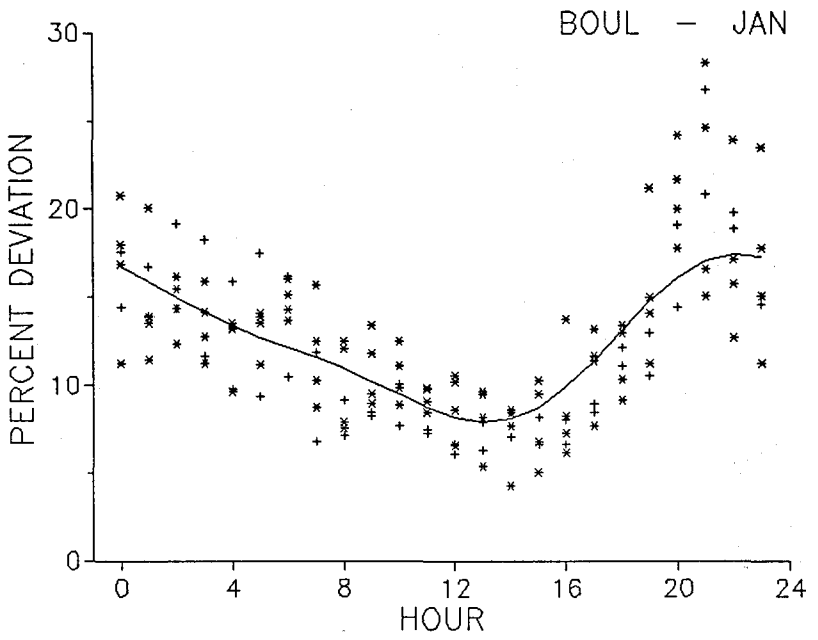


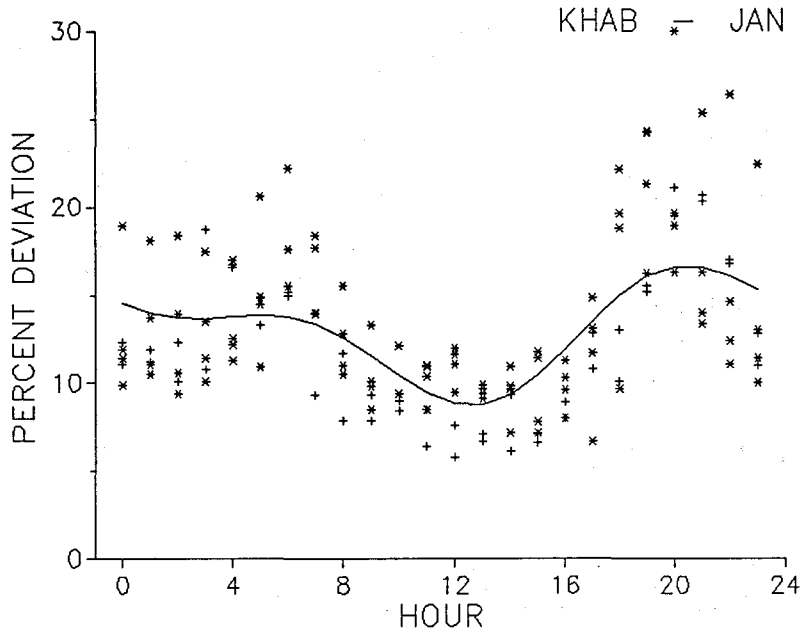


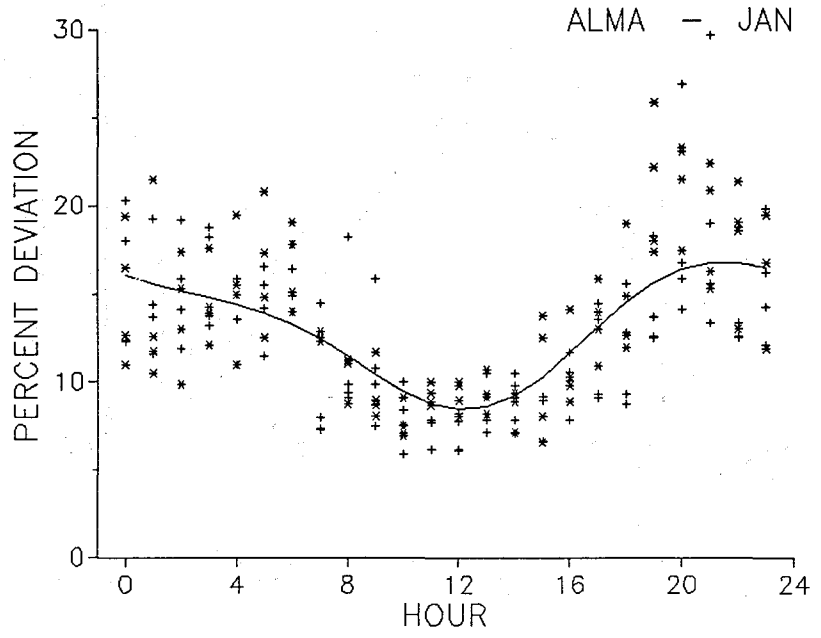


QUIET MAGNETIC -- HIGH SSN

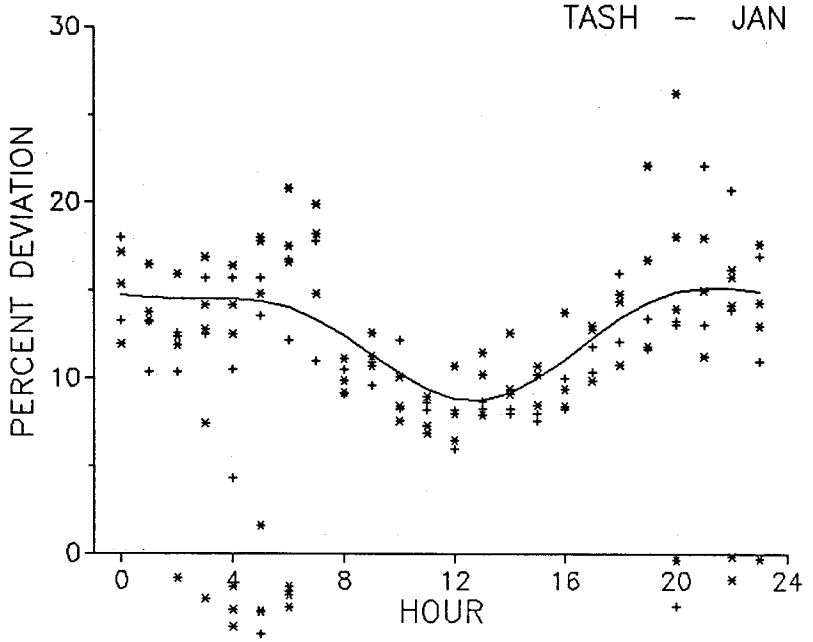


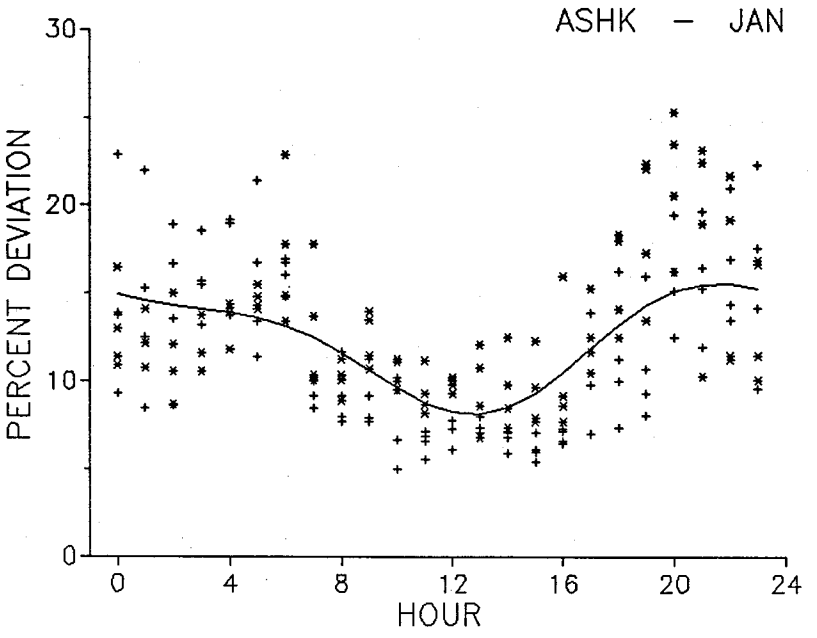


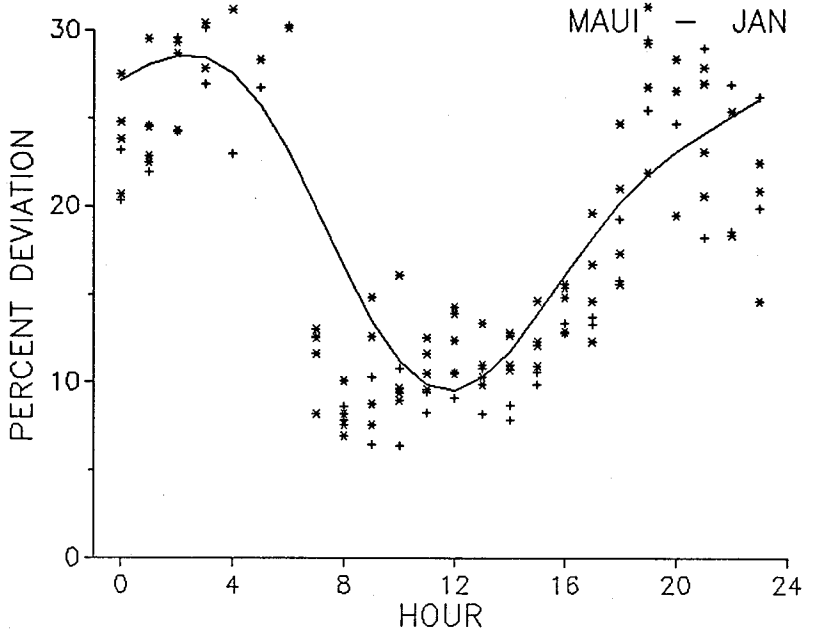


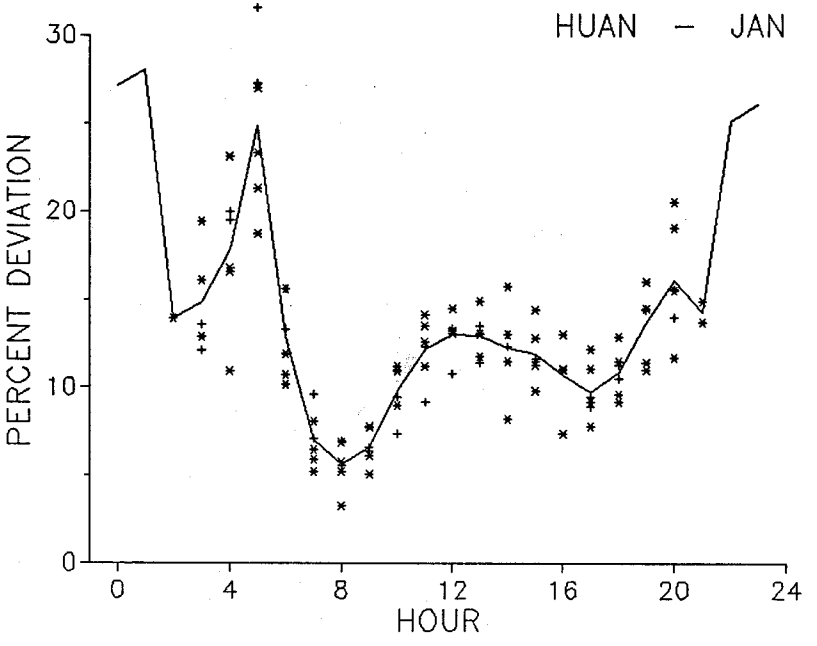


QUIET MAGNETIC -- HIGH SSN

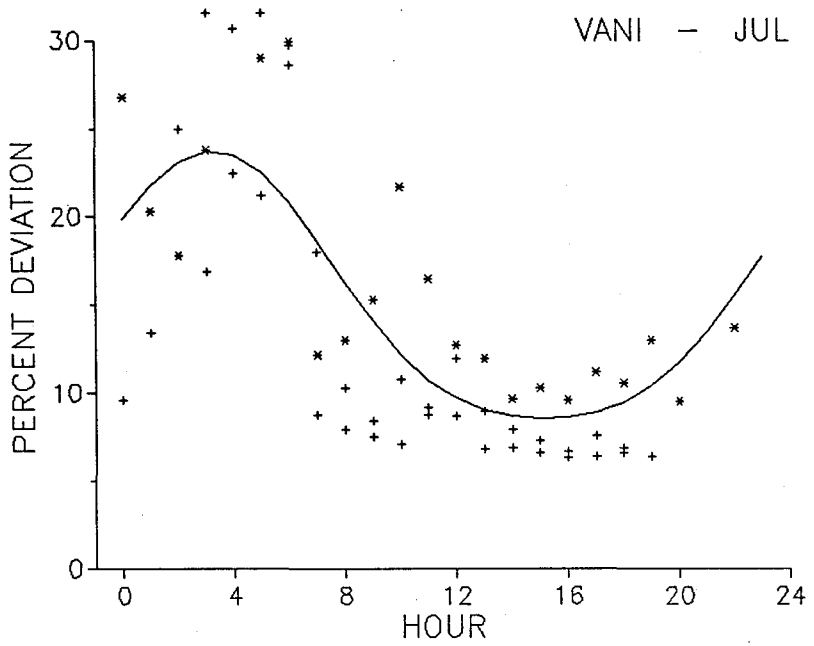


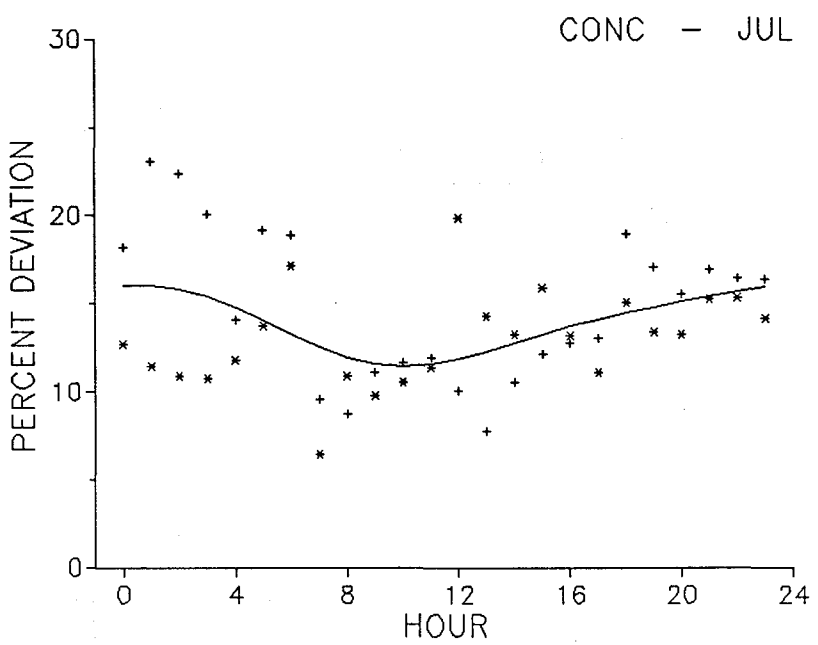


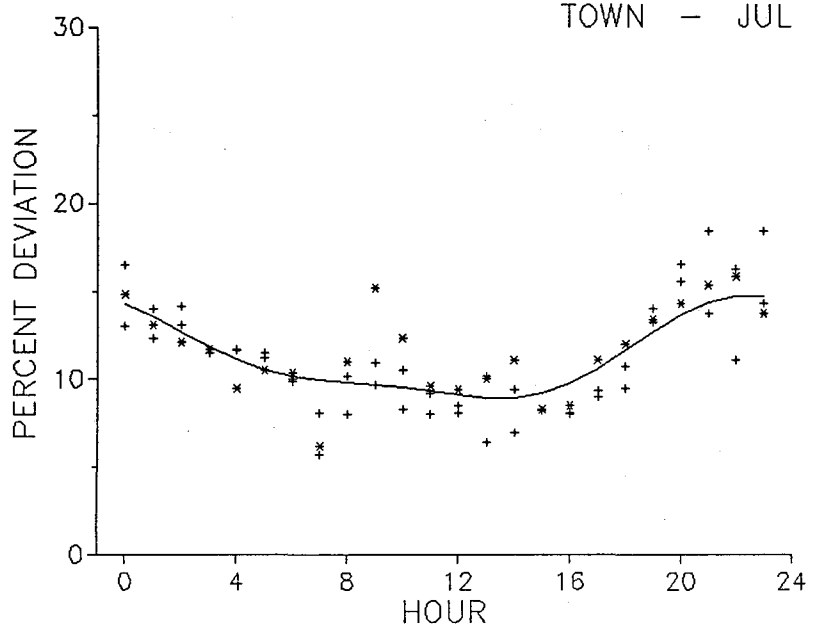


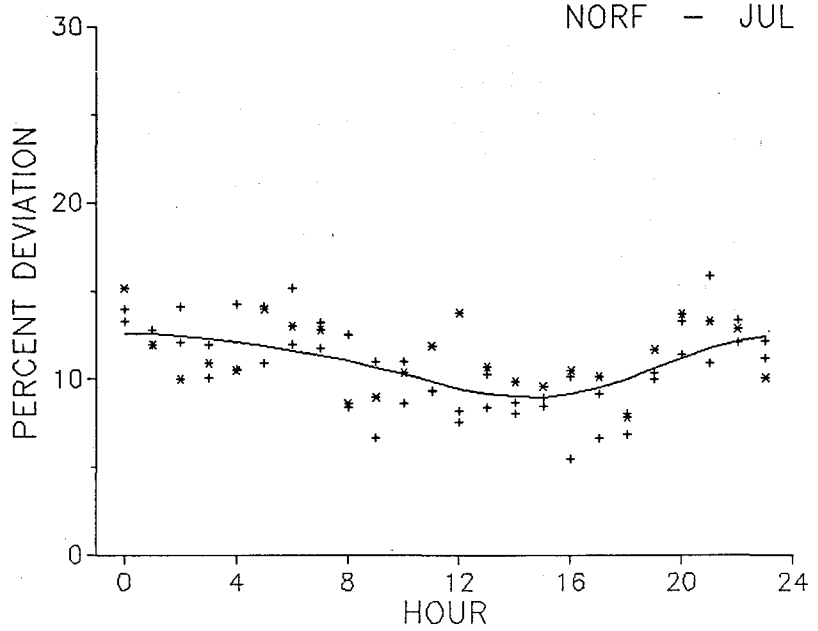


QUIET MAGNETIC -- HIGH SSN









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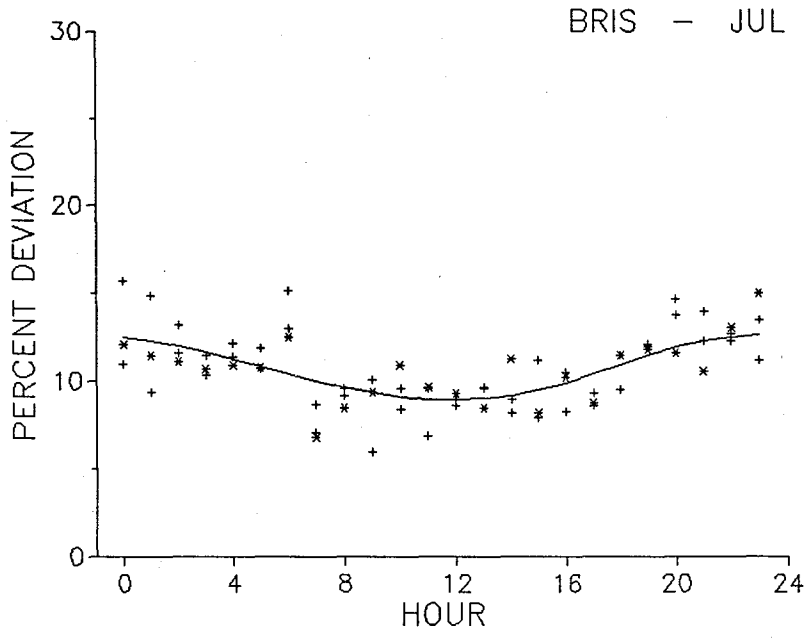

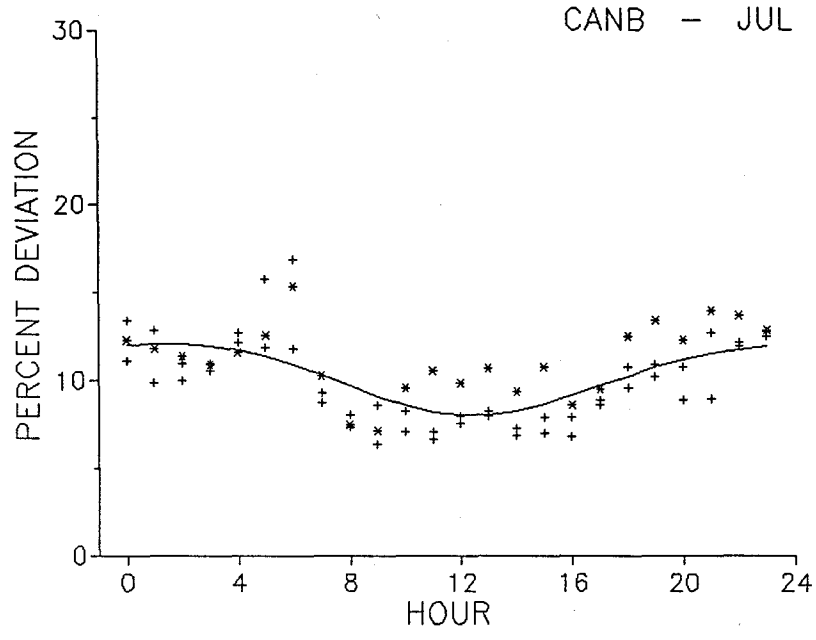

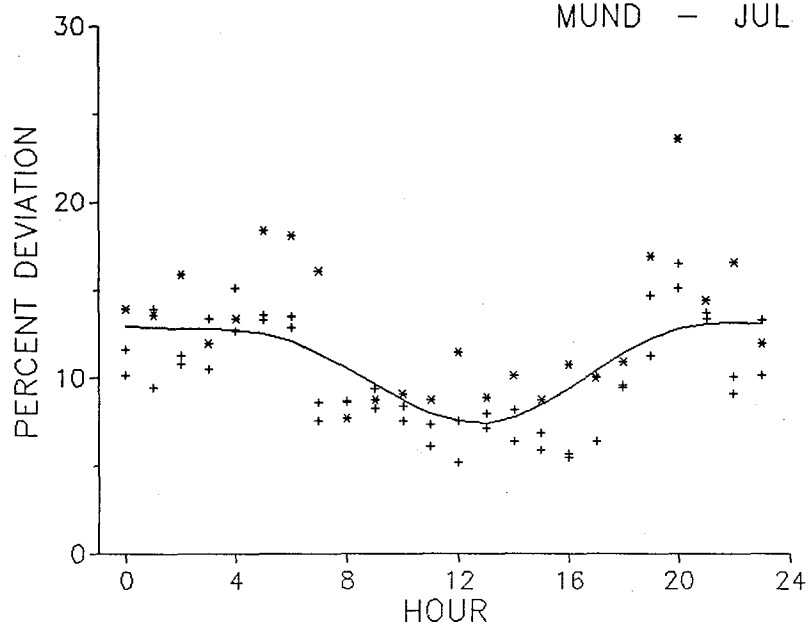

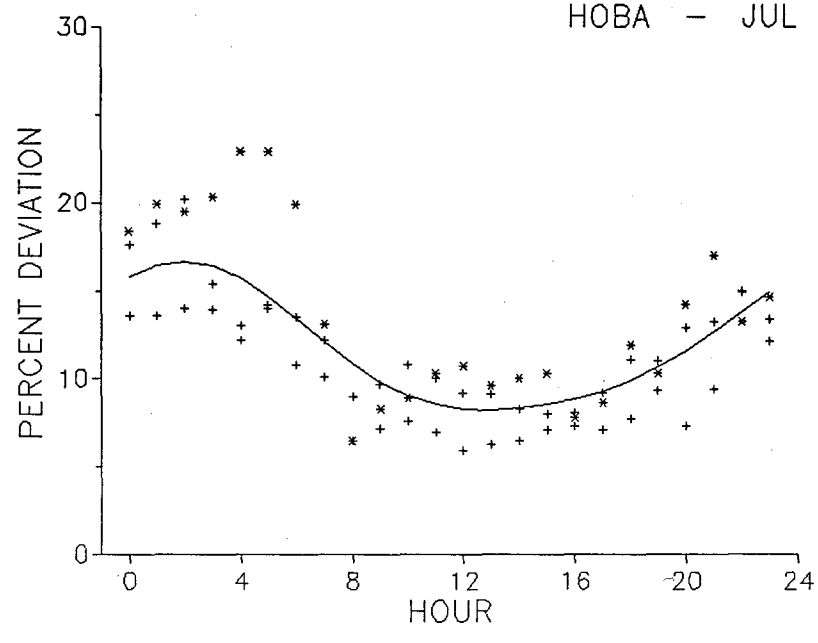

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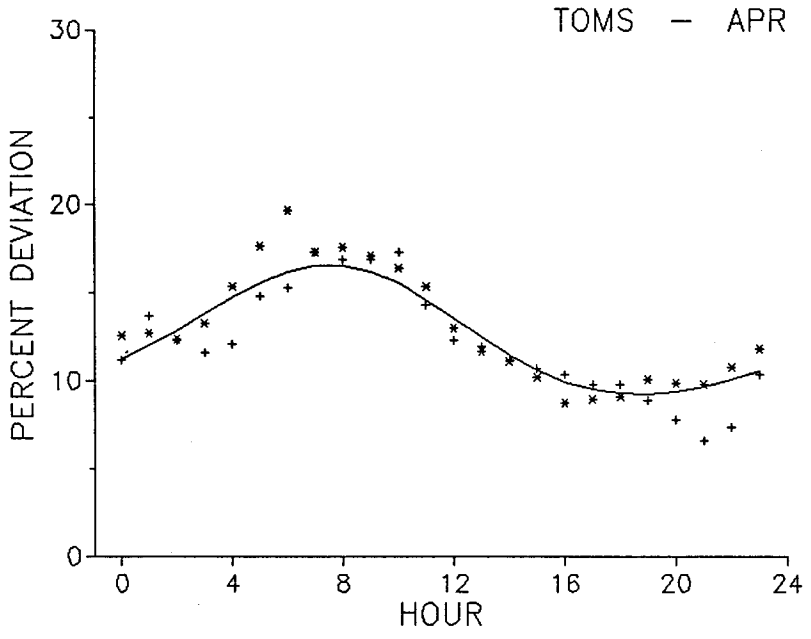

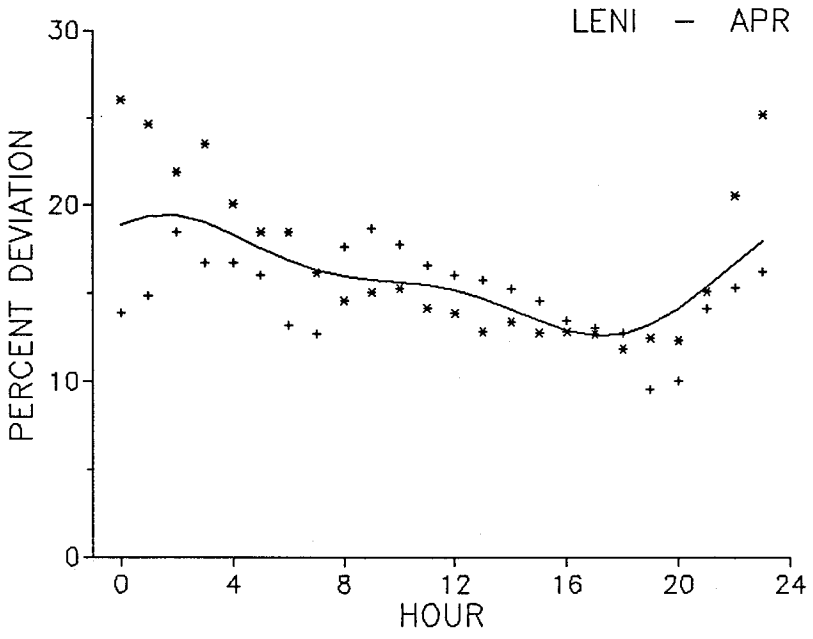

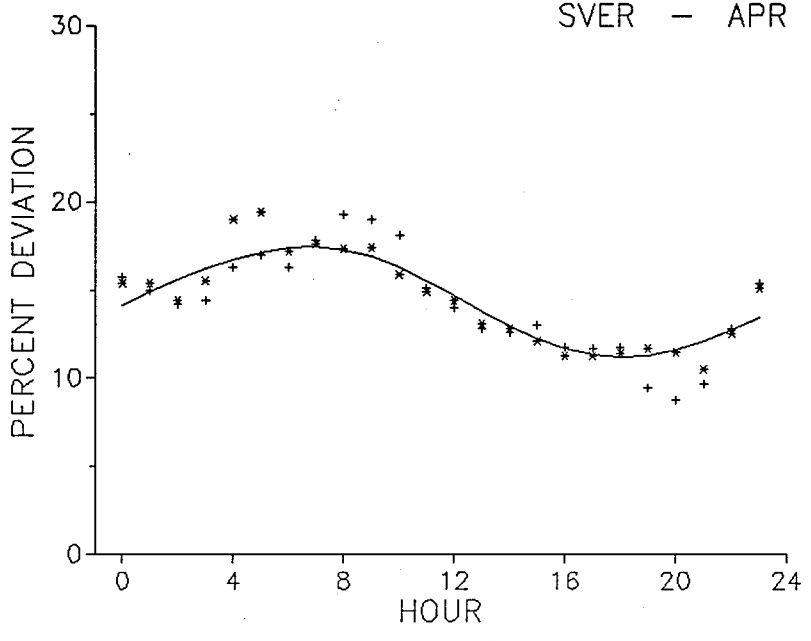

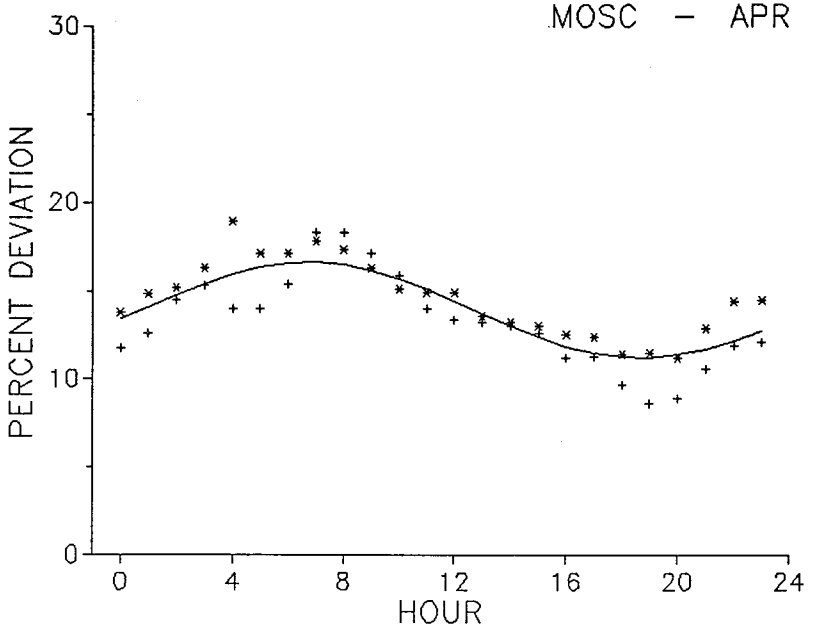

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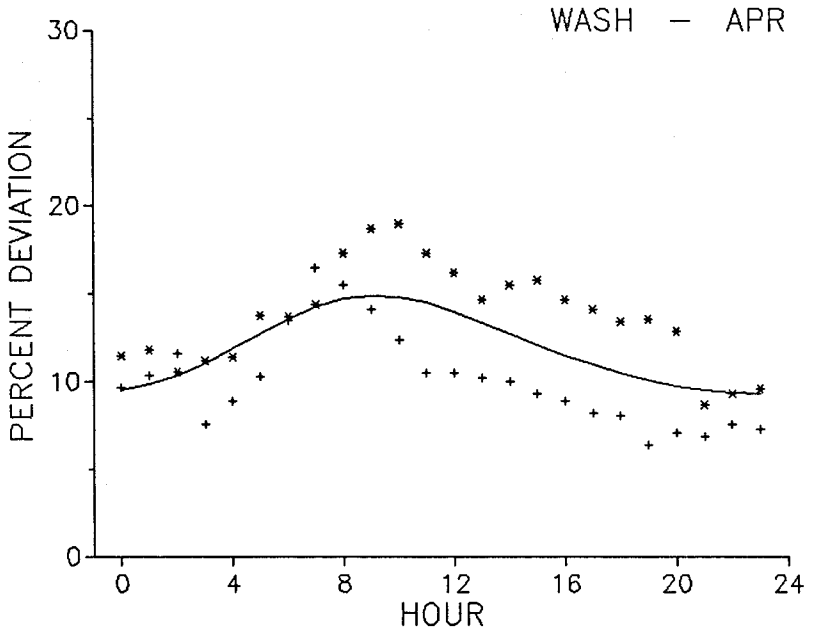

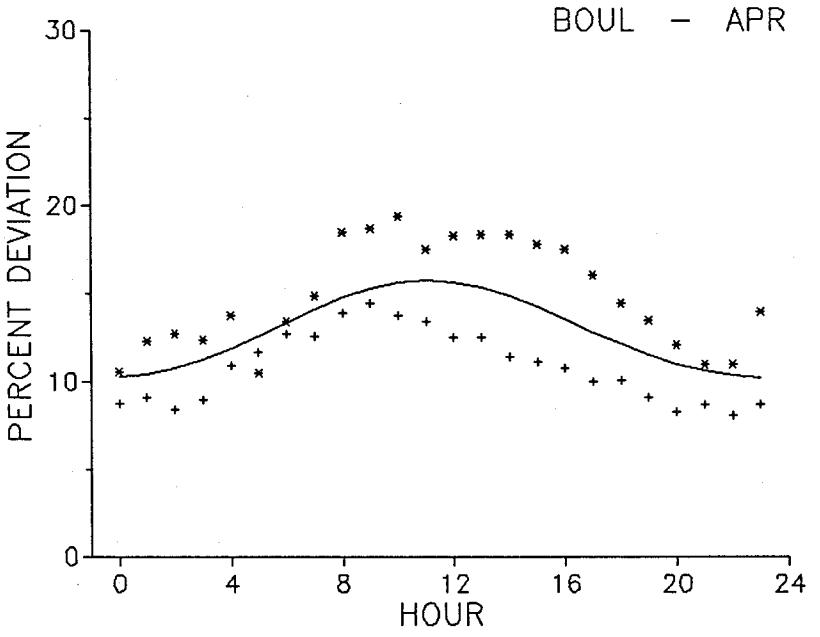

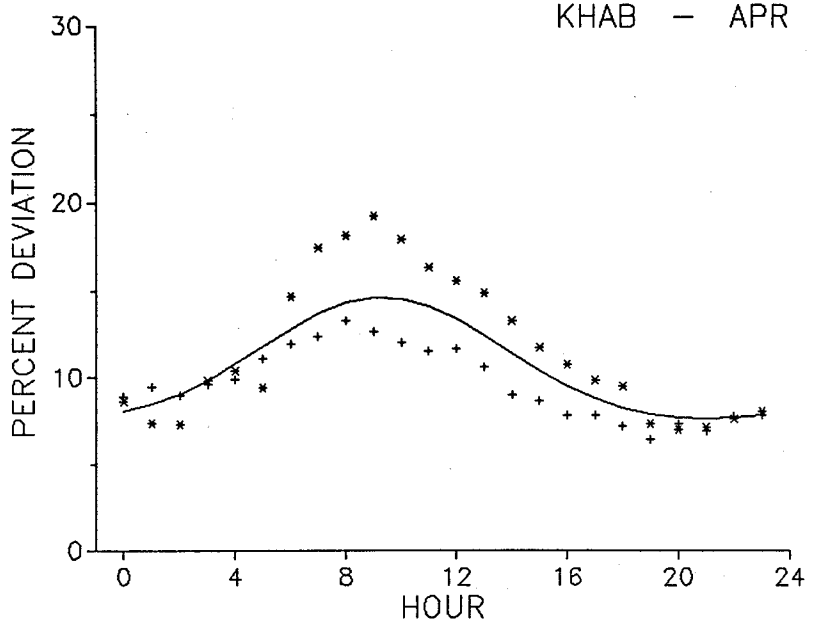

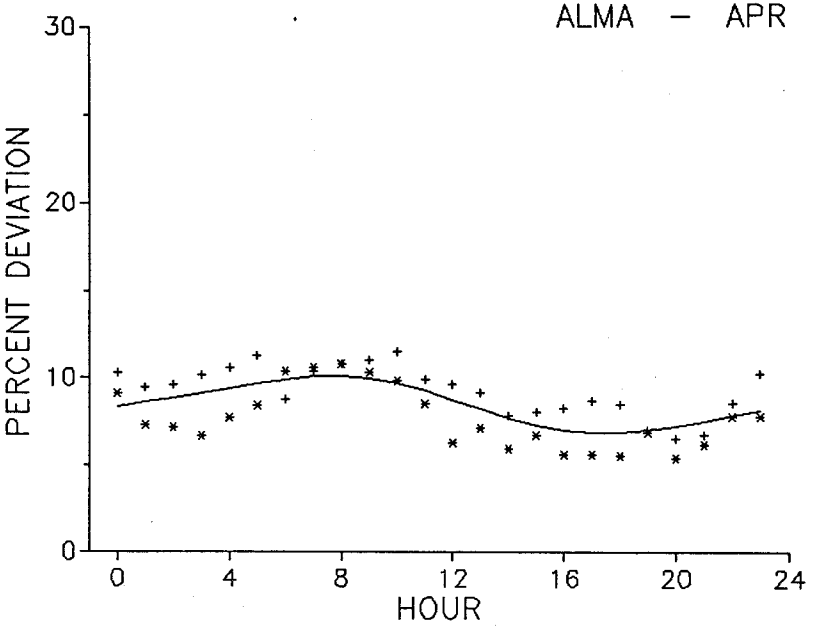

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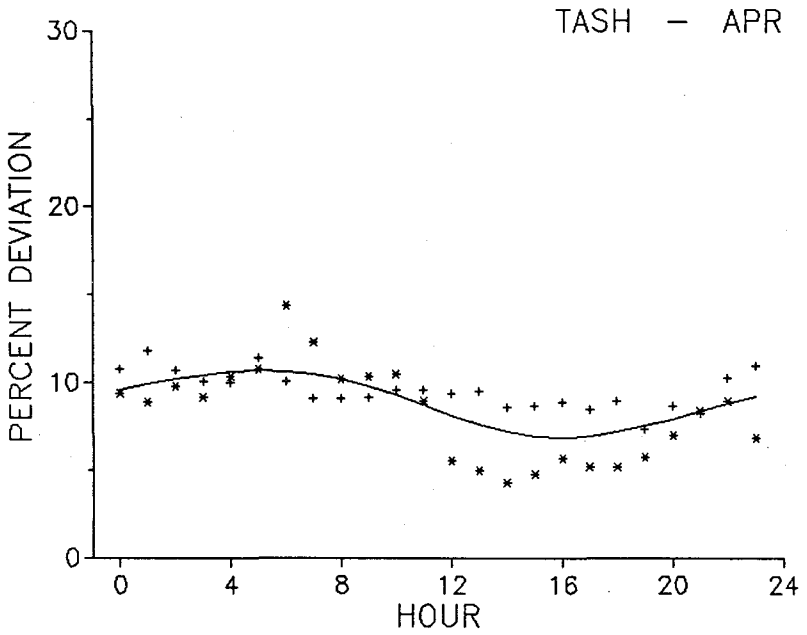

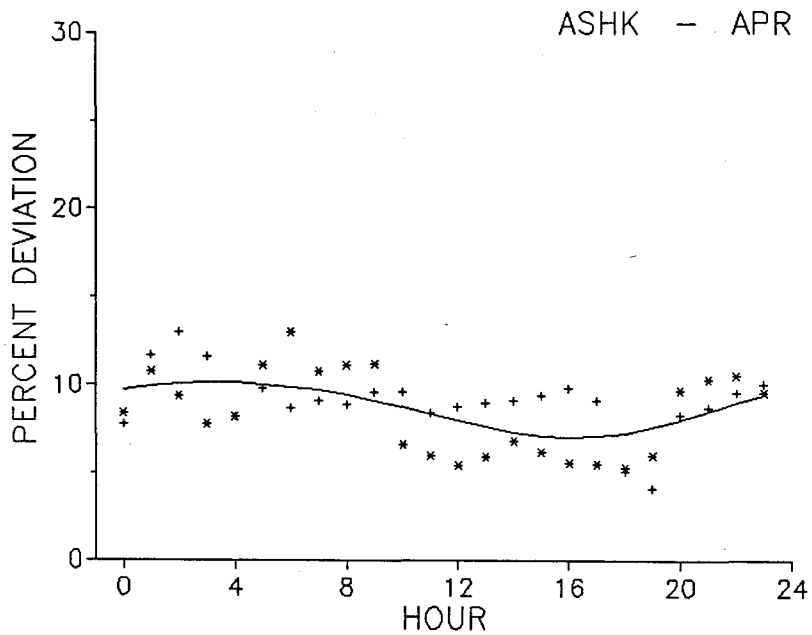

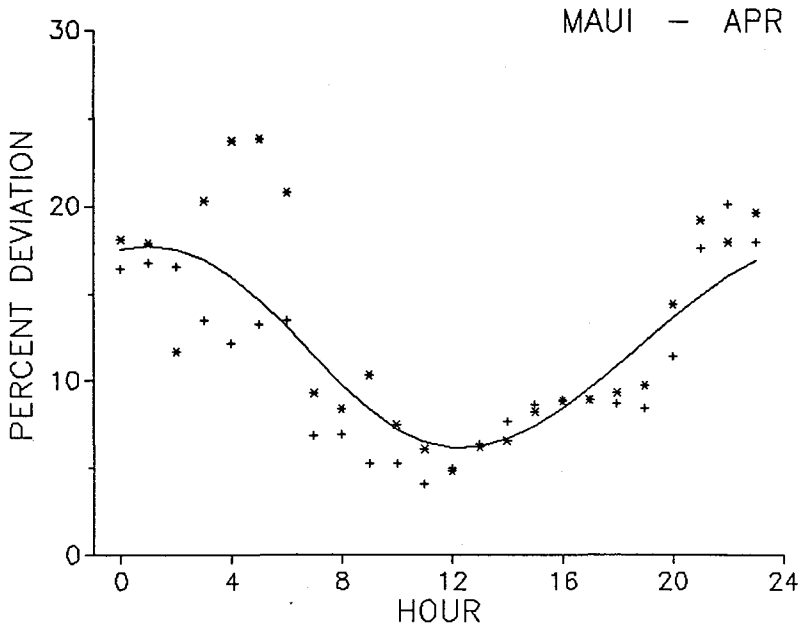

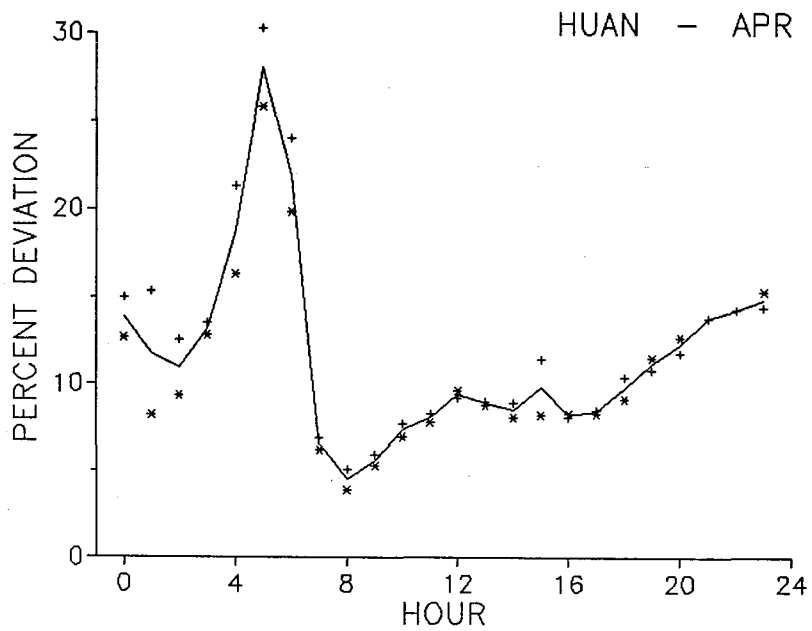

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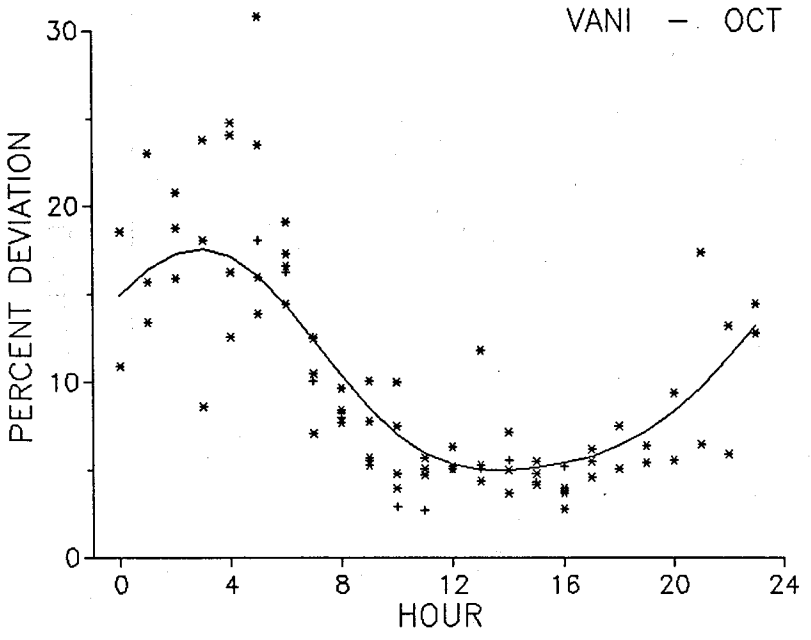

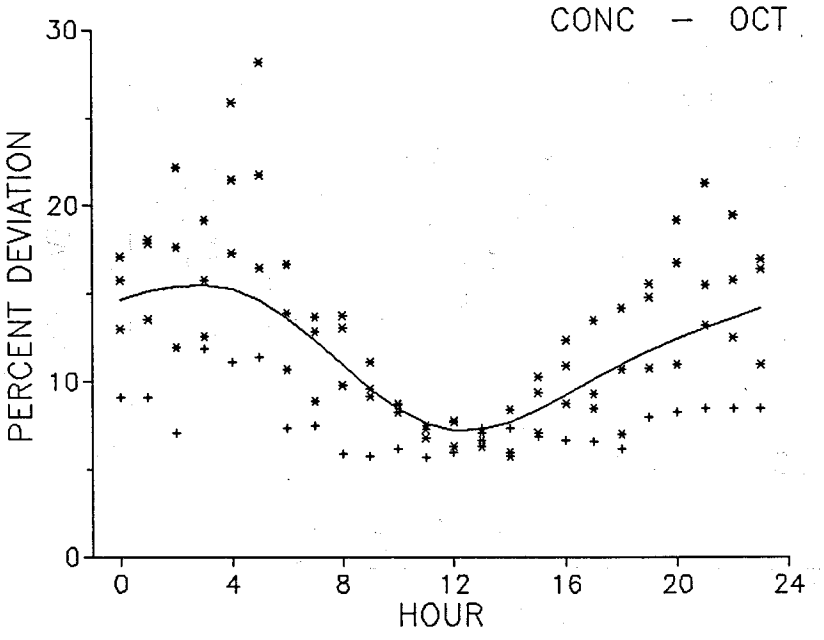

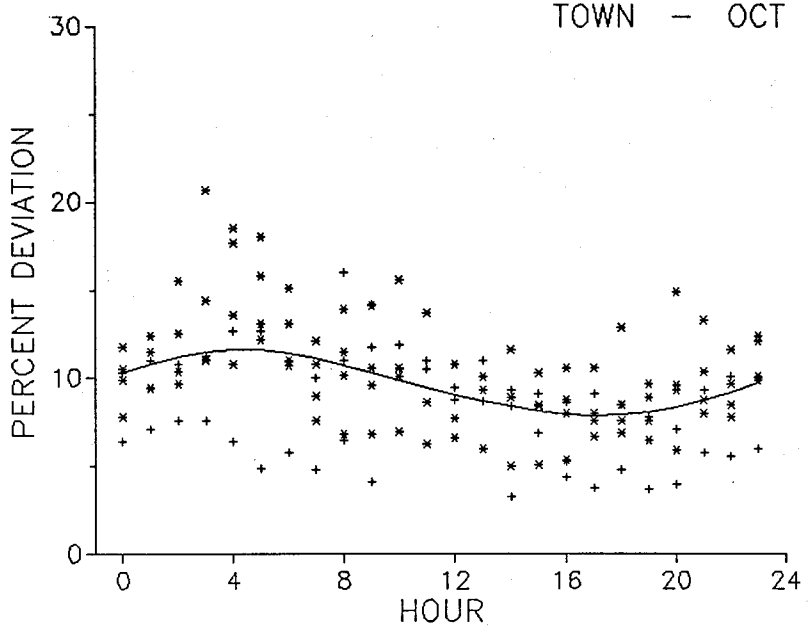

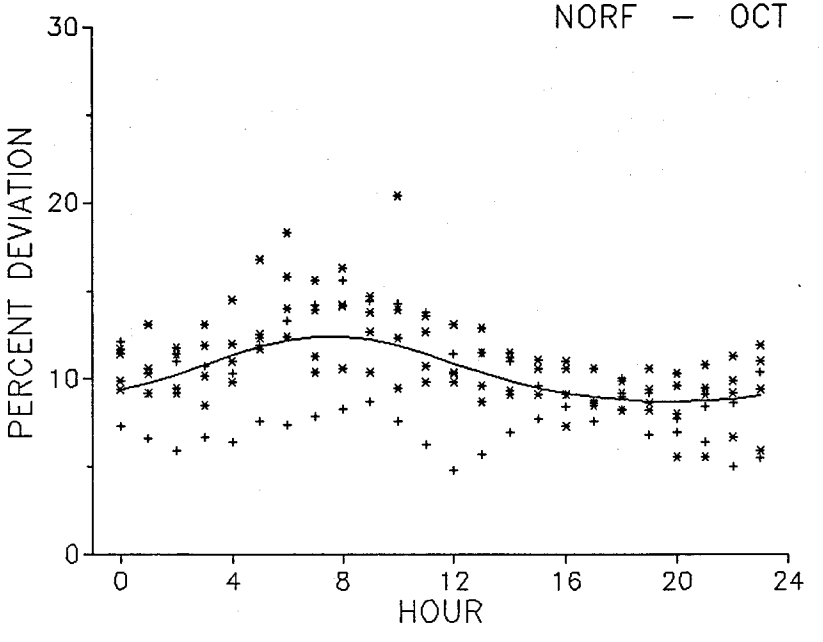

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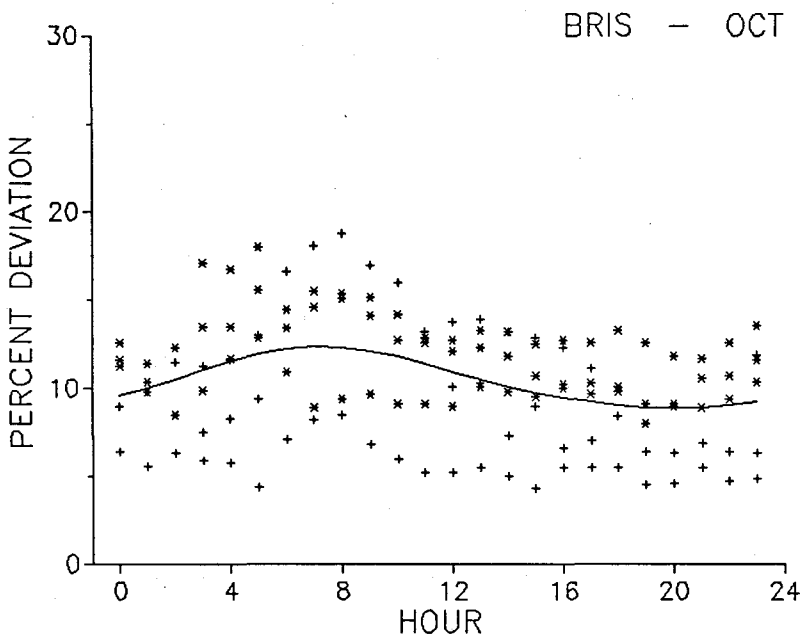

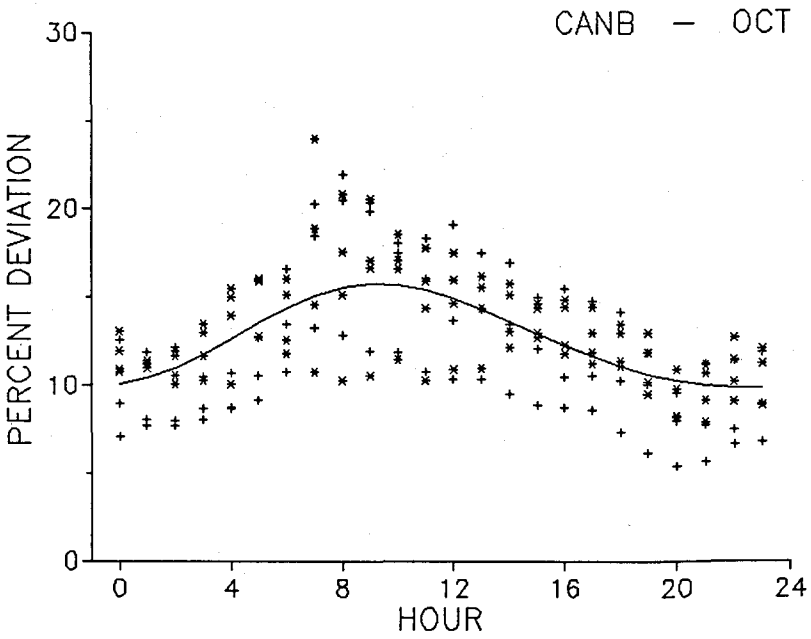

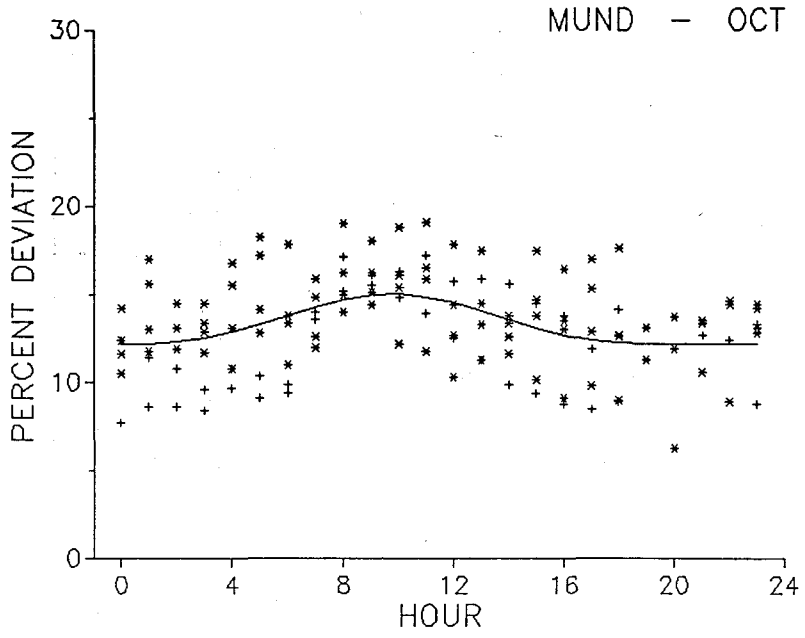

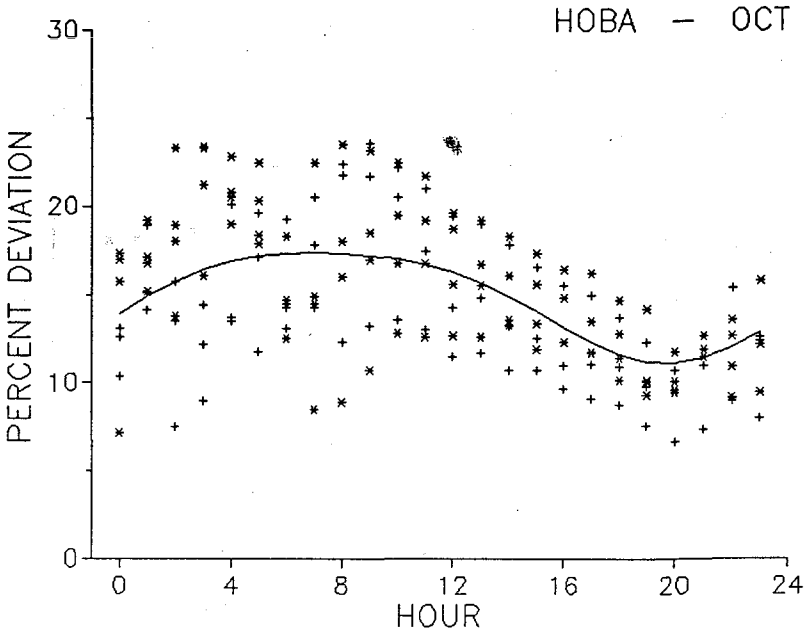

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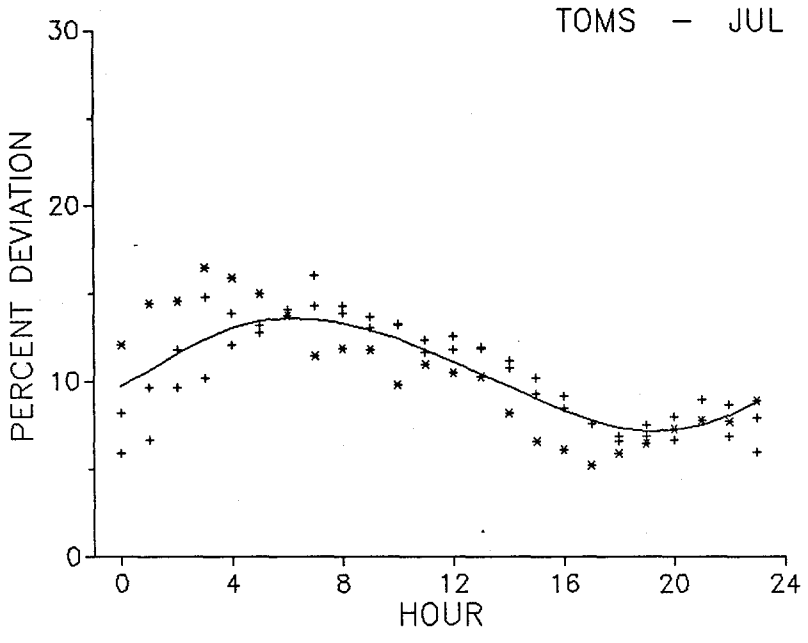

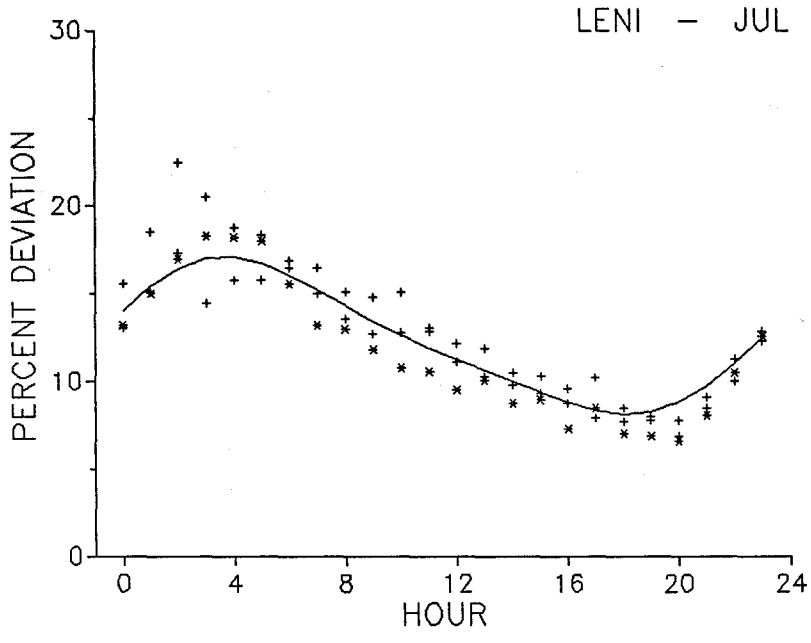

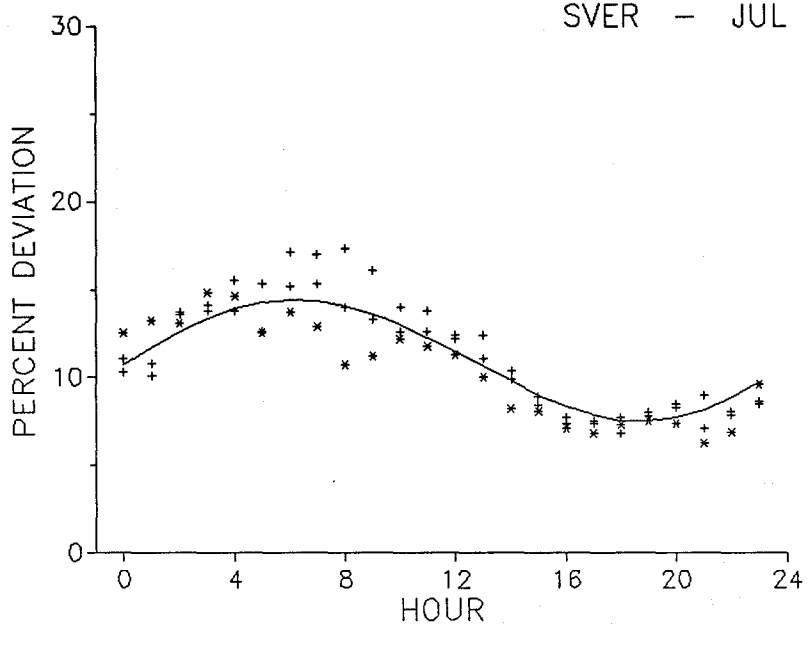

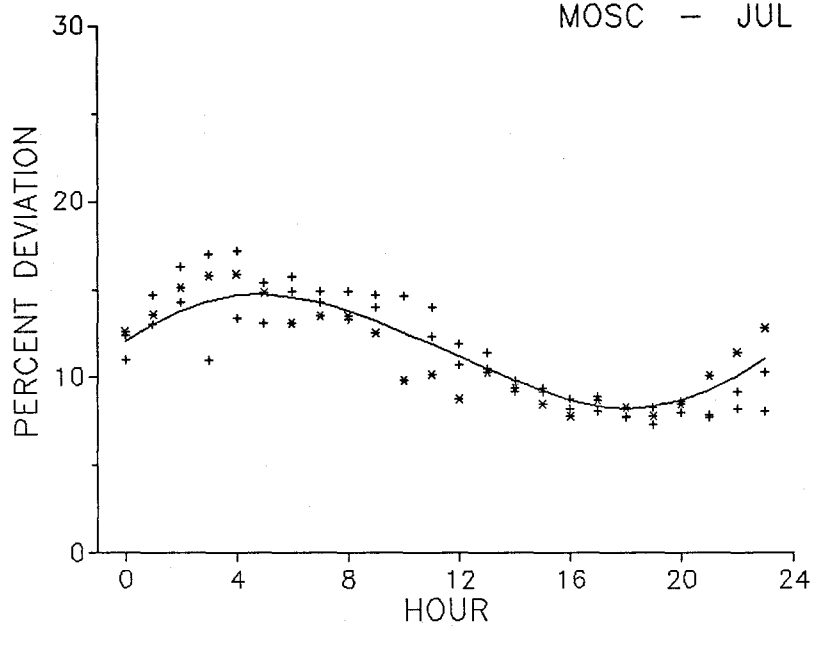

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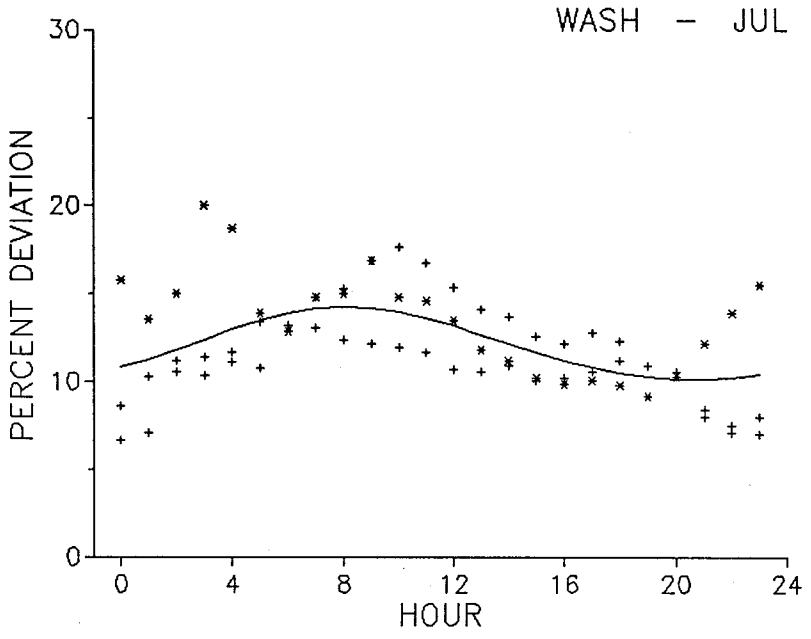

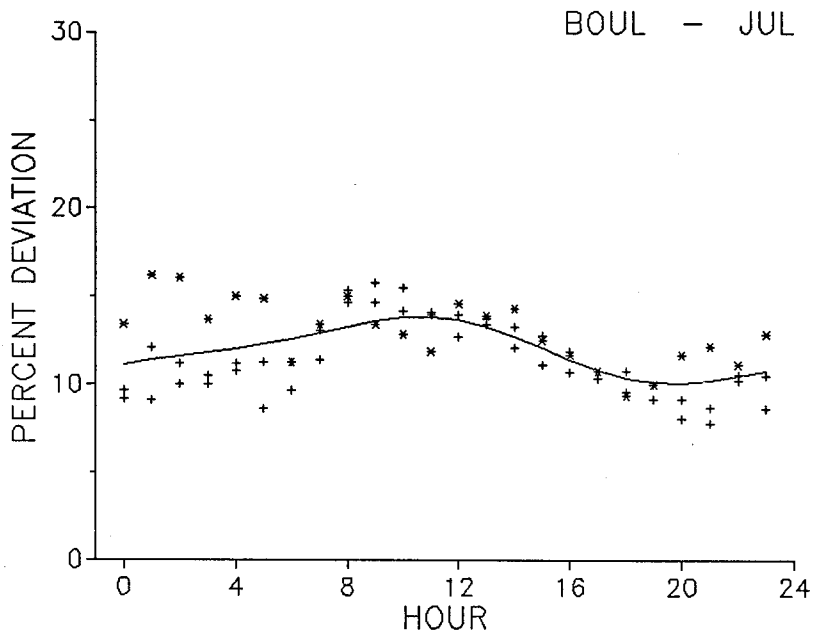

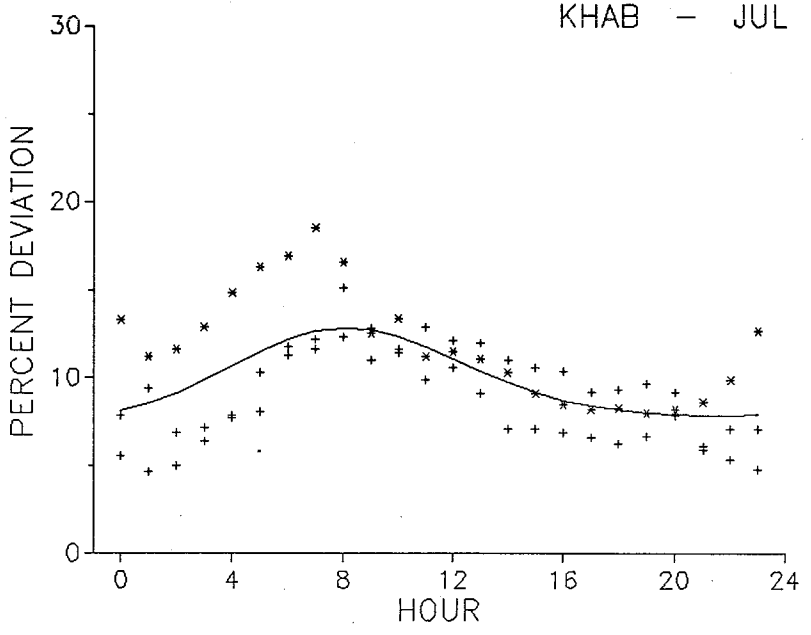

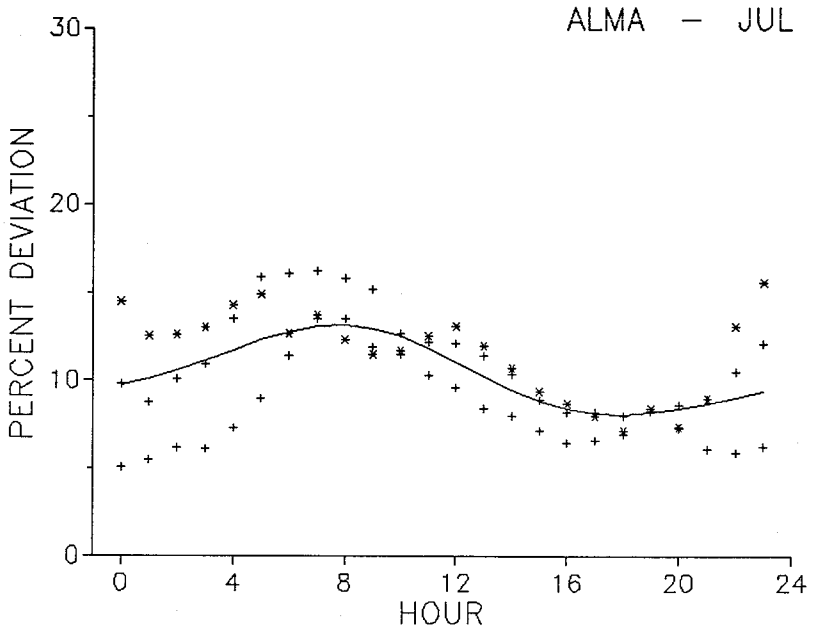

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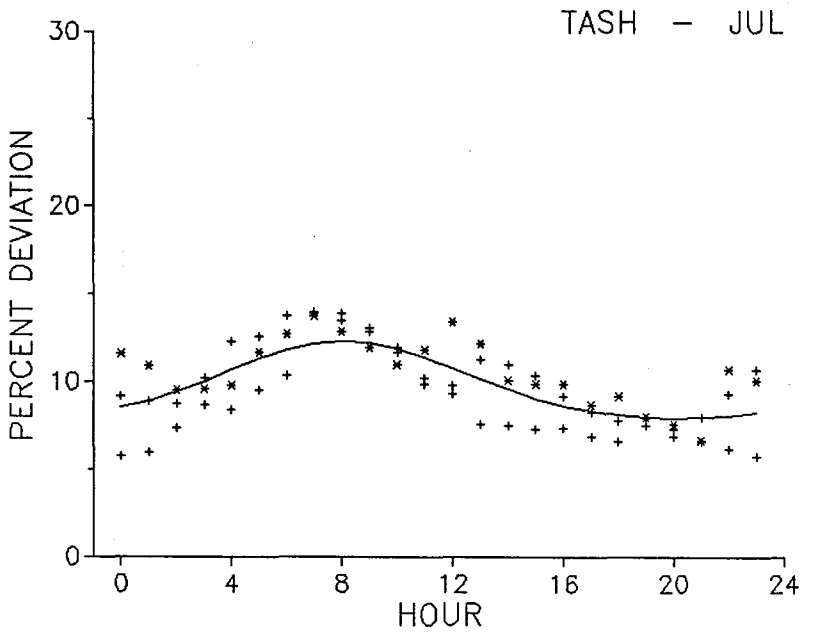

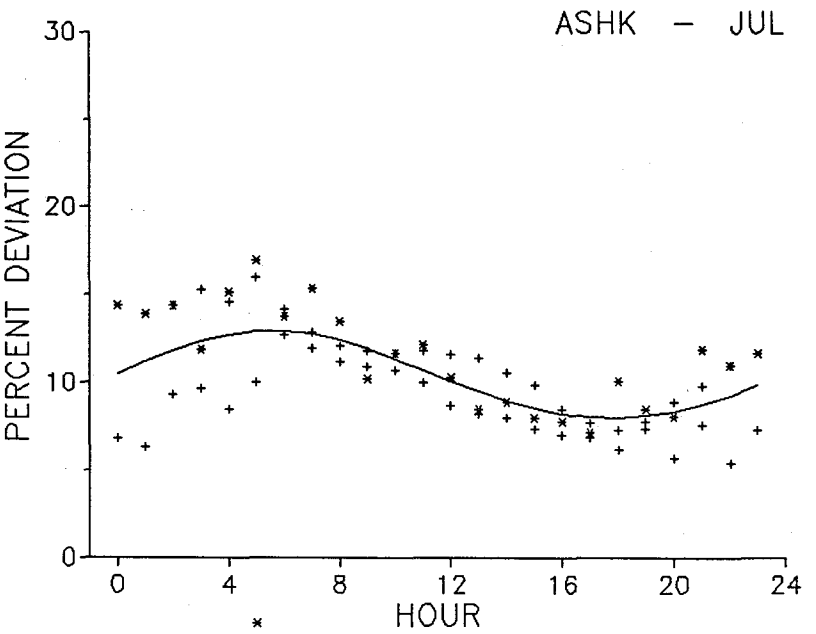

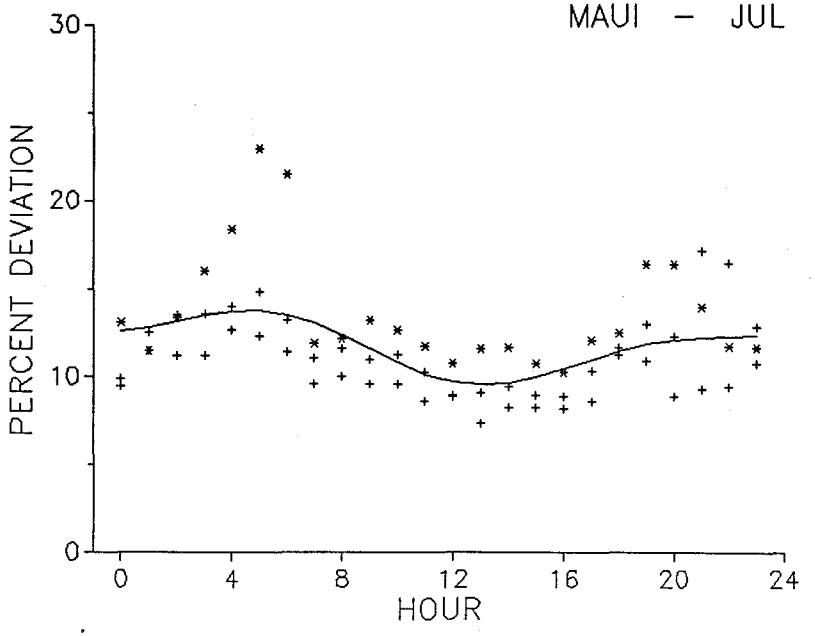

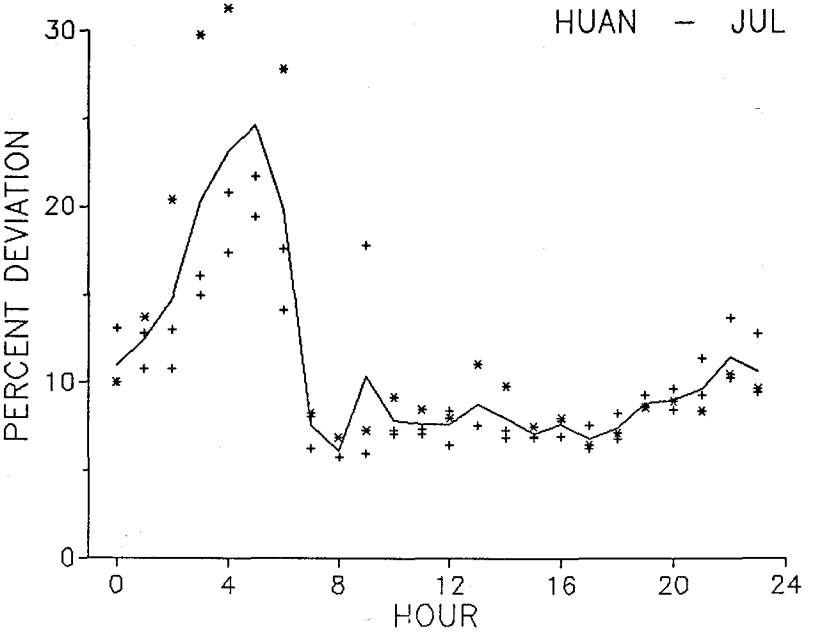

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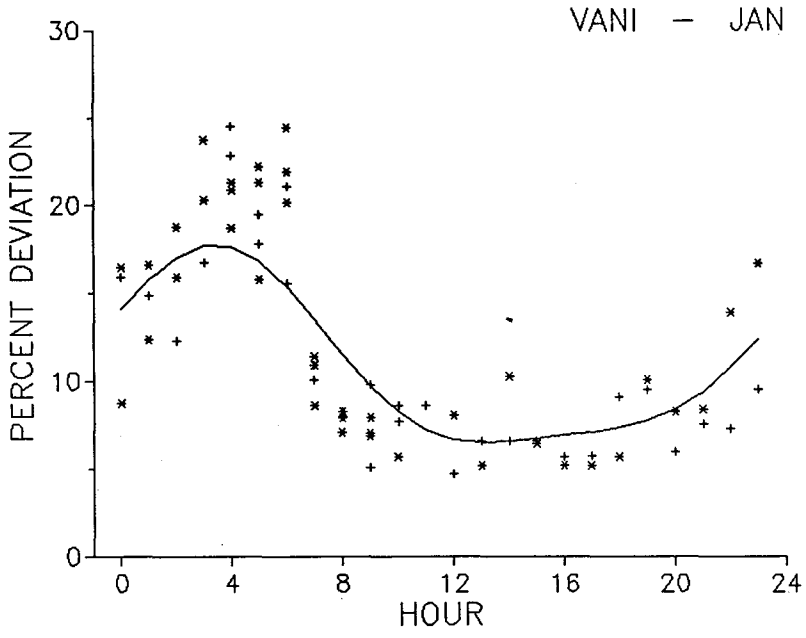

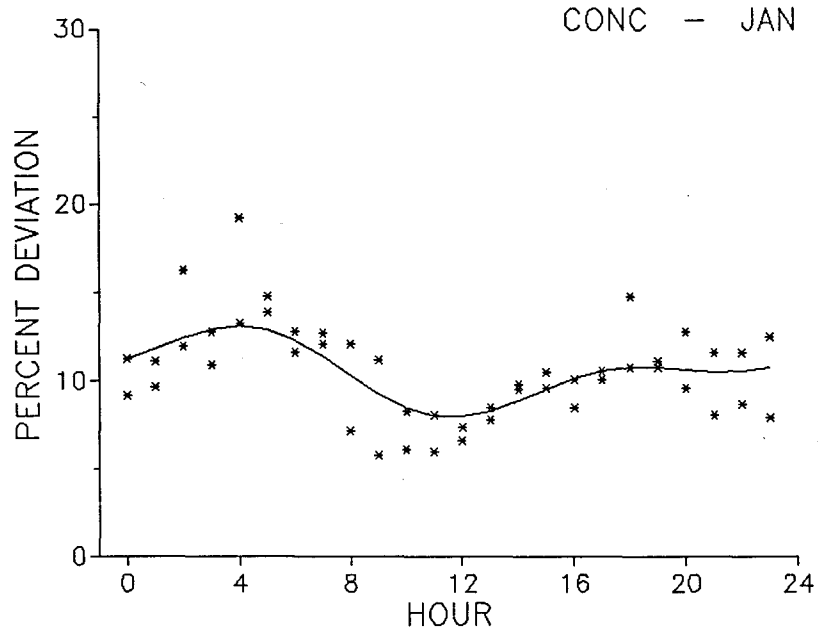

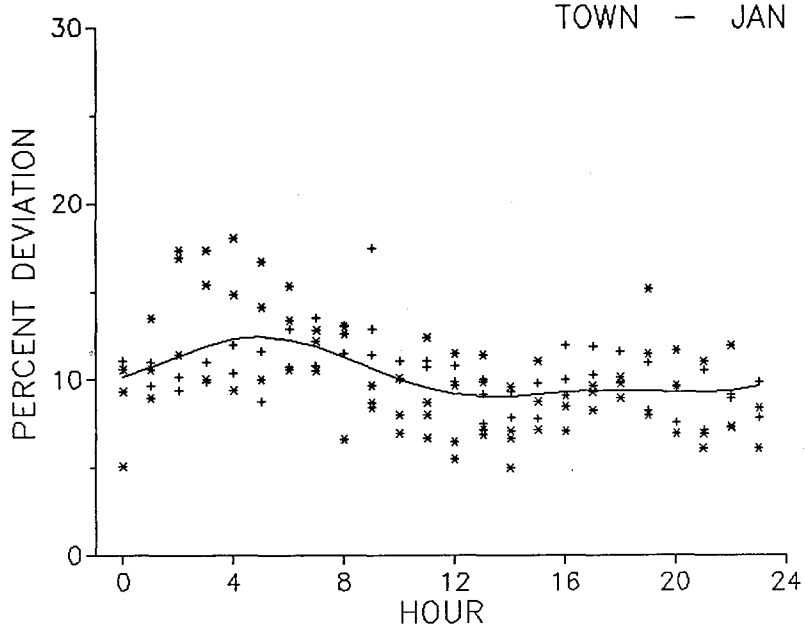

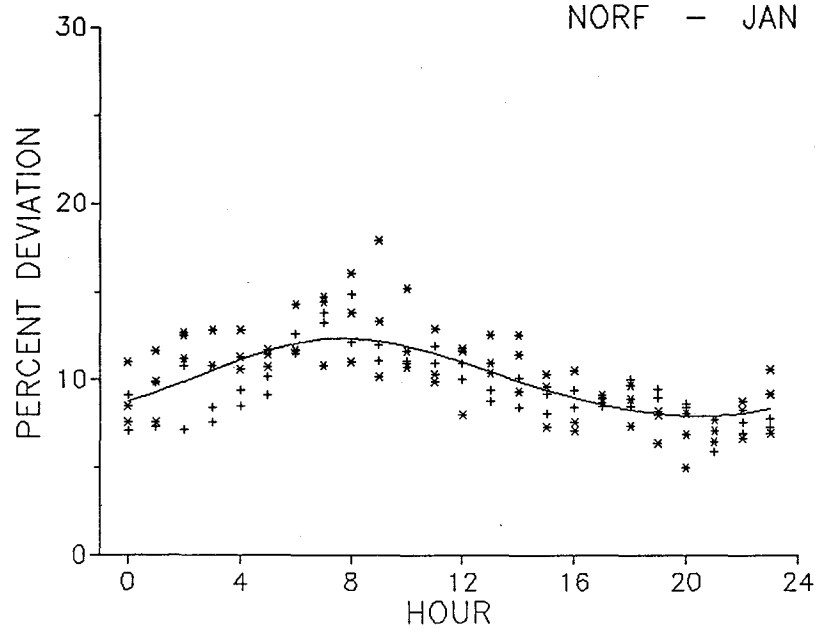

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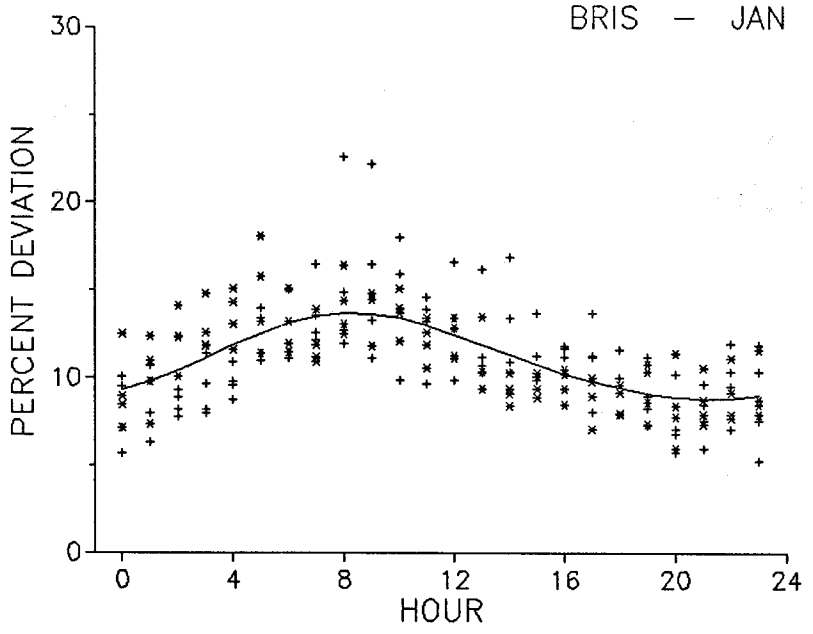

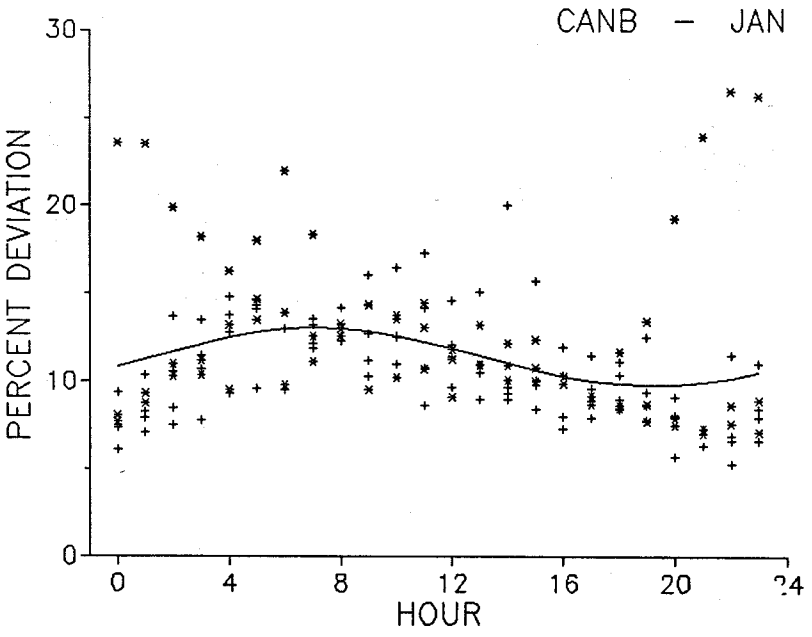

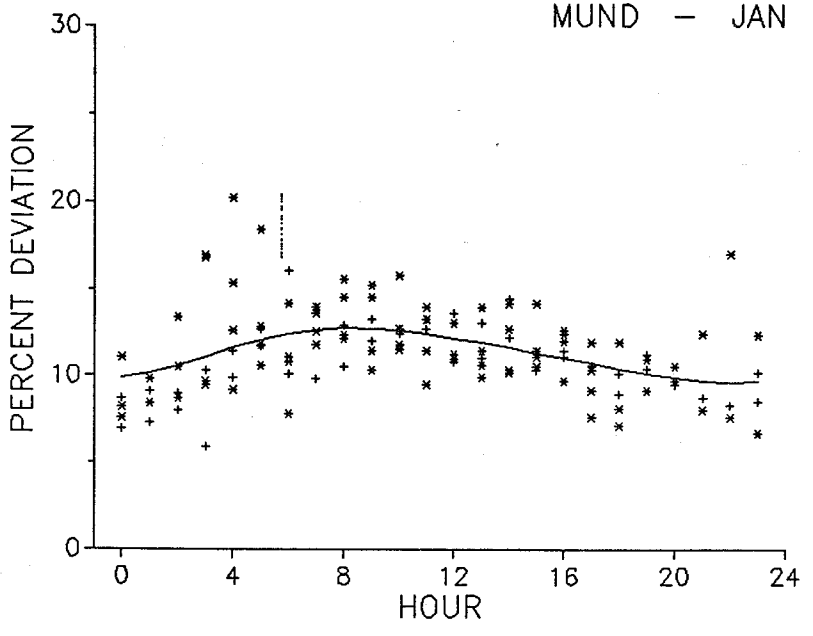

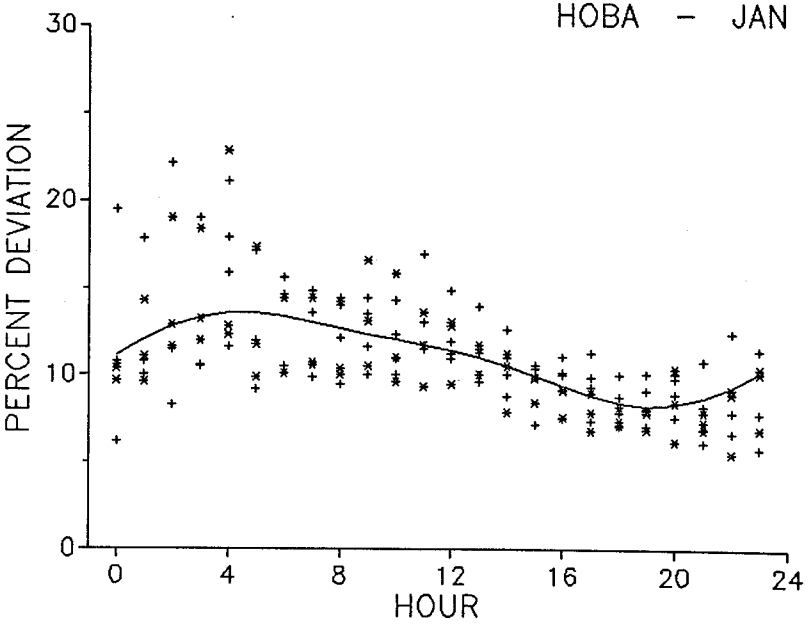

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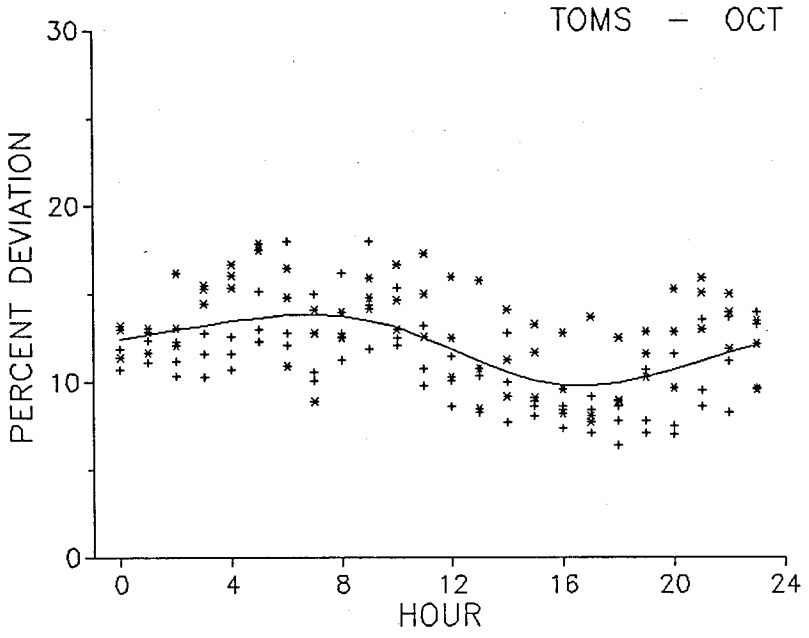

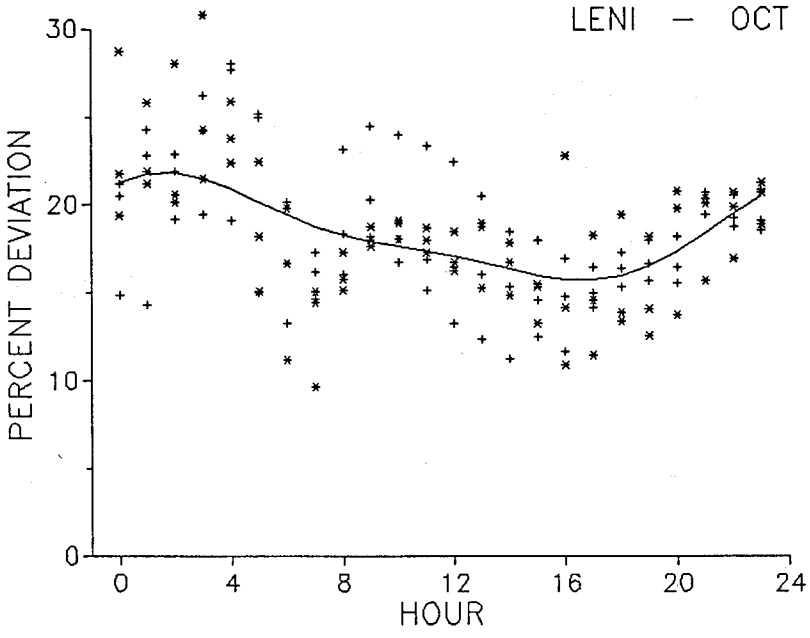

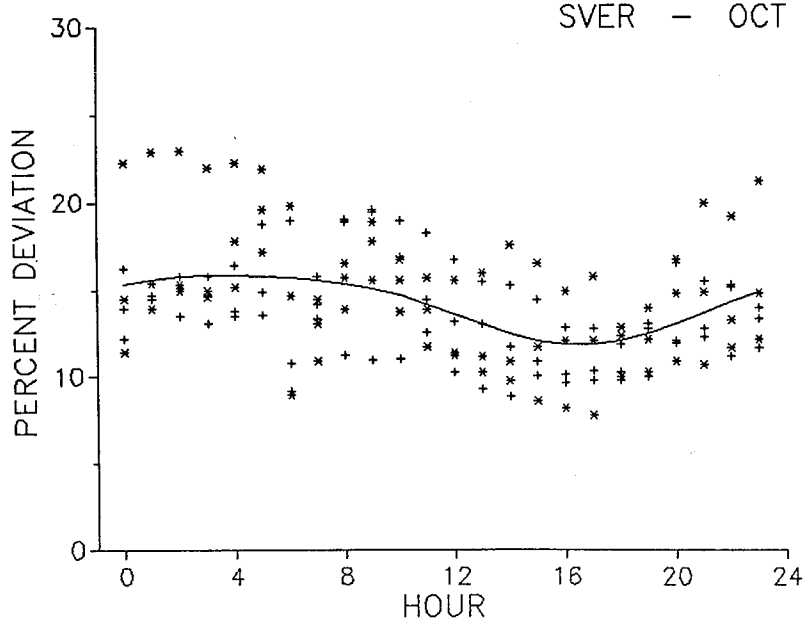

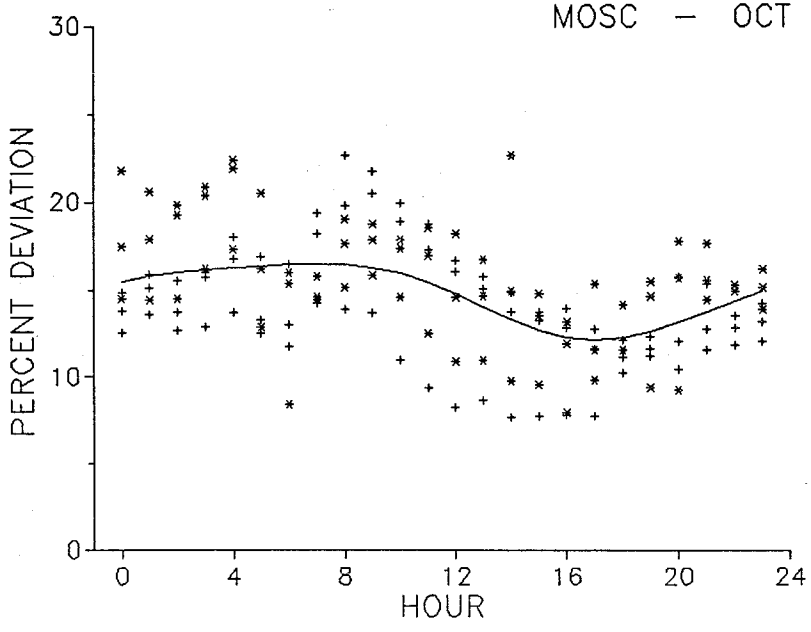

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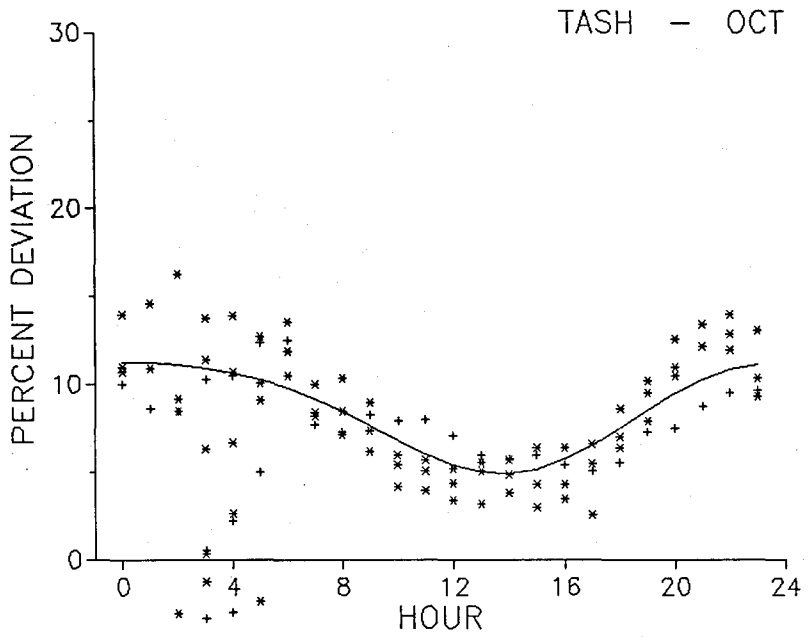

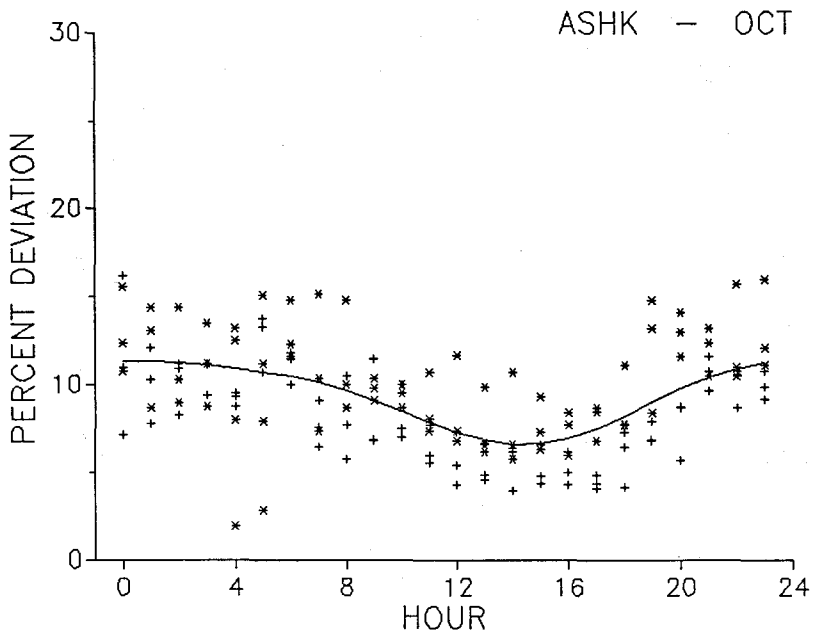

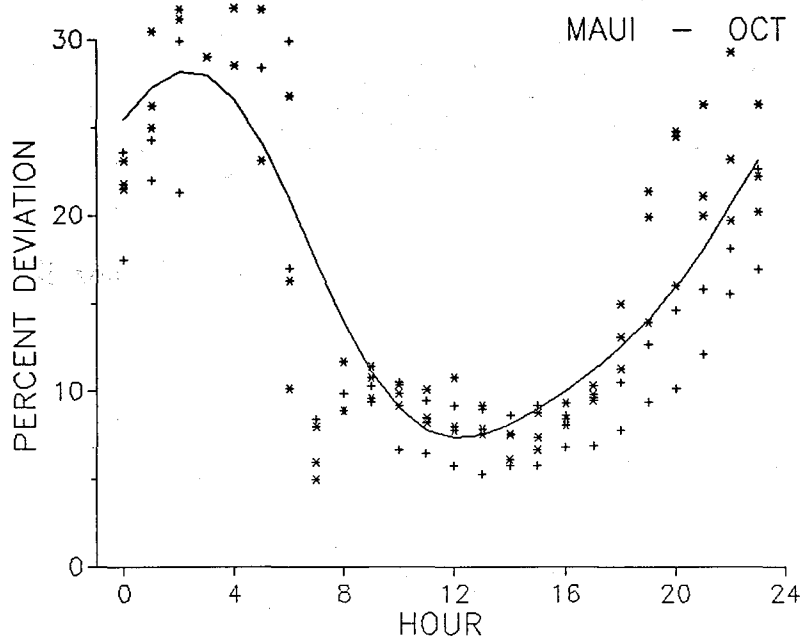

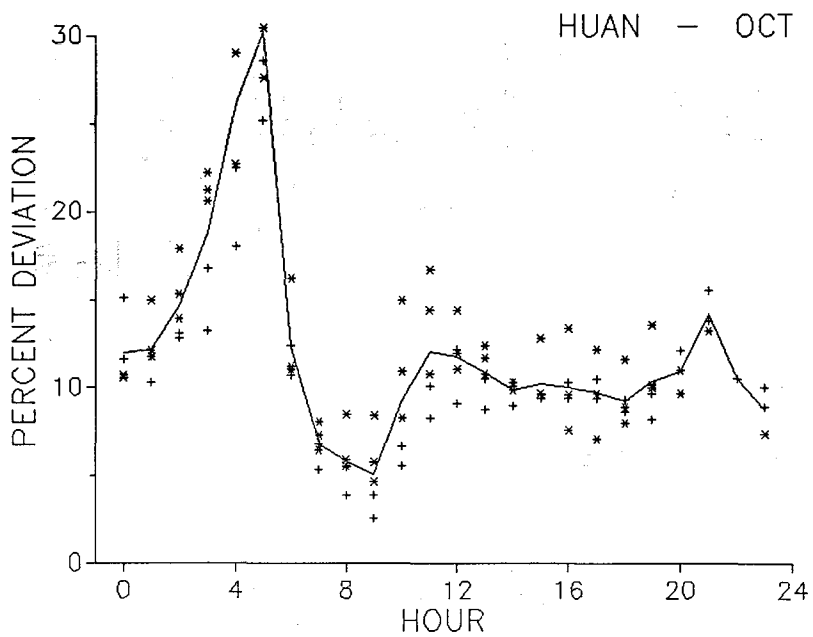

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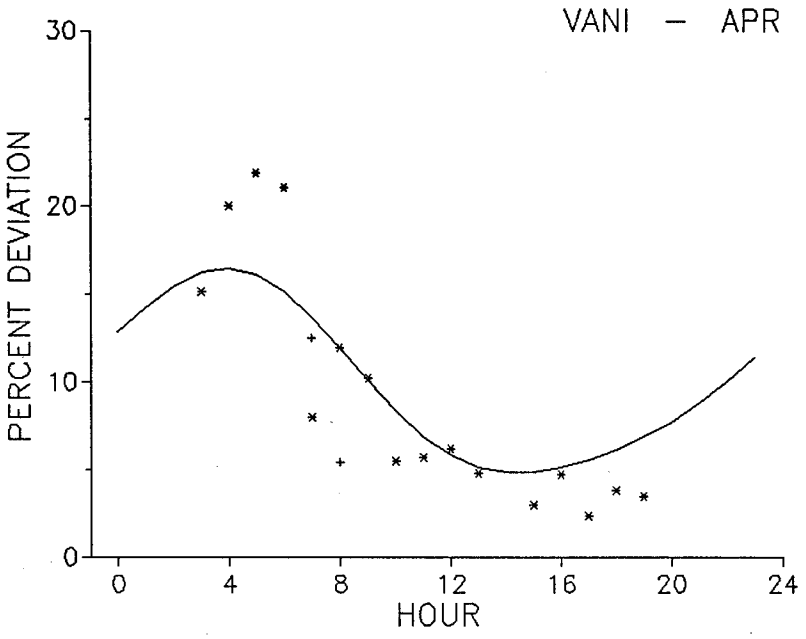

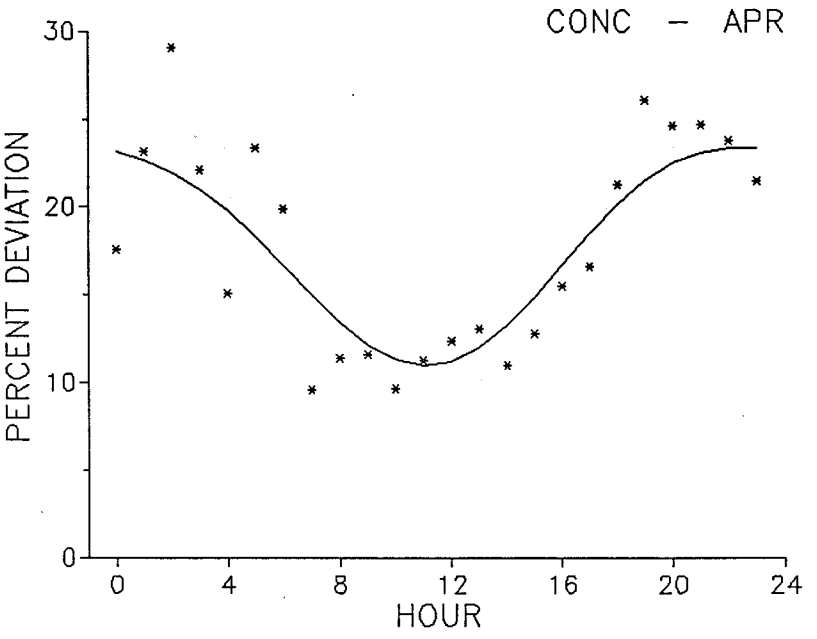

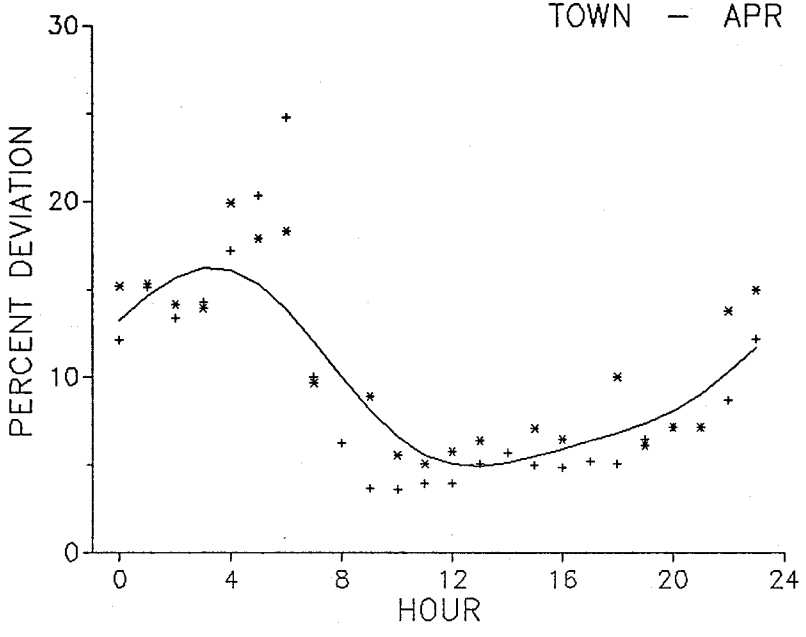

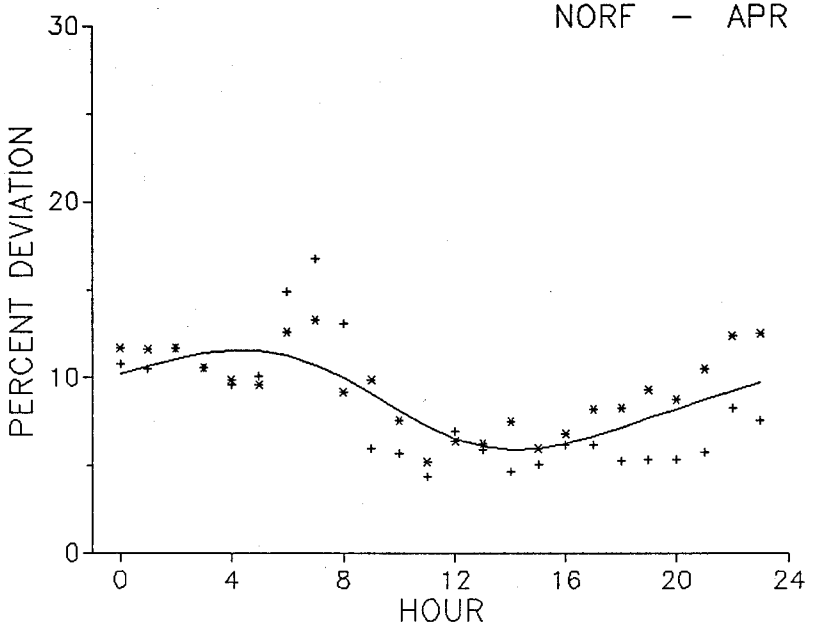

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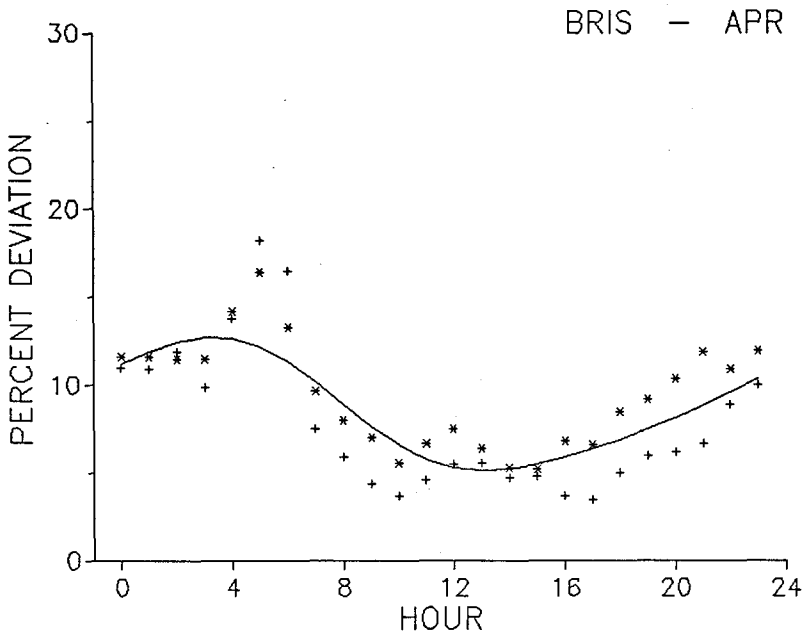
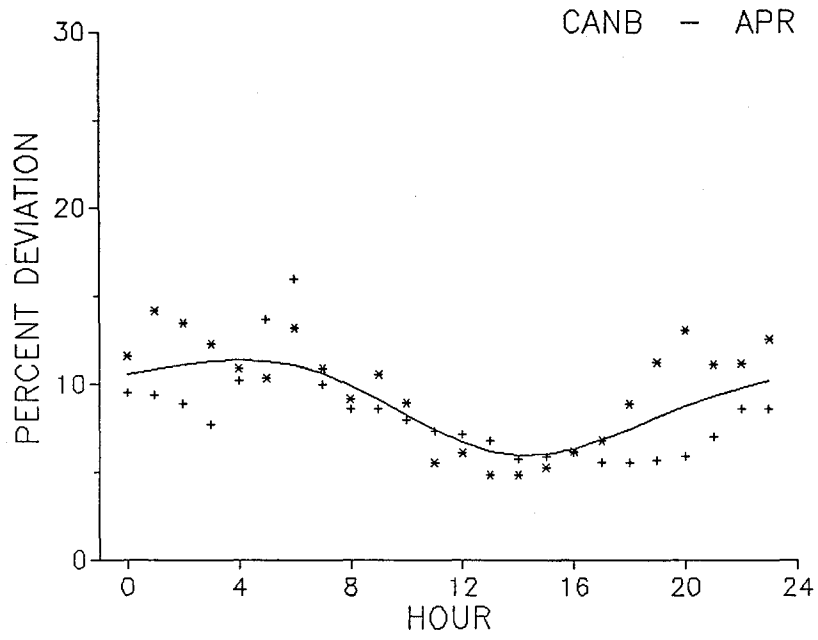
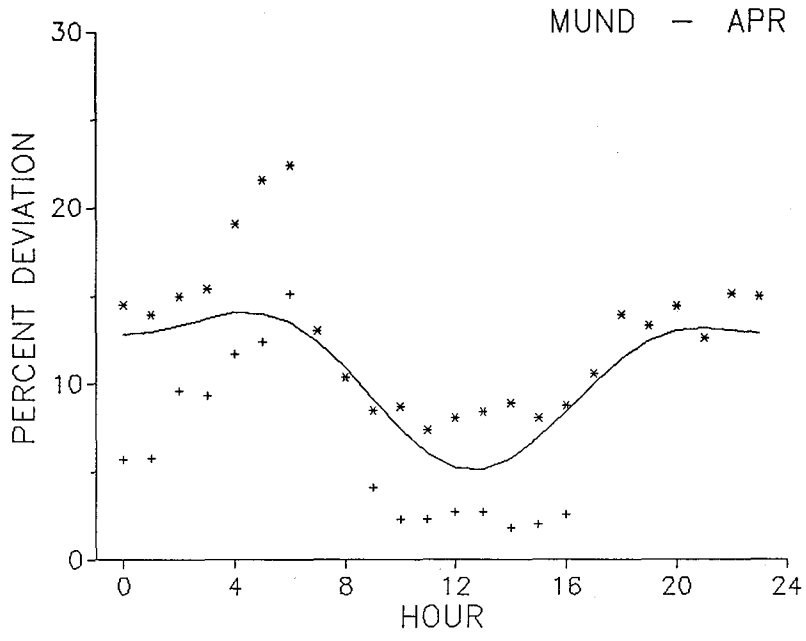
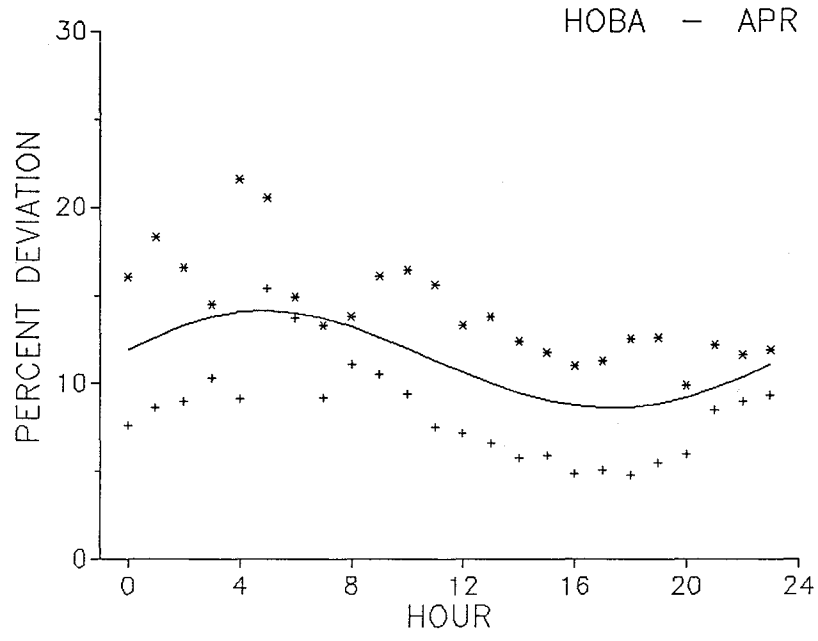








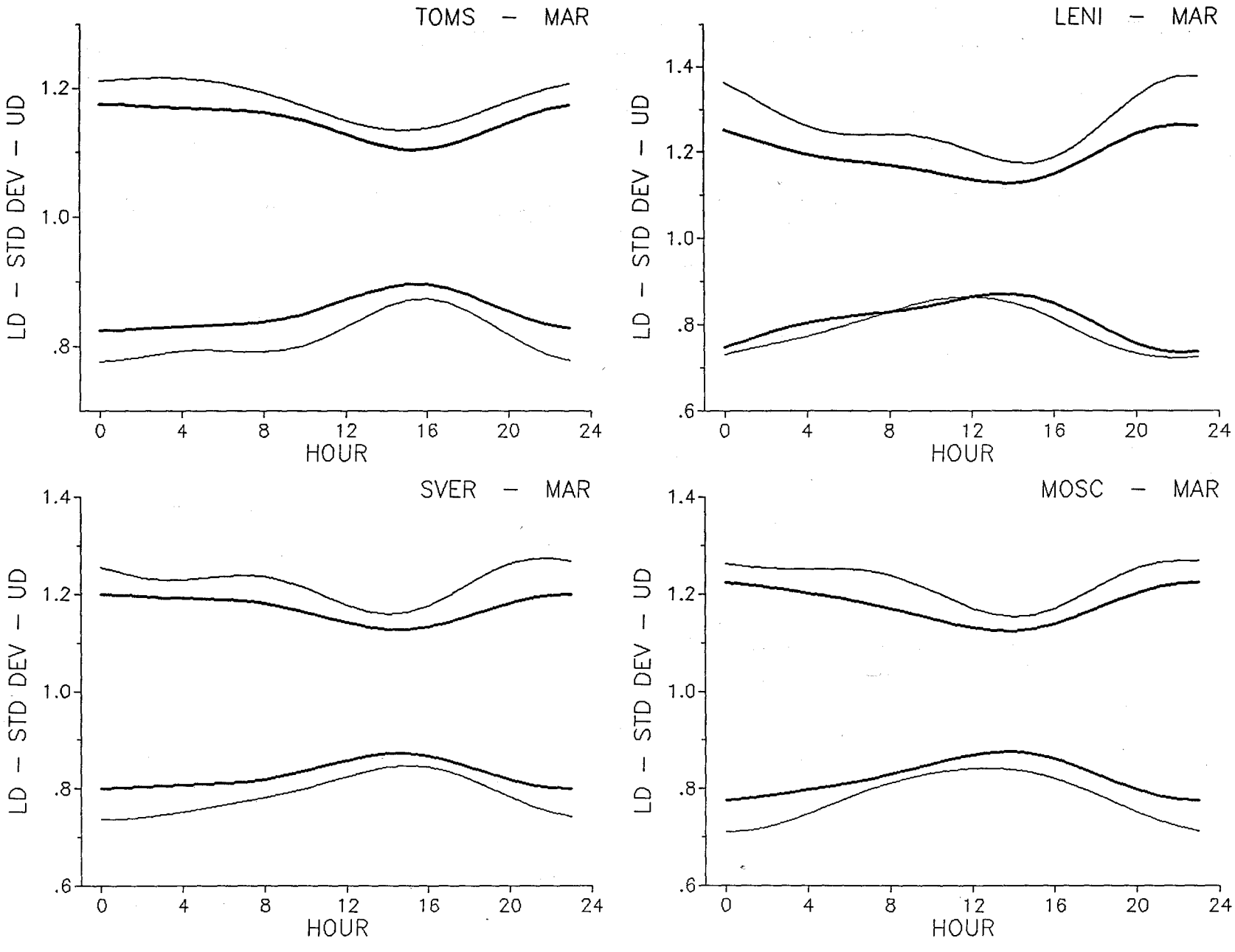
APPENDIX B

LOWER DECILE, UPPER DECILE, AND STANDARD DEVIATION FACTORS FOR ALL STATIONS FOR ACTIVE MAGNETIC PERIODS FOR LOW AND HIGH SOLAR PERIODS DURING SPRING AND FALL EQUINOX

LOW SOLAR	SPRING EQUINOX		FALL EQUINOX	
TOMSK, LENINGRAD SVERDLOVSK, MOSCOW	84	89	94	99
WASHINGTON, BOULDER KHABAROVSK, ALMA ATA	85	90	95	100
TASHKENT, ASHKABAD MAUI, HUANCAYO	86	91	96	101
VANIMO, CONCEPCION TOWNSVILLE, NORFOLK	87	92	97	102
BRISBANE, CANBERRA MUNDARING, HOBART	88	93	98	103

HIGH SOLAR	SPRING EQUINOX		FALL EQUINOX	
TOMSK, LENINGRAD SVERDLOVSK, MOSCOW	104	109	114	119
WASHINGTON, BOULDER KHABAROVSK, ALMA ATA	105	110	115	120
TASHKENT, ASHKABAD MAUI, HUANCAYO	106	111	116	121
VANIMO, CONCEPCION TOWNSVILLE, NORFOLK	107	112	117	122
BRISBANE, CANBERRA MUNDARING, HOBART	108	113	118	123

ACTIVE MAGNETIC -- LOW SSN



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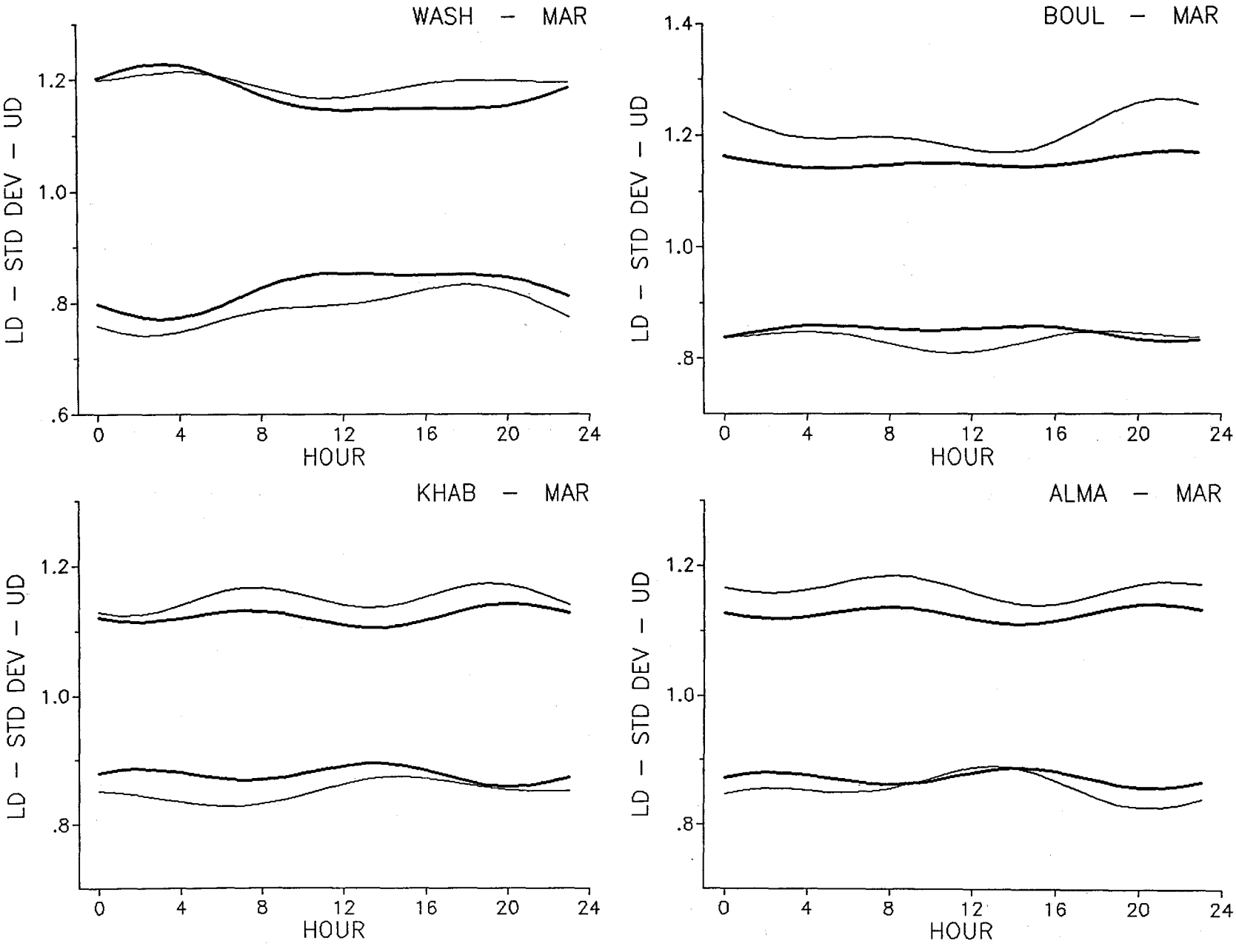
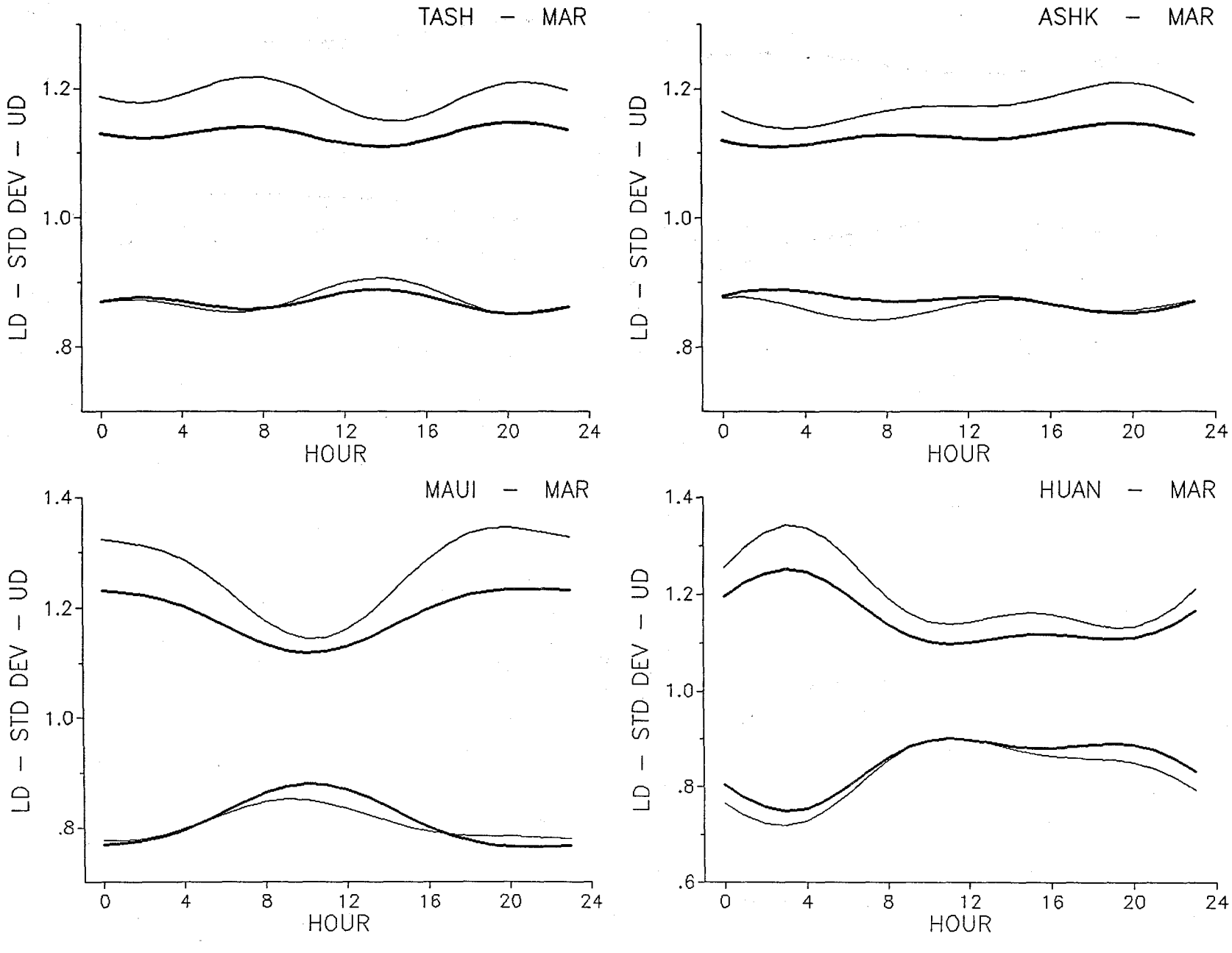


ACTIVE MAGNETIC -- LOW SSN



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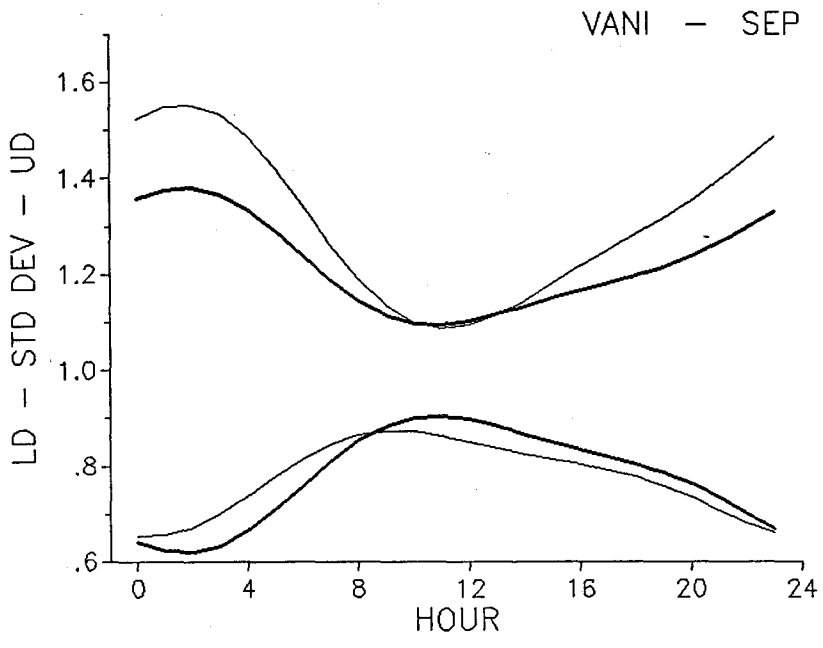
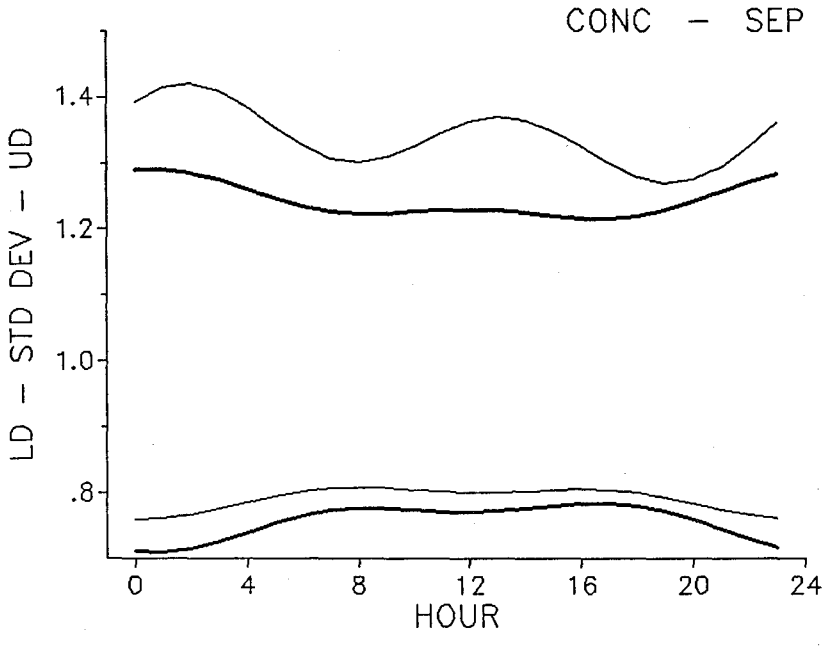
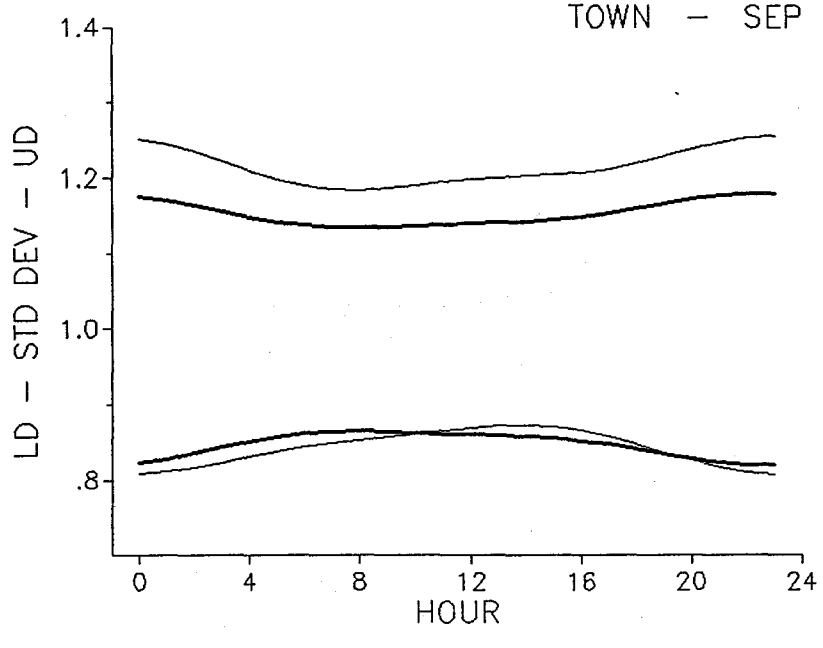
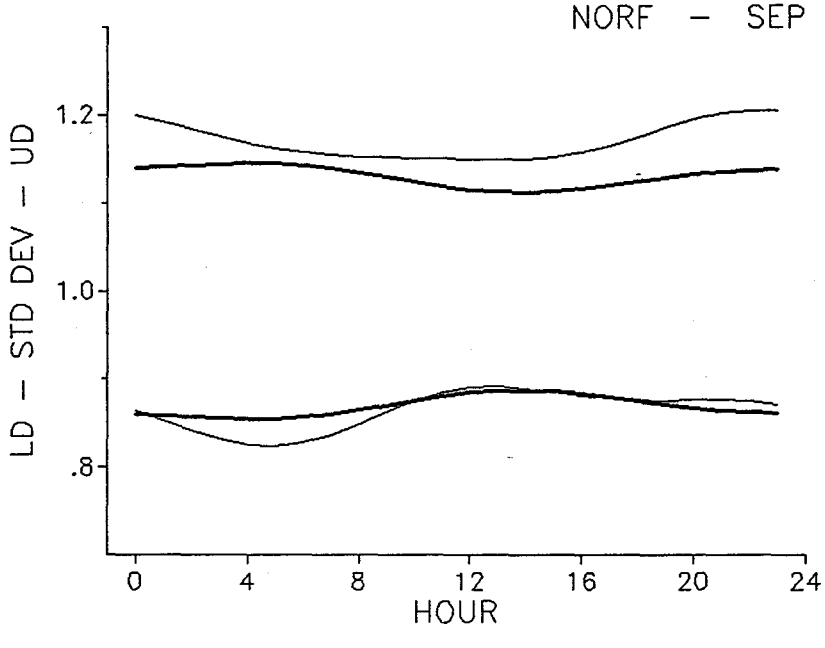
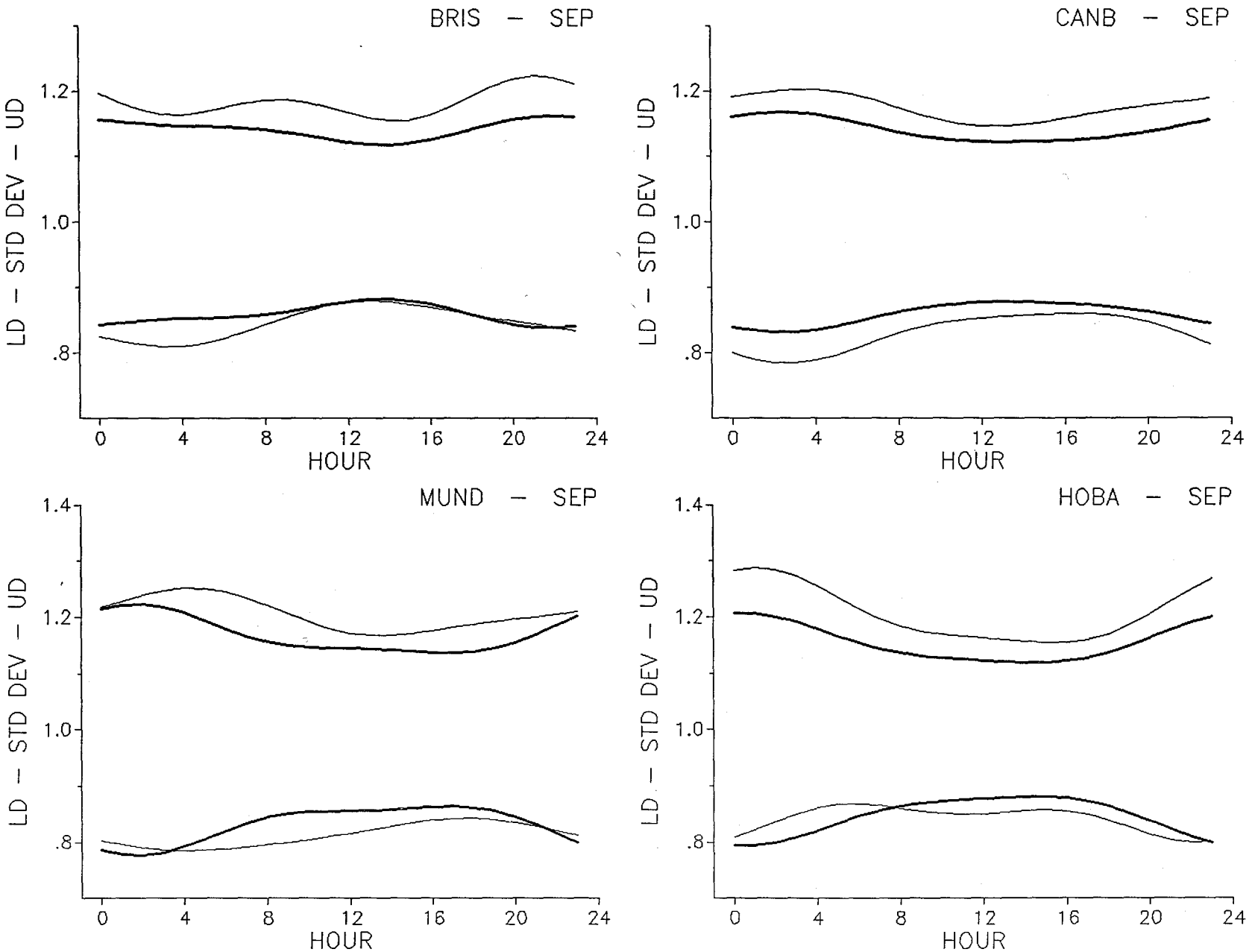




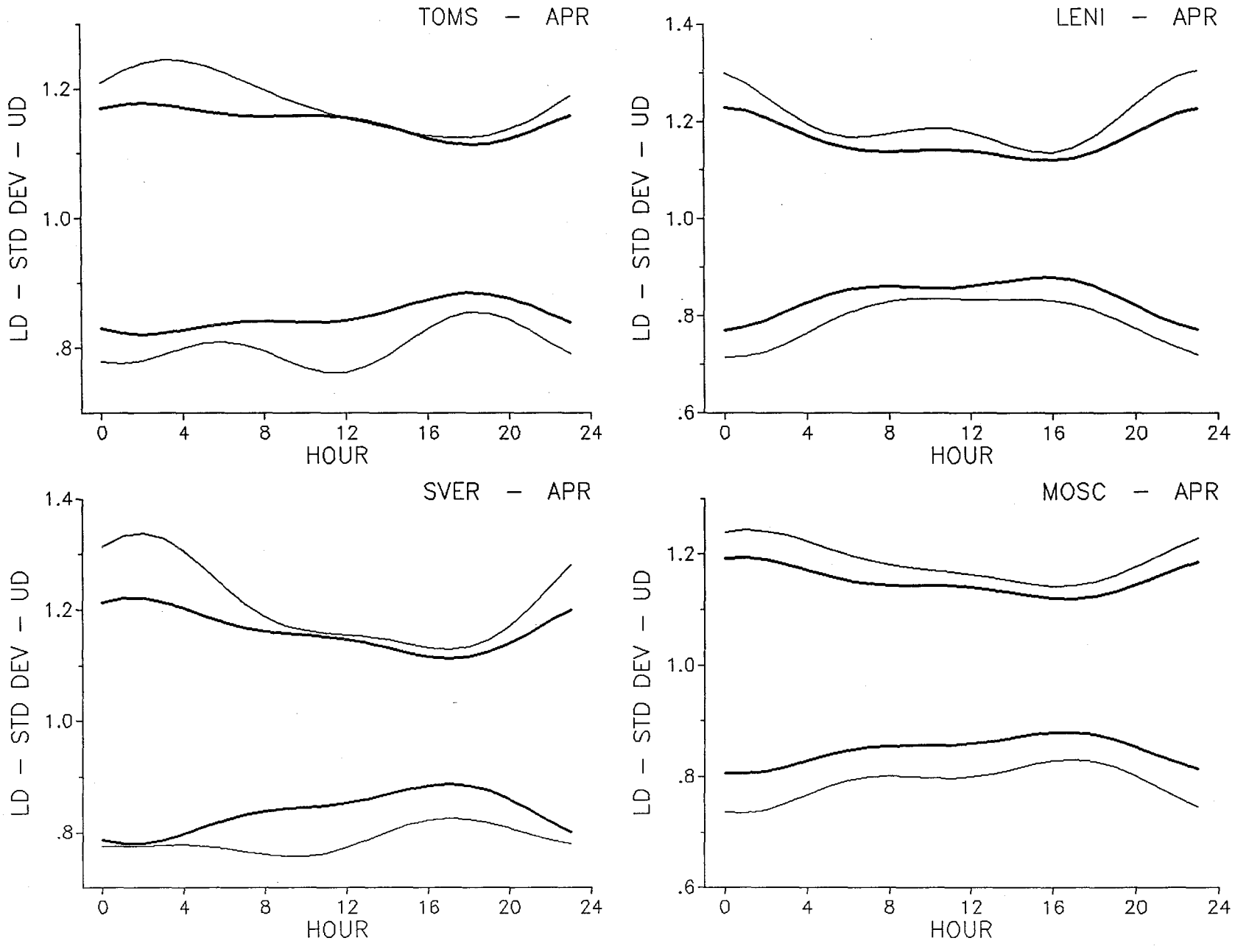




ACTIVE MAGNETIC -- LOW SSN



ACTIVE MAGNETIC -- LOW SSN



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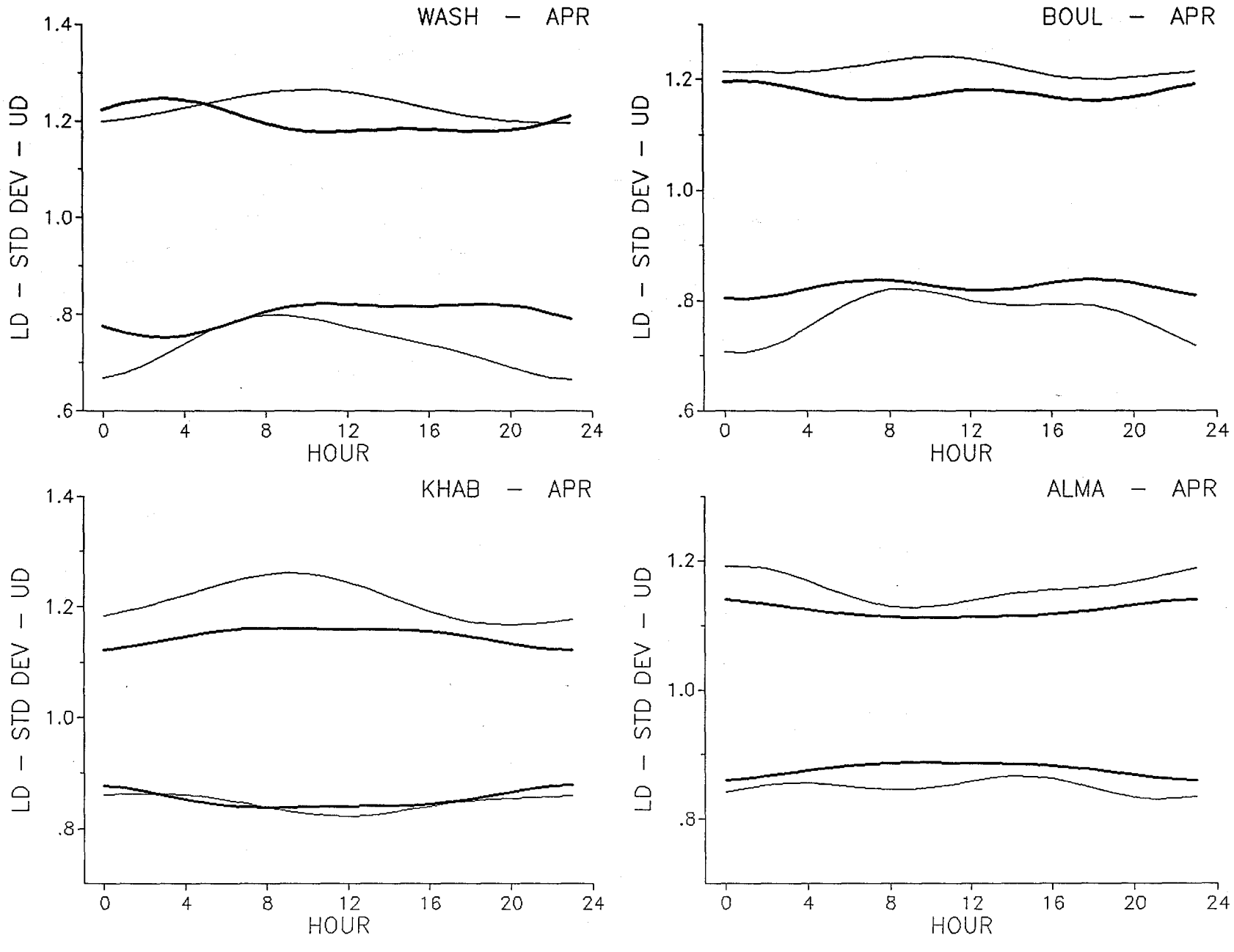
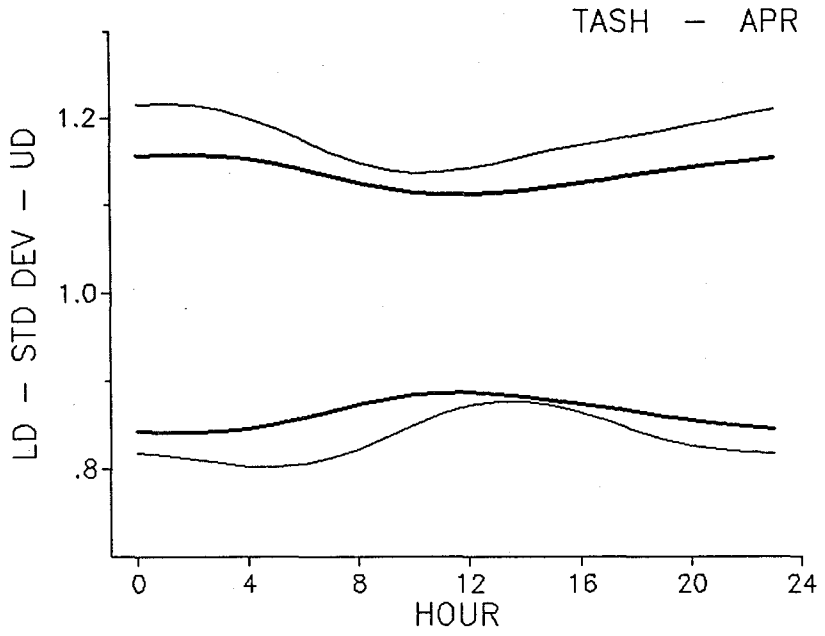
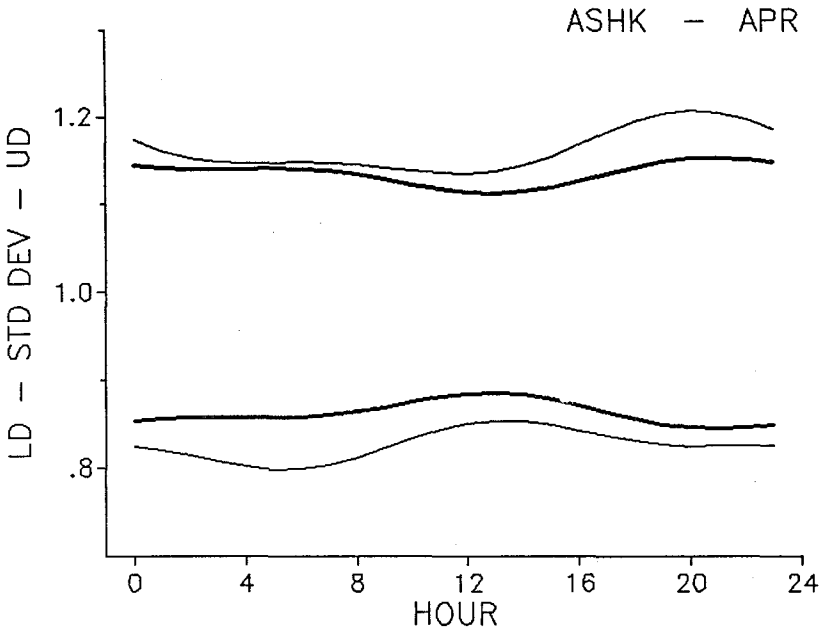
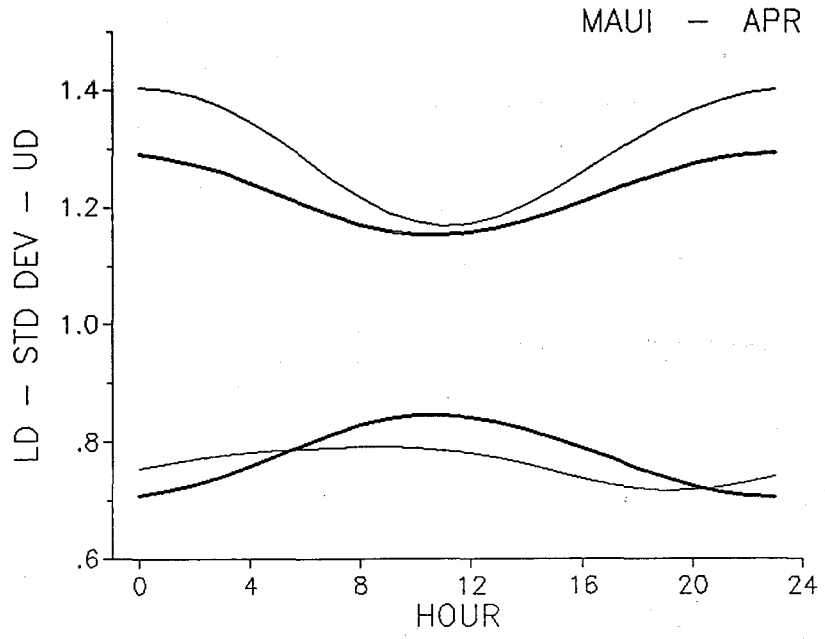
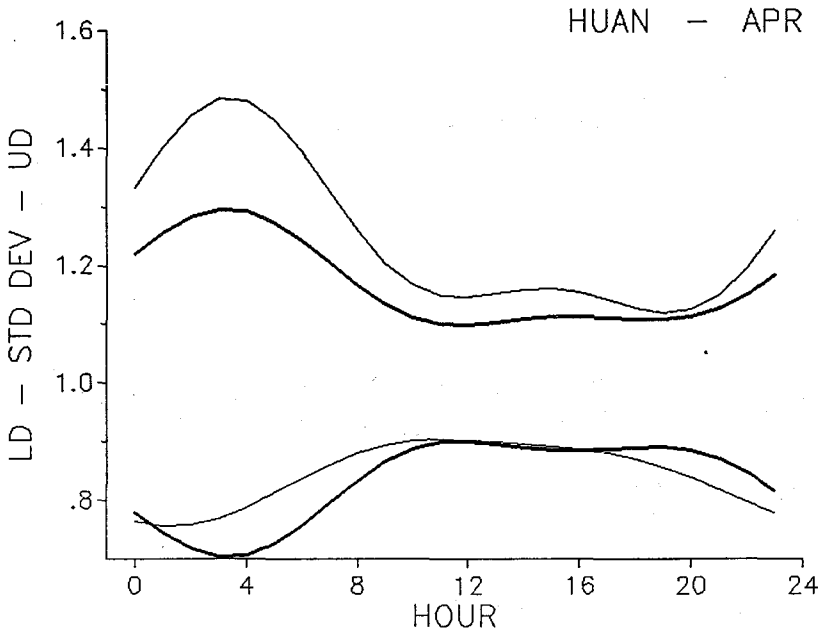


ACTIVE MAGNETIC -- LOW SSN









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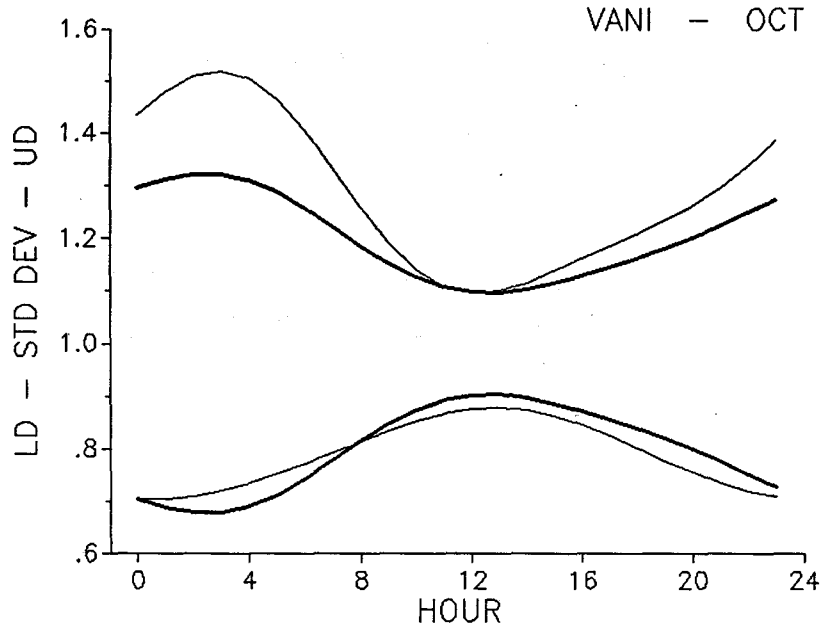

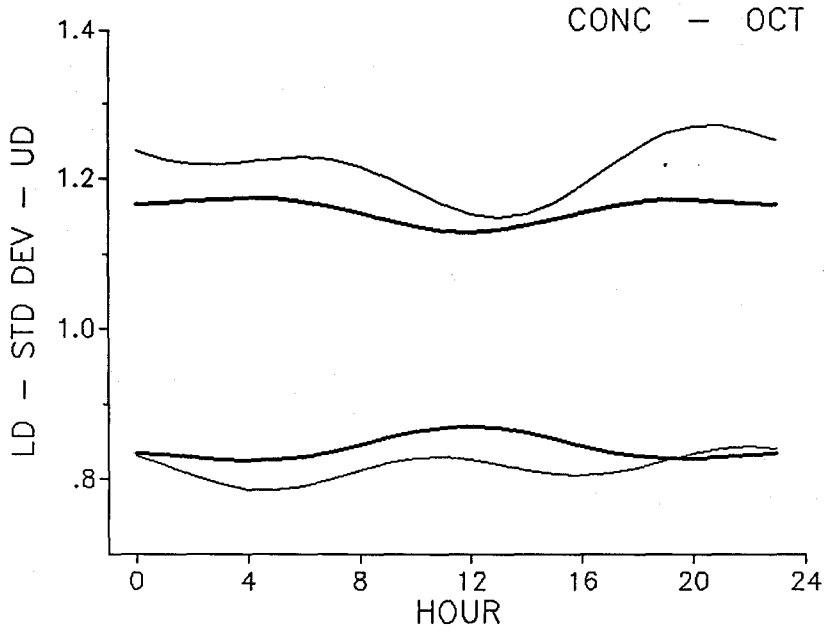

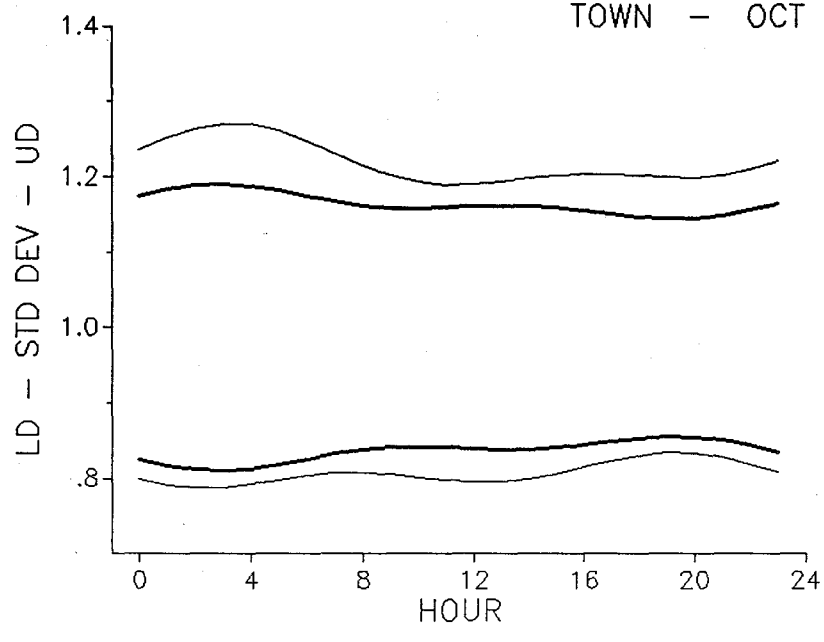

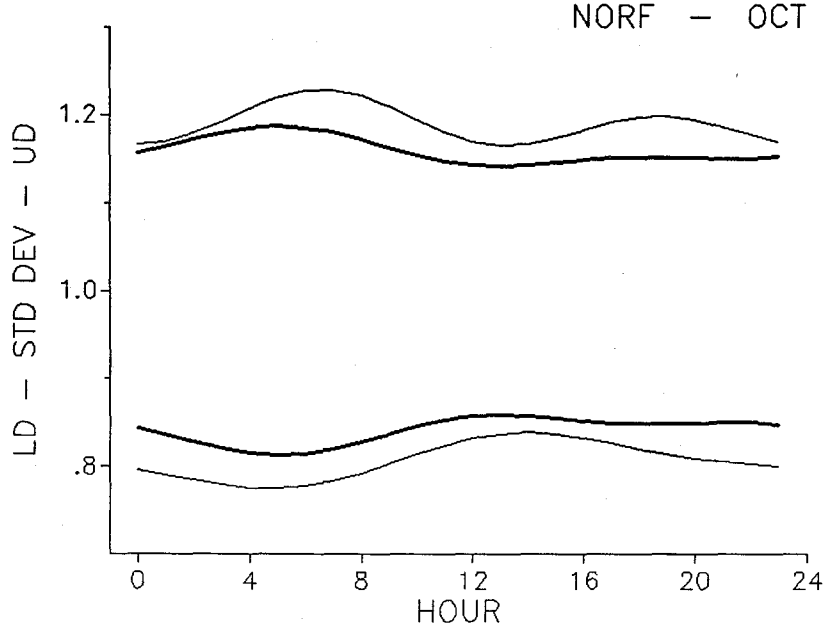

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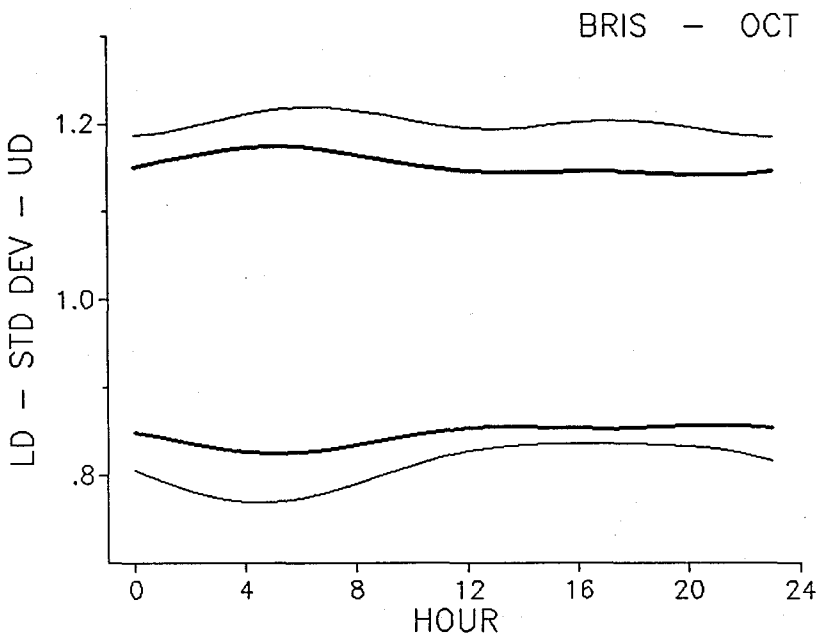

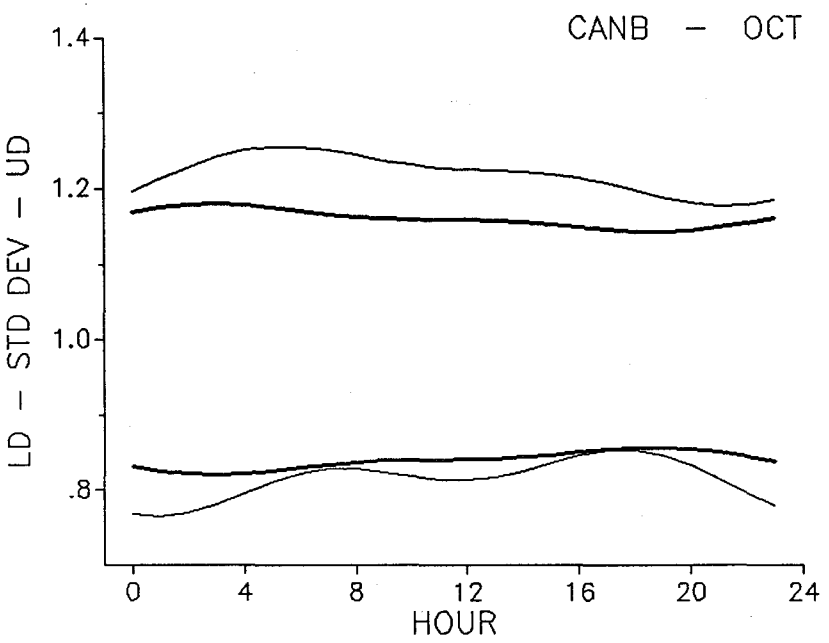

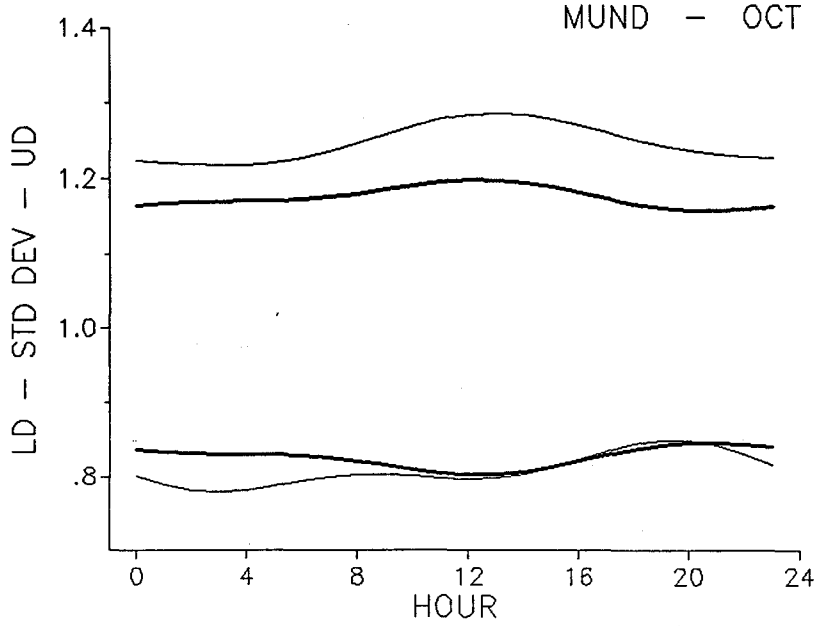

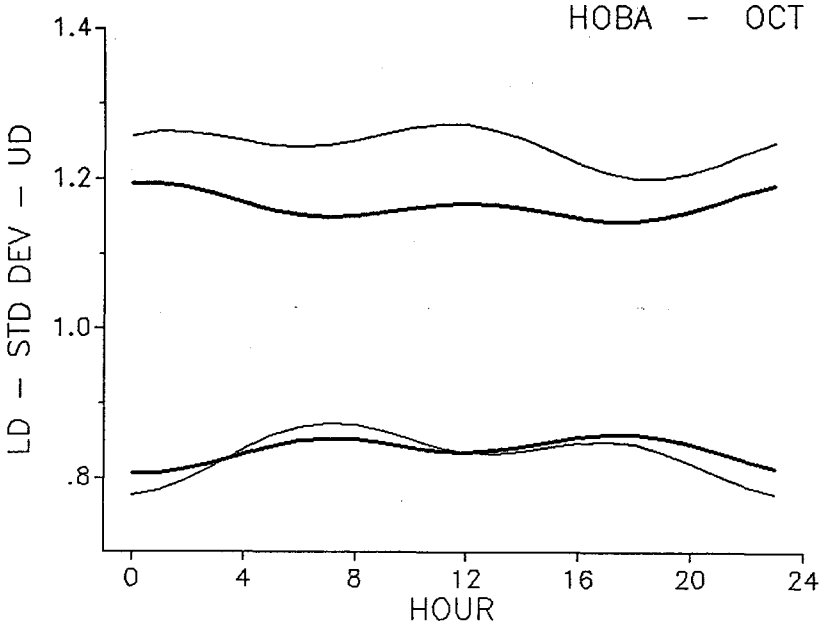

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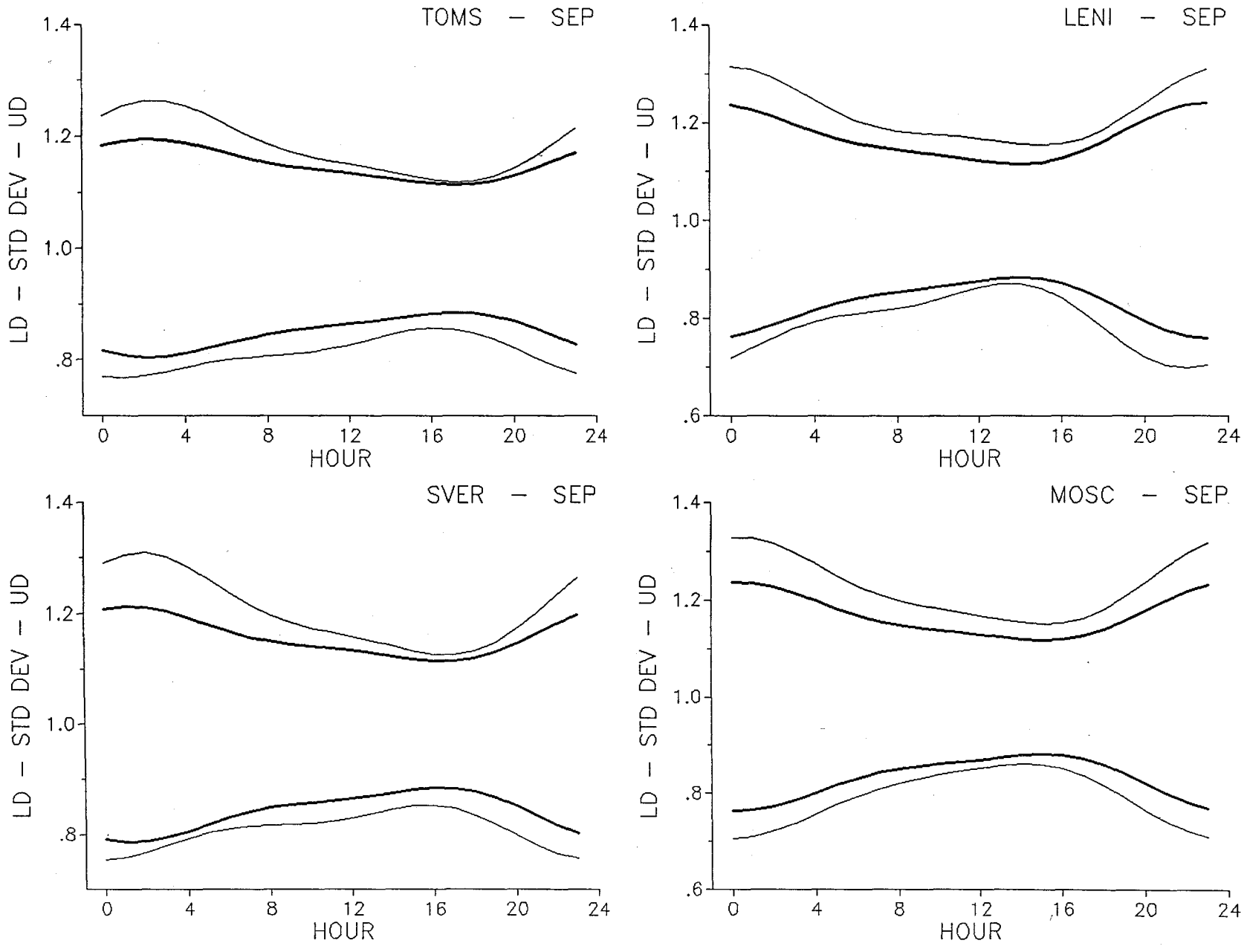

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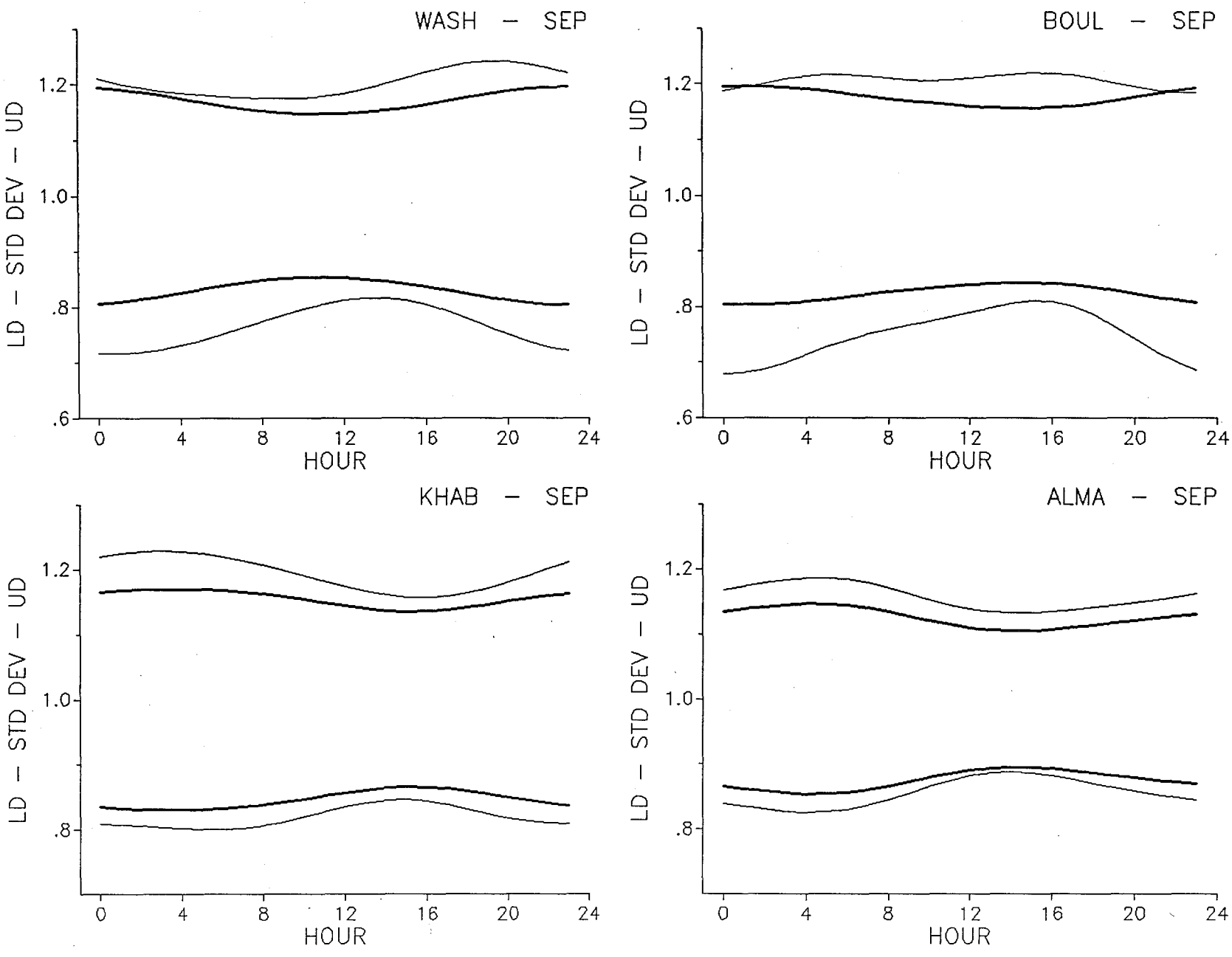

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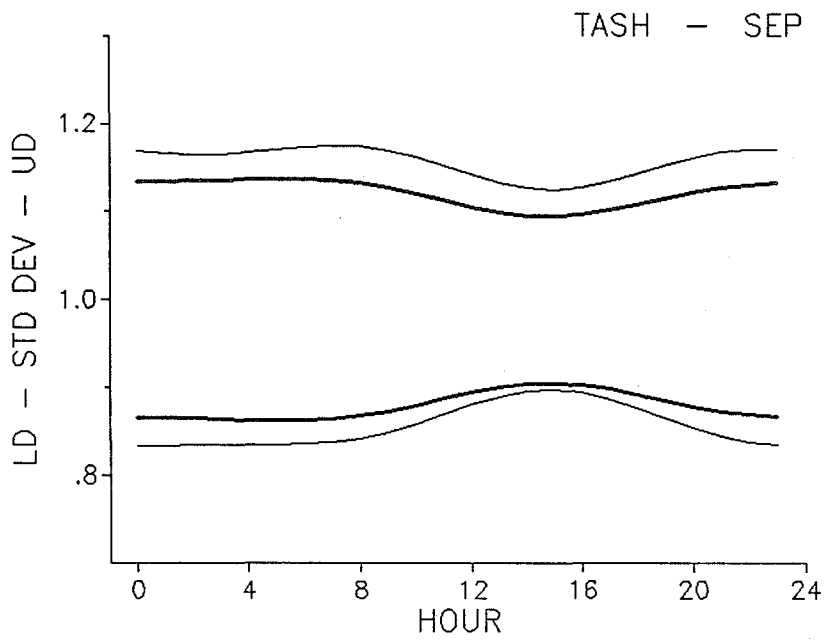

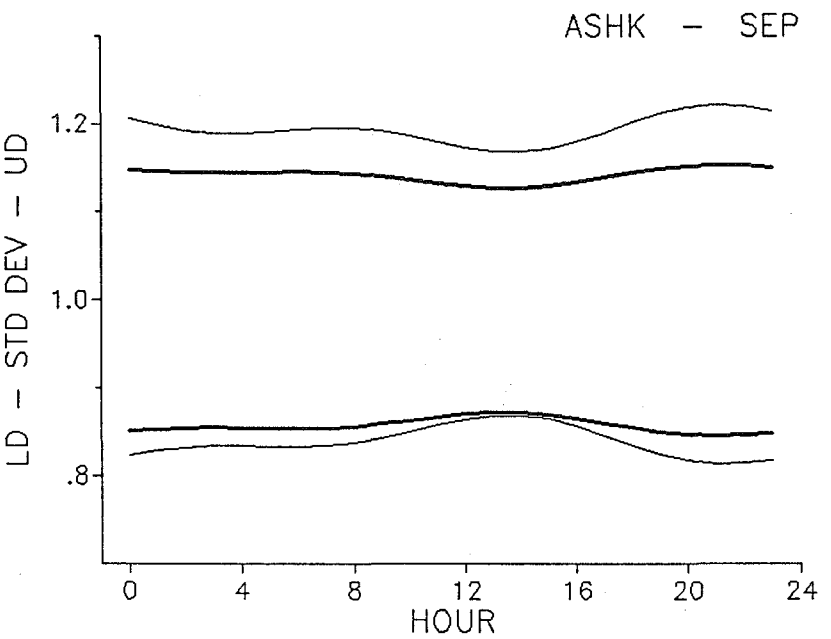

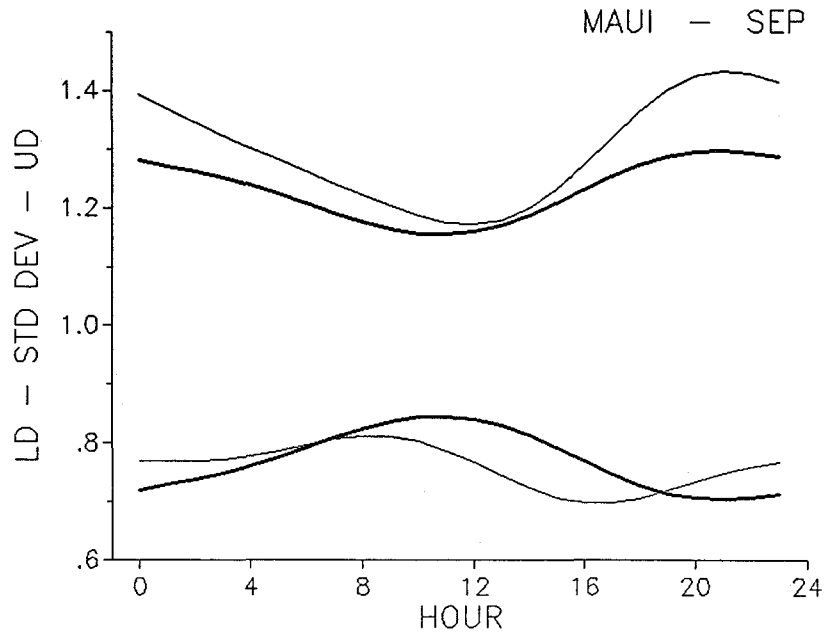

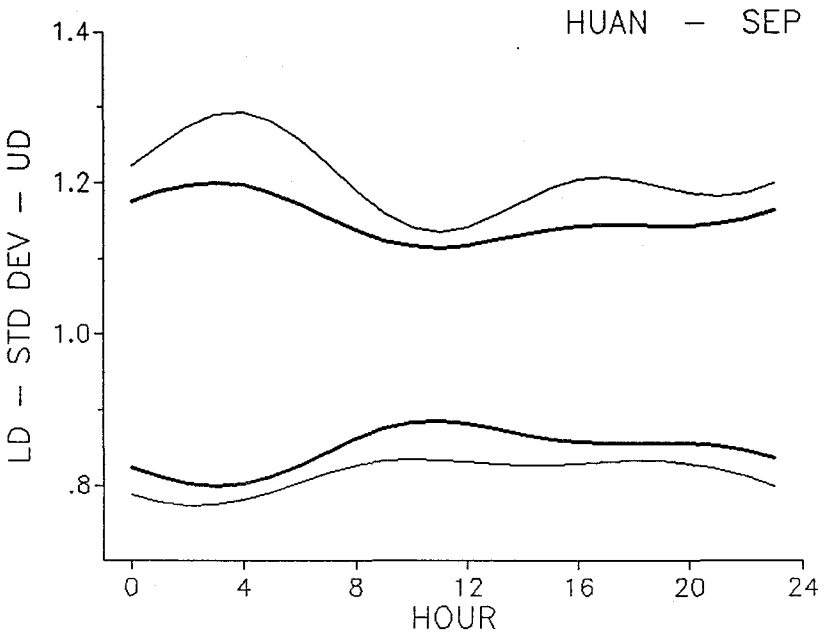

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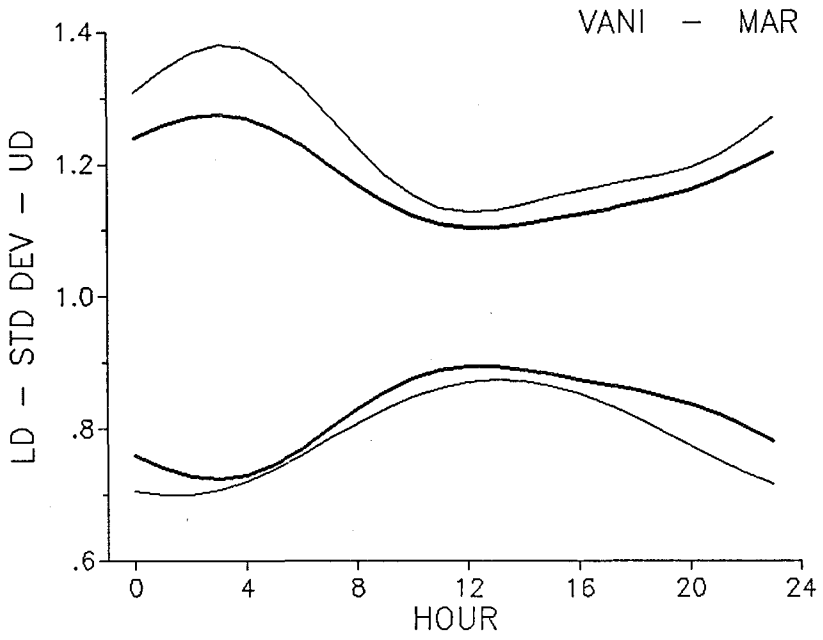

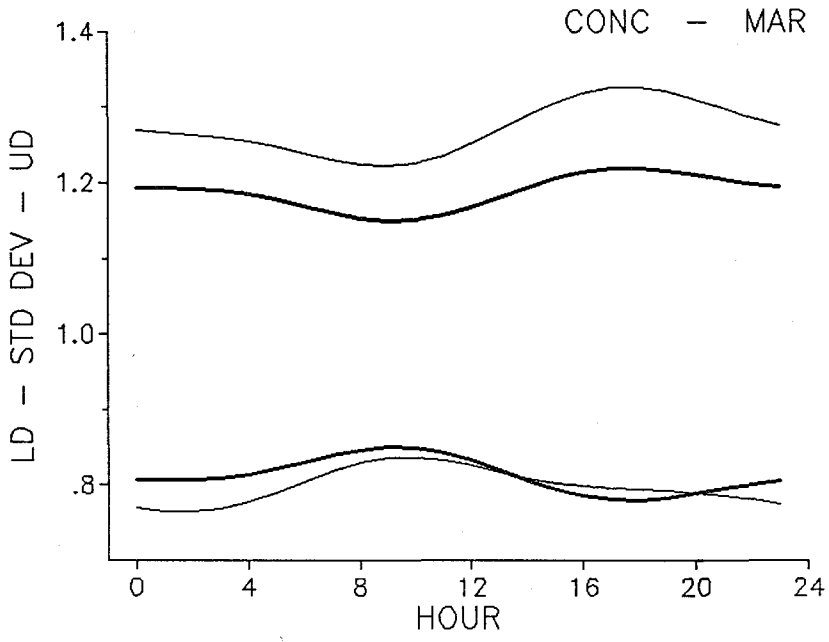

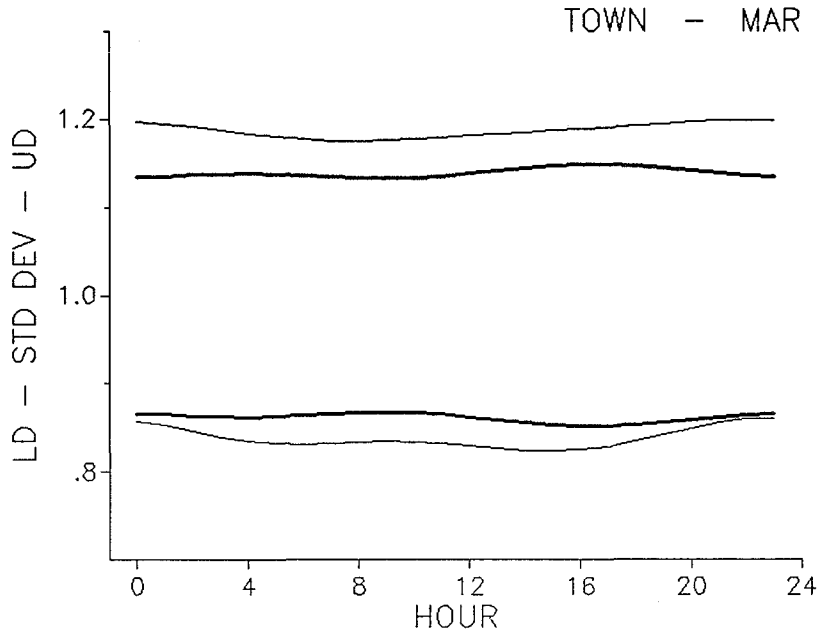

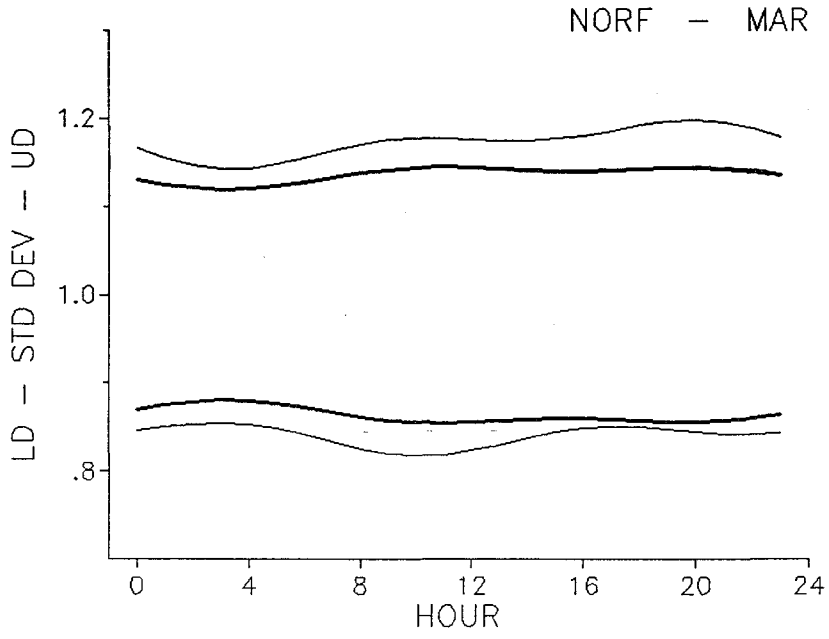

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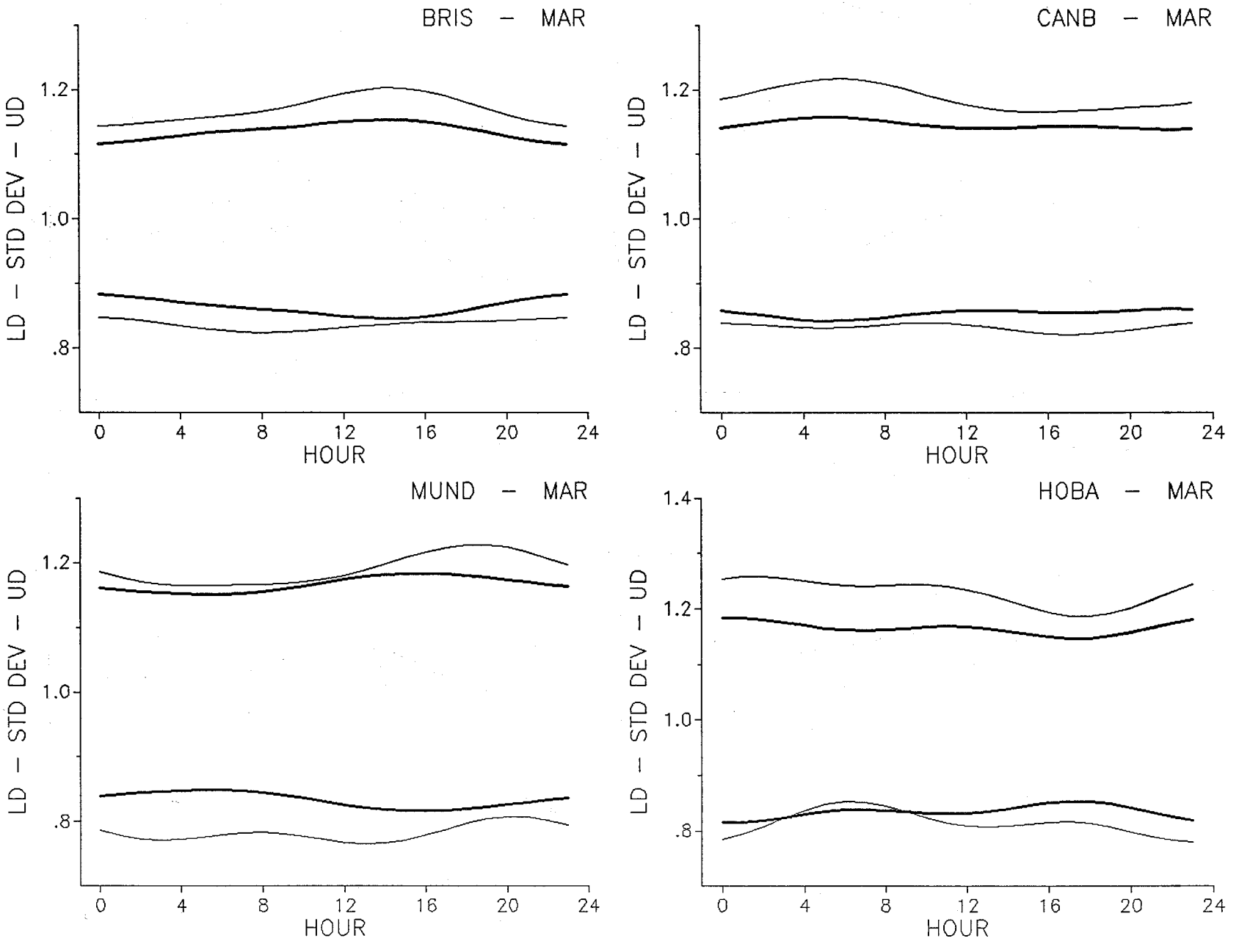

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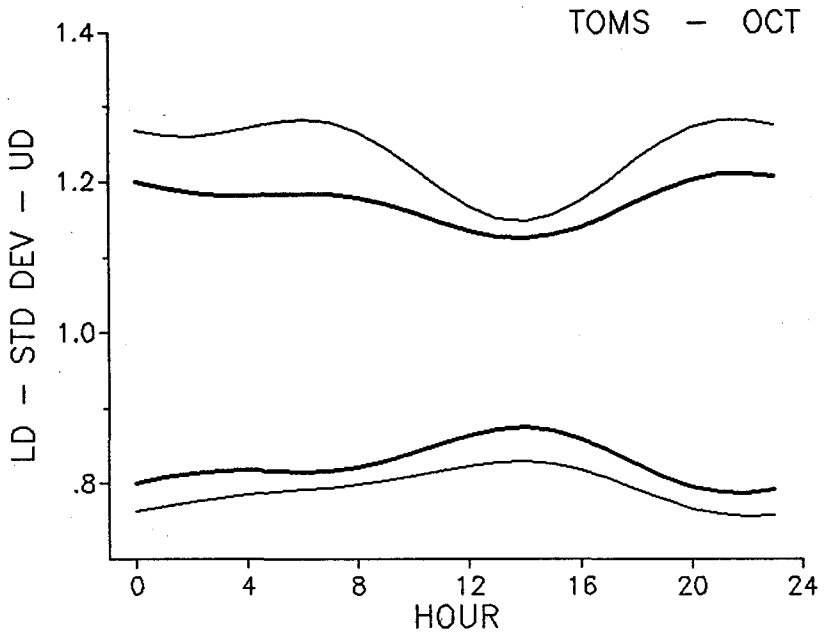
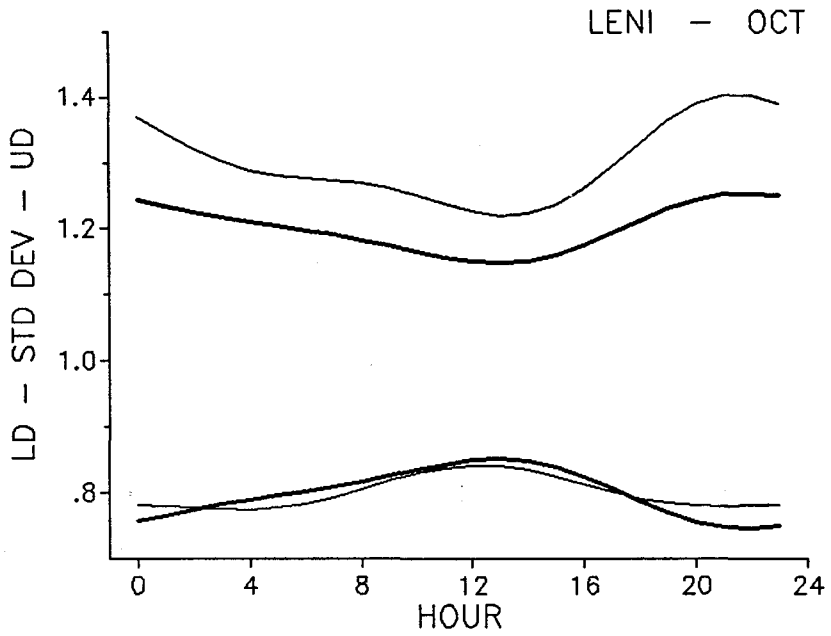
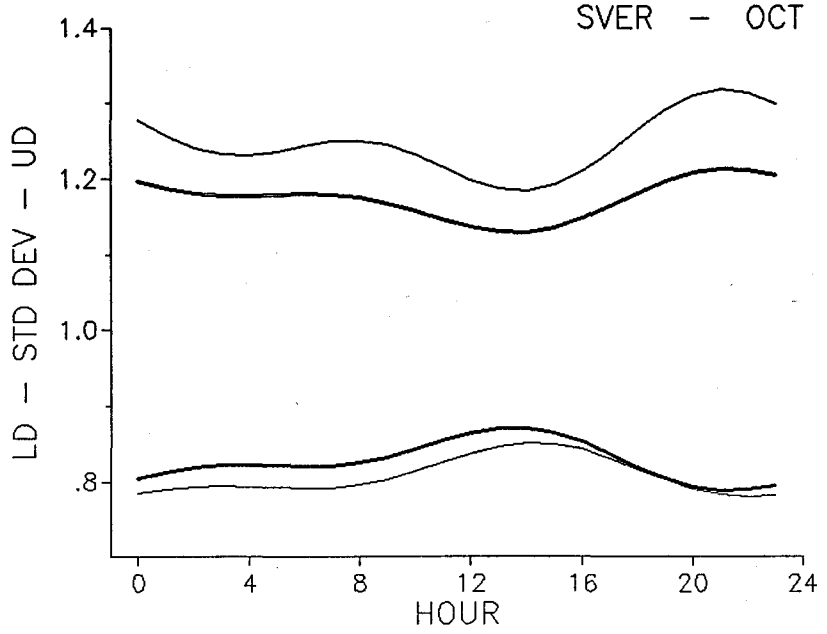
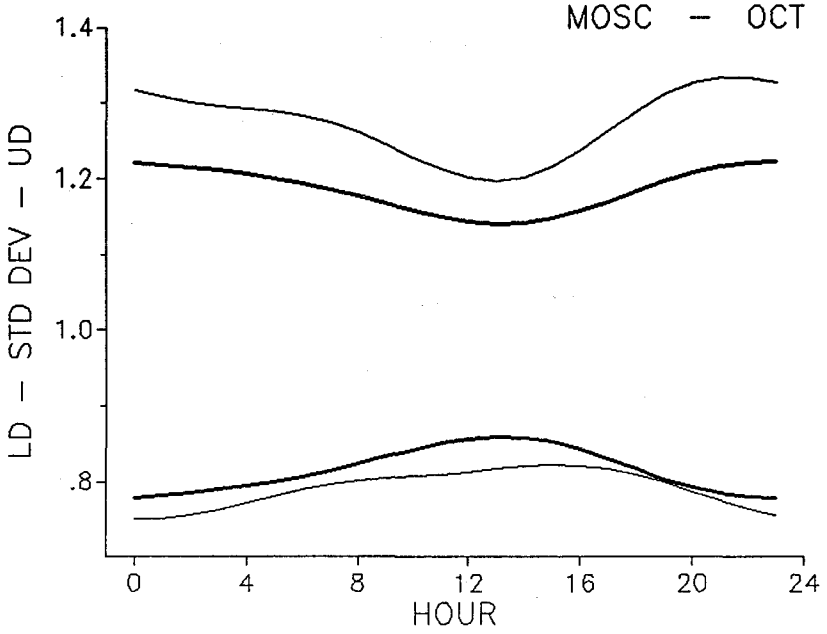
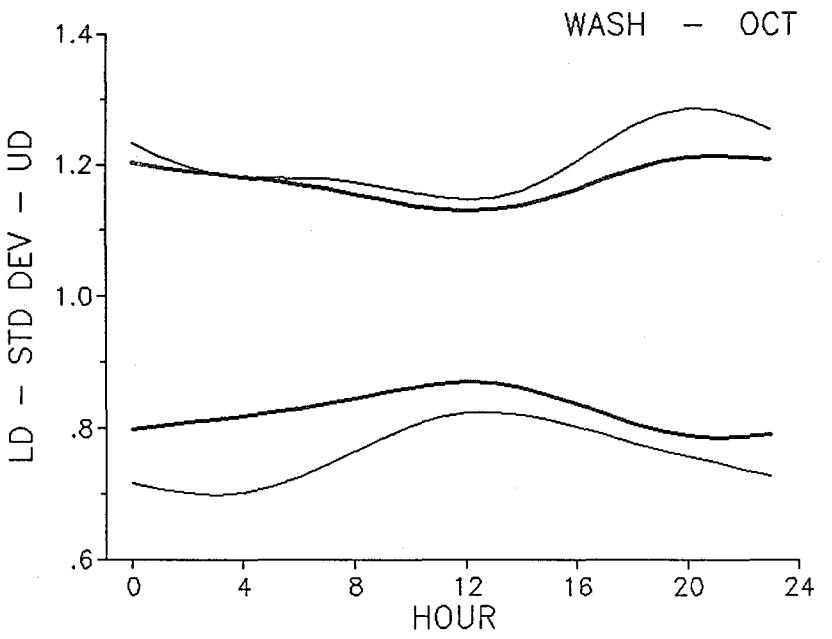


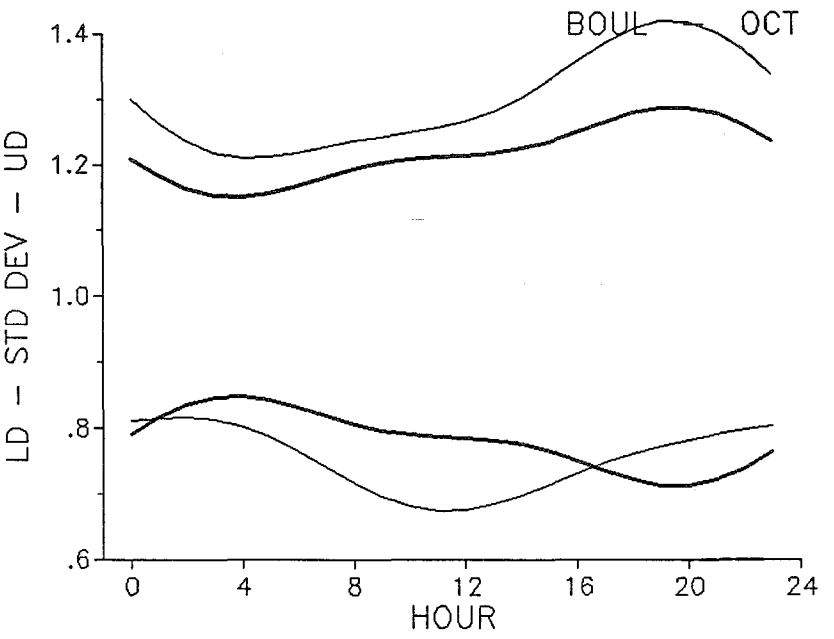


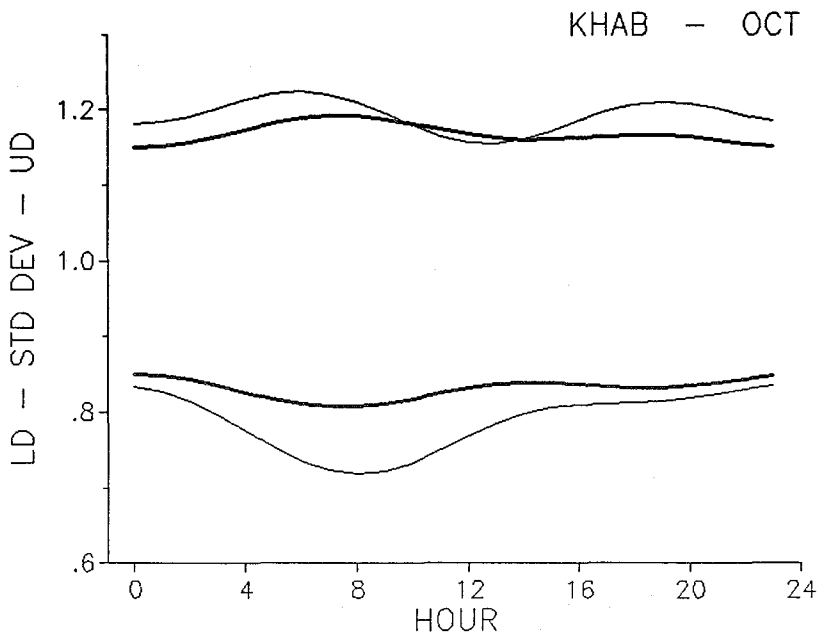


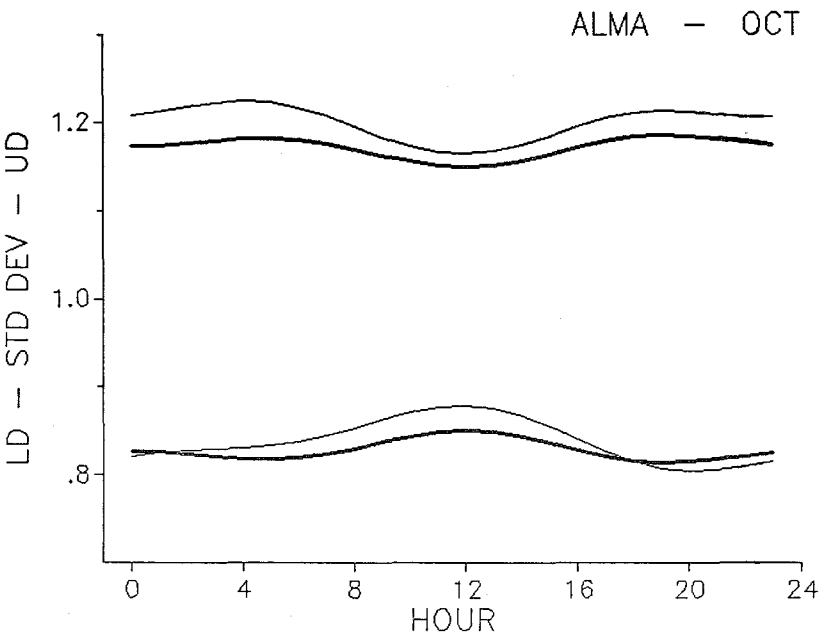


ACTIVE MAGNETIC -- LOW SSN









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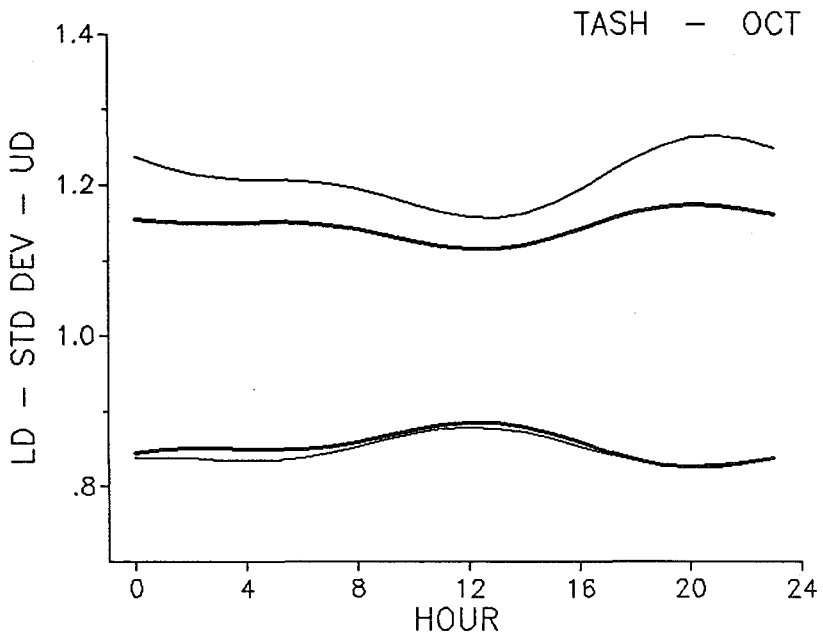
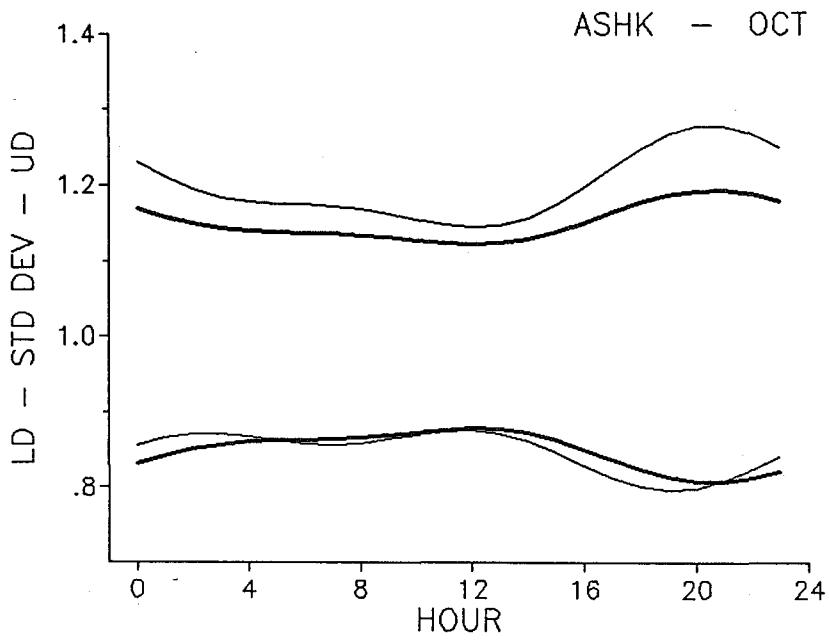
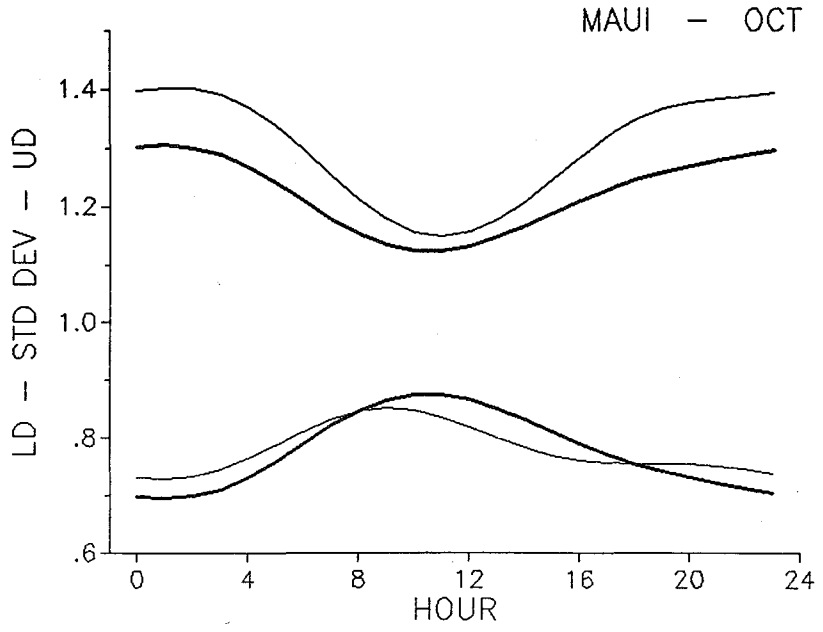
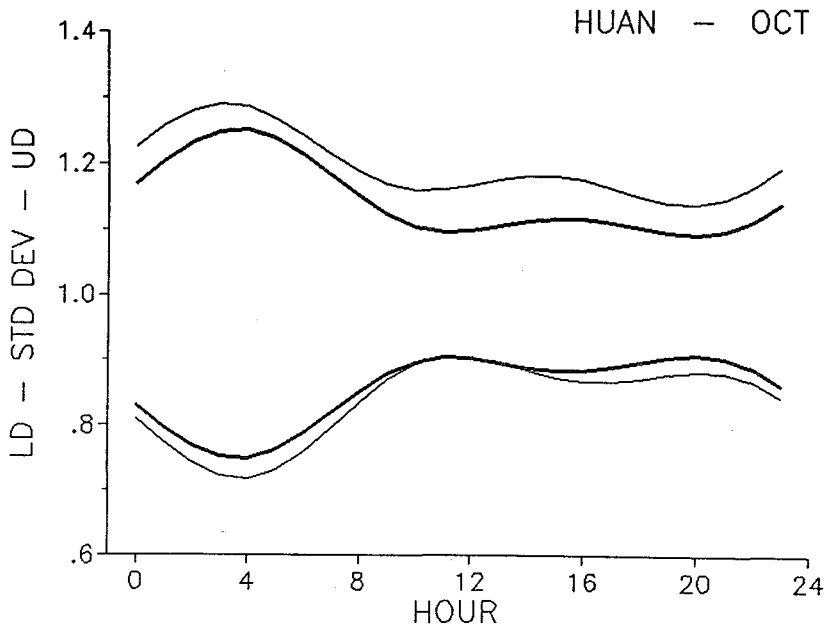
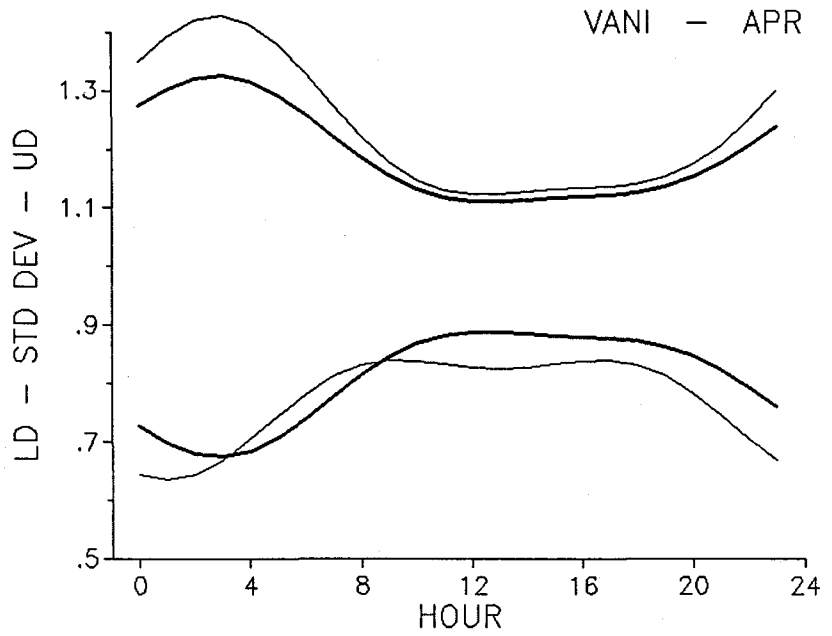


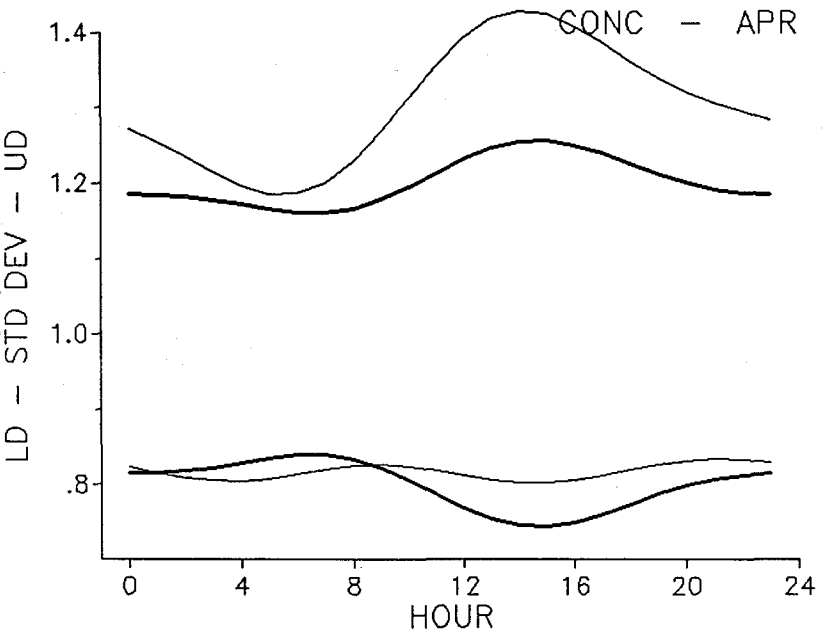


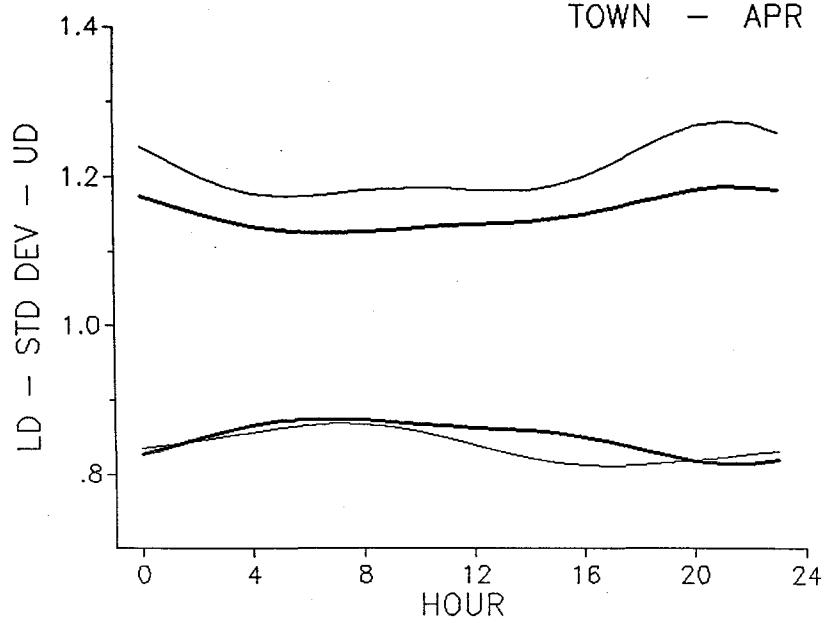


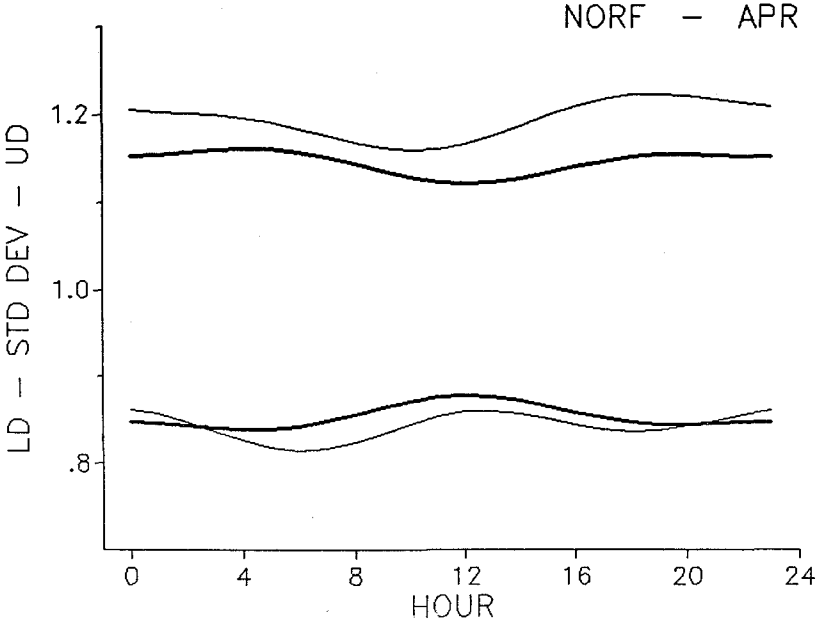


ACTIVE MAGNETIC -- LOW SSN

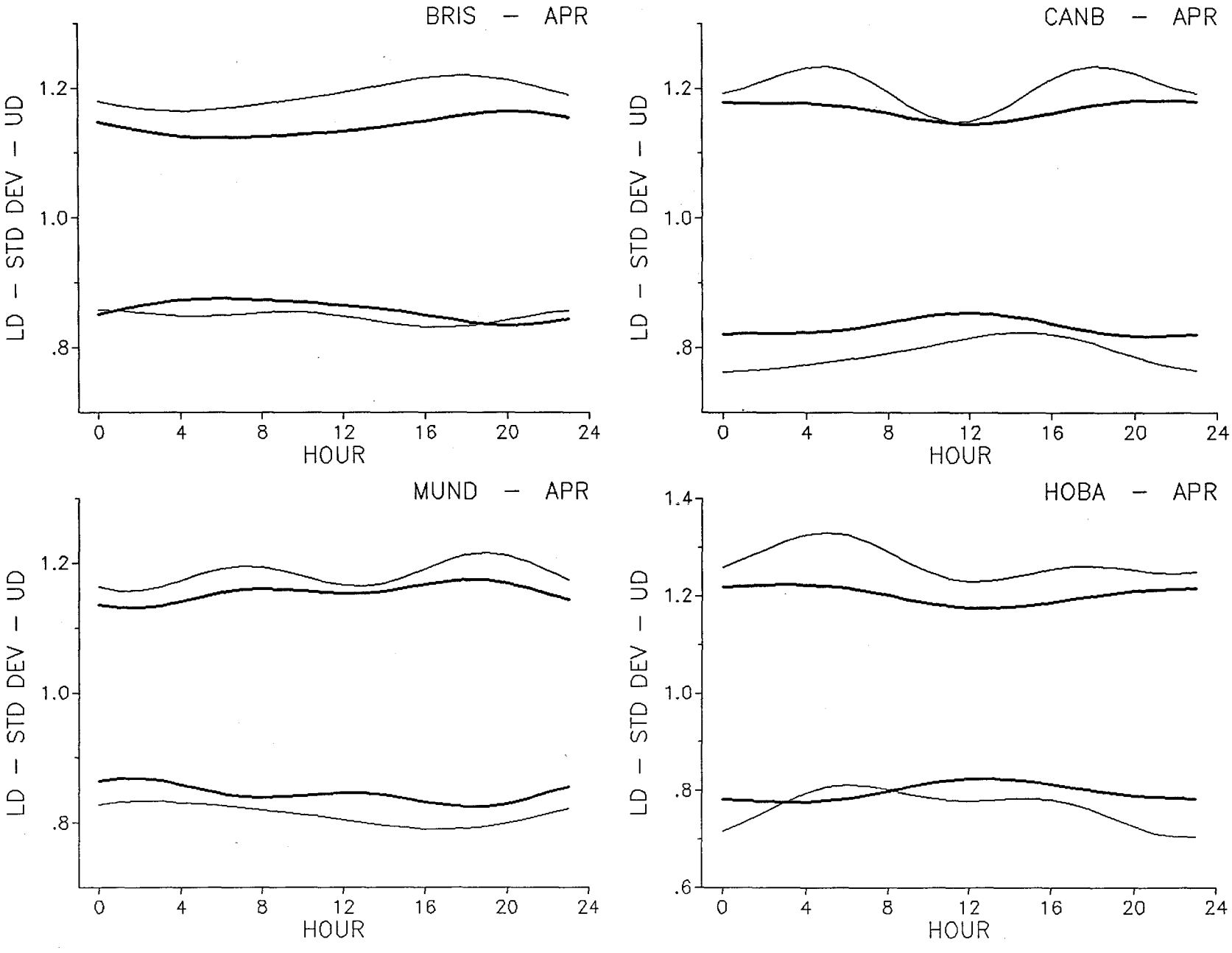




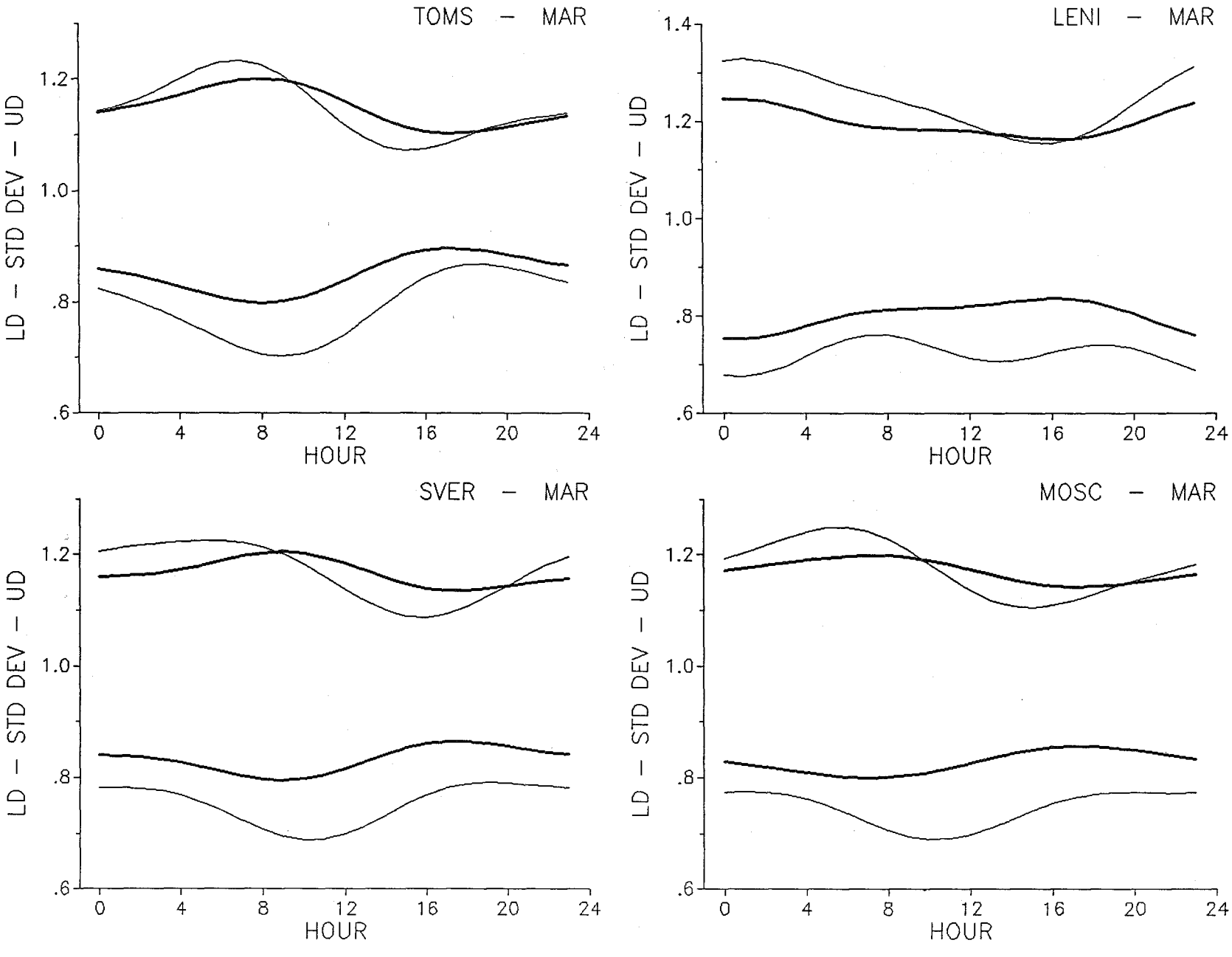




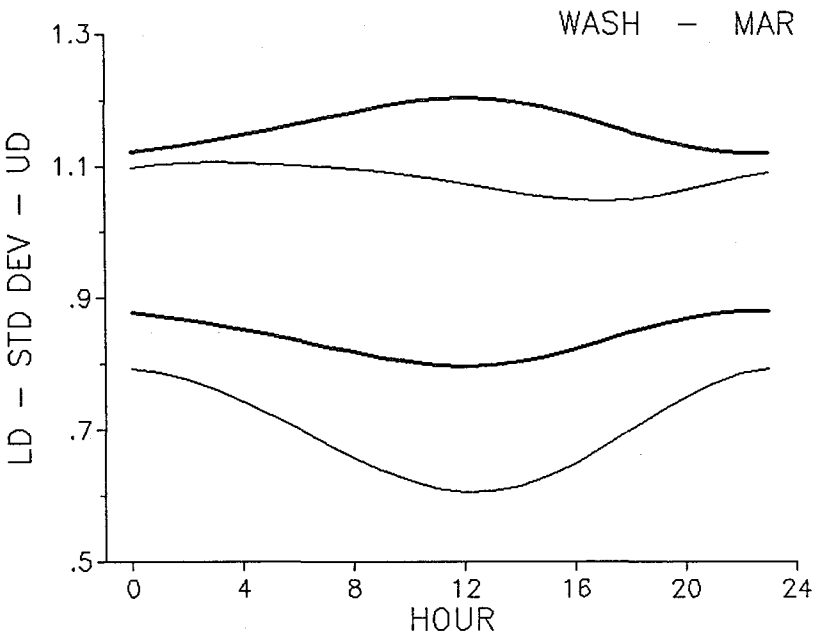
ACTIVE MAGNETIC -- LOW SSN

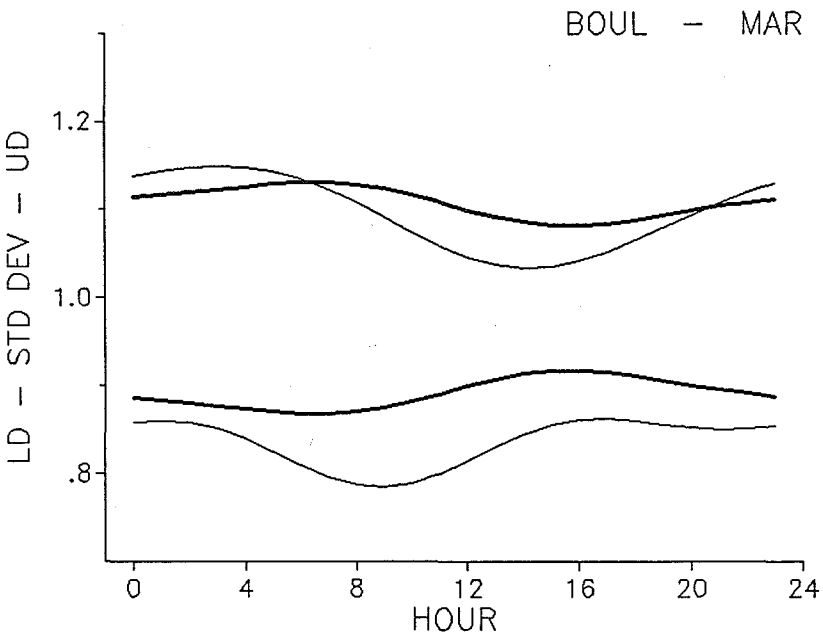


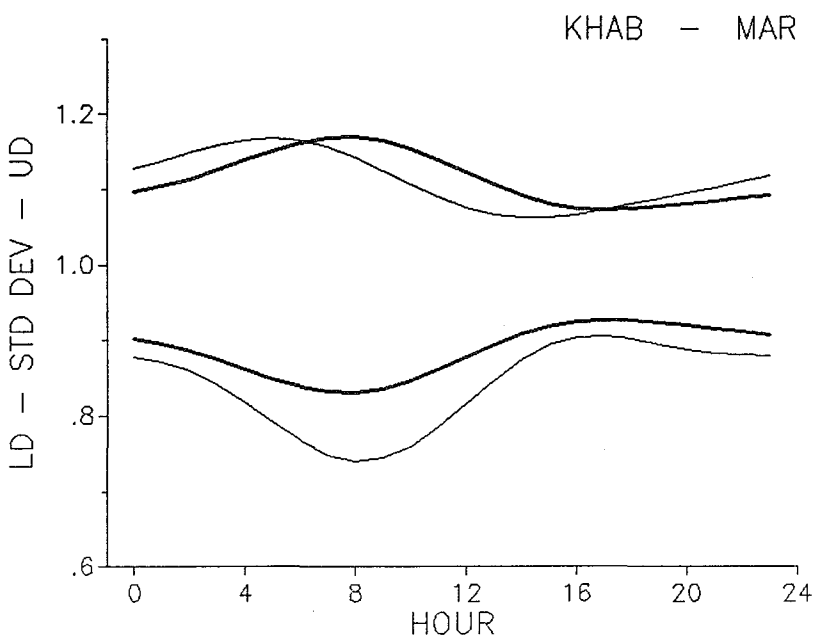
ACTIVE MAGNETIC -- HIGH SSN

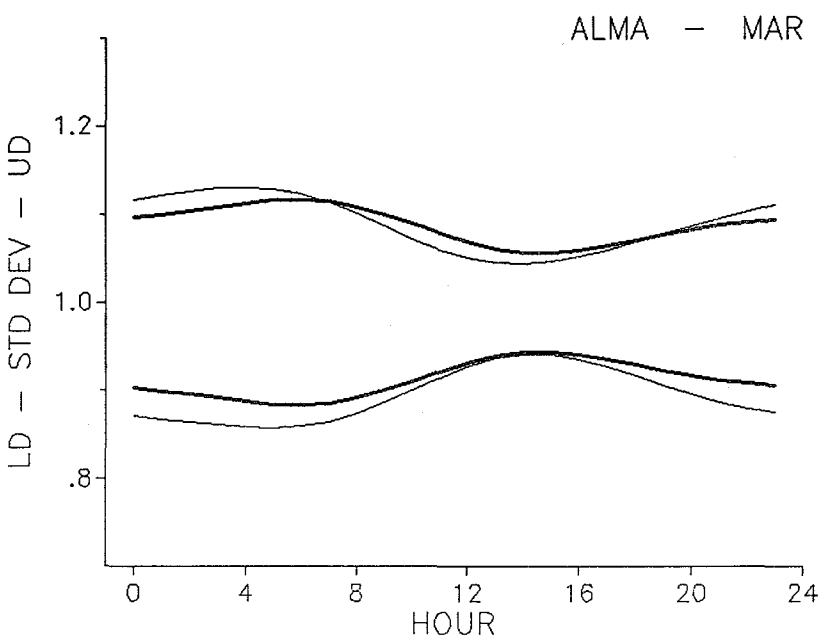


ACTIVE MAGNETIC -- HIGH SSN

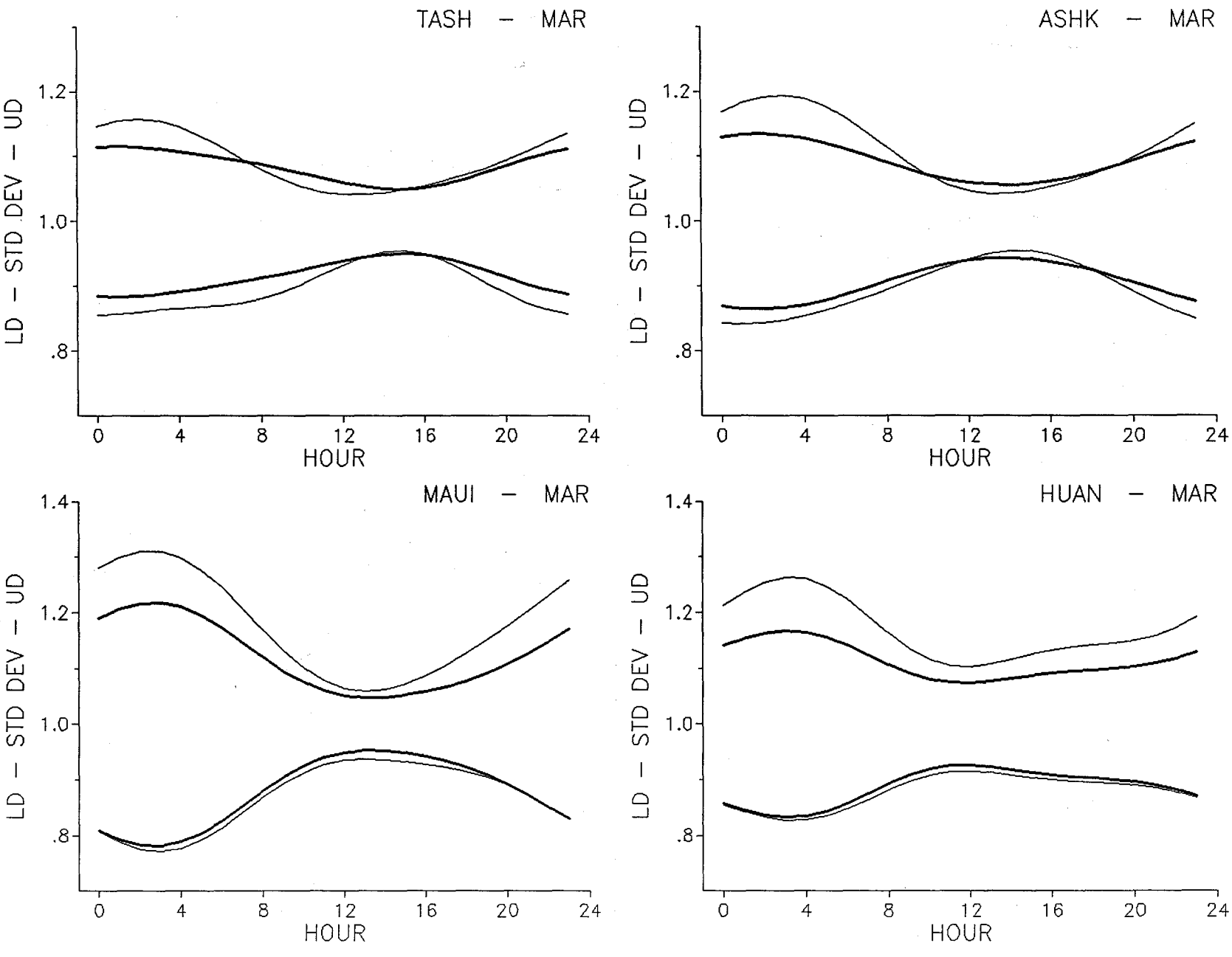




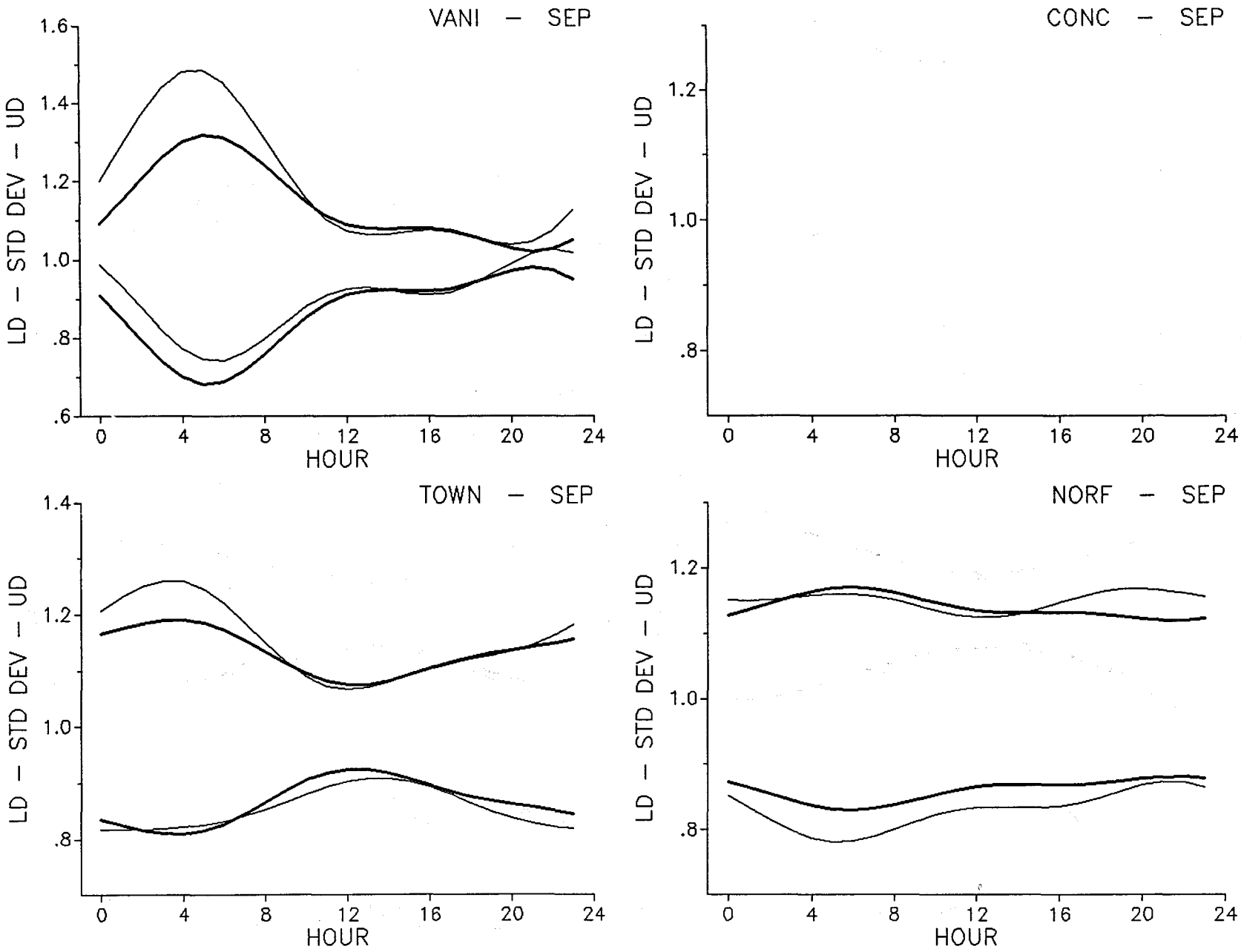




ACTIVE MAGNETIC -- HIGH SSN



ACTIVE MAGNETIC -- HIGH SSN



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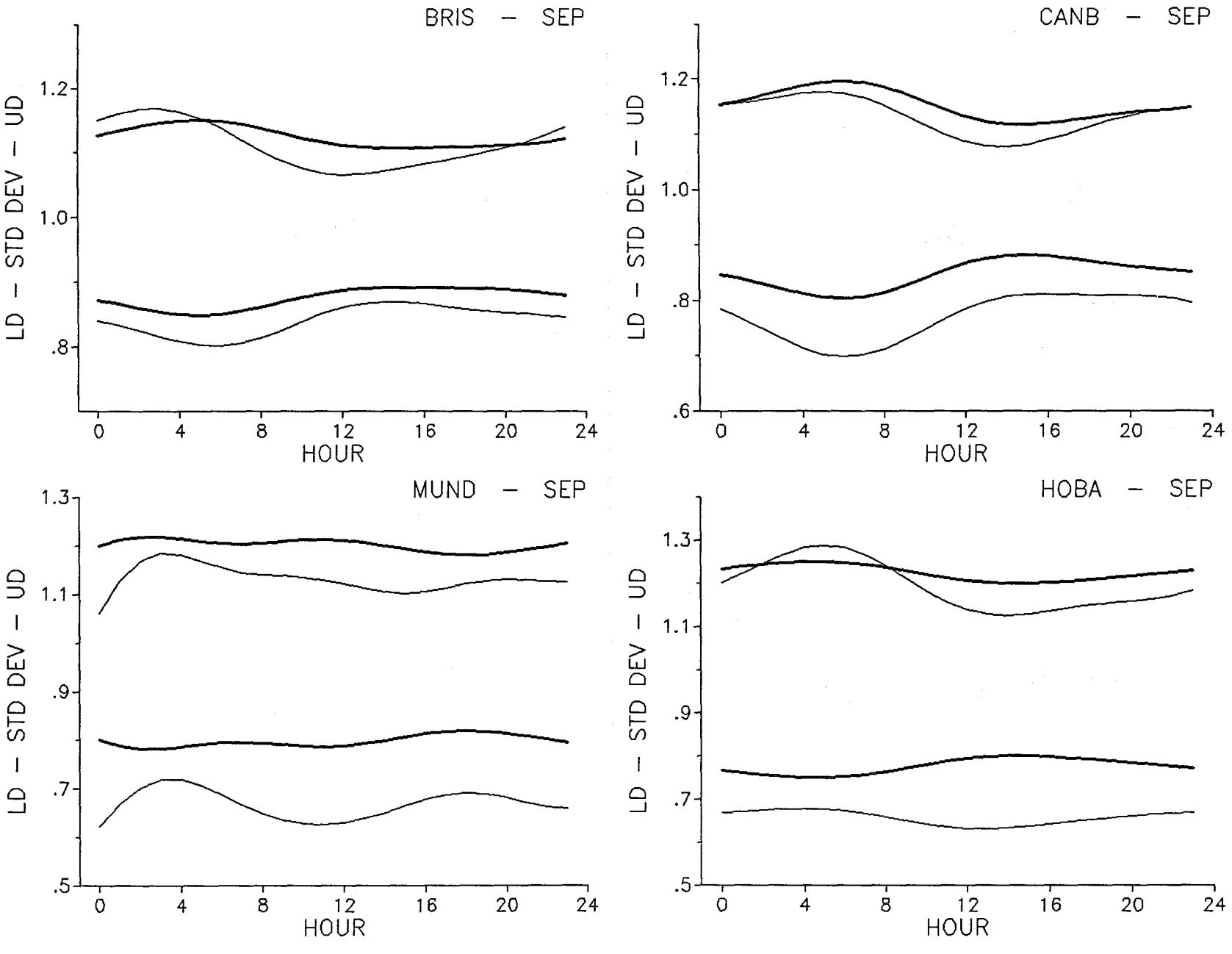
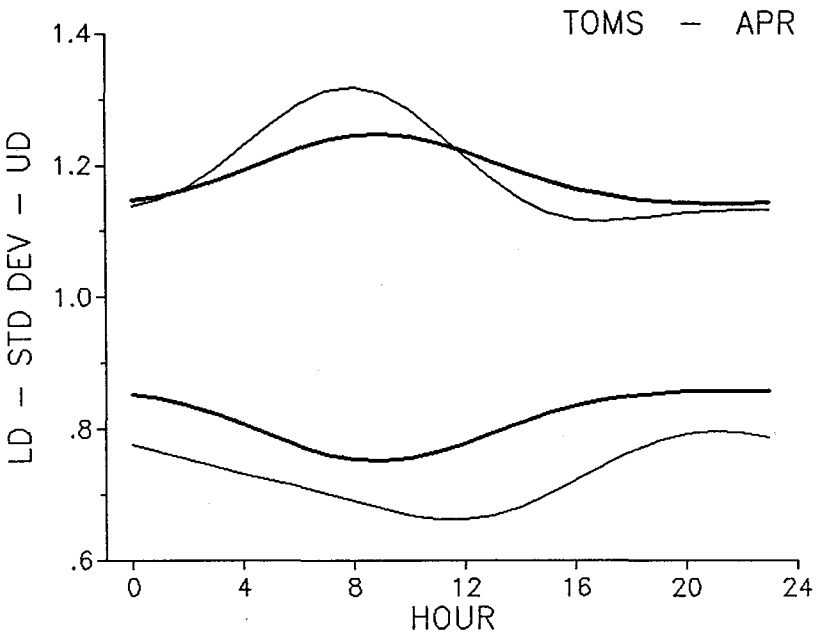
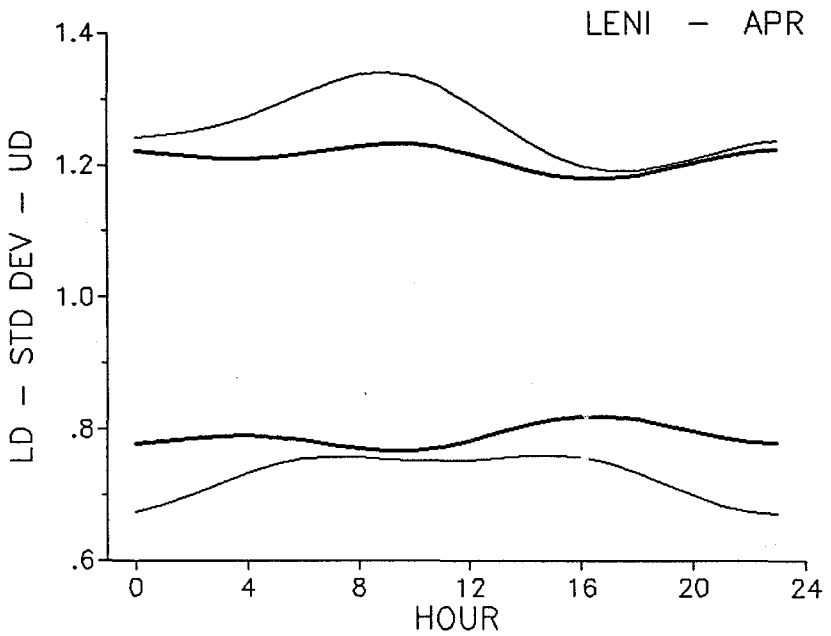
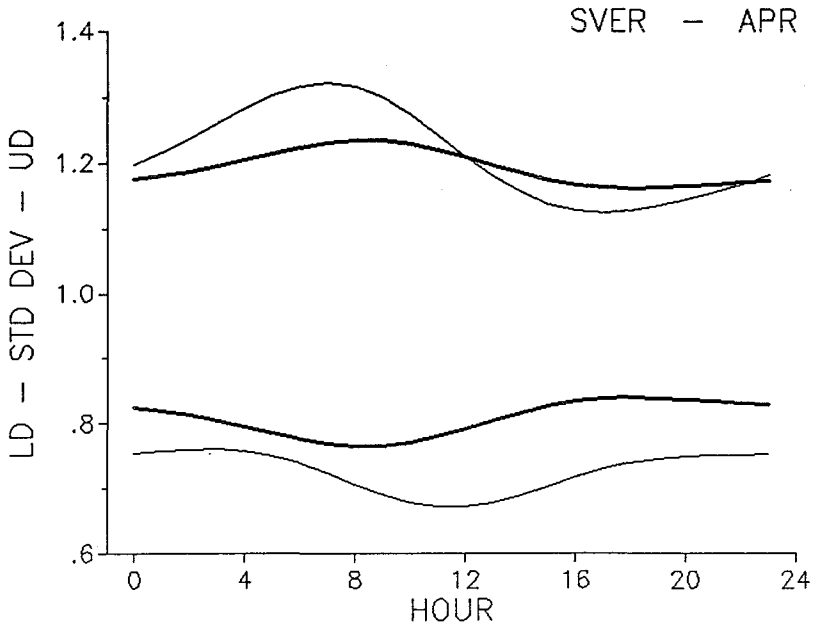
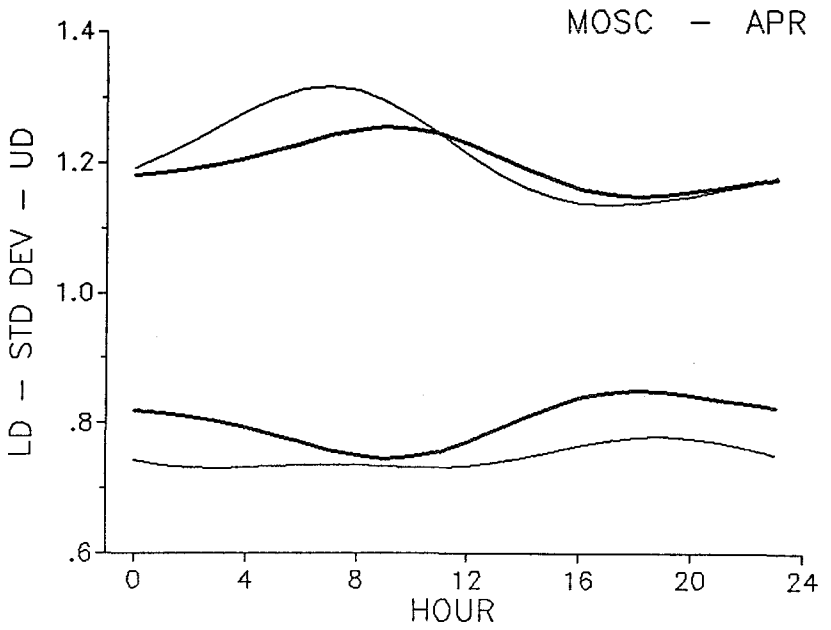


ACTIVE MAGNETIC -- HIGH SSN

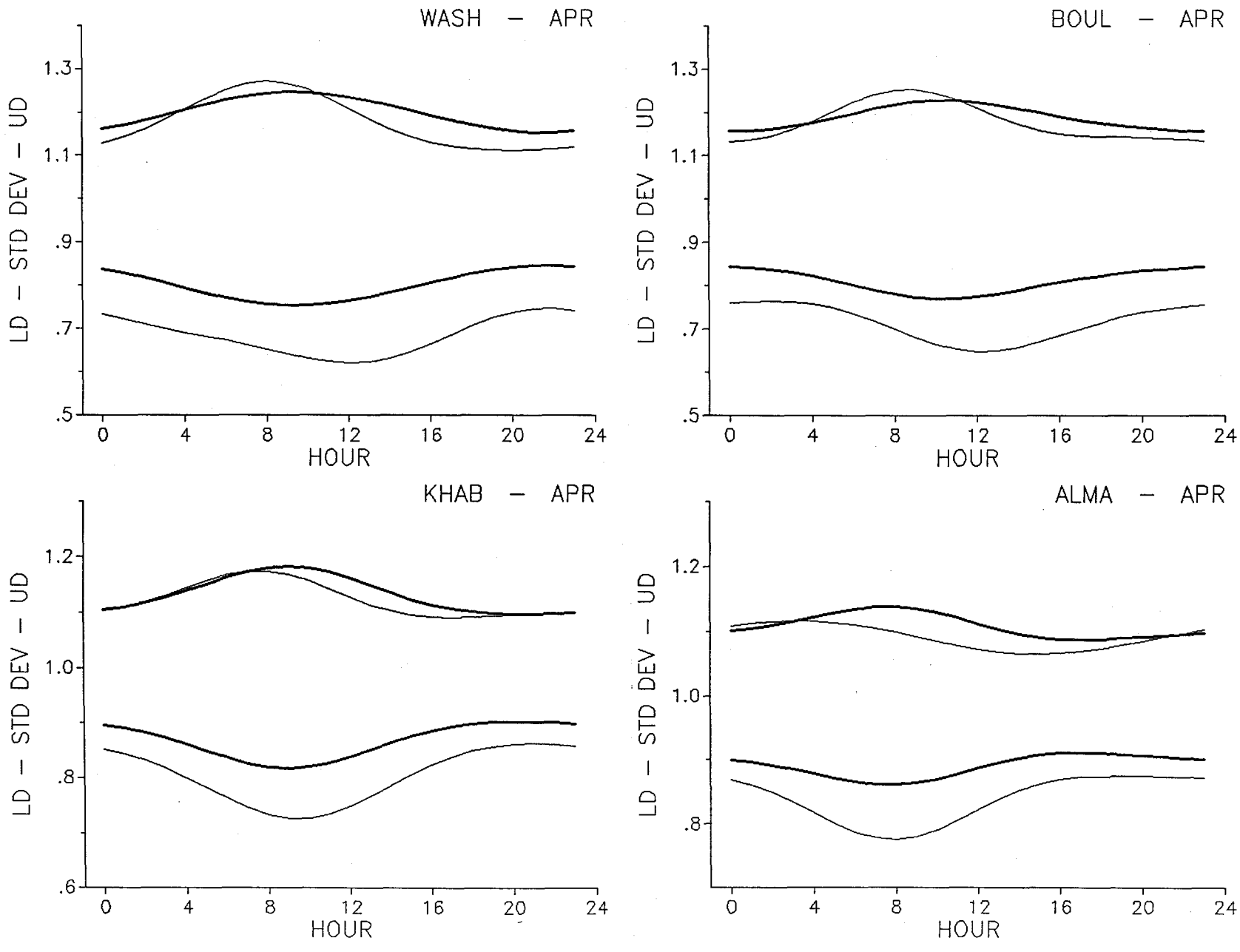








ACTIVE MAGNETIC -- HIGH SSN



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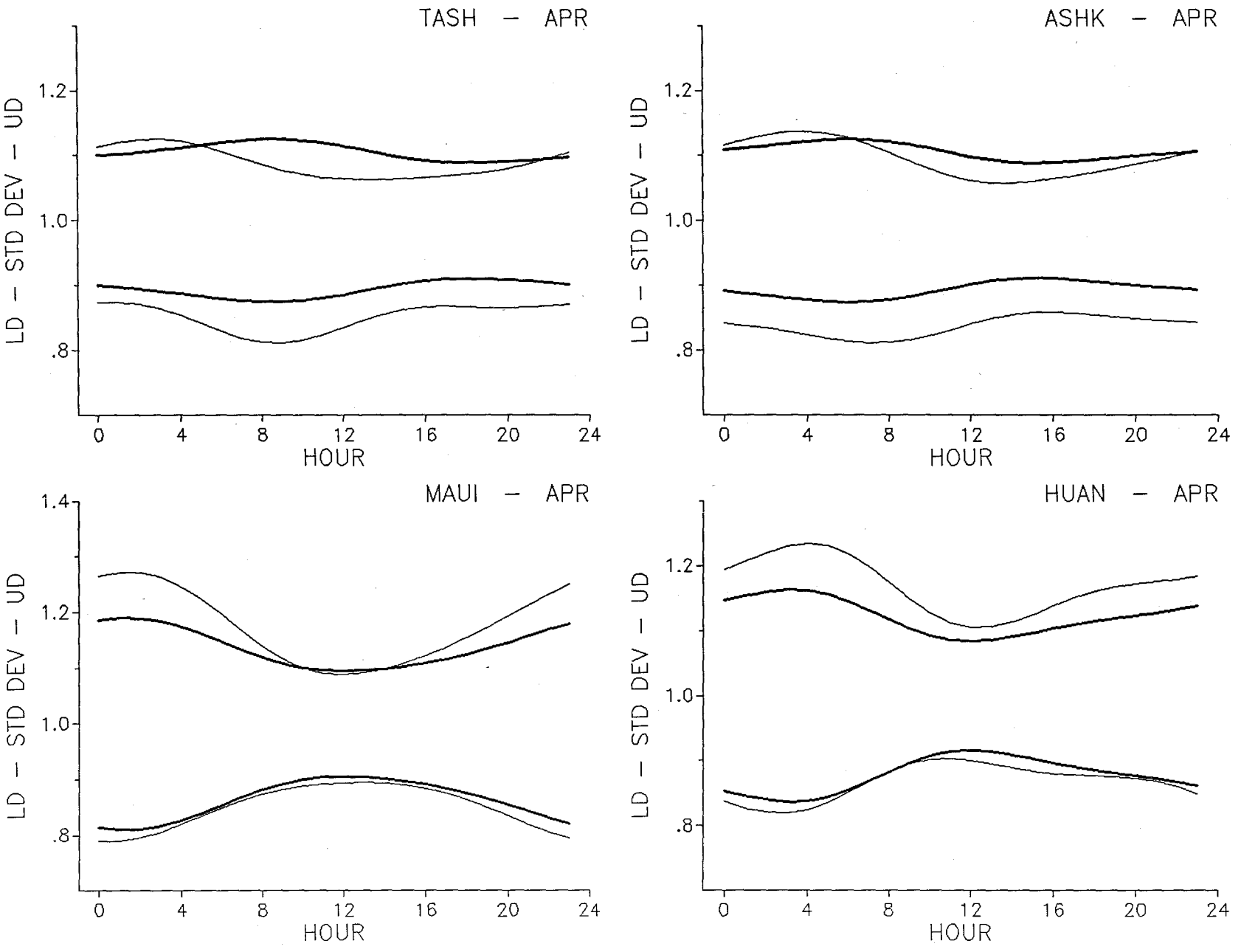

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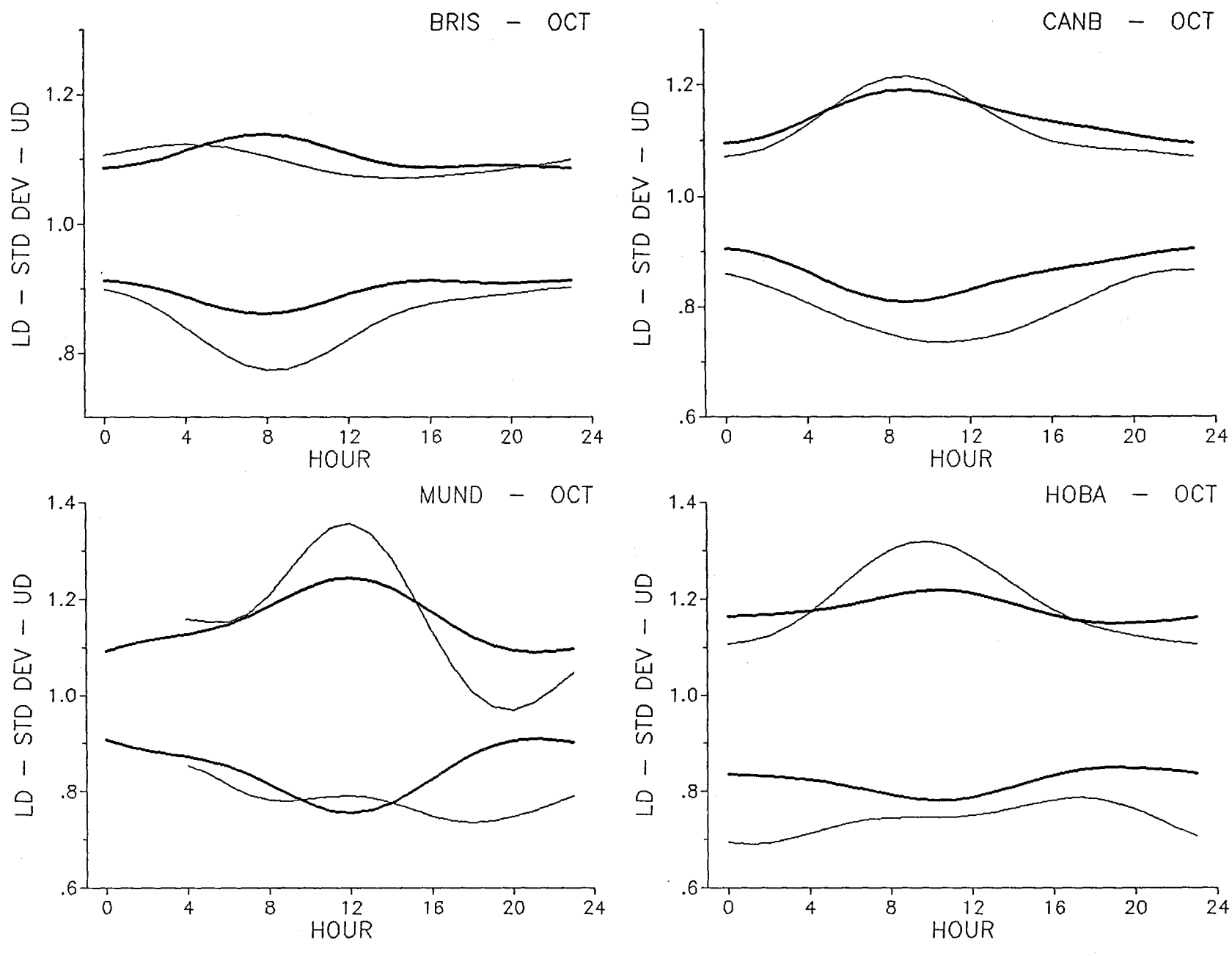
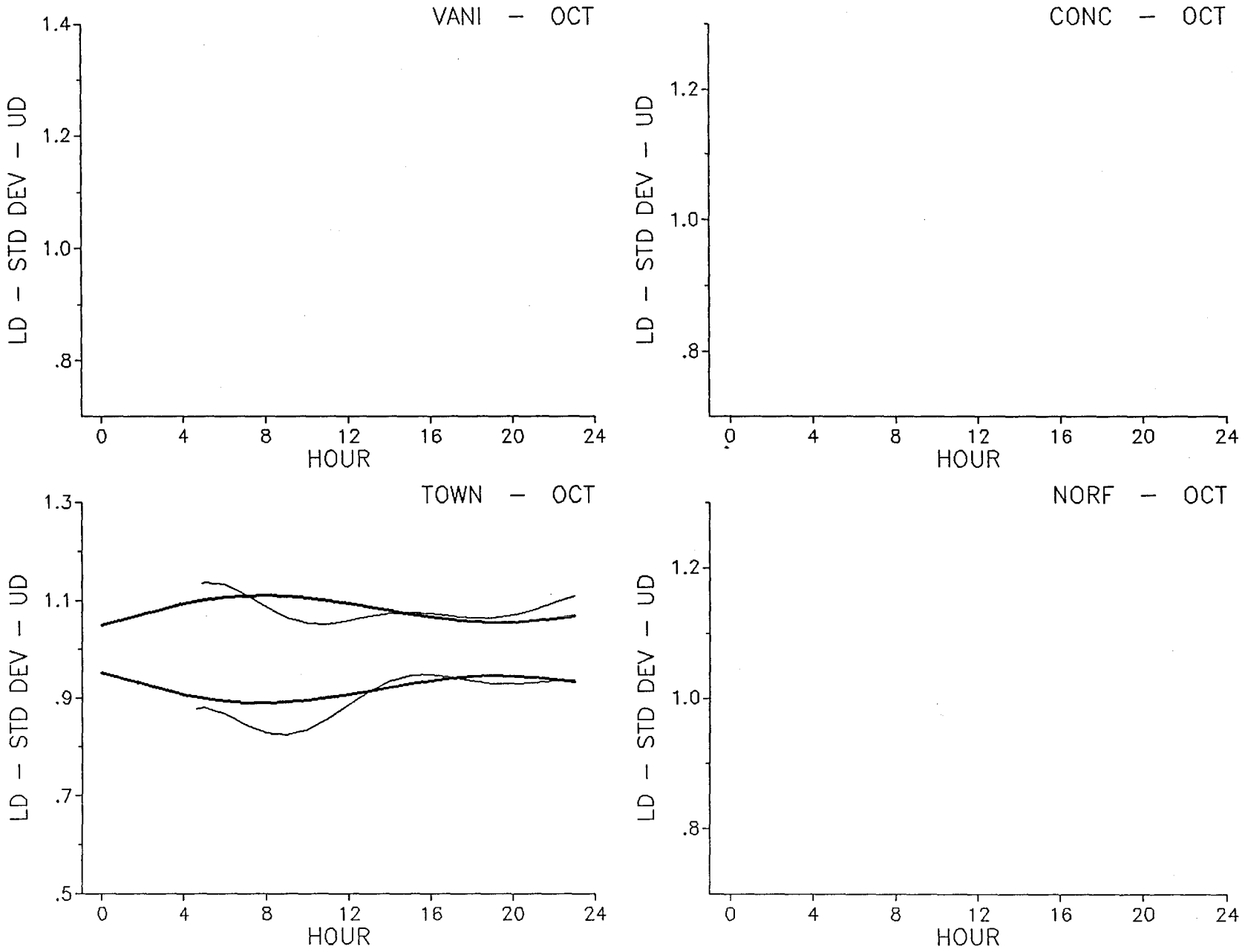


ACTIVE MAGNETIC — HIGH SSN



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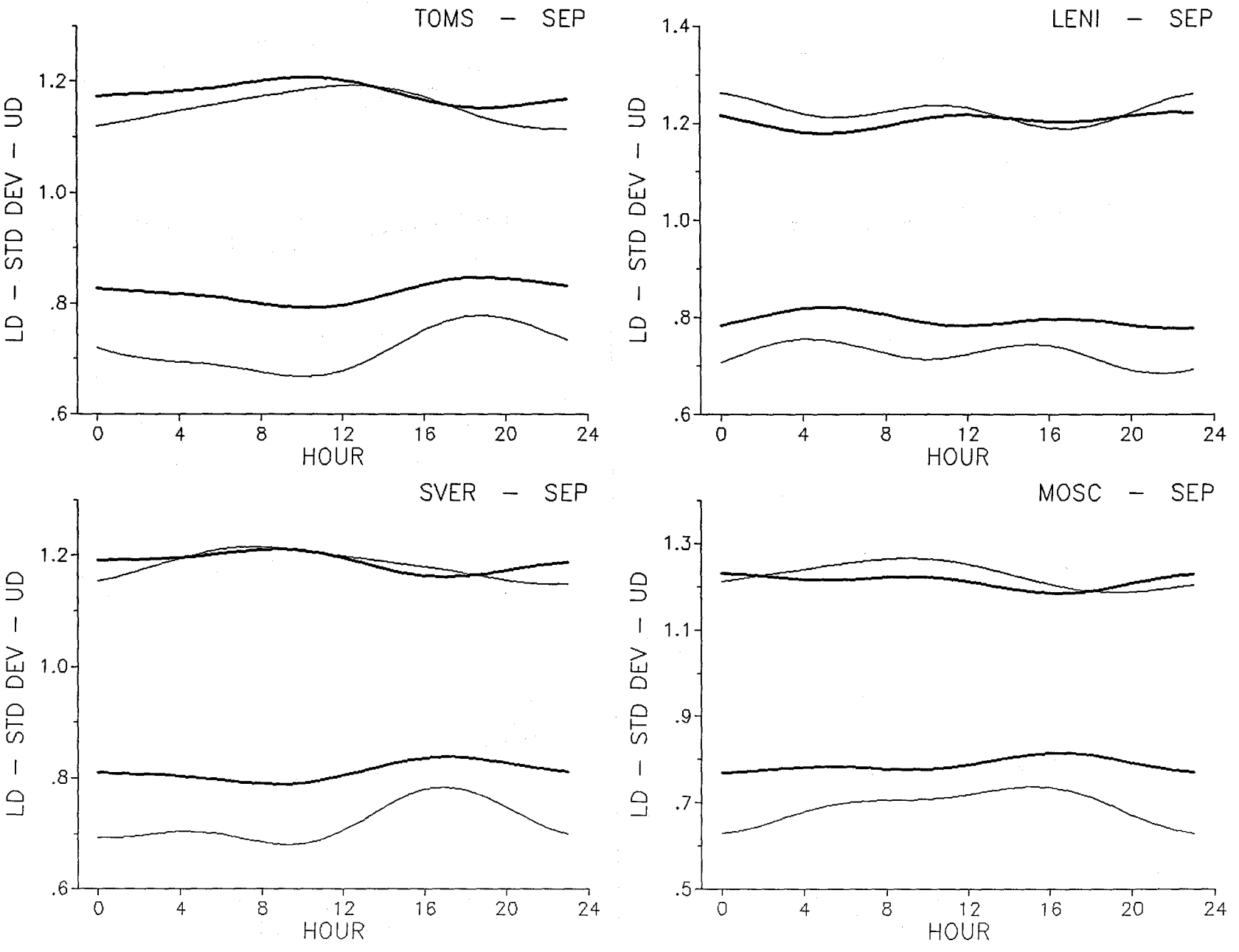
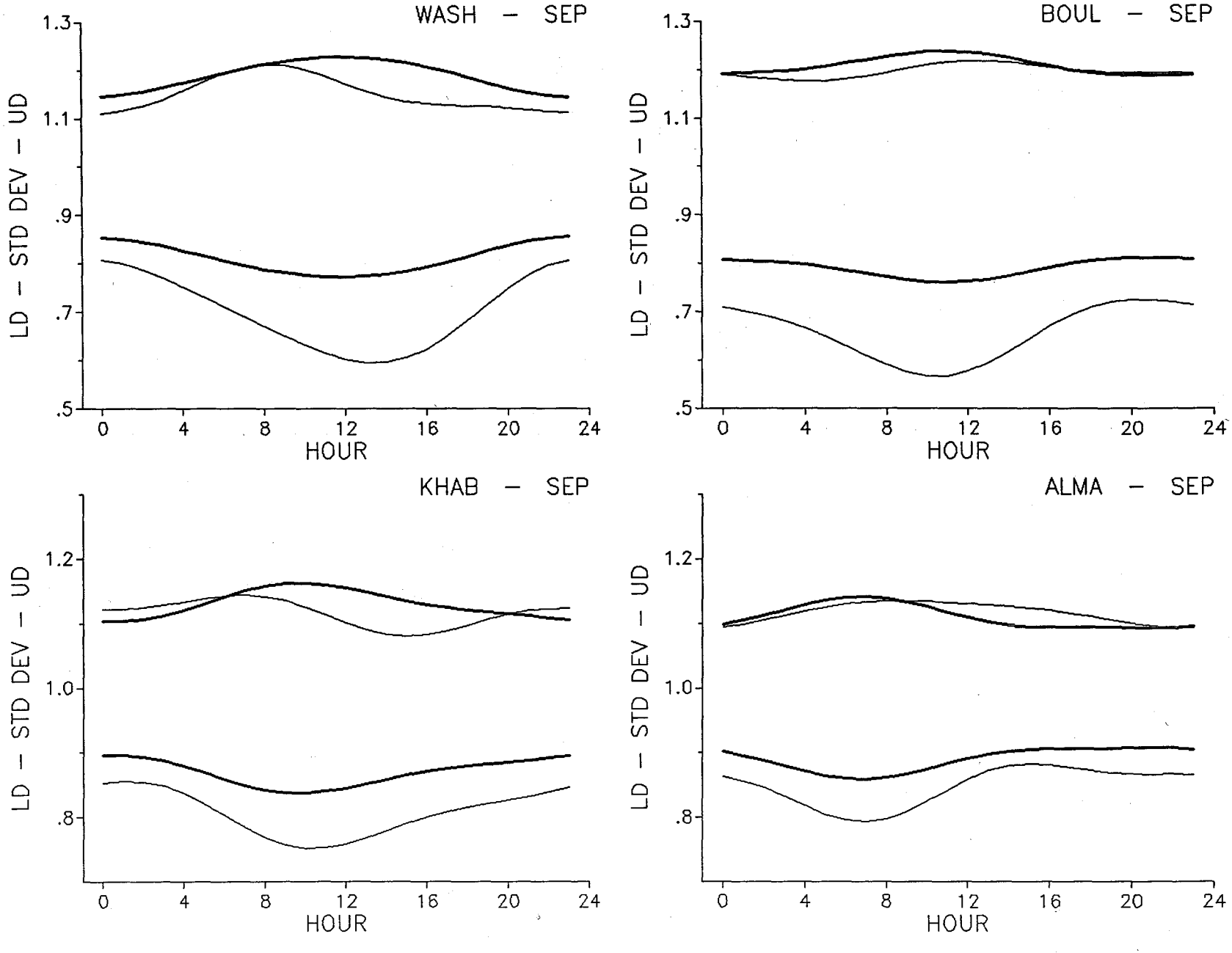
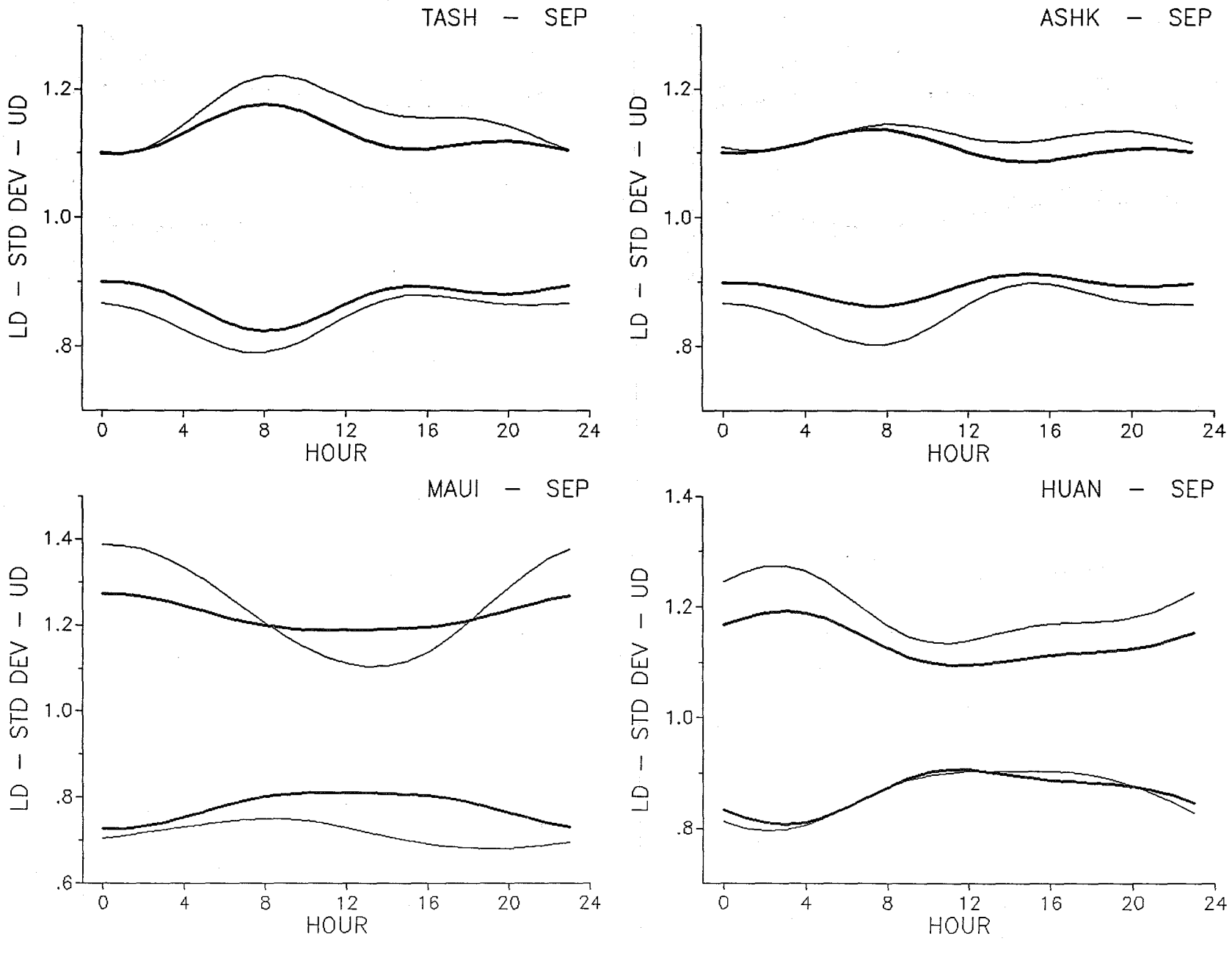


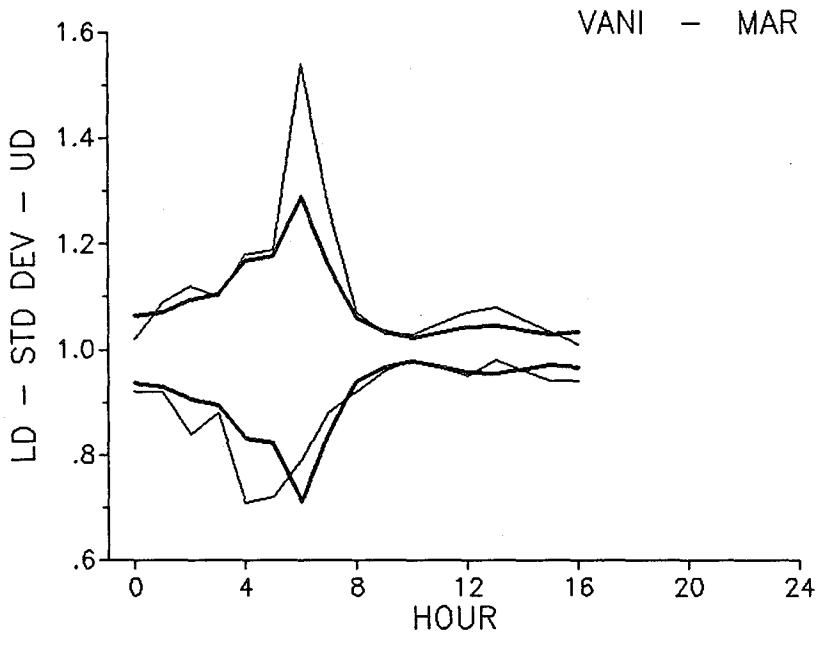
ACTIVE MAGNETIC -- HIGH SSN

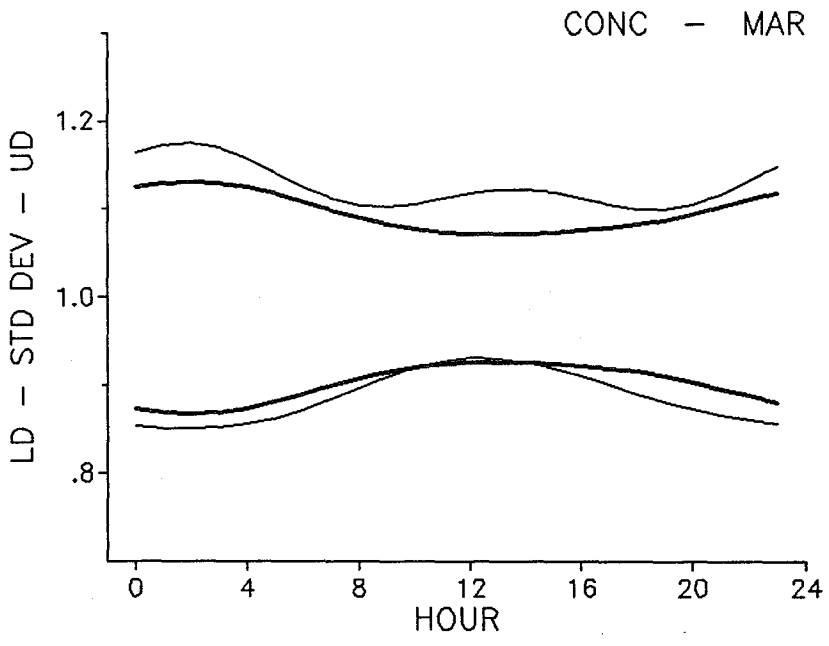


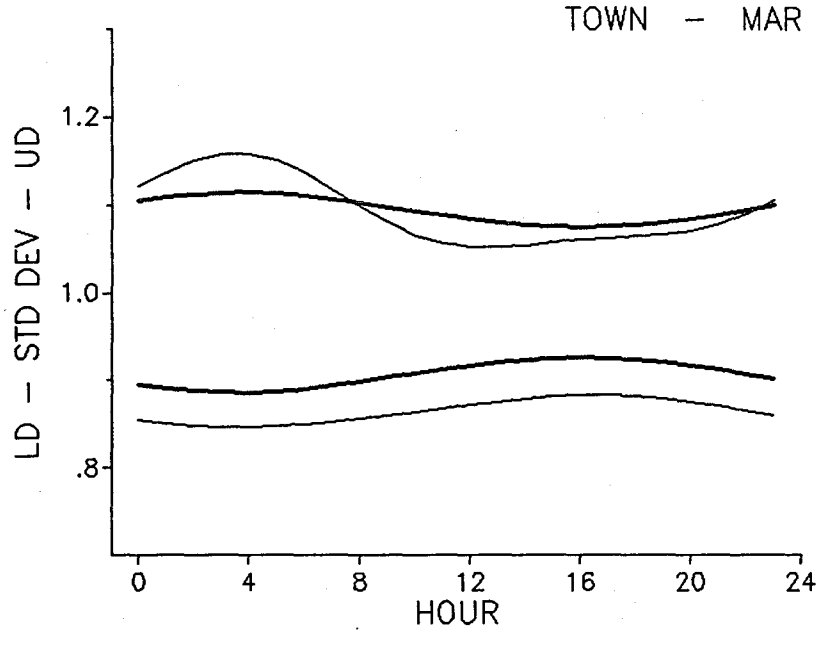
ACTIVE MAGNETIC -- HIGH SSN

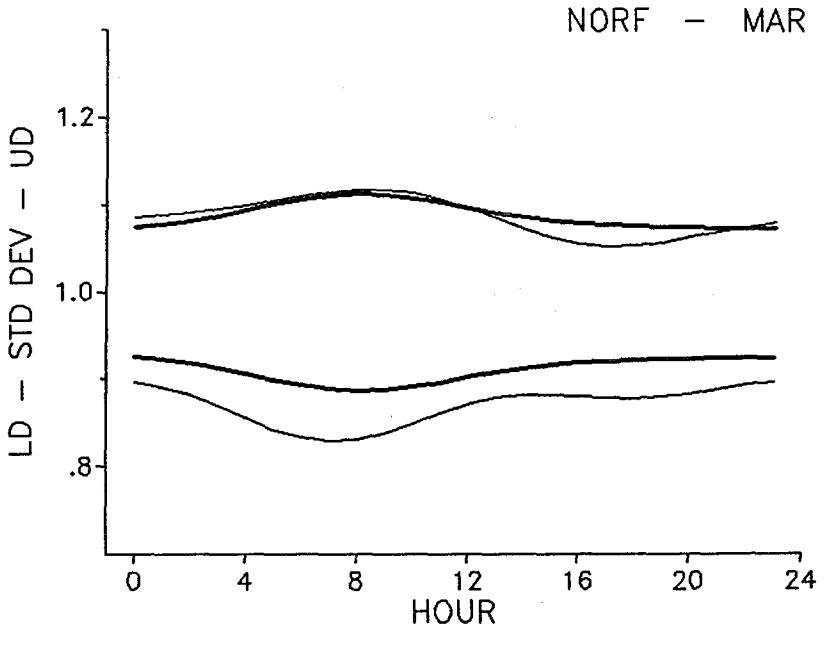


ACTIVE MAGNETIC -- HIGH SSN

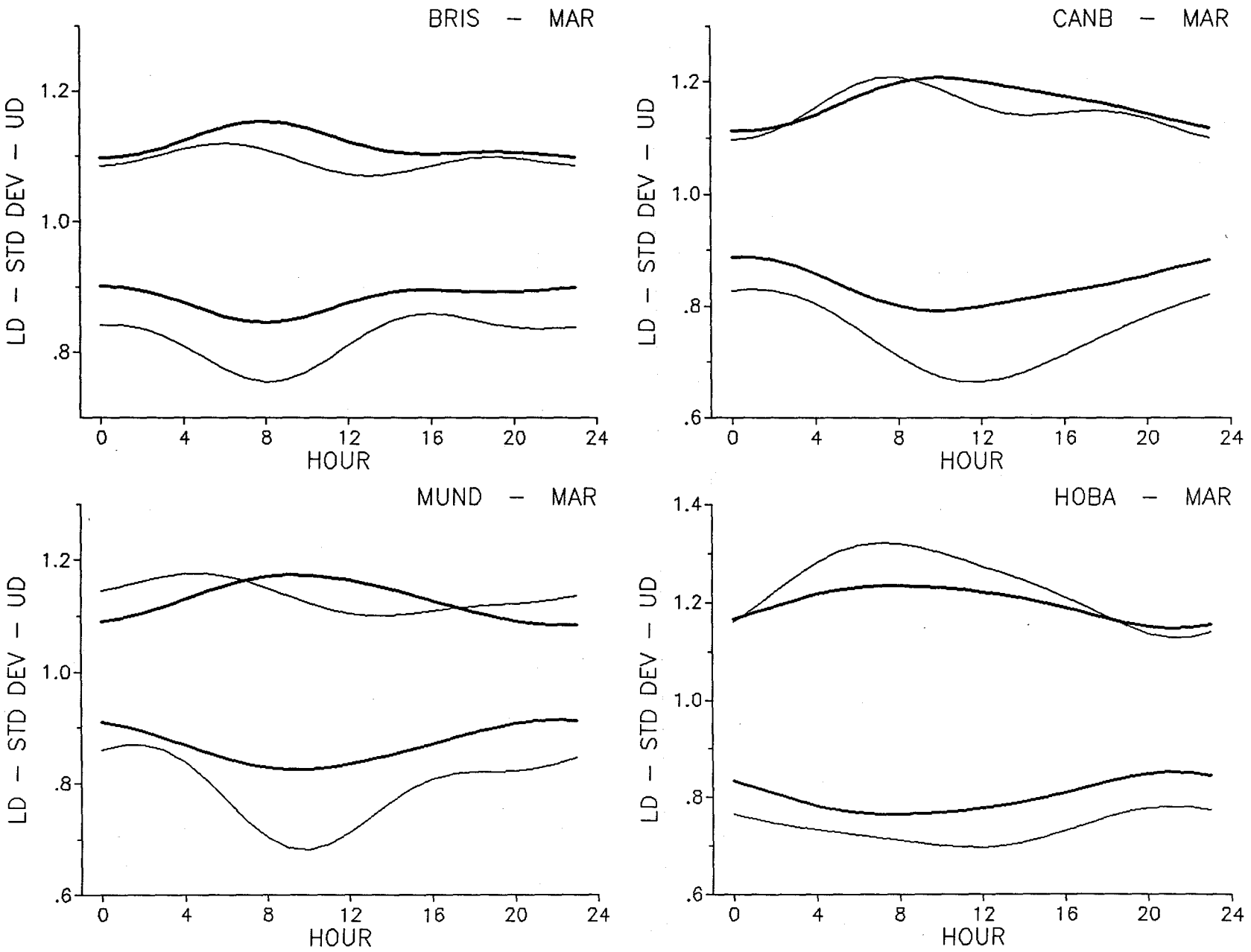








ACTIVE MAGNETIC -- HIGH SSN



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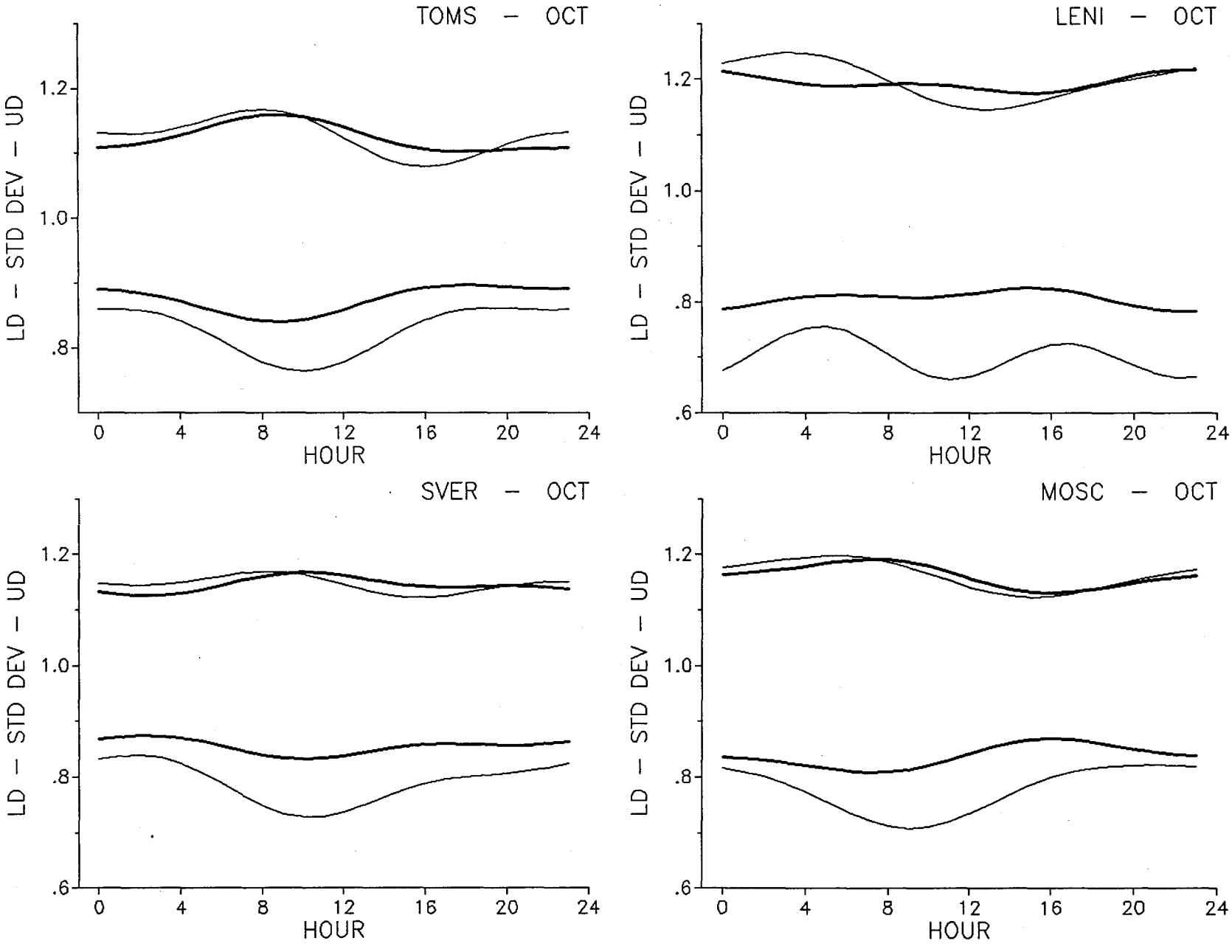

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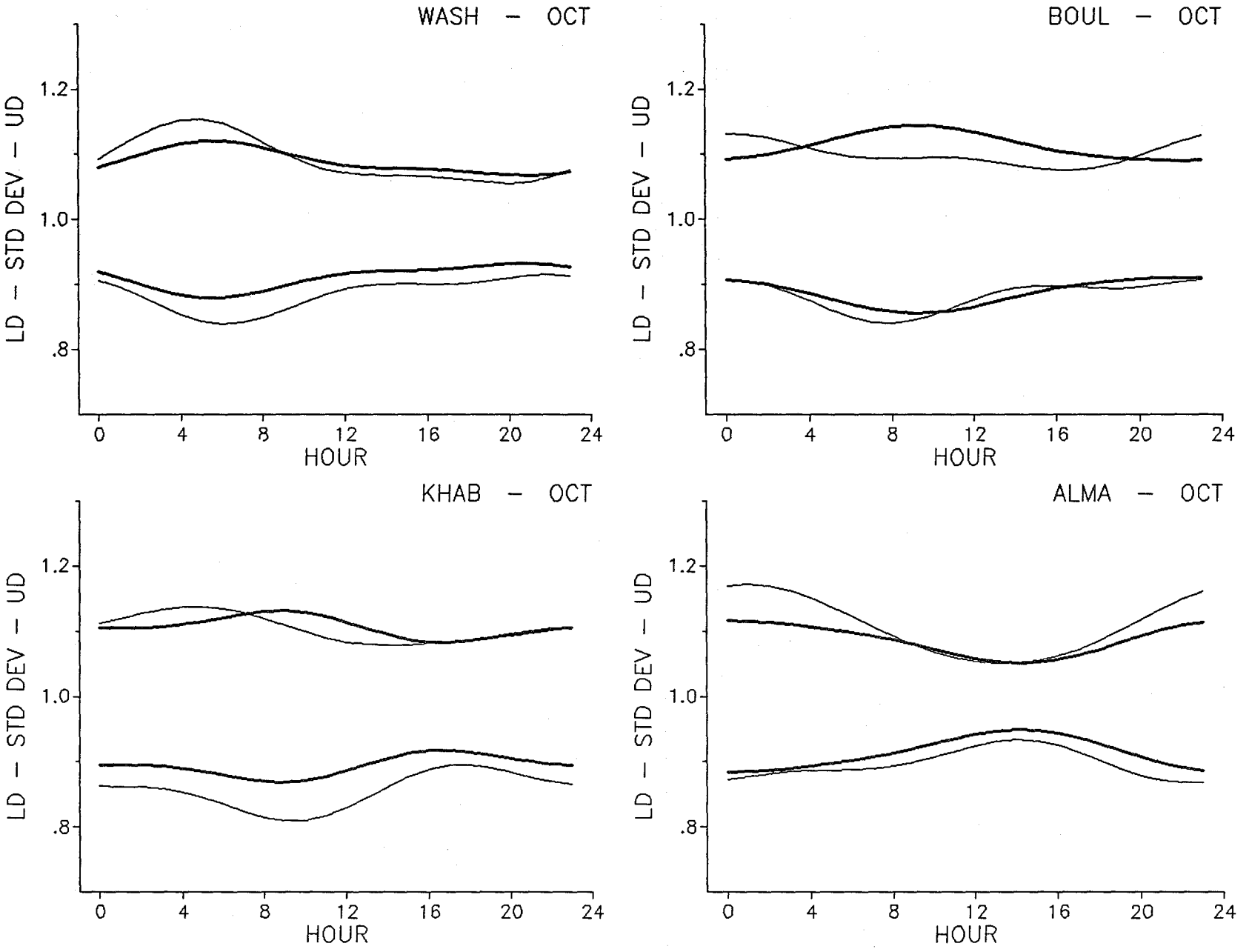

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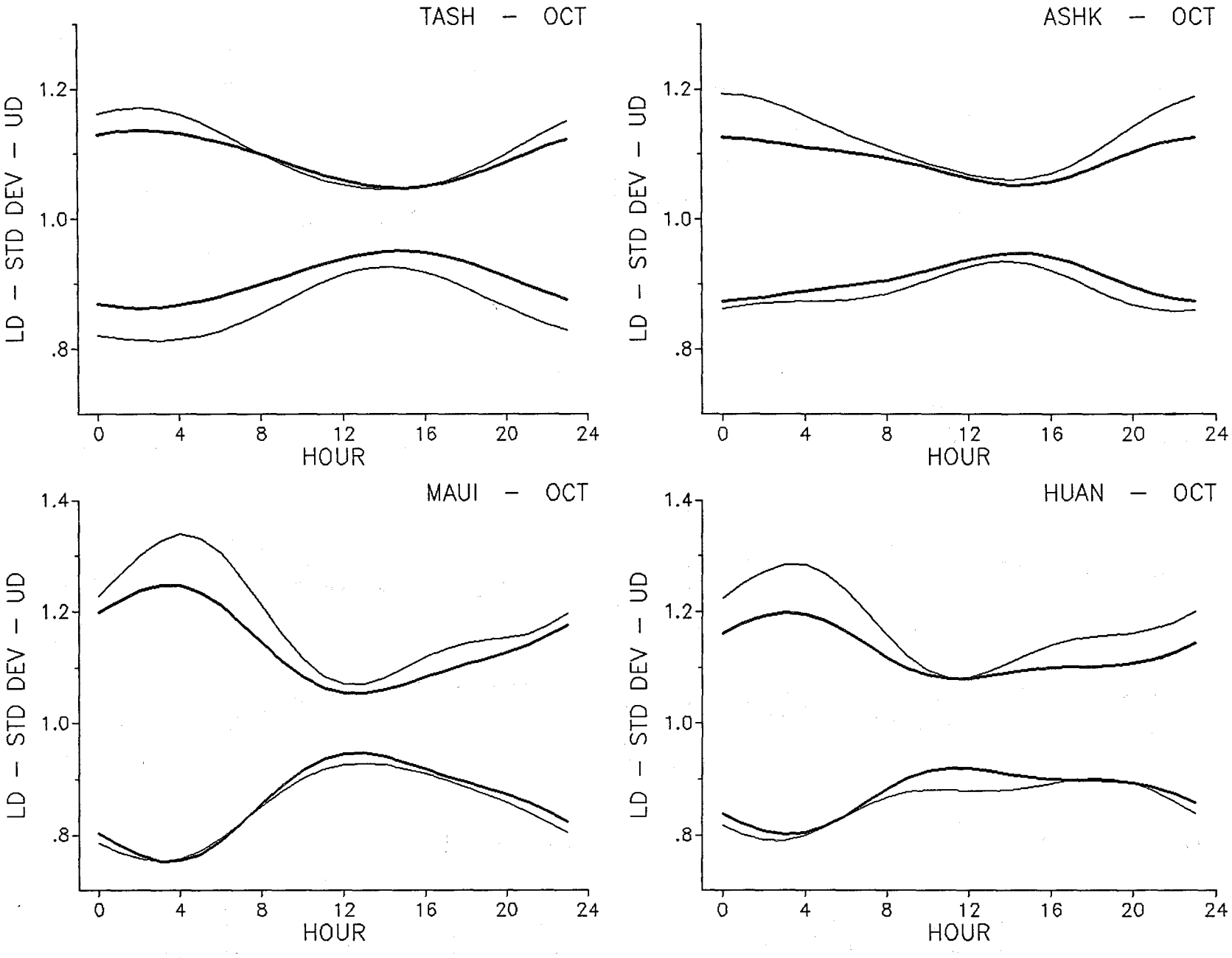

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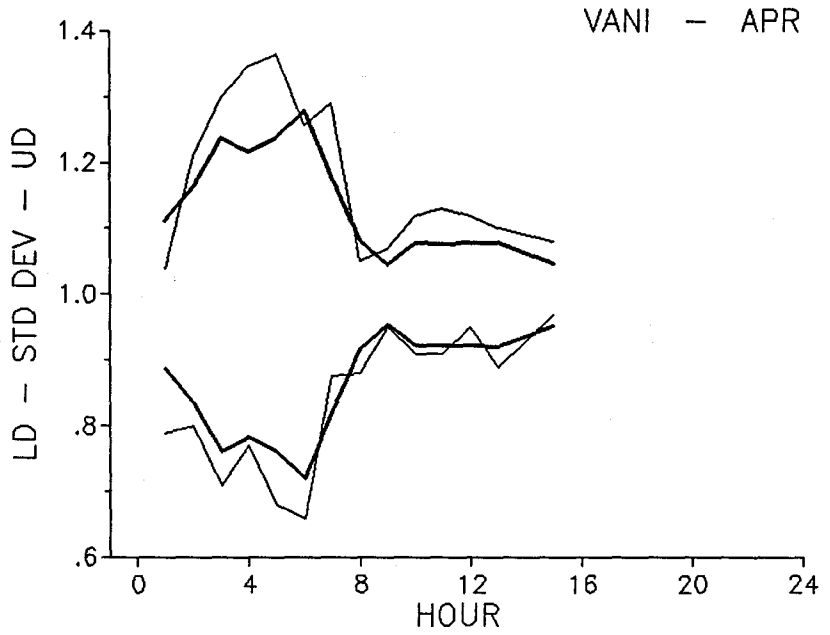

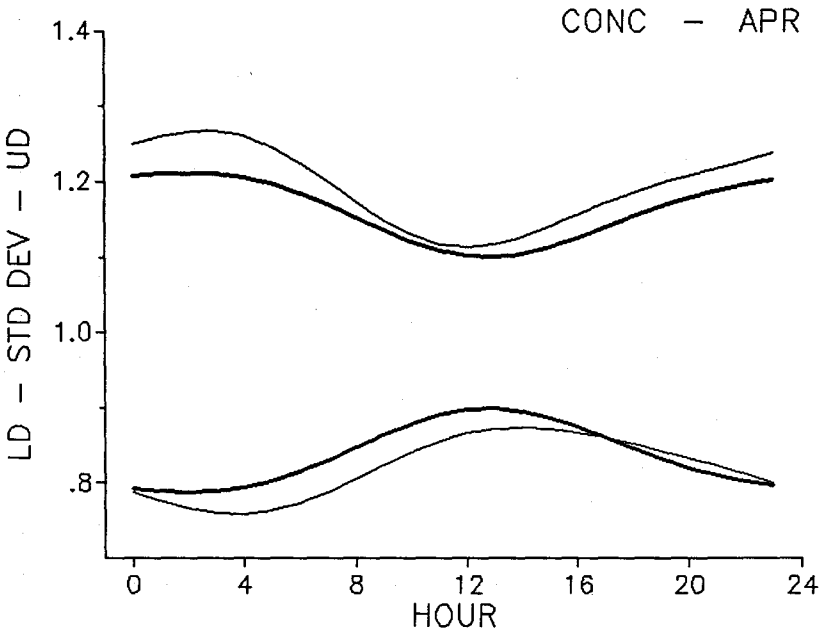

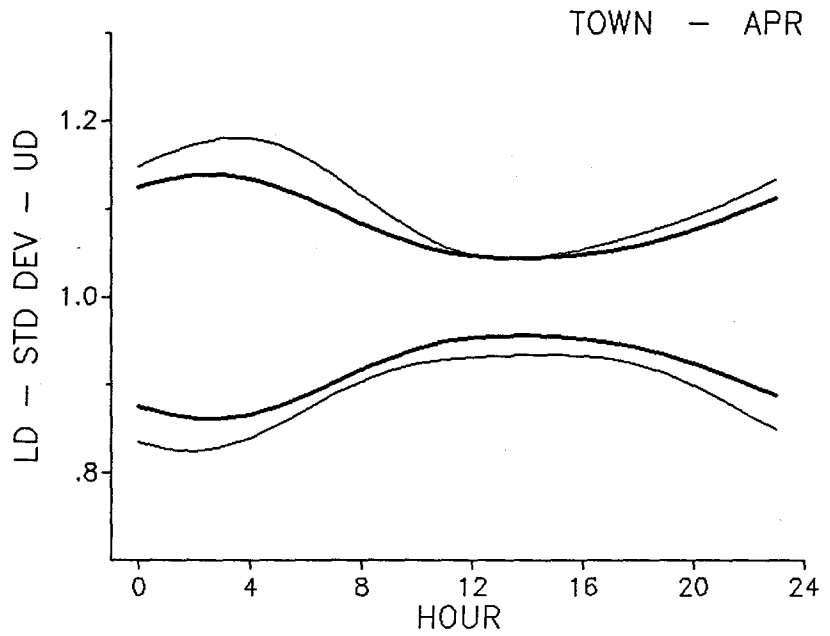

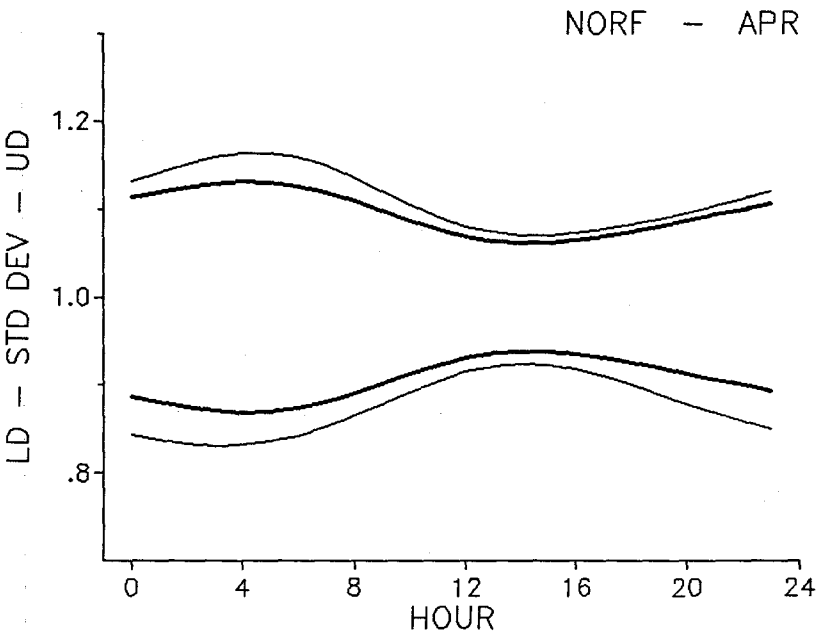

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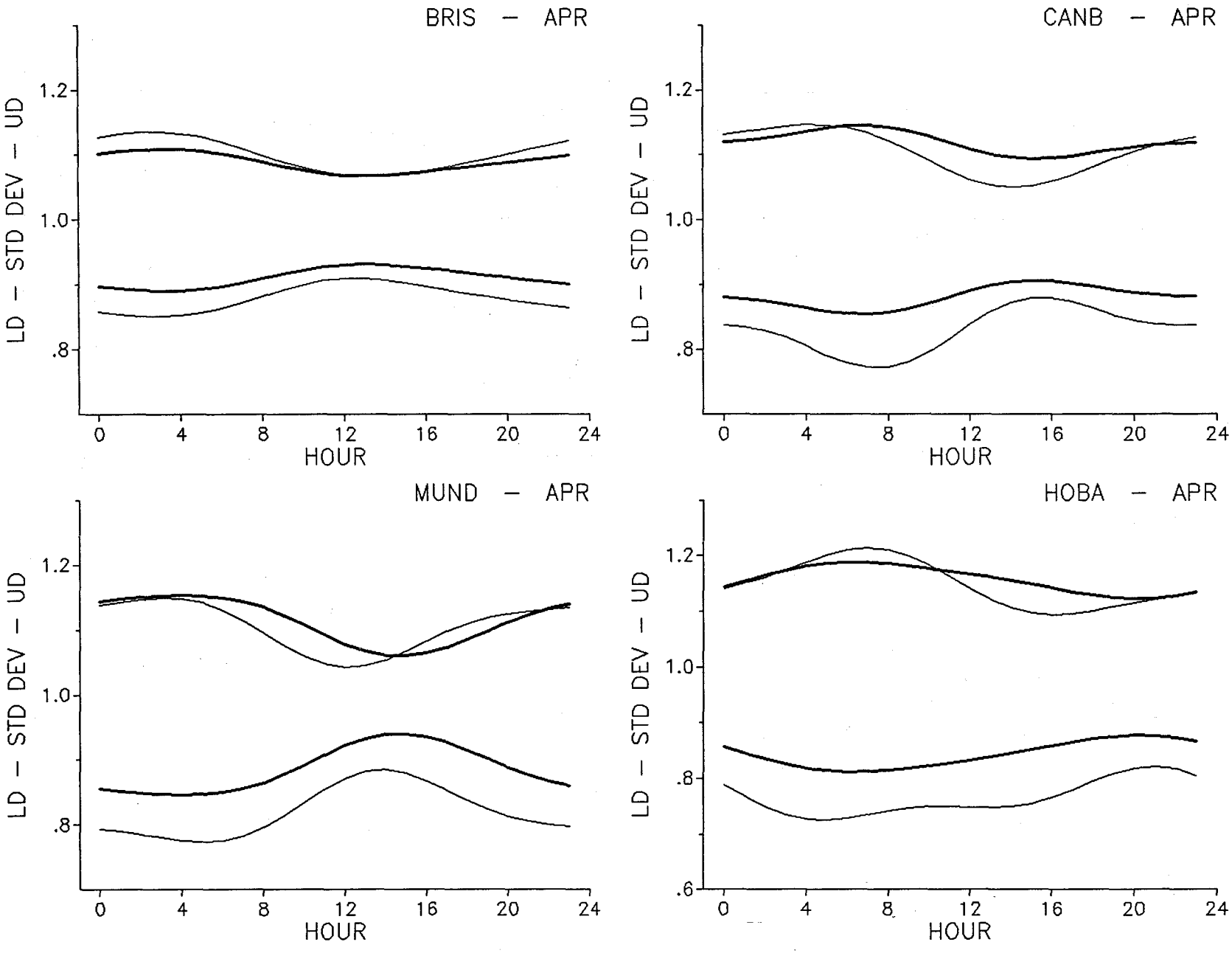

APPENDIX C

TABLES OF PERCENT DEVIATION, AND UPPER AND LOWER DECILE FACTORS AT TEN DEGREE INCREMENTS IN MAGNETIC LATITUDE FOR ALL MONTHS

********** QUIET MAGNETIC - LOW SOLAR **********

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 01	17.45	17.61	17.76	17.80	17.63	17.14	16.30	15.13	13.75	12.33	11.08	10.19	9.78	9.92	10.56	11.58	12.81	14.07	15.17	16.04	16.64	16.99	17.19	17.31
	1.24	1.24	1.24	1.25	1.25	1.24	1.23	1.21	1.19	1.17	1.15	1.13	1.13	1.13	1.14	1.15	1.17	1.19	1.20	1.22	1.22	1.23	1.23	1.24
	.81	.81	.80	.81	.81	.81	.82	.83	.85	.86	.87	.88	.89	.89	.88	.87	.86	.84	.83	.83	.82	.82	.81	.81
45-55N 01	17.31	17.35	17.31	17.11	16.68	16.00	15.04	13.88	12.62	11.43	10.44	9.81	9.60	9.84	10.50	11.47	12.60	13.77	14.84	15.71	16.36	16.79	17.06	17.21
	1.24	1.24	1.24	1.23	1.22	1.22	1.20	1.19	1.17	1.16	1.14	1.13	1.13	1.13	1.14	1.15	1.17	1.18	1.20	1.22	1.23	1.23	1.24	1.24
	.81	.81	.80	.80	.81	.82	.83	.85	.86	.88	.89	.90	.90	.89	.89	.88	.87	.86	.85	.84	.84	.83	.83	.82
35-45N 01	13.45	13.38	13.52	13.80	14.10	14.27	14.21	13.84	13.20	12.40	11.58	10.90	10.52	10.51	10.91	11.62	12.52	13.43	14.17	14.62	14.73	14.53	14.15	13.75
	1.19	1.19	1.19	1.20	1.20	1.20	1.19	1.19	1.19	1.18	1.17	1.16	1.15	1.15	1.15	1.16	1.17	1.18	1.19	1.20	1.20	1.20	1.20	1.20
	.87	.87	.86	.86	.85	.85	.85	.85	.86	.87	.89	.89	.90	.90	.89	.88	.86	.85	.85	.85	.85	.86	.86	.87
25-35N																								
15-25N 01	23.94	24.02	23.47	22.28	20.60	18.72	16.99	15.74	15.20	15.45	16.38	17.76	19.23	20.50	21.34	21.67	21.57	21.23	20.90	20.80	21.06	21.67	22.51	23.34
	1.35	1.35	1.35	1.33	1.31	1.28	1.25	1.23	1.21	1.21	1.22	1.24	1.26	1.29	1.30	1.31	1.31	1.31	1.30	1.30	1.31	1.31	1.33	1.34
	.79	.79	.80	.81	.82	.83	.84	.85	.84	.83	.81	.80	.78	.77	.77	.78	.79	.80	.81	.82	.82	.81	.81	.80
5-15N																								
5N-5S 07	28.28	30.02	30.24	28.88	26.18	22.64	18.90	15.58	13.13	11.74	11.34	11.62	12.16	12.58	12.63	12.31	11.81	11.51	11.78	12.94	15.11	18.17	21.75	25.32
	1.37	1.40	1.41	1.40	1.37	1.32	1.26	1.21	1.17	1.15	1.14	1.15	1.16	1.17	1.17	1.16	1.15	1.14	1.14	1.15	1.17	1.21	1.26	1.32
	.65	.64	.65	.68	.72	.76	.80	.83	.85	.86	.86	.85	.85	.85	.85	.85	.85	.85	.84	.82	.79	.75	.71	.67
5-15S 07	36.97	37.53	36.45	33.85	30.12	25.85	21.72	18.31	16.02	14.95	14.94	15.63	16.59	17.47	18.06	18.41	18.70	19.28	20.46	22.43	25.20	28.52	31.95	34.95
	1.58	1.60	1.59	1.56	1.50	1.43	1.35	1.29	1.24	1.22	1.21	1.22	1.23	1.24	1.25	1.26	1.26	1.27	1.29	1.32	1.37	1.42	1.49	1.54
	.69	.70	.71	.74	.77	.80	.82	.84	.85	.85	.84	.83	.81	.81	.80	.80	.80	.79	.78	.77	.75	.73	.71	.70
15-25S 07	16.05	15.69	15.46	15.32	15.17	14.94	14.59	14.13	13.59	13.08	12.71	12.57	12.73	13.20	13.95	14.88	15.86	16.75	17.42	17.78	17.80	17.53	17.07	16.53
	1.24	1.23	1.22	1.22	1.21	1.21	1.20	1.19	1.19	1.18	1.18	1.18	1.18	1.19	1.20	1.21	1.23	1.24	1.25	1.26	1.26	1.26	1.25	1.25
	.85	.85	.85	.85	.85	.86	.86	.87	.88	.89	.89	.89	.89	.88	.87	.85	.84	.83	.83	.82	.83	.83	.84	.85
25-35S 07	13.71	14.12	14.45	14.59	14.43	13.94	13.17	12.23	11.26	10.44	9.88	9.66	9.79	10.22	10.83	11.51	12.13	12.61	12.90	13.03	13.04	13.05	13.14	13.36
	1.18	1.19	1.19	1.20	1.20	1.19	1.18	1.17	1.16	1.15	1.14	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.18	1.17	1.17	1.17	1.17	1.17
	.86	.85	.85	.84	.84	.84	.85	.86	.88	.89	.90	.90	.90	.90	.89	.88	.88	.87	.87	.87	.87	.87	.87	.87
35-45S 07	13.12	13.49	13.94	14.34	14.51	14.35	13.80	12.89	11.76	10.58	9.57	8.88	8.61	8.80	9.35	10.14	11.02	11.82	12.42	12.77	12.91	12.90	12.86	12.91
	1.18	1.18	1.19	1.19	1.20	1.20	1.20	1.18	1.17	1.15	1.14	1.12	1.12	1.12	1.13	1.14	1.16	1.17	1.18	1.18	1.19	1.18	1.18	1.18
	.86	.86	.85	.85	.84	.85	.86	.87	.88	.89	.90	.90	.91	.90	.89	.89	.88	.88	.87	.87	.87	.87	.87	.86
45-55S 07	15.62	15.60	15.59	15.51	15.24	14.69	13.83	12.68	11.36	10.06	8.96	8.24	7.99	8.27	9.02	10.14	11.44	12.77	13.94	14.85	15.44	15.71	15.76	15.70
	1.21	1.21	1.21	1.21	1.21	1.20	1.18	1.17	1.15	1.14	1.12	1.12	1.11	1.11	1.12	1.13	1.15	1.17	1.18	1.20	1.20	1.21	1.21	1.21
	.82	.82	.81	.81	.82	.83	.84	.85	.88	.88	.90	.91	.91	.90	.90	.88	.88	.87	.86	.85	.84	.83	.83	.83
55-65S 07	19.42	20.39	20.93	20.89	20.18	18.83	16.98	14.85	12.71	10.82	9.37	8.47	8.12	8.26	8.77	9.52	10.42	11.37	12.35	13.38	14.46	15.64	16.90	18.20
	1.29	1.31	1.32	1.33	1.31	1.29	1.26	1.22	1.18	1.15	1.12	1.11	1.10	1.10	1.11	1.12	1.14	1.15	1.17	1.19	1.20	1.23	1.25	1.27
	.84	.84	.84	.84	.85	.85	.86	.87	.88	.89	.89	.90	.90	.89	.89	.88	.88	.87	.87	.86	.86	.85	.85	.85

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 02	16.97	16.70	16.64	16.78	16.97	17.03	16.78	16.12	15.04	13.64	12.13	10.76	9.80	9.45	9.80	10.79	12.26	13.96	15.58	16.87	17.67	17.95	17.80	17.40
	1.24	1.23	1.23	1.23	1.23	1.23	1.22	1.21	1.19	1.17	1.15	1.13	1.12	1.12	1.12	1.14	1.16	1.19	1.21	1.23	1.25	1.26	1.25	1.25
	.82	.82	.82	.81	.81	.80	.80	.81	.82	.84	.85	.87	.88	.88	.88	.87	.85	.83	.82	.81	.80	.80	.81	.81
45-55N 02	15.45	15.16	14.97	14.86	14.77	14.59	14.23	13.64	12.84	11.89	10.93	10.13	9.63	9.54	9.91	10.69	11.77	13.00	14.19	15.16	15.80	16.08	16.03	15.78
	1.21	1.21	1.20	1.19	1.19	1.19	1.19	1.18	1.17	1.16	1.15	1.13	1.13	1.13	1.13	1.14	1.15	1.17	1.19	1.20	1.21	1.22	1.21	1.21
	.83	.83	.83	.83	.83	.83	.83	.84	.85	.86	.88	.89	.90	.90	.89	.88	.87	.85	.83	.83	.82	.82	.82	.83
35-45N 02	12.50	12.33	12.42	12.73	13.15	13.56	13.81	13.81	13.53	13.01	12.34	11.68	11.17	10.93	11.00	11.38	11.98	12.67	13.28	13.70	13.82	13.67	13.30	12.86
	1.17	1.17	1.17	1.17	1.17	1.18	1.19	1.19	1.18	1.18	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.18	1.18	1.19	1.18	1.18	1.17
	.87	.87	.87	.87	.86	.85	.85	.85	.85	.86	.87	.88	.89	.89	.89	.88	.87	.86	.85	.85	.85	.85	.86	.86
25-35N																								
15-25N 02	21.68	22.28	22.52	22.17	21.15	19.54	17.57	15.59	13.97	13.03	12.93	13.66	15.06	16.81	18.59	20.06	21.04	21.44	21.36	20.99	20.60	20.40	20.54	21.01
	1.30	1.31	1.31	1.31	1.30	1.27	1.24	1.21	1.18	1.16	1.16	1.17	1.20	1.23	1.26	1.29	1.31	1.32	1.32	1.31	1.30	1.29	1.29	1.29
	.81	.81	.80	.80	.81	.82	.83	.83	.84	.84	.83	.82	.81	.80	.79	.78	.78	.79	.80	.81	.82	.82	.82	.82
5-15N																								
5N-5S 08	23.03	24.81	25.75	25.59	24.30	22.05	19.22	16.31	13.80	12.07	11.24	11.23	11.75	12.46	13.05	13.34	13.35	13.25	13.29	13.71	14.70	16.29	18.37	20.71
	1.33	1.37	1.39	1.40	1.38	1.34	1.29	1.24	1.20	1.17	1.16	1.16	1.17	1.18	1.19	1.19	1.18	1.17	1.16	1.16	1.17	1.19	1.23	1.28
	.72	.71	.72	.73	.75	.77	.80	.83	.85	.87	.88	.88	.88	.87	.87	.86	.85	.85	.83	.82	.80	.77	.75	.73
5-15S 08	35.78	35.87	34.55	31.97	28.48	24.60	20.84	17.66	15.35	14.01	13.55	13.74	14.27	14.93	15.57	16.24	17.07	18.29	20.08	22.52	25.50	28.75	31.85	34.32
	1.55	1.55	1.53	1.49	1.43	1.37	1.30	1.25	1.21	1.18	1.16	1.16	1.16	1.17	1.18	1.20	1.21	1.24	1.27	1.32	1.37	1.43	1.48	1.52
	.69	.71	.73	.76	.79	.82	.84	.85	.85	.85	.83	.81	.80	.79	.78	.78	.78	.77	.76	.75	.73	.71	.70	.69
15-25S 08	17.63	17.64	17.59	17.40	17.02	16.47	15.80	15.15	14.65	14.42	14.52	14.96	15.64	16.45	17.25	17.91	18.36	18.57	18.56	18.39	18.15	17.91	17.74	17.64
	1.25	1.25	1.25	1.25	1.24	1.24	1.23	1.23	1.22	1.22	1.23	1.24	1.25	1.26	1.26	1.27	1.27	1.27	1.26	1.25	1.25	1.25	1.24	1.24
	.84	.84	.83	.83	.83	.84	.84	.85	.86	.86	.87	.87	.86	.85	.84	.84	.83	.83	.83	.83	.83	.83	.84	.84
25-35S 08	14.00	14.13	14.18	14.14	13.96	13.66	13.25	12.79	12.32	11.88	11.51	11.23	11.05	10.99	11.05	11.23	11.52	11.90	12.31	12.71	13.07	13.37	13.62	13.82
	1.18	1.18	1.18	1.18	1.18	1.18	1.17	1.17	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.18	1.18	1.18	1.18	1.18
	.85	.85	.84	.84	.84	.84	.85	.85	.86	.87	.88	.88	.89	.89	.89	.88	.88	.87	.87	.87	.87	.86	.86	.86
35-45S 08	12.27	12.66	13.14	13.58	13.84	13.80	13.41	12.68	11.73	10.70	9.76	9.07	8.72	8.73	9.07	9.65	10.32	10.98	11.50	11.82	11.96	11.98	11.97	12.05
	1.17	1.17	1.18	1.18	1.19	1.19	1.18	1.17	1.16	1.15	1.14	1.13	1.13	1.13	1.13	1.14	1.15	1.15	1.16	1.17	1.17	1.17	1.16	1.16
	.87	.86	.86	.85	.85	.85	.85	.86	.87	.88	.89	.90	.90	.90	.90	.89	.88	.88	.88	.87	.87	.87	.87	.87
45-55S 08	13.94	14.16	14.37	14.48	14.39	14.03	13.37	12.44	11.36	10.26	9.32	8.66	8.37	8.47	8.92	9.63	10.47	11.32	12.09	12.69	13.12	13.40	13.59	13.75
	1.18	1.18	1.19	1.19	1.19	1.18	1.18	1.16	1.15	1.13	1.12	1.11	1.11	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.17	1.18	1.18	1.18
	.84	.84	.83	.83	.83	.83	.84	.85	.86	.88	.89	.89	.90	.90	.90	.89	.88	.88	.87	.86	.85	.85	.84	.84
55-65S 08	16.84	16.98	16.91	16.60	16.04	15.25	14.25	13.12	11.94	10.82	9.86	9.15	8.75	8.68	8.94	9.50	10.31	11.28	12.34	13.40	14.40	15.26	15.97	16.50
	1.26	1.26	1.27	1.26	1.25	1.23	1.21	1.19	1.16	1.14	1.12	1.11	1.10	1.10	1.11	1.12	1.13	1.15	1.17	1.18	1.20	1.22	1.23	1.25
	.86	.86	.87	.87	.87	.88	.87	.87	.87	.87	.88	.88	.88	.88	.88	.88	.87	.86	.85	.85	.84	.84	.84	.85

MONTH		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	03	17.03	16.81	16.43	15.99	15.54	15.09	14.62	14.08	13.43	12.64	11.74	10.78	9.87	9.15	8.75	8.79	9.31	10.28	11.60	13.07	14.50	15.70	16.54	16.97
		1.21	1.21	1.21	1.20	1.19	1.19	1.18	1.18	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.11	1.11	1.12	1.14	1.16	1.18	1.19	1.21	1.21
		.79	.79	.80	.80	.81	.81	.81	.82	.83	.84	.85	.87	.88	.89	.90	.90	.89	.87	.85	.84	.82	.80	.79	.79
45-55N	03	15.05	14.80	14.46	14.10	13.74	13.38	13.00	12.59	12.13	11.63	11.09	10.56	10.12	9.84	9.80	10.04	10.57	11.34	12.26	13.21	14.04	14.68	15.05	15.17
		1.19	1.18	1.17	1.17	1.17	1.16	1.16	1.16	1.15	1.14	1.14	1.13	1.12	1.12	1.12	1.13	1.14	1.15	1.16	1.17	1.19	1.19	1.19	1.19
		.82	.82	.82	.82	.83	.83	.83	.83	.84	.85	.86	.87	.88	.88	.88	.88	.88	.87	.86	.85	.83	.83	.82	.82
35-45N	03	13.24	12.90	12.56	12.26	12.01	11.80	11.59	11.36	11.09	10.77	10.43	10.09	9.82	9.67	9.72	9.99	10.50	11.18	11.93	12.65	13.21	13.55	13.65	13.52
		1.19	1.18	1.18	1.17	1.17	1.16	1.15	1.15	1.15	1.15	1.15	1.14	1.14	1.14	1.14	1.14	1.15	1.15	1.16	1.17	1.18	1.19	1.19	1.19
		.86	.87	.87	.87	.87	.87	.87	.87	.88	.88	.88	.89	.90	.90	.90	.89	.89	.88	.87	.86	.85	.85	.85	.85
25-35N																									
15-25N	03	20.85	20.39	20.05	19.67	19.06	18.10	16.74	15.11	13.39	11.88	10.85	10.53	11.02	12.31	14.25	16.56	18.92	20.98	22.49	23.30	23.42	23.00	22.28	21.50
		1.29	1.27	1.27	1.26	1.25	1.25	1.23	1.21	1.18	1.16	1.14	1.13	1.14	1.16	1.19	1.23	1.27	1.31	1.34	1.35	1.35	1.34	1.32	1.30
		.80	.80	.80	.80	.81	.82	.83	.85	.86	.87	.87	.87	.86	.85	.83	.82	.80	.79	.78	.78	.78	.78	.79	.79
5-15N																									
5N-5S	09	17.41	20.87	23.81	25.63	25.93	24.66	22.11	18.84	15.51	12.74	10.93	10.20	10.36	11.05	11.82	12.29	12.23	11.64	10.73	9.86	9.48	9.95	11.50	14.08
		1.23	1.29	1.34	1.37	1.38	1.37	1.33	1.29	1.24	1.20	1.17	1.16	1.16	1.16	1.17	1.17	1.17	1.15	1.14	1.12	1.11	1.12	1.14	1.18
		.80	.76	.74	.73	.74	.76	.80	.83	.87	.89	.90	.90	.90	.88	.87	.86	.86	.87	.87	.88	.88	.87	.85	.83
5-15S	09	31.23	32.76	33.04	31.91	29.42	25.88	21.78	17.68	14.10	11.43	9.89	9.44	9.88	10.92	12.22	13.55	14.78	15.95	17.21	18.75	20.74	23.20	26.00	28.82
		1.45	1.48	1.49	1.48	1.44	1.39	1.32	1.26	1.20	1.15	1.12	1.10	1.10	1.11	1.13	1.14	1.16	1.18	1.20	1.23	1.27	1.31	1.36	1.41
		.66	.66	.67	.69	.72	.76	.80	.83	.86	.87	.88	.87	.86	.84	.82	.81	.79	.78	.77	.75	.74	.72	.69	.67
15-25S	09	17.37	17.98	18.34	18.28	17.75	16.87	15.89	15.10	14.79	15.10	16.04	17.43	18.99	20.39	21.34	21.68	21.36	20.51	19.34	18.12	17.12	16.53	16.43	16.76
		1.26	1.26	1.26	1.26	1.25	1.24	1.23	1.23	1.24	1.25	1.27	1.29	1.31	1.33	1.34	1.34	1.33	1.32	1.31	1.29	1.27	1.26	1.26	1.25
		.85	.84	.83	.83	.83	.83	.84	.85	.86	.87	.87	.87	.86	.85	.84	.84	.83	.84	.84	.85	.86	.86	.86	.86
25-35S	09	16.47	16.53	16.18	15.49	14.57	13.60	12.74	12.09	11.73	11.61	11.67	11.80	11.89	11.90	11.83	11.74	11.70	11.81	12.14	12.72	13.50	14.41	15.30	16.03
		1.25	1.25	1.24	1.23	1.21	1.19	1.18	1.17	1.16	1.16	1.17	1.17	1.18	1.18	1.18	1.17	1.17	1.17	1.17	1.18	1.19	1.21	1.23	1.24
		.84	.85	.85	.85	.86	.86	.87	.87	.87	.87	.87	.87	.88	.88	.88	.88	.88	.87	.87	.86	.85	.85	.85	.84
35-45S	09	12.57	12.85	13.14	13.35	13.42	13.28	12.91	12.33	11.63	10.88	10.18	9.66	9.33	9.24	9.38	9.69	10.14	10.64	11.10	11.50	11.80	12.01	12.17	12.35
		1.17	1.17	1.17	1.18	1.17	1.17	1.16	1.16	1.15	1.14	1.14	1.13	1.13	1.13	1.13	1.14	1.15	1.15	1.16	1.16	1.16	1.17	1.17	1.17
		.86	.85	.85	.85	.85	.85	.85	.86	.87	.88	.89	.90	.91	.91	.91	.90	.89	.89	.88	.88	.87	.87	.86	.86
45-55S	09	14.20	14.42	14.52	14.48	14.22	13.72	13.01	12.18	11.30	10.48	9.83	9.42	9.26	9.36	9.67	10.15	10.72	11.32	11.92	12.45	12.92	13.31	13.64	13.94
		1.19	1.19	1.19	1.19	1.19	1.18	1.17	1.16	1.15	1.13	1.13	1.12	1.11	1.12	1.12	1.13	1.13	1.14	1.16	1.17	1.18	1.18	1.19	1.19
		.83	.83	.82	.82	.82	.83	.84	.85	.86	.87	.88	.88	.89	.88	.88	.88	.88	.88	.87	.87	.86	.85	.85	.84
55-65S	09	17.46	17.29	16.84	16.18	15.40	14.56	13.70	12.86	12.07	11.35	10.70	10.15	9.73	9.49	9.49	9.76	10.34	11.21	12.32	13.56	14.81	15.92	16.78	17.30
		1.25	1.26	1.26	1.25	1.23	1.21	1.19	1.18	1.16	1.15	1.13	1.13	1.12	1.12	1.12	1.12	1.13	1.13	1.15	1.17	1.19	1.21	1.23	1.24
		.82	.83	.84	.86	.86	.87	.87	.87	.86	.86	.87	.87	.87	.88	.87	.87	.86	.85	.83	.82	.80	.80	.80	.80

MONTH		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	04	17.05	17.46	17.42	17.00	16.29	15.43	14.54	13.72	13.01	12.42	11.90	11.41	10.91	10.40	9.93	9.58	9.45	9.64	10.20	11.11	12.32	13.69	15.04	16.21
		1.19	1.20	1.20	1.20	1.20	1.19	1.18	1.17	1.16	1.15	1.15	1.14	1.13	1.12	1.11	1.11	1.11	1.10	1.11	1.12	1.13	1.14	1.16	1.17
		.76	.76	.77	.78	.79	.81	.82	.83	.84	.85	.85	.86	.87	.87	.88	.88	.88	.87	.86	.84	.83	.81	.79	.77
45-55N	04	14.19	14.25	14.19	14.04	13.80	13.51	13.18	12.84	12.49	12.15	11.82	11.51	11.25	11.06	10.97	11.00	11.15	11.43	11.83	12.31	12.81	13.29	13.70	14.00
		1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.16	1.15	1.15	1.14	1.14	1.13	1.13	1.14	1.14	1.14	1.15	1.15	1.16	1.16	1.16
		.82	.81	.82	.83	.83	.83	.84	.84	.85	.85	.85	.86	.86	.86	.87	.87	.86	.86	.85	.85	.84	.83	.82	.81
35-45N	04	13.69	13.33	12.90	12.45	12.04	11.70	11.42	11.20	11.02	10.86	10.70	10.53	10.39	10.31	10.33	10.50	10.85	11.37	11.99	12.65	13.24	13.67	13.90	13.89
		1.16	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.13	1.13	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.17
		.81	.81	.82	.83	.84	.84	.85	.85	.86	.86	.87	.87	.88	.88	.88	.88	.87	.86	.84	.83	.81	.81	.80	.80
25-35N																									
15-25N	04	22.89	22.59	21.94	20.97	19.74	18.30	16.76	15.23	13.82	12.64	11.77	11.27	11.17	11.46	12.13	13.14	14.42	15.90	17.47	19.01	20.40	21.54	22.35	22.81
		1.33	1.33	1.32	1.30	1.28	1.26	1.23	1.21	1.18	1.17	1.15	1.15	1.15	1.15	1.16	1.17	1.19	1.21	1.23	1.26	1.28	1.30	1.32	1.33
		.78	.79	.79	.80	.80	.81	.82	.83	.84	.85	.86	.86	.86	.86	.85	.84	.83	.81	.80	.79	.78	.78	.78	.78
5-15N																									
5N-5S	10	18.77	21.11	22.84	23.58	23.17	21.68	19.38	16.72	14.18	12.13	10.83	10.29	10.35	10.73	11.16	11.40	11.37	11.12	10.84	10.77	11.18	12.22	13.95	16.22
		1.24	1.28	1.30	1.31	1.31	1.29	1.26	1.23	1.19	1.17	1.15	1.14	1.14	1.14	1.14	1.14	1.13	1.13	1.12	1.12	1.13	1.15	1.17	1.21
		.77	.74	.72	.71	.72	.74	.78	.81	.85	.88	.89	.90	.89	.89	.88	.87	.87	.87	.87	.87	.87	.85	.83	.80
5-15S	10	25.65	27.32	28.19	28.06	26.85	24.66	21.74	18.47	15.24	12.42	10.28	8.94	8.37	8.46	9.02	9.89	10.94	12.12	13.44	14.97	16.76	18.83	21.12	23.47
		1.35	1.39	1.42	1.43	1.42	1.39	1.35	1.29	1.24	1.18	1.14	1.11	1.09	1.09	1.10	1.11	1.12	1.14	1.15	1.17	1.19	1.22	1.26	1.30
		.70	.69	.69	.71	.73	.76	.79	.83	.85	.88	.89	.89	.89	.89	.88	.87	.85	.84	.82	.80	.78	.76	.74	.71
15-25S	10	23.23	23.36	23.16	22.56	21.57	20.25	18.77	17.30	16.03	15.14	14.69	14.71	15.13	15.84	16.72	17.65	18.54	19.34	20.04	20.66	21.23	21.80	22.35	22.85
		1.29	1.30	1.30	1.29	1.28	1.26	1.24	1.23	1.21	1.20	1.19	1.19	1.19	1.20	1.21	1.22	1.23	1.24	1.24	1.25	1.26	1.27	1.28	1.28
		.69	.69	.69	.70	.71	.74	.76	.79	.81	.82	.83	.82	.81	.79	.78	.76	.75	.75	.74	.74	.73	.72	.71	.70
25-35S	10	17.82	17.89	17.58	16.89	15.91	14.80	13.74	12.92	12.46	12.42	12.74	13.33	14.02	14.67	15.16	15.44	15.53	15.51	15.49	15.58	15.85	16.31	16.88	17.43
		1.23	1.23	1.23	1.22	1.21	1.20	1.19	1.18	1.17	1.17	1.17	1.17	1.18	1.20	1.21	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
		.79	.79	.80	.81	.82	.84	.85	.85	.86	.85	.84	.83	.82	.82	.82	.82	.82	.82	.83	.82	.82	.81	.80	.79
35-45S	10	14.46	14.76	14.93	14.92	14.70	14.28	13.69	13.04	12.41	11.91	11.57	11.42	11.45	11.63	11.89	12.18	12.45	12.71	12.93	13.12	13.31	13.53	13.81	14.12
		1.20	1.21	1.21	1.21	1.21	1.21	1.20	1.19	1.18	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.18	1.18	1.18	1.18	1.18	1.19	1.19	1.19
		.84	.84	.83	.84	.84	.84	.85	.86	.86	.87	.87	.87	.87	.87	.87	.86	.86	.86	.86	.85	.85	.85	.84	.84
45-55S	10	15.28	15.33	15.23	14.97	14.55	13.99	13.36	12.73	12.18	11.75	11.48	11.37	11.42	11.58	11.83	12.15	12.51	12.91	13.33	13.75	14.16	14.53	14.85	15.11
		1.20	1.20	1.20	1.20	1.19	1.18	1.17	1.16	1.15	1.15	1.14	1.14	1.14	1.15	1.15	1.16	1.16	1.17	1.18	1.19	1.19	1.19	1.20	1.20
		.83	.82	.82	.82	.82	.83	.84	.85	.85	.86	.86	.86	.86	.86	.86	.86	.85	.85	.85	.85	.84	.84	.84	.83
55-65S	10	20.38	20.35	19.78	18.76	17.47	16.10	14.82	13.75	12.95	12.40	12.05	11.80	11.59	11.40	11.27	11.28	11.52	12.10	13.05	14.33	15.84	17.39	18.79	19.83
		1.30	1.31	1.30	1.29	1.27	1.24	1.22	1.19	1.18	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.15	1.16	1.17	1.19	1.22	1.24	1.27	1.29
		.79	.80	.81	.82	.84	.85	.86	.86	.86	.86	.85	.85	.85	.86	.86	.86	.86	.85	.84	.83	.81	.80	.79	.79

MONTH		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	05	18.25	18.86	18.84	18.25	17.24	16.03	14.80	13.70	12.80	12.10	11.52	10.99	10.43	9.83	9.23	8.72	8.46	8.57	9.16	10.25	11.77	13.56	15.40	17.04
		1.20	1.21	1.22	1.22	1.21	1.20	1.18	1.17	1.16	1.14	1.13	1.12	1.12	1.11	1.10	1.10	1.09	1.09	1.10	1.11	1.13	1.14	1.16	1.19
		.74	.73	.74	.75	.76	.78	.80	.81	.83	.83	.84	.85	.86	.87	.87	.88	.89	.89	.88	.86	.84	.81	.78	.76
45-55N	05	15.32	15.28	15.05	14.69	14.26	13.80	13.36	12.94	12.53	12.13	11.73	11.34	10.98	10.69	10.53	10.55	10.77	11.20	11.83	12.58	13.37	14.12	14.73	15.14
		1.18	1.18	1.18	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.15	1.14	1.13	1.13	1.13	1.13	1.13	1.14	1.14	1.15	1.16	1.16	1.17	1.17
		.80	.80	.80	.81	.82	.82	.83	.83	.84	.84	.85	.85	.86	.86	.87	.87	.87	.86	.85	.84	.83	.82	.81	.80
35-45N	05	10.86	10.90	10.95	11.02	11.13	11.28	11.45	11.62	11.78	11.90	11.95	11.92	11.82	11.67	11.48	11.28	11.10	10.96	10.86	10.80	10.78	10.79	10.81	10.84
		1.14	1.13	1.13	1.13	1.13	1.13	1.14	1.14	1.15	1.15	1.15	1.16	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.14	1.14	1.14	1.14
		.86	.86	.86	.86	.85	.85	.85	.85	.85	.85	.85	.86	.87	.87	.88	.89	.89	.89	.88	.88	.88	.87	.87	.87
25-35N																									
15-25N	05	20.04	20.29	20.21	19.77	18.98	17.92	16.72	15.51	14.43	13.58	13.02	12.77	12.78	13.03	13.44	13.98	14.61	15.28	15.98	16.70	17.44	18.18	18.90	19.55
		1.29	1.30	1.30	1.29	1.28	1.25	1.23	1.20	1.18	1.16	1.15	1.14	1.14	1.14	1.14	1.15	1.16	1.17	1.19	1.20	1.22	1.24	1.26	1.28
		.79	.80	.80	.81	.81	.82	.82	.82	.83	.83	.83	.83	.83	.83	.83	.82	.81	.81	.80	.79	.79	.79	.79	.79
5-15N																									
5N-5S	11	19.32	21.55	23.11	23.70	23.18	21.62	19.27	16.53	13.83	11.55	9.91	8.98	8.65	8.73	8.97	9.21	9.35	9.43	9.60	10.03	10.92	12.38	14.38	16.79
		1.26	1.29	1.31	1.32	1.32	1.30	1.26	1.23	1.19	1.16	1.14	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.13	1.14	1.16	1.19	1.22
		.77	.74	.73	.72	.73	.75	.79	.82	.85	.88	.90	.90	.91	.90	.90	.90	.89	.89	.89	.89	.87	.86	.83	.80
5-15S	11	22.36	23.09	23.11	22.37	20.92	18.95	16.70	14.44	12.42	10.82	9.73	9.15	9.01	9.22	9.66	10.27	11.01	11.92	13.02	14.35	15.91	17.64	19.42	21.07
		1.30	1.31	1.31	1.30	1.28	1.25	1.22	1.19	1.16	1.13	1.12	1.10	1.10	1.10	1.10	1.10	1.11	1.12	1.14	1.16	1.18	1.21	1.24	1.27
		.74	.74	.74	.75	.77	.79	.81	.84	.86	.88	.89	.90	.90	.89	.88	.87	.86	.85	.83	.82	.80	.79	.77	.76
15-25S	11	13.31	13.40	13.64	13.94	14.21	14.37	14.38	14.26	14.05	13.83	13.68	13.68	13.86	14.21	14.67	15.14	15.51	15.69	15.62	15.31	14.82	14.27	13.77	13.43
		1.17	1.18	1.18	1.19	1.20	1.21	1.21	1.21	1.20	1.20	1.19	1.18	1.17	1.17	1.18	1.18	1.19	1.20	1.20	1.20	1.20	1.19	1.18	1.18
		.86	.86	.86	.85	.85	.85	.85	.85	.85	.85	.84	.84	.83	.82	.82	.81	.81	.81	.82	.83	.84	.85	.85	.86
25-35S	11	16.93	18.05	18.82	19.09	18.80	18.01	16.88	15.62	14.47	13.60	13.10	12.97	13.12	13.39	13.64	13.76	13.71	13.51	13.28	13.15	13.27	13.74	14.58	15.69
		1.22	1.23	1.25	1.25	1.25	1.24	1.23	1.21	1.19	1.17	1.16	1.15	1.14	1.15	1.15	1.15	1.16	1.16	1.16	1.16	1.17	1.17	1.19	1.20
		.79	.78	.78	.78	.78	.79	.80	.82	.83	.83	.83	.83	.82	.81	.81	.81	.81	.82	.82	.83	.83	.83	.82	.81
35-45S	11	14.07	14.55	14.89	15.02	14.91	14.59	14.12	13.60	13.10	12.72	12.48	12.38	12.37	12.41	12.43	12.42	12.35	12.25	12.18	12.18	12.31	12.58	12.99	13.51
		1.19	1.19	1.20	1.20	1.20	1.19	1.19	1.18	1.17	1.17	1.17	1.16	1.16	1.16	1.17	1.16	1.17	1.17	1.16	1.16	1.17	1.17	1.17	1.18
		.84	.83	.83	.83	.83	.83	.83	.84	.84	.85	.85	.85	.85	.85	.85	.86	.86	.86	.86	.86	.86	.85	.85	.84
45-55S	11	14.90	14.96	14.85	14.57	14.16	13.68	13.22	12.83	12.56	12.43	12.44	12.53	12.67	12.81	12.92	13.00	13.05	13.11	13.23	13.43	13.69	14.02	14.37	14.68
		1.19	1.19	1.19	1.19	1.18	1.18	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.17	1.18	1.18	1.19	1.19	1.19
		.82	.82	.82	.83	.83	.84	.84	.84	.84	.85	.84	.84	.84	.84	.84	.84	.84	.84	.84	.84	.83	.83	.83	.82
55-65S	11	21.57	21.80	21.22	19.92	18.13	16.13	14.22	12.64	11.51	10.85	10.58	10.54	10.59	10.64	10.65	10.68	10.85	11.31	12.17	13.47	15.16	17.08	18.98	20.56
		1.30	1.30	1.29	1.28	1.25	1.23	1.20	1.18	1.16	1.15	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.15	1.17	1.19	1.21	1.24	1.26	1.28
		.75	.74	.75	.77	.79	.81	.84	.85	.86	.87	.86	.86	.86	.86	.86	.87	.87	.87	.86	.85	.83	.81	.78	.76

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 06	12.11	12.47	12.52	12.31	11.91	11.42	10.91	10.43	10.00	9.62	9.24	8.84	8.39	7.91	7.44	7.06	6.84	6.86	7.18	7.77	8.61	9.59	10.58	11.46
	1.14	1.15	1.15	1.15	1.15	1.15	1.14	1.14	1.13	1.12	1.11	1.11	1.10	1.10	1.09	1.09	1.08	1.08	1.09	1.09	1.10	1.11	1.12	1.13
	.84	.84	.84	.85	.86	.86	.87	.87	.88	.88	.89	.89	.89	.90	.91	.91	.91	.92	.91	.90	.89	.88	.86	.85
45-55N 06	13.26	13.27	13.10	12.81	12.45	12.09	11.76	11.47	11.20	10.94	10.66	10.35	10.02	9.72	9.49	9.39	9.46	9.72	10.16	10.74	11.40	12.06	12.63	13.04
	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.15	1.15	1.15	1.14	1.14	1.13	1.13	1.13	1.12	1.13	1.13	1.13	1.13	1.14	1.15	1.16	1.16
	.84	.84	.84	.85	.85	.86	.86	.86	.87	.87	.87	.88	.88	.88	.89	.89	.89	.89	.88	.88	.87	.86	.85	.84
35-45N 06	11.39	11.49	11.49	11.42	11.32	11.22	11.15	11.11	11.10	11.08	11.03	10.93	10.77	10.56	10.33	10.12	9.97	9.90	9.95	10.10	10.34	10.64	10.94	11.20
	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.14	1.14	1.14	1.13	1.14	1.13	1.13	1.14	1.14	1.14
	.85	.85	.85	.86	.86	.87	.87	.87	.87	.87	.87	.88	.88	.89	.89	.90	.90	.89	.89	.88	.87	.86	.86	.85
25-35N																								
15-25N 06	18.35	18.40	18.32	18.11	17.75	17.26	16.67	16.03	15.40	14.83	14.37	14.05	13.89	13.91	14.10	14.45	14.93	15.49	16.08	16.66	17.17	17.61	17.95	18.20
	1.25	1.25	1.26	1.26	1.26	1.25	1.24	1.23	1.21	1.20	1.18	1.17	1.15	1.15	1.15	1.15	1.16	1.17	1.18	1.20	1.21	1.22	1.23	1.24
	.78	.79	.79	.80	.81	.82	.82	.83	.83	.82	.82	.81	.80	.79	.79	.79	.79	.79	.79	.79	.79	.78	.78	.78
5-15N																								
5N-5S 12	22.38	24.66	25.95	26.00	24.76	22.42	19.36	16.08	13.07	10.70	9.16	8.43	8.34	8.62	8.99	9.27	9.42	9.55	9.85	10.58	11.93	13.96	16.58	19.52
	1.28	1.31	1.34	1.35	1.34	1.31	1.27	1.23	1.18	1.15	1.12	1.11	1.11	1.11	1.12	1.12	1.12	1.12	1.12	1.13	1.14	1.16	1.19	1.23
	.70	.68	.68	.68	.71	.74	.78	.82	.86	.88	.90	.90	.90	.90	.90	.90	.89	.89	.88	.86	.84	.81	.77	.74
5-15S 12	23.33	25.08	25.99	25.89	24.76	22.73	20.06	17.12	14.24	11.74	9.79	8.47	7.73	7.46	7.55	7.89	8.44	9.24	10.34	11.81	13.69	15.94	18.45	21.01
	1.31	1.33	1.35	1.34	1.33	1.30	1.27	1.23	1.19	1.16	1.13	1.11	1.10	1.09	1.09	1.09	1.10	1.10	1.12	1.14	1.17	1.20	1.24	1.27
	.73	.71	.70	.70	.71	.73	.77	.80	.84	.86	.89	.90	.91	.90	.90	.89	.88	.87	.86	.84	.83	.80	.78	.75
15-25S 12	15.61	15.81	16.09	16.37	16.59	16.70	16.64	16.44	16.12	15.74	15.38	15.10	14.95	14.96	15.12	15.36	15.63	15.85	15.96	15.95	15.84	15.68	15.56	15.52
	1.18	1.18	1.19	1.19	1.20	1.21	1.21	1.22	1.22	1.22	1.21	1.21	1.21	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.19	1.19	1.18
	.80	.80	.80	.80	.80	.79	.80	.80	.80	.81	.81	.82	.82	.82	.82	.81	.80	.80	.79	.79	.79	.79	.80	.80
25-35S 12	18.37	19.37	19.96	19.97	19.36	18.18	16.64	15.00	13.53	12.45	11.88	11.82	12.17	12.75	13.38	13.89	14.22	14.36	14.39	14.46	14.71	15.25	16.10	17.19
	1.25	1.26	1.27	1.27	1.26	1.25	1.23	1.20	1.18	1.16	1.15	1.15	1.15	1.16	1.17	1.18	1.19	1.19	1.20	1.20	1.21	1.21	1.22	1.24
	.80	.79	.78	.77	.78	.79	.81	.82	.84	.85	.85	.85	.85	.84	.83	.83	.83	.84	.84	.84	.85	.84	.83	.82
35-45S 12	14.30	14.73	15.01	15.06	14.89	14.54	14.11	13.69	13.39	13.27	13.32	13.50	13.75	13.95	14.05	13.99	13.78	13.48	13.17	12.94	12.88	13.01	13.33	13.79
	1.19	1.20	1.20	1.21	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.19	1.19	1.18	1.18	1.17	1.17	1.17	1.18	1.18
	.83	.83	.82	.82	.83	.83	.84	.85	.86	.87	.87	.87	.86	.85	.85	.84	.84	.84	.84	.85	.85	.85	.85	.84
45-55S 12	13.20	13.41	13.45	13.32	13.05	12.68	12.33	12.04	11.87	11.85	11.95	12.13	12.32	12.43	12.44	12.35	12.19	12.01	11.88	11.85	11.95	12.19	12.52	12.88
	1.17	1.17	1.18	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.17
	.85	.85	.85	.85	.85	.85	.86	.86	.86	.87	.87	.87	.87	.87	.86	.86	.86	.86	.86	.86	.86	.86	.85	.85
55-65S 12	14.32	14.81	14.84	14.39	13.56	12.50	11.40	10.44	9.75	9.37	9.26	9.34	9.49	9.61	9.63	9.55	9.42	9.33	9.41	9.75	10.39	11.30	12.37	13.44
	1.17	1.18	1.18	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.12	1.13	1.14	1.15	1.16
	.81	.81	.81	.82	.84	.86	.87	.88	.89	.89	.89	.89	.88	.88	.88	.88	.89	.89	.88	.88	.87	.85	.84	.82

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 07	13.80	14.26	14.25	13.79	13.01	12.06	11.10	10.23	9.53	9.00	8.60	8.26	7.91	7.53	7.13	6.79	6.59	6.65	7.06	7.83	8.94	10.26	11.64	12.88
	1.16	1.17	1.17	1.17	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.10	1.10	1.09	1.09	1.08	1.08	1.09	1.10	1.11	1.12	1.13	1.15
	.81	.81	.81	.82	.84	.85	.87	.88	.89	.89	.89	.90	.90	.91	.91	.92	.93	.92	.92	.91	.89	.87	.85	.83
45-55N 07	13.98	14.01	13.82	13.43	12.93	12.39	11.84	11.33	10.89	10.49	10.12	9.77	9.44	9.18	9.00	8.97	9.12	9.49	10.06	10.79	11.61	12.43	13.15	13.68
	1.18	1.18	1.18	1.17	1.17	1.16	1.15	1.15	1.15	1.14	1.13	1.13	1.12	1.12	1.12	1.11	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.17
	.83	.83	.83	.84	.85	.86	.86	.87	.87	.88	.88	.88	.89	.89	.89	.90	.89	.89	.88	.87	.86	.85	.84	.83
35-45N 07	11.94	12.01	11.95	11.77	11.50	11.21	10.95	10.74	10.60	10.53	10.50	10.48	10.45	10.39	10.30	10.22	10.16	10.18	10.28	10.48	10.76	11.10	11.44	11.74
	1.16	1.16	1.16	1.15	1.15	1.15	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.14	1.14	1.14	1.14	1.14	1.15	1.15	1.15	1.16
	.86	.86	.86	.86	.87	.87	.88	.88	.88	.88	.89	.89	.90	.90	.91	.91	.91	.90	.90	.89	.88	.87	.87	.86
25-35N																								
15-25N 07	22.62	22.65	22.26	21.50	20.47	19.28	18.08	17.00	16.13	15.52	15.14	14.96	14.91	14.95	15.09	15.35	15.77	16.39	17.21	18.22	19.33	20.44	21.44	22.19
	1.33	1.33	1.32	1.31	1.29	1.28	1.26	1.24	1.23	1.22	1.22	1.21	1.20	1.19	1.19	1.18	1.18	1.19	1.21	1.23	1.25	1.28	1.30	1.32
	.77	.77	.78	.79	.80	.81	.82	.82	.83	.83	.83	.82	.82	.81	.80	.79	.79	.78	.78	.77	.77	.77	.77	.77
5-15N																								
5N-5S 01	22.25	24.84	26.52	26.95	26.00	23.80	20.70	17.22	13.91	11.22	9.41	8.53	8.42	8.78	9.30	9.74	10.00	10.13	10.34	10.87	11.97	13.78	16.27	19.21
	1.27	1.32	1.35	1.37	1.36	1.34	1.30	1.25	1.20	1.15	1.12	1.11	1.11	1.11	1.12	1.13	1.14	1.14	1.14	1.14	1.14	1.16	1.19	1.23
	.72	.70	.69	.70	.72	.75	.79	.83	.86	.89	.91	.91	.91	.91	.90	.90	.89	.89	.88	.87	.85	.82	.79	.76
5-15S 01	24.33	25.38	25.88	25.67	24.68	22.95	20.64	18.00	15.31	12.88	10.92	9.58	8.90	8.83	9.29	10.17	11.35	12.75	14.30	15.96	17.69	19.45	21.21	22.87
	1.35	1.37	1.39	1.39	1.37	1.34	1.30	1.26	1.21	1.17	1.14	1.12	1.11	1.11	1.11	1.12	1.14	1.15	1.17	1.19	1.22	1.25	1.28	1.32
	.72	.72	.73	.74	.75	.77	.79	.81	.83	.85	.87	.88	.88	.89	.88	.87	.86	.84	.82	.80	.77	.75	.74	.73
15-25S 01	16.67	16.24	16.04	16.10	16.36	16.74	17.12	17.44	17.63	17.68	17.62	17.53	17.48	17.54	17.74	18.08	18.50	18.90	19.19	19.25	19.06	18.61	17.98	17.29
	1.22	1.21	1.20	1.20	1.21	1.23	1.24	1.25	1.26	1.26	1.26	1.25	1.24	1.23	1.23	1.23	1.23	1.24	1.25	1.25	1.26	1.25	1.24	1.23
	.80	.79	.79	.79	.79	.80	.80	.81	.81	.81	.81	.80	.79	.78	.77	.76	.75	.75	.75	.76	.77	.78	.79	.79
25-35S 01	18.89	19.92	20.61	20.73	20.18	18.99	17.37	15.61	14.05	12.95	12.47	12.64	13.31	14.29	15.32	16.17	16.68	16.84	16.72	16.48	16.32	16.45	16.95	17.81
	1.27	1.28	1.30	1.30	1.29	1.28	1.25	1.22	1.20	1.18	1.16	1.16	1.17	1.18	1.19	1.21	1.22	1.22	1.22	1.22	1.22	1.22	1.23	1.25
	.78	.77	.77	.78	.79	.80	.82	.84	.85	.86	.86	.85	.84	.82	.81	.80	.80	.81	.81	.81	.82	.81	.80	.79
35-45S 01	16.59	16.85	16.82	16.47	15.84	15.05	14.21	13.50	13.00	12.80	12.88	13.18	13.58	13.97	14.26	14.42	14.44	14.40	14.36	14.44	14.67	15.06	15.58	16.12
	1.23	1.24	1.24	1.23	1.23	1.21	1.20	1.19	1.18	1.18	1.18	1.19	1.20	1.20	1.21	1.21	1.21	1.21	1.21	1.20	1.21	1.21	1.21	1.22
	.82	.82	.81	.82	.82	.83	.84	.85	.86	.86	.87	.87	.86	.86	.86	.86	.85	.85	.84	.84	.84	.83	.83	.82
45-55S 01	14.22	14.39	14.41	14.25	13.92	13.44	12.89	12.33	11.83	11.47	11.25	11.17	11.22	11.34	11.52	11.70	11.90	12.10	12.34	12.60	12.90	13.23	13.58	13.93
	1.19	1.19	1.20	1.19	1.19	1.18	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.18	1.18	1.18	1.19
	.83	.83	.83	.83	.84	.84	.85	.86	.86	.87	.87	.88	.88	.88	.87	.87	.87	.87	.86	.86	.85	.85	.84	.84
55-65S 01	16.55	17.03	16.99	16.45	15.54	14.42	13.29	12.31	11.55	11.03	10.72	10.52	10.34	10.14	9.89	9.66	9.52	9.58	9.94	10.64	11.68	12.97	14.34	15.60
	1.21	1.22	1.22	1.22	1.21	1.19	1.17	1.16	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.11	1.12	1.12	1.13	1.14	1.15	1.16	1.18	1.20
	.78	.78	.78	.79	.81	.82	.83	.84	.85	.85	.85	.85	.85	.85	.85	.86	.87	.87	.87	.87	.85	.83	.81	.80

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 08	15.53	15.73	15.38	14.57	13.46	12.28	11.20	10.35	9.75	9.39	9.15	8.94	8.67	8.30	7.89	7.53	7.37	7.54	8.13	9.14	10.50	12.03	13.53	14.76
	1.19	1.19	1.19	1.18	1.17	1.15	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.10	1.10	1.09	1.09	1.10	1.10	1.11	1.13	1.15	1.16	1.18
	.79	.79	.80	.81	.82	.84	.86	.87	.88	.88	.89	.89	.90	.90	.91	.91	.91	.91	.90	.89	.86	.85	.82	.80
45-55N 08	14.29	14.29	14.01	13.52	12.91	12.26	11.66	11.15	10.74	10.41	10.14	9.89	9.65	9.43	9.27	9.22	9.33	9.67	10.22	10.95	11.80	12.67	13.43	14.00
	1.18	1.18	1.18	1.17	1.16	1.16	1.15	1.15	1.14	1.14	1.13	1.13	1.13	1.12	1.12	1.12	1.12	1.13	1.13	1.14	1.15	1.16	1.17	1.18
	.82	.83	.83	.84	.85	.86	.86	.87	.87	.87	.87	.88	.88	.89	.89	.89	.89	.89	.88	.87	.86	.85	.84	.83
35-45N 08	11.56	11.61	11.55	11.40	11.19	10.96	10.74	10.58	10.48	10.43	10.41	10.39	10.36	10.30	10.22	10.15	10.10	10.12	10.22	10.40	10.64	10.92	11.19	11.42
	1.15	1.15	1.15	1.15	1.15	1.15	1.14	1.14	1.14	1.14	1.14	1.15	1.15	1.15	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.15
	.87	.87	.87	.87	.87	.87	.87	.88	.88	.89	.89	.89	.90	.90	.90	.90	.90	.89	.89	.88	.88	.87	.87	.87
25-35N																								
15-25N 08	23.79	23.80	23.38	22.54	21.35	19.94	18.46	17.08	15.91	15.06	14.53	14.30	14.32	14.54	14.95	15.51	16.25	17.15	18.20	19.35	20.54	21.67	22.65	23.38
	1.34	1.33	1.33	1.31	1.29	1.27	1.25	1.23	1.22	1.21	1.20	1.19	1.18	1.18	1.18	1.19	1.20	1.21	1.23	1.25	1.28	1.30	1.32	1.33
	.78	.78	.79	.80	.80	.81	.82	.83	.83	.84	.84	.84	.83	.83	.82	.80	.79	.78	.77	.77	.76	.76	.77	.77
5-15N																								
5N-5S 02	22.82	25.26	26.76	27.02	25.95	23.73	20.74	17.48	14.46	12.10	10.59	9.94	9.93	10.28	10.68	10.94	10.99	10.94	11.01	11.49	12.60	14.44	16.96	19.88
	1.27	1.30	1.33	1.34	1.33	1.31	1.27	1.23	1.20	1.17	1.15	1.14	1.14	1.15	1.16	1.16	1.16	1.16	1.15	1.15	1.16	1.18	1.20	1.24
	.70	.67	.66	.66	.69	.72	.76	.81	.84	.87	.89	.89	.89	.89	.88	.88	.88	.88	.88	.87	.85	.82	.78	.74
5-15S 02	21.73	23.21	24.13	24.32	23.70	22.28	20.23	17.78	15.22	12.83	10.86	9.42	8.57	8.25	8.38	8.85	9.58	10.50	11.60	12.90	14.40	16.12	17.99	19.92
	1.31	1.33	1.35	1.36	1.35	1.33	1.29	1.26	1.21	1.18	1.15	1.12	1.11	1.10	1.10	1.10	1.11	1.12	1.13	1.15	1.18	1.20	1.24	1.27
	.79	.78	.77	.77	.77	.78	.80	.82	.84	.86	.87	.88	.89	.89	.89	.88	.87	.87	.86	.85	.84	.83	.82	.81
15-25S 02	16.10	15.84	15.68	15.59	15.52	15.44	15.33	15.21	15.11	15.05	15.08	15.24	15.52	15.93	16.43	16.97	17.47	17.85	18.05	18.03	17.80	17.41	16.94	16.48
	1.24	1.23	1.22	1.22	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.22	1.23	1.24	1.25	1.26	1.27	1.27	1.27	1.27	1.26	1.25
	.83	.83	.83	.83	.83	.83	.84	.84	.85	.85	.84	.84	.83	.82	.81	.80	.80	.80	.80	.81	.82	.83	.83	.83
25-35S 02	16.34	16.79	16.96	16.75	16.14	15.20	14.08	12.98	12.09	11.57	11.48	11.77	12.34	13.04	13.70	14.21	14.50	14.60	14.57	14.53	14.58	14.80	15.21	15.76
	1.22	1.23	1.23	1.23	1.23	1.21	1.20	1.18	1.17	1.16	1.16	1.16	1.17	1.18	1.18	1.19	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.21
	.82	.82	.82	.82	.83	.84	.85	.86	.86	.87	.86	.86	.85	.84	.83	.83	.83	.83	.83	.84	.84	.84	.83	.83
35-45S 02	13.89	14.11	14.25	14.22	14.02	13.66	13.22	12.78	12.45	12.26	12.27	12.45	12.74	13.05	13.33	13.51	13.56	13.52	13.42	13.31	13.26	13.28	13.42	13.63
	1.18	1.18	1.18	1.19	1.18	1.18	1.18	1.17	1.17	1.17	1.17	1.18	1.18	1.19	1.19	1.20	1.20	1.19	1.19	1.19	1.18	1.18	1.18	1.18
	.83	.83	.83	.83	.84	.85	.85	.86	.87	.87	.87	.87	.87	.87	.87	.87	.87	.87	.86	.86	.85	.84	.84	.83
45-55S 02	13.35	13.53	13.55	13.38	13.02	12.53	11.96	11.40	10.91	10.57	10.38	10.33	10.40	10.53	10.69	10.86	11.02	11.19	11.40	11.65	11.96	12.32	12.70	13.06
	1.17	1.18	1.18	1.17	1.17	1.16	1.16	1.14	1.14	1.13	1.13	1.13	1.13	1.14	1.15	1.15	1.15	1.15	1.15	1.15	1.16	1.16	1.17	1.17
	.84	.84	.84	.84	.84	.85	.85	.86	.87	.87	.88	.88	.88	.88	.88	.88	.88	.87	.87	.87	.86	.86	.85	.85
55-65S 02	16.03	16.42	16.30	15.72	14.77	13.61	12.41	11.31	10.43	9.79	9.37	9.11	8.94	8.80	8.67	8.60	8.66	8.93	9.48	10.34	11.46	12.74	14.05	15.20
	1.18	1.19	1.19	1.19	1.18	1.17	1.16	1.15	1.13	1.12	1.11	1.10	1.10	1.10	1.10	1.10	1.11	1.11	1.12	1.13	1.14	1.15	1.16	1.17
	.79	.78	.79	.80	.82	.83	.85	.86	.87	.88	.88	.88	.88	.88	.89	.89	.90	.90	.89	.88	.86	.84	.82	.80

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 09	17.35	17.33	16.94	16.30	15.51	14.68	13.89	13.17	12.52	11.91	11.29	10.67	10.04	9.48	9.07	8.94	9.17	9.81	10.83	12.15	13.58	14.97	16.14	16.96
	1.21	1.21	1.21	1.20	1.19	1.18	1.17	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.11	1.11	1.12	1.13	1.16	1.17	1.19	1.21	1.21
	.78	.77	.78	.79	.80	.81	.82	.84	.84	.85	.86	.87	.87	.88	.89	.89	.89	.88	.87	.85	.83	.81	.79	.78
45-55N 09	15.37	14.99	14.55	14.11	13.72	13.41	13.12	12.83	12.49	12.07	11.57	11.03	10.54	10.19	10.09	10.29	10.82	11.64	12.62	13.64	14.53	15.20	15.55	15.59
	1.20	1.19	1.18	1.18	1.17	1.17	1.16	1.15	1.15	1.14	1.13	1.12	1.12	1.12	1.12	1.12	1.13	1.15	1.16	1.18	1.19	1.20	1.20	1.20
	.82	.82	.82	.82	.83	.83	.84	.84	.84	.85	.85	.86	.87	.87	.88	.88	.87	.87	.85	.84	.83	.82	.82	.81
35-45N 09	13.56	13.31	12.99	12.64	12.30	12.00	11.71	11.43	11.14	10.81	10.47	10.12	9.82	9.61	9.56	9.72	10.11	10.68	11.39	12.13	12.79	13.30	13.60	13.68
	1.19	1.19	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.15	1.14	1.14	1.13	1.13	1.13	1.13	1.14	1.15	1.15	1.16	1.17	1.18	1.19	1.19
	.85	.85	.86	.86	.86	.87	.87	.87	.87	.88	.88	.89	.90	.90	.91	.90	.90	.89	.88	.86	.85	.85	.85	.85
25-35N																								
15-25N 09	24.29	24.16	23.69	22.86	21.67	20.18	18.53	16.85	15.31	14.06	13.19	12.76	12.78	13.23	14.06	15.22	16.60	18.10	19.59	20.97	22.14	23.07	23.73	24.14
	1.34	1.34	1.34	1.33	1.32	1.30	1.27	1.25	1.22	1.20	1.18	1.17	1.17	1.17	1.19	1.20	1.22	1.24	1.26	1.28	1.30	1.31	1.32	1.33
	.79	.80	.80	.81	.81	.81	.82	.83	.83	.84	.85	.85	.84	.84	.83	.81	.80	.79	.78	.77	.77	.77	.78	.79
5-15N																								
5N-5S 03	18.03	20.06	21.55	22.20	21.87	20.61	18.64	16.32	14.04	12.12	10.76	10.03	9.82	9.95	10.21	10.41	10.48	10.44	10.41	10.57	11.11	12.17	13.77	15.80
	1.24	1.27	1.29	1.30	1.30	1.28	1.26	1.23	1.20	1.17	1.15	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.15	1.16	1.18	1.21
	.79	.77	.75	.74	.74	.76	.78	.81	.84	.86	.88	.89	.89	.89	.88	.88	.88	.87	.87	.87	.86	.85	.84	.81
5-15S 03	27.08	28.67	29.31	28.78	27.07	24.36	21.02	17.52	14.30	11.73	10.02	9.20	9.14	9.64	10.48	11.47	12.51	13.60	14.80	16.22	17.96	20.05	22.42	24.86
	1.37	1.40	1.42	1.42	1.40	1.36	1.31	1.25	1.20	1.16	1.13	1.11	1.11	1.11	1.12	1.14	1.15	1.17	1.19	1.21	1.23	1.26	1.30	1.34
	.69	.69	.69	.70	.72	.75	.78	.81	.84	.87	.89	.89	.89	.89	.88	.86	.84	.83	.81	.79	.77	.75	.73	.71
15-25S 03	20.62	20.16	19.55	18.80	17.92	16.96	16.00	15.13	14.45	14.04	13.93	14.11	14.55	15.20	16.02	16.93	17.89	18.82	19.65	20.33	20.80	21.06	21.09	20.94
	1.27	1.26	1.26	1.25	1.24	1.24	1.23	1.22	1.21	1.21	1.21	1.21	1.21	1.22	1.23	1.25	1.26	1.28	1.29	1.29	1.29	1.29	1.28	1.28
	.79	.79	.80	.80	.82	.83	.84	.85	.85	.86	.85	.85	.84	.83	.83	.82	.81	.80	.79	.79	.79	.78	.78	.78
25-35S 03	14.42	14.42	14.33	14.15	13.88	13.54	13.16	12.80	12.48	12.23	12.08	12.01	12.03	12.10	12.23	12.41	12.63	12.88	13.17	13.46	13.74	13.99	14.19	14.34
	1.20	1.20	1.20	1.20	1.19	1.18	1.18	1.17	1.16	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.16	1.16	1.17	1.18	1.18	1.19	1.19	1.20
	.84	.84	.84	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.84	.84	.84	.84	.84	.84	.84	.84	.84
35-45S 03	12.51	12.38	12.33	12.35	12.42	12.51	12.58	12.61	12.60	12.55	12.46	12.38	12.33	12.33	12.39	12.51	12.68	12.86	13.03	13.12	13.13	13.04	12.89	12.69
	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.17	1.17	1.16	1.17	1.17	1.17	1.18	1.18	1.18	1.18	1.18	1.18	1.17	1.17	1.17	1.18	1.17
	.87	.87	.87	.87	.86	.86	.86	.86	.85	.85	.85	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86	.87	.87	.87
45-55S 03	13.44	13.64	13.78	13.82	13.74	13.52	13.20	12.82	12.44	12.11	11.85	11.71	11.66	11.69	11.75	11.85	11.96	12.08	12.21	12.37	12.55	12.75	12.97	13.20
	1.16	1.17	1.17	1.17	1.18	1.17	1.17	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
	.83	.83	.83	.83	.83	.83	.84	.84	.85	.85	.86	.86	.87	.87	.87	.87	.87	.86	.85	.85	.84	.84	.83	.83
55-65S 03	17.17	17.54	17.47	17.01	16.25	15.32	14.38	13.56	12.92	12.48	12.20	12.02	11.84	11.63	11.38	11.14	11.01	11.09	11.45	12.12	13.08	14.21	15.38	16.42
	1.19	1.20	1.20	1.20	1.19	1.18	1.18	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.15	1.16	1.16	1.17	1.18	1.19
	.76	.75	.75	.76	.78	.80	.81	.83	.84	.84	.85	.85	.85	.86	.87	.87	.88	.88	.87	.86	.84	.82	.79	.77

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 10	16.44	16.19	15.91	15.65	15.42	15.18	14.89	14.50	13.99	13.36	12.65	11.94	11.33	10.92	10.80	11.05	11.64	12.52	13.56	14.61	15.51	16.16	16.51	16.58
	1.22	1.21	1.21	1.20	1.20	1.20	1.19	1.19	1.18	1.17	1.16	1.15	1.14	1.14	1.13	1.14	1.15	1.17	1.18	1.20	1.21	1.22	1.22	1.22
	.81	.81	.81	.81	.82	.82	.82	.83	.84	.84	.85	.86	.87	.87	.87	.86	.86	.85	.84	.83	.82	.81	.81	.81
45-55N 10	15.23	15.10	14.98	14.86	14.72	14.50	14.18	13.76	13.27	12.76	12.28	11.92	11.72	11.73	11.96	12.40	12.98	13.64	14.28	14.83	15.21	15.41	15.44	15.36
	1.19	1.19	1.18	1.19	1.19	1.19	1.18	1.18	1.17	1.16	1.15	1.15	1.15	1.15	1.15	1.16	1.17	1.18	1.20	1.20	1.20	1.21	1.20	1.20
	.82	.82	.82	.82	.82	.82	.83	.83	.84	.85	.86	.86	.87	.87	.86	.86	.86	.85	.85	.84	.83	.83	.82	.82
35-45N 10	12.77	12.51	12.41	12.42	12.47	12.47	12.34	12.05	11.62	11.09	10.58	10.18	10.01	10.13	10.55	11.22	12.04	12.87	13.56	14.00	14.13	13.97	13.60	13.17
	1.18	1.18	1.18	1.18	1.18	1.17	1.17	1.17	1.16	1.15	1.15	1.14	1.14	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.20	1.20	1.20	1.19
	.87	.88	.87	.87	.87	.87	.87	.87	.87	.88	.88	.89	.89	.89	.88	.88	.86	.86	.85	.85	.85	.85	.86	.87
25-35N																								
15-25N 10	20.97	20.93	20.60	19.91	18.84	17.47	15.96	14.53	13.38	12.67	12.50	12.85	13.67	14.79	16.06	17.31	18.41	19.26	19.85	20.21	20.42	20.56	20.71	20.86
	1.29	1.29	1.29	1.28	1.27	1.25	1.22	1.20	1.18	1.16	1.15	1.15	1.17	1.18	1.20	1.23	1.25	1.27	1.28	1.28	1.29	1.29	1.29	1.29
	.80	.80	.80	.80	.81	.82	.83	.84	.85	.85	.85	.84	.83	.81	.80	.79	.79	.79	.79	.80	.80	.80	.80	.80
5-15N																								
5N-5S 04	16.87	19.58	21.81	23.12	23.23	22.15	20.14	17.65	15.21	13.28	12.11	11.75	11.99	12.53	13.01	13.16	12.85	12.15	11.26	10.52	10.24	10.71	12.05	14.19
	1.23	1.28	1.32	1.34	1.35	1.33	1.30	1.26	1.22	1.19	1.17	1.16	1.17	1.18	1.19	1.19	1.19	1.17	1.15	1.14	1.13	1.13	1.15	1.18
	.80	.79	.77	.77	.77	.78	.80	.82	.84	.85	.86	.87	.87	.87	.87	.87	.87	.87	.87	.86	.86	.85	.84	.82
5-15S 04	29.60	29.91	29.05	27.11	24.30	20.99	17.57	14.46	11.94	10.17	9.16	8.79	8.92	9.39	10.11	11.04	12.24	13.78	15.72	18.06	20.70	23.47	26.09	28.24
	1.43	1.46	1.47	1.45	1.41	1.35	1.28	1.22	1.16	1.12	1.10	1.10	1.11	1.12	1.14	1.15	1.16	1.17	1.19	1.21	1.25	1.29	1.34	1.39
	.69	.71	.74	.77	.80	.82	.84	.85	.86	.87	.87	.88	.88	.88	.87	.86	.83	.81	.78	.74	.71	.69	.68	.68
15-25S 04	17.74	17.85	17.86	17.68	17.27	16.64	15.89	15.16	14.59	14.32	14.39	14.80	15.45	16.22	16.97	17.59	18.00	18.18	18.17	18.02	17.82	17.66	17.59	17.62
	1.24	1.25	1.25	1.26	1.25	1.24	1.23	1.22	1.21	1.20	1.21	1.22	1.23	1.24	1.25	1.26	1.26	1.26	1.25	1.24	1.24	1.23	1.23	1.23
	.82	.82	.83	.83	.83	.83	.83	.84	.84	.84	.84	.83	.83	.83	.82	.82	.82	.81	.81	.81	.82	.82	.82	.82
25-35S 04	15.09	14.76	14.37	13.93	13.43	12.87	12.28	11.72	11.24	10.91	10.77	10.83	11.09	11.53	12.10	12.77	13.47	14.16	14.76	15.23	15.52	15.62	15.56	15.37
	1.20	1.19	1.19	1.18	1.18	1.17	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.21	1.21	1.21	1.21	1.20
	.84	.84	.84	.84	.85	.85	.86	.87	.87	.87	.87	.86	.86	.85	.85	.84	.84	.84	.84	.84	.84	.84	.84	.84
35-45S 04	12.76	12.62	12.61	12.68	12.71	12.64	12.41	12.03	11.57	11.12	10.79	10.68	10.82	11.24	11.87	12.61	13.35	13.97	14.36	14.48	14.32	13.96	13.51	13.08
	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.15	1.16	1.17	1.19	1.20	1.21	1.21	1.21	1.20	1.19	1.18
	.86	.86	.86	.85	.85	.85	.86	.86	.87	.87	.88	.88	.88	.88	.87	.87	.86	.85	.85	.85	.86	.86	.86	.86
45-55S 04	13.15	12.93	12.83	12.80	12.76	12.65	12.39	12.00	11.50	11.00	10.58	10.34	10.36	10.66	11.21	11.94	12.72	13.45	14.02	14.33	14.38	14.19	13.86	13.49
	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.15	1.14	1.13	1.13	1.13	1.13	1.13	1.15	1.16	1.17	1.19	1.19	1.19	1.19	1.18	1.17
	.85	.86	.86	.85	.85	.86	.86	.86	.87	.88	.88	.88	.88	.88	.87	.86	.85	.85	.84	.84	.83	.84	.84	.85
55-65S 04	19.14	19.60	19.83	19.74	19.23	18.28	16.95	15.34	13.65	12.06	10.75	9.86	9.45	9.52	10.03	10.87	11.92	13.08	14.23	15.30	16.26	17.11	17.87	18.54
	1.24	1.25	1.26	1.26	1.26	1.24	1.23	1.20	1.17	1.15	1.12	1.11	1.10	1.10	1.11	1.12	1.14	1.16	1.18	1.19	1.21	1.22	1.23	1.24
	.76	.76	.76	.76	.77	.79	.80	.82	.84	.86	.87	.88	.89	.89	.88	.87	.86	.84	.83	.81	.80	.78	.77	.77

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 11	17.46	17.61	17.93	18.28	18.47	18.33	17.76	16.75	15.39	13.90	12.52	11.51	11.06	11.25	12.04	13.28	14.72	16.10	17.19	17.87	18.11	18.02	17.77	17.54
	1.23	1.23	1.24	1.24	1.24	1.24	1.24	1.22	1.20	1.18	1.16	1.14	1.14	1.14	1.16	1.17	1.20	1.22	1.24	1.25	1.25	1.25	1.24	1.23
	.80	.79	.79	.78	.78	.78	.79	.80	.81	.83	.85	.86	.86	.86	.86	.85	.83	.82	.81	.81	.80	.80	.80	.80
45-55N 11	17.08	17.00	16.94	16.79	16.48	15.92	15.09	14.05	12.90	11.81	10.95	10.48	10.49	10.99	11.91	13.11	14.41	15.62	16.58	17.20	17.50	17.52	17.39	17.22
	1.23	1.23	1.22	1.23	1.22	1.21	1.20	1.19	1.17	1.16	1.15	1.14	1.14	1.14	1.16	1.18	1.19	1.21	1.23	1.24	1.24	1.24	1.24	1.24
	.81	.82	.81	.81	.80	.81	.82	.83	.85	.86	.88	.88	.89	.88	.88	.87	.85	.84	.83	.83	.82	.82	.82	.82
35-45N 11	12.81	12.72	12.83	13.07	13.34	13.52	13.52	13.29	12.85	12.29	11.70	11.23	10.99	11.04	11.38	11.97	12.68	13.36	13.88	14.15	14.14	13.88	13.48	13.09
	1.18	1.18	1.18	1.18	1.19	1.19	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.15	1.16	1.17	1.18	1.19	1.20	1.20	1.20	1.19	1.19	1.18
	.87	.87	.87	.86	.85	.85	.85	.85	.86	.87	.88	.88	.88	.88	.88	.87	.86	.85	.85	.85	.85	.86	.86	.87
25-35N																								
15-25N 11	22.74	23.55	24.06	23.96	23.06	21.38	19.16	16.80	14.78	13.50	13.23	14.02	15.68	17.87	20.14	22.07	23.37	23.90	23.74	23.11	22.35	21.78	21.64	22.00
	1.33	1.34	1.36	1.36	1.35	1.33	1.29	1.25	1.21	1.19	1.17	1.18	1.21	1.24	1.28	1.32	1.35	1.36	1.36	1.34	1.33	1.32	1.31	1.31
	.78	.77	.78	.79	.80	.82	.84	.85	.86	.85	.84	.82	.80	.79	.78	.78	.79	.80	.80	.81	.81	.81	.80	.79
5-15N																								
5N-5S 05	0.00	0.00	0.00	0.00	28.10	28.57	6.92	6.74	7.00	9.24	10.96	12.32	11.86	13.00	12.94	12.48	12.22	11.64	10.96	10.42	11.22	12.92	16.20	0.00
	0.00	0.00	0.00	0.00	1.44	1.32	1.10	1.10	1.08	1.08	1.13	1.17	1.18	1.19	1.18	1.17	1.16	1.17	1.13	1.10	1.13	1.16	1.16	0.00
	0.00	0.00	0.00	0.00	.62	.69	.91	.91	.89	.85	.85	.85	.88	.88	.86	.84	.83	.86	.84	.84	.84	.83	.75	0.00
5-15S 05	35.67	35.62	34.20	31.56	28.07	24.25	20.65	17.73	15.80	14.92	14.93	15.54	16.41	17.24	17.92	18.48	19.11	20.06	21.56	23.68	26.35	29.30	32.14	34.40
	1.56	1.57	1.55	1.51	1.45	1.39	1.32	1.27	1.23	1.21	1.20	1.21	1.22	1.23	1.23	1.24	1.25	1.26	1.29	1.33	1.38	1.43	1.49	1.53
	.68	.69	.71	.73	.76	.78	.80	.82	.83	.83	.82	.81	.79	.78	.77	.76	.76	.75	.74	.73	.72	.70	.69	.69
15-25S 05	15.20	15.12	15.10	15.12	15.19	15.28	15.42	15.61	15.87	16.20	16.59	16.98	17.34	17.60	17.73	17.70	17.54	17.27	16.92	16.55	16.18	15.85	15.57	15.35
	1.19	1.19	1.19	1.19	1.19	1.19	1.20	1.21	1.22	1.23	1.25	1.26	1.27	1.27	1.27	1.27	1.26	1.25	1.23	1.22	1.21	1.20	1.19	1.19
	.85	.86	.86	.85	.85	.84	.84	.84	.84	.84	.85	.86	.86	.87	.87	.86	.86	.85	.85	.84	.84	.84	.85	.85
25-35S 05	13.58	13.61	13.60	13.50	13.25	12.85	12.33	11.79	11.32	11.01	10.92	11.07	11.45	11.98	12.59	13.18	13.67	14.01	14.16	14.15	14.02	13.85	13.69	13.60
	1.18	1.18	1.19	1.19	1.19	1.18	1.18	1.17	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.18	1.19	1.19	1.19	1.19	1.18	1.18	1.18	1.18
	.86	.86	.86	.86	.87	.87	.87	.88	.88	.89	.89	.89	.89	.88	.88	.87	.87	.86	.86	.86	.86	.86	.86	.86
35-45S 05	13.10	13.46	13.88	14.23	14.34	14.16	13.64	12.86	11.95	11.09	10.44	10.12	10.16	10.55	11.16	11.86	12.52	13.01	13.28	13.33	13.20	13.02	12.89	12.90
	1.17	1.18	1.19	1.19	1.19	1.19	1.19	1.18	1.17	1.16	1.15	1.15	1.15	1.15	1.16	1.17	1.18	1.18	1.19	1.19	1.18	1.18	1.17	1.17
	.86	.86	.85	.85	.85	.86	.86	.87	.88	.89	.89	.90	.89	.89	.88	.88	.88	.87	.86	.87	.87	.87	.86	.86
45-55S 05	15.65	15.84	15.93	15.85	15.53	14.94	14.11	13.12	12.09	11.16	10.46	10.08	10.05	10.33	10.86	11.56	12.32	13.05	13.69	14.22	14.63	14.94	15.19	15.42
	1.20	1.19	1.20	1.19	1.19	1.18	1.17	1.16	1.15	1.14	1.13	1.13	1.13	1.14	1.15	1.15	1.16	1.17	1.18	1.19	1.19	1.19	1.20	1.19
	.83	.82	.82	.82	.82	.82	.83	.84	.86	.87	.88	.89	.89	.89	.88	.88	.87	.86	.85	.84	.84	.83	.83	.83
55-65S 05	21.20	22.07	22.67	22.82	22.39	21.31	19.66	17.59	15.38	13.30	11.60	10.47	9.98	10.10	10.73	11.70	12.86	14.07	15.22	16.29	17.28	18.23	19.20	20.20
	1.30	1.31	1.33	1.33	1.32	1.31	1.28	1.25	1.21	1.17	1.14	1.12	1.11	1.11	1.12	1.13	1.15	1.17	1.19	1.21	1.23	1.25	1.26	1.28
	.77	.77	.76	.76	.77	.78	.79	.81	.83	.85	.86	.87	.87	.87	.86	.85	.84	.84	.83	.82	.81	.80	.80	.79

	MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	12	17.48	17.92	18.32	18.52	18.44	17.95	17.06	15.83	14.39	12.94	11.67	10.77	10.34	10.39	10.88	11.69	12.66	13.65	14.54	15.27	15.84	16.27	16.65	17.04
		1.22	1.23	1.24	1.25	1.26	1.25	1.24	1.22	1.21	1.18	1.16	1.14	1.13	1.14	1.14	1.15	1.17	1.18	1.18	1.19	1.19	1.20	1.20	1.21
		.80	.79	.79	.80	.80	.81	.82	.84	.85	.86	.87	.88	.88	.88	.88	.87	.86	.85	.84	.83	.82	.81	.80	.80
45-55N	12	16.86	17.00	17.13	17.17	17.01	16.55	15.76	14.67	13.38	12.07	10.92	10.12	9.78	9.95	10.59	11.59	12.76	13.94	14.98	15.77	16.28	16.56	16.69	16.77
		1.23	1.23	1.23	1.23	1.22	1.22	1.21	1.20	1.18	1.16	1.15	1.14	1.14	1.14	1.15	1.16	1.18	1.19	1.21	1.22	1.23	1.23	1.23	1.23
		.82	.81	.81	.80	.80	.81	.82	.83	.85	.86	.88	.89	.89	.89	.88	.88	.87	.86	.85	.84	.84	.83	.83	.82
35-45N	12	12.61	12.78	13.20	13.78	14.33	14.71	14.77	14.44	13.75	12.82	11.83	10.96	10.40	10.24	10.49	11.08	11.84	12.61	13.21	13.54	13.55	13.33	12.99	12.71
		1.17	1.18	1.18	1.19	1.19	1.20	1.20	1.19	1.19	1.18	1.16	1.16	1.15	1.14	1.15	1.15	1.16	1.17	1.18	1.18	1.19	1.18	1.18	1.18
		.87	.87	.86	.85	.84	.83	.83	.84	.85	.86	.88	.88	.89	.89	.89	.88	.87	.86	.86	.85	.85	.86	.86	.87
25-35N																									
15-25N	12	24.91	26.14	26.58	26.06	24.63	22.56	20.31	18.34	17.09	16.76	17.37	18.66	20.23	21.63	22.50	22.64	22.12	21.16	20.16	19.49	19.45	20.15	21.49	23.20
		1.37	1.39	1.39	1.38	1.36	1.33	1.29	1.26	1.24	1.24	1.26	1.29	1.32	1.35	1.37	1.38	1.37	1.35	1.32	1.30	1.29	1.30	1.32	1.34
		.76	.76	.76	.77	.79	.80	.82	.82	.83	.82	.81	.80	.79	.79	.79	.80	.81	.82	.82	.82	.81	.80	.78	.77
5-15N																									
5N-5S	06	0.00	0.00	0.00	0.00	0.00	0.00	8.57	6.14	6.73	8.10	9.99	12.40	12.93	12.29	11.86	10.50	9.59	9.49	9.60	11.10	13.23	16.51	24.06	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	1.09	1.07	1.08	1.10	1.10	1.15	1.15	1.14	1.14	1.13	1.12	1.13	1.11	1.12	1.15	1.17	1.29	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	.89	.92	.90	.88	.86	.83	.81	.82	.83	.85	.87	.90	.86	.83	.82	.76	.67	0.00
5-15S	06	33.28	32.08	29.78	26.69	23.25	19.93	17.13	15.12	13.98	13.63	13.86	14.41	15.03	15.62	16.18	16.85	17.86	19.39	21.51	24.14	27.02	29.78	31.97	33.22
		1.50	1.48	1.45	1.40	1.35	1.30	1.25	1.22	1.20	1.20	1.20	1.21	1.22	1.23	1.24	1.25	1.27	1.29	1.32	1.36	1.40	1.44	1.48	1.50
		.72	.74	.76	.79	.82	.84	.86	.87	.87	.86	.86	.85	.84	.83	.83	.82	.81	.80	.78	.76	.74	.73	.72	.71
15-25S	06	13.33	12.89	12.68	12.62	12.64	12.65	12.60	12.48	12.35	12.28	12.33	12.59	13.06	13.73	14.53	15.36	16.09	16.60	16.82	16.70	16.26	15.57	14.76	13.97
		1.18	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.18	1.18	1.19	1.20	1.21	1.22	1.23	1.24	1.25	1.25	1.25	1.24	1.23	1.21	1.20
		.87	.87	.87	.87	.86	.86	.86	.86	.87	.87	.88	.88	.88	.87	.87	.85	.84	.84	.83	.84	.84	.85	.86	.87
25-35S	06	12.86	13.24	13.66	13.99	14.08	13.84	13.26	12.40	11.43	10.50	9.79	9.41	9.43	9.82	10.48	11.27	12.03	12.64	12.99	13.09	12.98	12.79	12.64	12.65
		1.17	1.17	1.18	1.18	1.18	1.18	1.17	1.17	1.15	1.14	1.14	1.13	1.13	1.13	1.14	1.15	1.16	1.17	1.17	1.18	1.18	1.17	1.17	1.17
		.86	.85	.85	.85	.85	.85	.86	.87	.88	.89	.90	.91	.91	.90	.90	.89	.88	.87	.87	.87	.86	.86	.86	.86
35-45S	06	14.36	14.75	15.19	15.53	15.63	15.36	14.67	13.62	12.34	11.03	9.91	9.14	8.84	9.02	9.61	10.47	11.42	12.31	13.02	13.50	13.76	13.88	13.95	14.09
		1.19	1.19	1.20	1.20	1.20	1.20	1.19	1.18	1.17	1.15	1.14	1.13	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.19	1.19	1.19	1.19
		.83	.82	.82	.81	.81	.82	.83	.85	.87	.88	.89	.91	.91	.91	.90	.89	.88	.88	.87	.86	.86	.85	.85	.84
45-55S	06	15.47	15.45	15.40	15.24	14.90	14.32	13.49	12.47	11.35	10.28	9.41	8.87	8.71	8.97	9.59	10.49	11.53	12.60	13.56	14.33	14.89	15.23	15.39	15.45
		1.21	1.21	1.20	1.20	1.19	1.19	1.18	1.16	1.15	1.14	1.12	1.12	1.11	1.12	1.13	1.14	1.15	1.17	1.18	1.20	1.21	1.21	1.21	1.21
		.83	.83	.83	.83	.83	.83	.84	.86	.87	.88	.89	.90	.90	.90	.89	.88	.88	.87	.86	.85	.84	.84	.83	.83
55-65S	06	20.39	21.45	22.02	21.98	21.26	19.91	18.09	16.00	13.91	12.04	10.59	9.63	9.18	9.17	9.50	10.05	10.75	11.56	12.47	13.51	14.70	16.05	17.52	19.01
		1.30	1.32	1.33	1.33	1.32	1.29	1.26	1.23	1.19	1.16	1.13	1.11	1.11	1.11	1.11	1.12	1.13	1.14	1.16	1.17	1.19	1.22	1.24	1.27
		.81	.80	.78	.78	.78	.79	.81	.83	.85	.87	.88	.88	.88	.88	.88	.87	.87	.87	.87	.86	.86	.85	.84	.83

********** QUIET MAGNETIC -- SOLAR RANGE 41 - 109 **********

	MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	01	19.21	19.78	20.44	20.95	21.09	20.68	19.65	18.08	16.17	14.22	12.56	11.44	11.05	11.42	12.45	13.89	15.47	16.91	17.99	18.62	18.86	18.84	18.78	18.87
		1.26	1.27	1.28	1.29	1.30	1.30	1.28	1.26	1.24	1.21	1.17	1.15	1.14	1.15	1.16	1.19	1.21	1.24	1.26	1.27	1.28	1.28	1.27	1.26
		.81	.81	.80	.80	.80	.81	.82	.83	.84	.86	.87	.87	.87	.87	.86	.85	.83	.82	.82	.82	.81	.81	.81	.81
45-55N	01	18.69	18.42	18.11	17.76	17.29	16.65	15.82	14.82	13.71	12.62	11.68	11.03	10.79	11.00	11.67	12.72	14.02	15.41	16.70	17.76	18.50	18.91	19.01	18.91
		1.25	1.24	1.24	1.23	1.23	1.22	1.21	1.20	1.18	1.17	1.16	1.15	1.15	1.15	1.16	1.18	1.20	1.22	1.24	1.25	1.26	1.26	1.26	1.26
		.80	.80	.79	.79	.80	.81	.82	.83	.85	.86	.87	.88	.88	.88	.88	.87	.86	.85	.84	.83	.82	.81	.81	.81
35-45N	01	14.71	14.68	14.95	15.42	15.89	16.15	16.03	15.47	14.50	13.29	12.06	11.06	10.52	10.54	11.13	12.19	13.49	14.76	15.78	16.36	16.46	16.15	15.62	15.07
		1.21	1.21	1.21	1.22	1.23	1.22	1.23	1.21	1.20	1.19	1.16	1.15	1.14	1.14	1.15	1.17	1.19	1.20	1.22	1.23	1.23	1.23	1.23	1.22
		.86	.86	.85	.85	.84	.84	.84	.84	.85	.86	.87	.88	.88	.88	.87	.86	.85	.84	.83	.83	.83	.84	.85	.86
25-35N																									
15-25N	01	31.90	32.45	32.38	31.46	29.62	26.97	23.79	20.48	17.48	15.18	13.83	13.52	14.18	15.62	17.57	19.73	21.86	23.78	25.39	26.71	27.84	28.89	29.93	30.97
		1.46	1.47	1.46	1.45	1.42	1.38	1.33	1.28	1.23	1.20	1.17	1.17	1.18	1.20	1.24	1.28	1.32	1.36	1.39	1.41	1.43	1.44	1.45	1.46
		.74	.74	.75	.75	.77	.79	.81	.82	.84	.84	.84	.83	.81	.79	.78	.77	.76	.76	.76	.76	.76	.76	.75	.75
5-15N																									
5N-5S	07	0.00	26.50	22.25	25.54	27.27	31.88	11.93	6.82	7.17	9.25	12.23	14.38	13.60	13.57	13.02	11.85	10.62	10.10	10.17	12.87	15.45	13.10	0.00	0.00
		0.00	1.55	1.35	1.32	1.35	1.45	1.16	1.07	1.09	1.10	1.14	1.19	1.20	1.20	1.18	1.14	1.15	1.15	1.14	1.15	1.17	1.16	0.00	0.00
		0.00	.82	.76	.68	.67	.64	.88	.90	.90	.86	.81	.83	.85	.85	.85	.85	.88	.89	.88	.82	.80	.79	0.00	0.00
5-15S	07	30.16	31.04	30.80	29.44	27.13	24.19	21.01	17.98	15.44	13.56	12.41	11.87	11.79	11.99	12.33	12.80	13.46	14.44	15.88	17.84	20.28	23.04	25.83	28.32
		1.43	1.44	1.44	1.42	1.39	1.35	1.30	1.25	1.20	1.17	1.14	1.13	1.12	1.12	1.13	1.14	1.15	1.17	1.20	1.23	1.27	1.31	1.36	1.40
		.66	.66	.67	.68	.71	.74	.77	.80	.82	.83	.83	.83	.82	.82	.81	.81	.81	.80	.79	.78	.75	.73	.70	.68
15-25S	07	18.81	18.56	18.06	17.35	16.50	15.62	14.81	14.15	13.70	13.50	13.51	13.70	14.01	14.37	14.74	15.13	15.53	15.98	16.48	17.03	17.60	18.14	18.56	18.80
		1.25	1.25	1.23	1.22	1.20	1.19	1.18	1.18	1.18	1.18	1.19	1.19	1.20	1.20	1.21	1.21	1.22	1.22	1.23	1.24	1.25	1.25	1.26	1.26
		.85	.86	.86	.87	.87	.86	.86	.86	.86	.86	.87	.87	.86	.86	.85	.85	.84	.83	.82	.82	.82	.82	.83	.84
25-35S	07	13.46	13.20	12.87	12.50	12.08	11.63	11.18	10.74	10.36	10.05	9.84	9.75	9.80	9.99	10.34	10.82	11.39	12.00	12.59	13.09	13.45	13.66	13.72	13.64
		1.17	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.15	1.15	1.14	1.14	1.14	1.14	1.15	1.15	1.16	1.17	1.18	1.18	1.18	1.18	1.18	1.18
		.85	.85	.85	.86	.86	.87	.88	.88	.89	.89	.89	.89	.89	.89	.88	.88	.87	.87	.86	.86	.85	.85	.85	.85
35-45S	07	13.42	13.37	13.33	13.27	13.13	12.88	12.46	11.89	11.19	10.46	9.78	9.26	8.98	8.97	9.25	9.77	10.47	11.25	11.99	12.63	13.09	13.37	13.48	13.48
		1.19	1.18	1.18	1.17	1.17	1.17	1.17	1.16	1.15	1.14	1.14	1.13	1.12	1.12	1.13	1.13	1.14	1.15	1.16	1.18	1.19	1.19	1.19	1.19
		.85	.85	.84	.84	.84	.84	.85	.86	.87	.88	.89	.90	.90	.89	.89	.88	.88	.88	.87	.86	.85	.85	.85	.85
45-55S	07	14.31	14.30	14.24	14.09	13.78	13.30	12.60	11.73	10.77	9.85	9.06	8.53	8.33	8.46	8.92	9.63	10.50	11.42	12.29	13.03	13.60	13.97	14.18	14.28
		1.19	1.19	1.18	1.18	1.17	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.11	1.12	1.13	1.14	1.15	1.17	1.18	1.19	1.19	1.19	1.19
		.83	.83	.82	.83	.83	.84	.85	.86	.88	.89	.90	.90	.90	.90	.90	.89	.88	.87	.86	.86	.85	.85	.84	.84
55-65S	07	18.70	19.71	20.34	20.43	19.92	18.81	17.22	15.33	13.40	11.66	10.29	9.40	8.99	9.01	9.35	9.89	10.55	11.27	12.04	12.89	13.86	14.96	16.18	17.46
		1.28	1.29	1.30	1.30	1.29	1.27	1.25	1.21	1.18	1.15	1.13	1.11	1.11	1.11	1.11	1.12	1.13	1.15	1.16	1.18	1.19	1.21	1.23	1.26
		.80	.79	.78	.78	.79	.80	.81	.83	.85	.87	.88	.89	.89	.89	.89	.89	.88	.88	.87	.86	.85	.84	.83	.82

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 02	18.90	18.44	18.18	18.11	18.13	18.08	17.80	17.15	16.12	14.80	13.38	12.11	11.23	10.95	11.35	12.41	13.97	15.75	17.47	18.86	19.75	20.09	19.93	19.48
	1.25	1.24	1.23	1.24	1.24	1.24	1.24	1.24	1.23	1.21	1.18	1.16	1.14	1.14	1.15	1.17	1.19	1.23	1.25	1.27	1.29	1.29	1.28	1.26
	.78	.78	.78	.78	.78	.79	.80	.81	.82	.84	.85	.86	.87	.87	.87	.87	.86	.84	.83	.81	.80	.79	.78	.78
45-55N 02	17.02	16.28	15.68	15.26	14.98	14.75	14.46	14.02	13.39	12.62	11.81	11.12	10.72	10.75	11.29	12.30	13.67	15.19	16.64	17.79	18.49	18.68	18.40	17.79
	1.23	1.22	1.20	1.20	1.20	1.19	1.18	1.18	1.17	1.16	1.15	1.13	1.13	1.14	1.14	1.17	1.19	1.22	1.24	1.26	1.27	1.27	1.26	1.24
	.80	.81	.81	.82	.82	.82	.83	.84	.85	.85	.86	.87	.88	.88	.88	.88	.87	.85	.84	.83	.81	.81	.80	.80
35-45N 02	14.00	13.55	13.25	13.12	13.10	13.08	12.94	12.61	12.06	11.33	10.54	9.82	9.34	9.22	9.52	10.22	11.23	12.39	13.50	14.41	14.96	15.13	14.94	14.51
	1.19	1.18	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.15	1.14	1.13	1.13	1.13	1.13	1.14	1.15	1.17	1.19	1.20	1.21	1.21	1.21	1.20
	.84	.84	.84	.84	.84	.84	.84	.85	.86	.87	.88	.88	.89	.89	.89	.88	.87	.86	.85	.84	.83	.83	.83	.83
25-35N																								
15-25N 02	27.11	26.43	25.26	23.64	21.65	19.43	17.13	14.95	13.07	11.62	10.73	10.44	10.77	11.67	13.07	14.87	16.92	19.09	21.21	23.17	24.83	26.10	26.93	27.27
	1.41	1.40	1.38	1.35	1.31	1.28	1.24	1.20	1.17	1.15	1.14	1.14	1.15	1.16	1.18	1.21	1.24	1.27	1.30	1.34	1.36	1.39	1.40	1.41
	.74	.75	.76	.77	.79	.81	.83	.85	.87	.88	.88	.88	.87	.86	.84	.82	.81	.79	.77	.76	.75	.74	.74	.74
5-15N																								
5N-5S 08	0.00	0.00	17.15	23.90	32.10	45.25	21.90	7.20	6.00	6.15	9.50	12.70	15.20	14.40	13.40	12.95	12.90	13.80	13.40	13.70	15.40	0.00	0.00	0.00
	0.00	0.00	1.15	1.29	1.47	1.63	1.36	1.12	1.10	1.08	1.13	1.20	1.26	1.25	1.20	1.19	1.21	1.17	1.16	1.17	1.23	0.00	0.00	0.00
	0.00	0.00	.69	.66	.58	.60	.86	.95	.93	.93	.88	.88	.93	.90	.87	.85	.86	.84	.84	.85	.83	0.00	0.00	0.00
5-15S 08	24.88	26.85	28.01	28.10	27.03	24.89	21.98	18.71	15.54	12.89	11.00	9.97	9.70	9.98	10.56	11.23	11.90	12.55	13.32	14.35	15.77	17.66	19.95	22.45
	1.29	1.32	1.34	1.36	1.36	1.34	1.30	1.26	1.21	1.16	1.12	1.10	1.09	1.09	1.09	1.10	1.12	1.13	1.14	1.15	1.17	1.19	1.22	1.25
	.63	.62	.62	.64	.67	.72	.76	.80	.84	.85	.86	.86	.85	.84	.83	.82	.81	.81	.80	.78	.76	.72	.69	.65
15-25S 08	22.99	22.14	21.01	19.70	18.31	16.94	15.72	14.76	14.13	13.87	13.99	14.43	15.11	15.98	16.94	17.97	19.04	20.11	21.15	22.11	22.89	23.43	23.65	23.51
	1.29	1.29	1.28	1.27	1.26	1.25	1.23	1.22	1.21	1.20	1.20	1.20	1.21	1.22	1.23	1.24	1.25	1.26	1.26	1.27	1.27	1.28	1.28	1.29
	.82	.82	.83	.83	.83	.84	.85	.85	.86	.87	.87	.87	.87	.86	.85	.84	.83	.82	.81	.81	.80	.81	.81	.81
25-35S 08	16.31	15.92	15.33	14.61	13.84	13.07	12.36	11.73	11.17	10.68	10.25	9.88	9.62	9.50	9.60	9.96	10.60	11.51	12.59	13.73	14.80	15.65	16.21	16.42
	1.24	1.23	1.22	1.21	1.19	1.18	1.17	1.15	1.14	1.14	1.13	1.13	1.12	1.13	1.13	1.14	1.16	1.17	1.19	1.21	1.23	1.24	1.24	1.24
	.82	.82	.83	.84	.84	.85	.86	.86	.86	.87	.87	.88	.88	.89	.89	.89	.89	.88	.87	.86	.84	.83	.82	.82
35-45S 08	13.15	13.01	12.88	12.76	12.64	12.48	12.22	11.85	11.35	10.76	10.14	9.57	9.13	8.90	8.92	9.21	9.74	10.45	11.23	11.97	12.59	13.01	13.22	13.25
	1.19	1.19	1.19	1.18	1.18	1.17	1.17	1.17	1.16	1.15	1.14	1.13	1.13	1.13	1.12	1.13	1.13	1.15	1.16	1.17	1.18	1.19	1.19	1.19
	.86	.86	.86	.86	.86	.86	.86	.87	.87	.88	.88	.89	.90	.90	.90	.90	.89	.88	.88	.87	.86	.86	.85	.85
45-55S 08	13.81	13.75	13.67	13.56	13.39	13.09	12.63	12.00	11.24	10.40	9.60	8.93	8.51	8.36	8.56	9.03	9.76	10.64	11.54	12.36	13.03	13.48	13.74	13.83
	1.18	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.11	1.12	1.13	1.14	1.16	1.17	1.18	1.19	1.19	1.18
	.84	.84	.84	.84	.84	.85	.86	.87	.88	.88	.89	.89	.90	.90	.89	.89	.88	.88	.87	.86	.86	.86	.85	.84
55-65S 08	18.02	18.79	19.35	19.58	19.38	18.69	17.53	15.98	14.20	12.41	10.80	9.54	8.76	8.46	8.63	9.17	9.98	10.96	12.02	13.09	14.15	15.17	16.17	17.12
	1.23	1.24	1.25	1.25	1.25	1.24	1.22	1.20	1.18	1.15	1.13	1.11	1.10	1.09	1.10	1.10	1.12	1.13	1.15	1.17	1.18	1.20	1.21	1.22
	.79	.78	.77	.77	.77	.78	.80	.82	.84	.86	.88	.89	.90	.90	.89	.89	.88	.87	.86	.85	.84	.83	.82	.80

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 03	18.42	18.83	18.96	18.84	18.51	18.03	17.43	16.73	15.93	15.05	14.11	13.14	12.20	11.36	10.72	10.38	10.41	10.84	11.65	12.78	14.08	15.42	16.67	17.68
	1.24	1.25	1.25	1.25	1.24	1.24	1.23	1.21	1.20	1.18	1.16	1.14	1.13	1.11	1.11	1.11	1.11	1.13	1.15	1.17	1.18	1.21	1.22	1.24
	.78	.78	.78	.77	.78	.78	.78	.78	.79	.79	.80	.81	.82	.83	.84	.85	.85	.86	.85	.84	.83	.81	.80	.79
45-55N 03	14.35	14.34	14.25	14.11	13.98	13.84	13.67	13.42	13.06	12.58	11.98	11.32	10.66	10.10	9.74	9.64	9.84	10.31	11.00	11.80	12.61	13.33	13.86	14.21
	1.19	1.19	1.18	1.19	1.18	1.17	1.17	1.16	1.15	1.14	1.13	1.12	1.10	1.10	1.10	1.10	1.11	1.12	1.13	1.14	1.15	1.17	1.18	1.19
	.83	.83	.83	.83	.83	.83	.83	.83	.83	.83	.83	.84	.85	.86	.86	.87	.87	.87	.86	.86	.85	.84	.84	.84
35-45N 03	12.30	12.14	11.92	11.69	11.42	11.11	10.72	10.24	9.66	9.03	8.39	7.83	7.44	7.28	7.40	7.79	8.42	9.20	10.05	10.86	11.54	12.03	12.30	12.38
	1.17	1.17	1.16	1.16	1.15	1.14	1.14	1.13	1.12	1.11	1.10	1.09	1.08	1.08	1.09	1.09	1.10	1.12	1.13	1.14	1.15	1.16	1.17	1.17
	.86	.86	.86	.87	.87	.87	.88	.88	.88	.89	.90	.90	.91	.91	.91	.91	.90	.89	.88	.87	.86	.86	.85	.86
25-35N																								
15-25N 03	29.18	30.47	30.48	29.12	26.53	23.03	19.09	15.21	11.83	9.25	7.60	6.83	6.77	7.22	7.97	8.91	10.03	11.38	13.09	15.23	17.84	20.83	23.95	26.87
	1.44	1.46	1.46	1.43	1.38	1.33	1.26	1.20	1.15	1.12	1.10	1.09	1.09	1.10	1.11	1.12	1.14	1.16	1.18	1.21	1.25	1.30	1.36	1.40
	.75	.74	.75	.76	.78	.80	.82	.85	.88	.90	.91	.92	.92	.92	.91	.89	.88	.86	.84	.82	.80	.78	.77	.75
5-15N																								
5N-5S 09	17.39	19.19	20.66	21.44	21.29	20.18	18.26	15.86	13.42	11.34	9.90	9.23	9.25	9.76	10.50	11.22	11.75	12.05	12.16	12.24	12.49	13.07	14.11	15.59
	1.24	1.26	1.28	1.28	1.28	1.26	1.24	1.21	1.18	1.16	1.14	1.13	1.14	1.14	1.15	1.16	1.17	1.18	1.18	1.18	1.18	1.19	1.20	1.22
	.79	.76	.74	.73	.73	.75	.78	.81	.85	.88	.90	.91	.91	.90	.89	.88	.87	.87	.86	.86	.86	.85	.83	.81
5-15S 09	22.20	24.08	25.22	25.37	24.43	22.49	19.79	16.71	13.68	11.07	9.13	7.96	7.53	7.66	8.14	8.80	9.51	10.26	11.11	12.18	13.58	15.38	17.54	19.90
	1.26	1.30	1.33	1.35	1.34	1.32	1.28	1.23	1.18	1.14	1.10	1.08	1.07	1.07	1.08	1.09	1.09	1.10	1.10	1.11	1.12	1.14	1.17	1.21
	.71	.69	.68	.68	.70	.73	.76	.80	.84	.86	.88	.89	.90	.89	.88	.87	.86	.85	.84	.83	.81	.78	.76	.73
15-25S 09	21.33	21.96	22.52	22.78	22.54	21.71	20.37	18.69	16.98	15.54	14.65	14.44	14.92	15.95	17.29	18.67	19.84	20.63	21.01	21.03	20.84	20.65	20.61	20.83
	1.30	1.30	1.31	1.31	1.31	1.30	1.28	1.26	1.24	1.22	1.20	1.20	1.20	1.21	1.22	1.24	1.26	1.28	1.29	1.30	1.30	1.30	1.30	1.30
	.80	.78	.78	.77	.77	.78	.79	.80	.81	.82	.83	.83	.82	.81	.80	.79	.79	.79	.79	.80	.81	.81	.81	.80
25-35S 09	15.17	15.83	16.12	15.97	15.39	14.46	13.31	12.12	11.06	10.25	9.75	9.54	9.55	9.68	9.84	9.98	10.09	10.23	10.47	10.86	11.47	12.29	13.25	14.25
	1.20	1.22	1.22	1.22	1.22	1.20	1.18	1.16	1.15	1.13	1.13	1.12	1.12	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.14	1.15	1.17	1.18
	.82	.82	.82	.82	.83	.84	.85	.86	.87	.88	.88	.88	.89	.89	.89	.88	.88	.88	.87	.87	.86	.85	.84	.83
35-45S 09	12.67	12.95	13.22	13.42	13.52	13.47	13.24	12.82	12.23	11.53	10.80	10.11	9.57	9.21	9.07	9.14	9.40	9.80	10.26	10.76	11.23	11.66	12.03	12.36
	1.17	1.17	1.17	1.17	1.18	1.17	1.17	1.16	1.15	1.15	1.14	1.14	1.13	1.13	1.13	1.12	1.13	1.13	1.14	1.14	1.14	1.15	1.16	1.16
	.85	.85	.85	.84	.84	.84	.85	.85	.85	.86	.87	.88	.88	.89	.89	.89	.89	.88	.87	.87	.86	.86	.86	.85
45-55S 09	13.99	14.24	14.40	14.45	14.40	14.20	13.90	13.48	13.00	12.49	12.00	11.56	11.20	10.95	10.84	10.84	10.97	11.21	11.56	11.97	12.42	12.86	13.29	13.67
	1.16	1.16	1.16	1.15	1.16	1.15	1.15	1.14	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.14	1.14	1.14	1.15	1.16	1.16	1.16
	.81	.81	.81	.81	.81	.81	.82	.82	.83	.83	.84	.85	.86	.86	.86	.86	.86	.86	.85	.84	.84	.83	.82	.82
55-65S 09	21.29	22.26	22.70	22.53	21.80	20.61	19.17	17.65	16.26	15.12	14.27	13.71	13.36	13.14	12.98	12.88	12.87	13.03	13.45	14.21	15.32	16.73	18.32	19.90
	1.25	1.27	1.29	1.30	1.29	1.28	1.26	1.23	1.21	1.18	1.16	1.15	1.14	1.14	1.14	1.14	1.14	1.14	1.15	1.15	1.16	1.18	1.20	1.22
	.70	.70	.70	.71	.72	.74	.76	.78	.79	.80	.80	.80	.80	.80	.81	.82	.82	.82	.82	.81	.79	.77	.74	.72

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 04	16.73	17.20	17.33	17.14	16.74	16.22	15.72	15.31	15.02	14.83	14.67	14.47	14.17	13.74	13.20	12.65	12.18	11.92	11.95	12.32	13.01	13.94	14.97	15.94
	1.18	1.19	1.20	1.20	1.20	1.19	1.18	1.18	1.17	1.16	1.15	1.14	1.14	1.13	1.13	1.12	1.11	1.11	1.11	1.12	1.13	1.14	1.15	1.17
	.77	.76	.76	.77	.78	.79	.80	.80	.80	.80	.79	.79	.80	.80	.81	.82	.83	.83	.83	.82	.81	.80	.79	.77
45-55N 04	12.93	13.14	13.36	13.61	13.89	14.19	14.51	14.83	15.10	15.31	15.38	15.32	15.12	14.78	14.35	13.88	13.41	13.01	12.70	12.50	12.43	12.46	12.56	12.73
	1.14	1.14	1.14	1.15	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.16	1.15	1.15	1.14	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.14	1.14
	.83	.82	.81	.81	.80	.80	.80	.79	.79	.78	.78	.77	.77	.78	.78	.79	.80	.81	.82	.83	.84	.84	.83	.83
35-45N 04	10.94	11.15	11.43	11.77	12.09	12.31	12.36	12.19	11.80	11.23	10.57	9.92	9.37	9.01	8.87	8.94	9.19	9.54	9.92	10.25	10.50	10.66	10.75	10.83
	1.14	1.14	1.13	1.14	1.14	1.14	1.14	1.14	1.13	1.12	1.11	1.10	1.09	1.08	1.09	1.09	1.10	1.10	1.11	1.12	1.13	1.14	1.14	1.14
	.86	.86	.85	.85	.84	.84	.84	.84	.84	.85	.86	.87	.88	.88	.89	.89	.88	.88	.87	.87	.87	.87	.87	.87
25-35N																								
15-25N 04	21.05	21.75	22.00	21.69	20.77	19.28	17.31	15.07	12.79	10.71	9.04	7.91	7.36	7.37	7.86	8.73	9.88	11.22	12.68	14.20	15.75	17.27	18.70	19.99
	1.28	1.28	1.28	1.28	1.27	1.25	1.22	1.19	1.16	1.14	1.11	1.10	1.09	1.09	1.10	1.12	1.14	1.16	1.18	1.20	1.22	1.24	1.26	1.27
	.76	.76	.76	.76	.77	.79	.81	.84	.86	.88	.89	.90	.91	.91	.91	.90	.89	.88	.86	.85	.83	.81	.79	.78
5-15N																								
5N-5S 10	16.26	18.25	19.87	20.81	20.86	19.97	18.31	16.18	13.96	12.01	10.57	9.74	9.47	9.59	9.88	10.16	10.30	10.31	10.25	10.28	10.59	11.32	12.56	14.26
	1.20	1.23	1.26	1.28	1.28	1.28	1.26	1.23	1.20	1.18	1.16	1.14	1.13	1.13	1.13	1.13	1.12	1.12	1.11	1.11	1.11	1.12	1.14	1.17
	.81	.79	.79	.78	.79	.80	.81	.83	.86	.87	.89	.89	.89	.89	.88	.88	.87	.86	.86	.85	.85	.84	.83	.82
5-15S 10	19.11	20.74	21.75	21.97	21.33	19.87	17.80	15.39	12.93	10.71	8.91	7.65	6.93	6.66	6.75	7.08	7.58	8.22	9.05	10.11	11.47	13.14	15.08	17.13
	1.22	1.25	1.28	1.29	1.29	1.28	1.25	1.22	1.18	1.14	1.11	1.09	1.08	1.08	1.08	1.08	1.08	1.09	1.09	1.10	1.11	1.13	1.15	1.18
	.75	.74	.73	.74	.76	.78	.80	.83	.85	.87	.89	.90	.90	.91	.91	.90	.89	.88	.87	.85	.83	.81	.78	.76
15-25S 10	18.39	18.48	18.46	18.26	17.79	17.02	15.97	14.74	13.48	12.36	11.54	11.12	11.16	11.62	12.42	13.44	14.54	15.58	16.48	17.16	17.64	17.94	18.14	18.27
	1.24	1.24	1.24	1.24	1.24	1.23	1.21	1.20	1.18	1.16	1.15	1.15	1.15	1.15	1.16	1.18	1.19	1.21	1.22	1.23	1.24	1.24	1.24	1.24
	.81	.81	.80	.80	.80	.80	.81	.83	.84	.85	.86	.86	.86	.86	.85	.84	.83	.82	.82	.82	.82	.82	.82	.81
25-35S 10	14.88	16.07	16.88	17.12	16.71	15.69	14.23	12.57	10.99	9.71	8.88	8.53	8.57	8.88	9.28	9.63	9.86	9.96	10.03	10.19	10.57	11.25	12.26	13.52
	1.21	1.23	1.24	1.25	1.24	1.23	1.20	1.17	1.15	1.12	1.11	1.10	1.09	1.10	1.10	1.11	1.12	1.12	1.12	1.13	1.13	1.15	1.16	1.18
	.84	.83	.82	.81	.82	.83	.84	.85	.87	.88	.88	.88	.88	.88	.87	.87	.87	.87	.88	.88	.88	.87	.86	.85
35-45S 10	13.57	14.15	14.61	14.87	14.89	14.64	14.17	13.54	12.85	12.20	11.67	11.29	11.08	11.00	11.02	11.09	11.15	11.22	11.30	11.42	11.64	11.96	12.41	12.96
	1.18	1.18	1.19	1.19	1.20	1.19	1.18	1.17	1.16	1.14	1.14	1.13	1.13	1.13	1.13	1.14	1.14	1.14	1.14	1.14	1.14	1.15	1.16	1.17
	.84	.83	.83	.82	.82	.82	.82	.83	.84	.84	.85	.85	.85	.86	.86	.85	.86	.86	.85	.86	.85	.85	.85	.84
45-55S 10	13.64	14.02	14.25	14.32	14.23	14.04	13.80	13.56	13.35	13.20	13.09	12.98	12.83	12.61	12.35	12.05	11.76	11.54	11.44	11.51	11.75	12.13	12.62	13.15
	1.18	1.18	1.18	1.19	1.19	1.18	1.17	1.17	1.16	1.15	1.14	1.14	1.14	1.13	1.13	1.13	1.13	1.13	1.13	1.14	1.15	1.15	1.16	1.17
	.84	.83	.83	.83	.83	.83	.83	.83	.83	.83	.82	.82	.82	.82	.83	.83	.84	.84	.85	.85	.86	.85	.85	.84
55-65S 10	17.83	18.55	18.75	18.41	17.61	16.51	15.33	14.27	13.48	13.00	12.81	12.79	12.82	12.79	12.63	12.37	12.08	11.88	11.92	12.29	13.03	14.11	15.40	16.71
	1.20	1.21	1.21	1.21	1.21	1.20	1.20	1.19	1.18	1.17	1.16	1.16	1.15	1.14	1.14	1.13	1.13	1.13	1.14	1.14	1.15	1.17	1.18	1.19
	.75	.74	.74	.74	.76	.78	.80	.82	.83	.84	.84	.83	.82	.82	.81	.82	.82	.83	.84	.84	.83	.81	.79	.77

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 05	14.09	14.76	15.25	15.54	15.63	15.56	15.35	15.06	14.69	14.27	13.80	13.27	12.69	12.09	11.49	10.96	10.55	10.30	10.29	10.52	10.98	11.64	12.44	13.28
	1.16	1.17	1.19	1.19	1.20	1.21	1.21	1.21	1.20	1.19	1.18	1.17	1.16	1.15	1.14	1.13	1.13	1.12	1.11	1.11	1.12	1.12	1.13	1.14
	.82	.81	.81	.81	.81	.81	.82	.82	.83	.83	.83	.84	.84	.85	.85	.86	.86	.86	.86	.86	.86	.84	.84	.83
45-55N 05	12.85	13.18	13.52	13.87	14.21	14.51	14.75	14.90	14.92	14.83	14.59	14.25	13.84	13.39	12.95	12.57	12.27	12.05	11.94	11.92	11.97	12.11	12.31	12.56
	1.14	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.20	1.20	1.20	1.19	1.18	1.17	1.16	1.16	1.15	1.15	1.14	1.13	1.14	1.13	1.14	1.14
	.82	.81	.81	.82	.81	.81	.82	.82	.82	.82	.82	.82	.82	.82	.83	.83	.83	.84	.84	.84	.83	.83	.83	.82
35-45N 05	9.41	9.69	10.08	10.52	10.94	11.27	11.46	11.47	11.32	11.04	10.69	10.36	10.09	9.93	9.87	9.87	9.91	9.91	9.85	9.72	9.55	9.39	9.28	9.28
	1.12	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12
	.89	.88	.87	.86	.85	.84	.84	.84	.84	.85	.85	.86	.87	.87	.87	.87	.87	.87	.87	.88	.88	.89	.89	.89
25-35N																								
15-25N 05	16.23	16.54	16.73	16.74	16.51	16.04	15.36	14.56	13.76	13.08	12.59	12.35	12.36	12.60	12.98	13.43	13.89	14.28	14.60	14.86	15.08	15.30	15.57	15.88
	1.20	1.22	1.23	1.23	1.23	1.23	1.21	1.19	1.17	1.15	1.13	1.12	1.12	1.12	1.13	1.15	1.16	1.17	1.18	1.18	1.19	1.19	1.19	1.20
	.81	.81	.81	.81	.81	.82	.82	.83	.83	.83	.83	.83	.83	.84	.84	.84	.84	.84	.84	.84	.83	.83	.82	.81
5-15N																								
5N-5S 11	15.20	17.16	18.74	19.64	19.68	18.85	17.31	15.35	13.31	11.51	10.17	9.37	9.05	9.06	9.20	9.32	9.31	9.19	9.05	9.06	9.38	10.16	11.45	13.19
	1.19	1.22	1.24	1.25	1.26	1.25	1.23	1.21	1.18	1.16	1.14	1.13	1.13	1.13	1.13	1.13	1.12	1.12	1.12	1.11	1.12	1.13	1.14	1.16
	.82	.79	.78	.77	.77	.78	.80	.82	.84	.87	.88	.89	.90	.89	.89	.89	.88	.88	.88	.88	.88	.87	.86	.84
5-15S 11	17.36	18.14	18.44	18.22	17.48	16.33	14.89	13.34	11.83	10.49	9.38	8.52	7.92	7.55	7.39	7.46	7.78	8.37	9.24	10.38	11.74	13.24	14.76	16.18
	1.20	1.22	1.23	1.23	1.22	1.21	1.19	1.17	1.15	1.13	1.11	1.10	1.09	1.08	1.08	1.08	1.08	1.09	1.10	1.11	1.13	1.15	1.17	1.19
	.78	.77	.77	.77	.78	.80	.82	.84	.86	.88	.89	.90	.90	.90	.90	.90	.89	.88	.87	.85	.84	.82	.81	.79
15-25S 11	10.89	11.07	11.40	11.77	12.08	12.21	12.08	11.70	11.10	10.42	9.77	9.31	9.14	9.27	9.68	10.26	10.88	11.40	11.73	11.80	11.66	11.39	11.10	10.91
	1.14	1.14	1.14	1.15	1.15	1.15	1.14	1.14	1.13	1.13	1.12	1.12	1.12	1.12	1.13	1.14	1.15	1.16	1.16	1.16	1.16	1.15	1.15	1.14
	.88	.87	.86	.85	.85	.84	.84	.85	.85	.86	.88	.88	.89	.89	.88	.88	.87	.87	.87	.87	.87	.87	.88	.88
25-35S 11	12.98	14.06	14.96	15.52	15.65	15.34	14.66	13.76	12.81	11.98	11.37	11.04	10.94	11.00	11.10	11.13	11.04	10.83	10.54	10.31	10.25	10.48	11.04	11.91
	1.17	1.18	1.19	1.20	1.20	1.20	1.18	1.17	1.15	1.13	1.11	1.10	1.10	1.10	1.10	1.10	1.11	1.11	1.12	1.12	1.12	1.13	1.14	1.15
	.84	.83	.82	.81	.81	.81	.81	.82	.83	.83	.84	.84	.84	.83	.83	.83	.83	.84	.84	.85	.86	.86	.86	.85
35-45S 11	11.48	12.28	13.03	13.66	14.10	14.32	14.32	14.16	13.89	13.56	13.21	12.87	12.53	12.19	11.83	11.41	10.94	10.48	10.06	9.76	9.64	9.76	10.14	10.73
	1.16	1.17	1.18	1.19	1.19	1.18	1.18	1.17	1.16	1.16	1.15	1.14	1.14	1.14	1.13	1.12	1.12	1.12	1.11	1.11	1.11	1.12	1.13	1.14
	.87	.86	.85	.84	.83	.82	.82	.81	.81	.81	.81	.82	.82	.82	.83	.84	.85	.86	.87	.88	.88	.88	.88	.88
45-55S 11	12.91	13.22	13.46	13.65	13.78	13.90	14.02	14.19	14.39	14.58	14.73	14.78	14.70	14.47	14.09	13.61	13.08	12.58	12.19	11.95	11.89	12.00	12.24	12.57
	1.15	1.16	1.16	1.17	1.17	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.17	1.16	1.15	1.14	1.13	1.13	1.13	1.13	1.13	1.14	1.14	1.15
	.83	.83	.83	.82	.82	.83	.83	.82	.82	.81	.80	.80	.79	.79	.79	.80	.81	.81	.82	.83	.83	.83	.83	.84
55-65S 11	15.92	16.80	17.27	17.26	16.84	16.14	15.33	14.59	14.06	13.78	13.71	13.75	13.79	13.70	13.42	12.97	12.40	11.86	11.49	11.44	11.78	12.51	13.56	14.76
	1.15	1.17	1.18	1.18	1.19	1.19	1.19	1.19	1.19	1.19	1.18	1.18	1.17	1.17	1.16	1.15	1.14	1.13	1.13	1.13	1.12	1.13	1.13	1.14
	.77	.75	.75	.75	.76	.78	.81	.83	.84	.84	.84	.84	.83	.82	.82	.82	.83	.84	.85	.85	.84	.83	.81	.79

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 06	12.36	12.87	13.22	13.43	13.51	13.49	13.40	13.24	13.01	12.69	12.28	11.77	11.17	10.53	9.90	9.36	8.96	8.77	8.81	9.10	9.61	10.27	11.00	11.72
	1.13	1.14	1.15	1.16	1.16	1.17	1.18	1.18	1.18	1.17	1.17	1.16	1.15	1.13	1.12	1.11	1.11	1.11	1.11	1.11	1.11	1.12	1.13	
	.84	.83	.82	.82	.82	.83	.84	.84	.85	.86	.86	.86	.87	.87	.88	.89	.90	.90	.90	.90	.89	.87	.86	.85
45-55N 06	12.65	13.07	13.42	13.67	13.80	13.80	13.69	13.45	13.13	12.74	12.33	11.91	11.51	11.16	10.86	10.65	10.51	10.47	10.52	10.69	10.96	11.31	11.73	12.19
	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.15	1.15	1.14	1.14	1.13	1.13	1.13	1.13	1.13	1.14	1.14	1.15
	.85	.84	.84	.84	.84	.84	.84	.84	.85	.86	.86	.87	.87	.88	.88	.88	.88	.88	.88	.88	.88	.87	.87	.86
35-45N 06	10.27	10.48	10.77	11.12	11.48	11.82	12.11	12.29	12.36	12.31	12.16	11.94	11.68	11.41	11.17	10.95	10.76	10.60	10.45	10.32	10.21	10.13	10.11	10.15
	1.12	1.12	1.13	1.13	1.14	1.15	1.15	1.15	1.15	1.16	1.16	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.14	1.13	1.13	1.13	1.13
	.87	.87	.87	.86	.86	.85	.85	.85	.85	.85	.85	.85	.86	.87	.88	.88	.88	.89	.89	.88	.88	.88	.87	.87
25-35N																								
15-25N 06	15.82	16.34	16.84	17.21	17.36	17.22	16.79	16.10	15.25	14.35	13.53	12.88	12.48	12.36	12.47	12.76	13.15	13.55	13.91	14.20	14.44	14.67	14.96	15.34
	1.19	1.20	1.21	1.22	1.23	1.23	1.23	1.21	1.20	1.18	1.16	1.15	1.14	1.14	1.14	1.15	1.15	1.16	1.17	1.17	1.17	1.17	1.18	1.18
	.81	.80	.80	.79	.79	.79	.79	.80	.81	.81	.82	.83	.83	.83	.84	.84	.84	.84	.83	.83	.83	.83	.82	.82
5-15N																								
5N-5S 12	16.44	18.86	20.93	22.24	22.50	21.62	19.74	17.17	14.35	11.72	9.65	8.33	7.76	7.80	8.20	8.71	9.12	9.36	9.46	9.59	9.94	10.75	12.12	14.07
	1.22	1.26	1.29	1.32	1.33	1.32	1.29	1.25	1.21	1.17	1.13	1.11	1.10	1.10	1.11	1.12	1.13	1.13	1.13	1.13	1.13	1.14	1.16	1.18
	.80	.77	.74	.73	.73	.74	.76	.79	.83	.86	.88	.90	.91	.91	.91	.90	.90	.89	.89	.89	.89	.87	.86	.83
5-15S 12	19.87	21.20	21.88	21.80	20.95	19.42	17.41	15.19	13.03	11.15	9.69	8.72	8.17	7.96	7.99	8.19	8.54	9.07	9.85	10.96	12.41	14.16	16.12	18.09
	1.26	1.28	1.29	1.28	1.27	1.25	1.23	1.20	1.17	1.14	1.12	1.10	1.10	1.09	1.09	1.09	1.10	1.10	1.12	1.13	1.15	1.18	1.21	1.23
	.75	.74	.73	.73	.74	.76	.78	.81	.84	.86	.88	.89	.90	.90	.90	.89	.89	.88	.87	.85	.83	.81	.79	.77
15-25S 12	10.37	10.62	10.97	11.32	11.57	11.65	11.53	11.24	10.86	10.48	10.20	10.09	10.19	10.47	10.86	11.26	11.57	11.72	11.66	11.41	11.06	10.69	10.40	10.29
	1.13	1.14	1.14	1.14	1.14	1.14	1.14	1.13	1.13	1.12	1.12	1.12	1.12	1.12	1.13	1.13	1.14	1.14	1.14	1.14	1.13	1.13	1.13	1.13
	.87	.87	.86	.86	.85	.85	.85	.85	.86	.86	.86	.87	.87	.86	.86	.86	.85	.85	.85	.86	.86	.87	.87	.87
25-35S 12	14.07	15.11	16.02	16.62	16.75	16.39	15.61	14.54	13.39	12.36	11.60	11.20	11.15	11.36	11.71	12.05	12.26	12.29	12.17	11.98	11.87	11.97	12.37	13.09
	1.17	1.19	1.20	1.21	1.22	1.22	1.21	1.19	1.18	1.16	1.14	1.13	1.13	1.12	1.13	1.13	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.16
	.83	.82	.81	.81	.81	.81	.82	.83	.84	.85	.85	.86	.85	.85	.85	.84	.84	.84	.85	.85	.85	.85	.85	.84
35-45S 12	12.68	13.18	13.69	14.10	14.37	14.45	14.35	14.09	13.75	13.37	13.03	12.78	12.63	12.55	12.53	12.50	12.43	12.32	12.15	11.98	11.85	11.83	11.95	12.25
	1.16	1.17	1.17	1.17	1.17	1.18	1.18	1.18	1.17	1.17	1.16	1.15	1.15	1.15	1.14	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.16	1.16
	.85	.84	.83	.82	.82	.82	.82	.82	.83	.83	.84	.84	.84	.84	.83	.84	.84	.85	.86	.86	.87	.87	.87	.86
45-55S 12	11.87	12.38	12.88	13.27	13.50	13.55	13.43	13.22	12.99	12.80	12.70	12.69	12.75	12.84	12.87	12.81	12.63	12.32	11.94	11.57	11.26	11.12	11.18	11.44
	1.14	1.15	1.15	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.14	1.14	1.14	1.13	1.13	1.14
	.85	.84	.83	.83	.83	.83	.83	.83	.84	.84	.84	.84	.84	.83	.83	.83	.84	.84	.85	.85	.86	.86	.86	.86
55-65S 12	13.17	13.93	14.51	14.81	14.77	14.42	13.85	13.14	12.44	11.84	11.39	11.12	10.98	10.94	10.92	10.88	10.79	10.68	10.58	10.57	10.71	11.06	11.62	12.35
	1.13	1.13	1.14	1.15	1.15	1.15	1.15	1.15	1.15	1.14	1.14	1.14	1.13	1.13	1.13	1.13	1.13	1.12	1.12	1.12	1.11	1.11	1.11	1.12
	.82	.81	.79	.79	.79	.80	.81	.82	.84	.85	.86	.87	.87	.87	.87	.87	.87	.87	.87	.87	.87	.86	.85	.84

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 07	11.44	12.11	12.58	12.82	12.83	12.66	12.33	11.90	11.41	10.88	10.32	9.75	9.17	8.60	8.08	7.63	7.32	7.18	7.26	7.59	8.14	8.87	9.73	10.61
	1.13	1.15	1.16	1.16	1.17	1.17	1.16	1.16	1.15	1.14	1.12	1.11	1.10	1.09	1.09	1.09	1.08	1.08	1.08	1.09	1.09	1.10	1.11	1.12
	.85	.85	.84	.84	.84	.85	.85	.86	.86	.87	.87	.88	.88	.89	.90	.90	.91	.91	.91	.90	.90	.89	.87	.86
45-55N 07	11.09	11.45	11.80	12.11	12.36	12.52	12.59	12.54	12.37	12.09	11.71	11.28	10.84	10.41	10.05	9.77	9.60	9.53	9.56	9.68	9.86	10.11	10.40	10.74
	1.14	1.14	1.14	1.15	1.16	1.16	1.16	1.16	1.16	1.16	1.15	1.14	1.14	1.13	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.13	1.13	1.13
	.87	.86	.86	.85	.85	.85	.85	.85	.85	.86	.86	.86	.87	.87	.88	.88	.88	.88	.88	.88	.88	.88	.88	.87
35-45N 07	9.20	9.28	9.47	9.79	10.21	10.66	11.07	11.36	11.46	11.35	11.04	10.58	10.05	9.55	9.13	8.87	8.75	8.77	8.88	9.02	9.14	9.20	9.21	9.19
	1.11	1.12	1.12	1.13	1.14	1.14	1.15	1.15	1.15	1.15	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.12	1.12	1.12	1.12	1.12	1.12	1.11
	.89	.89	.88	.88	.87	.87	.86	.86	.85	.85	.86	.86	.87	.88	.89	.89	.90	.90	.90	.89	.89	.89	.89	.89
25-35N																								
15-25N 07	15.29	15.55	15.86	16.14	16.31	16.27	15.98	15.41	14.63	13.75	12.88	12.16	11.70	11.56	11.73	12.17	12.78	13.43	14.02	14.47	14.77	14.93	15.03	15.13
	1.21	1.22	1.22	1.22	1.23	1.22	1.22	1.21	1.19	1.17	1.15	1.13	1.12	1.11	1.11	1.11	1.12	1.13	1.15	1.16	1.18	1.19	1.20	1.21
	.81	.81	.81	.81	.81	.81	.81	.82	.82	.83	.83	.84	.84	.84	.84	.83	.82	.82	.81	.81	.81	.81	.81	.81
5-15N																								
5N-5S 01	15.50	17.44	19.06	20.02	20.11	19.29	17.66	15.52	13.20	11.09	9.45	8.43	8.01	8.06	8.38	8.77	9.06	9.23	9.32	9.47	9.86	10.63	11.87	13.54
	1.20	1.22	1.25	1.27	1.27	1.27	1.25	1.22	1.19	1.16	1.13	1.11	1.10	1.10	1.11	1.11	1.12	1.12	1.13	1.13	1.13	1.14	1.15	1.17
	.80	.78	.76	.75	.76	.77	.80	.83	.86	.88	.90	.91	.91	.90	.90	.89	.89	.88	.88	.88	.87	.86	.85	.82
5-15S 01	19.80	21.29	22.30	22.65	22.22	21.02	19.21	17.03	14.77	12.72	11.08	9.98	9.41	9.28	9.48	9.86	10.35	10.91	11.57	12.39	13.44	14.76	16.33	18.06
	1.23	1.25	1.27	1.28	1.28	1.26	1.24	1.21	1.18	1.15	1.13	1.11	1.10	1.10	1.11	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.19	1.21
	.73	.72	.71	.72	.73	.75	.78	.81	.84	.86	.88	.89	.89	.89	.89	.88	.87	.86	.85	.83	.82	.79	.77	.75
15-25S 01	12.88	13.47	14.37	15.37	16.21	16.67	16.64	16.13	15.26	14.25	13.36	12.80	12.70	13.05	13.76	14.60	15.35	15.79	15.79	15.36	14.62	13.78	13.09	12.74
	1.19	1.20	1.21	1.22	1.24	1.24	1.24	1.23	1.21	1.19	1.17	1.16	1.15	1.15	1.16	1.18	1.20	1.21	1.22	1.22	1.22	1.21	1.20	1.20
	.88	.87	.85	.84	.82	.81	.80	.80	.81	.81	.82	.82	.82	.82	.81	.80	.79	.80	.80	.82	.84	.85	.87	.88
25-35S 01	15.09	16.09	16.98	17.58	17.76	17.51	16.88	16.01	15.07	14.23	13.62	13.28	13.20	13.29	13.45	13.57	13.57	13.43	13.21	12.98	12.88	13.00	13.42	14.14
	1.19	1.20	1.22	1.23	1.23	1.23	1.22	1.20	1.17	1.15	1.13	1.12	1.11	1.11	1.12	1.13	1.14	1.14	1.15	1.15	1.15	1.16	1.16	1.17
	.81	.80	.80	.79	.79	.80	.80	.81	.81	.81	.81	.81	.80	.80	.79	.79	.80	.80	.81	.82	.82	.83	.82	.82
35-45S 01	12.81	13.61	14.40	15.06	15.48	15.61	15.47	15.12	14.65	14.17	13.76	13.46	13.28	13.18	13.09	12.95	12.73	12.41	12.04	11.69	11.45	11.42	11.64	12.11
	1.17	1.18	1.19	1.20	1.20	1.20	1.20	1.19	1.18	1.18	1.17	1.16	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.17
	.85	.84	.83	.82	.82	.81	.80	.80	.81	.81	.82	.83	.83	.84	.84	.85	.85	.85	.86	.86	.87	.87	.87	.86
45-55S 01	13.00	13.66	14.25	14.66	14.85	14.82	14.61	14.32	14.02	13.79	13.66	13.61	13.62	13.60	13.50	13.29	12.96	12.55	12.13	11.77	11.59	11.61	11.88	12.37
	1.17	1.18	1.19	1.19	1.19	1.19	1.18	1.18	1.18	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.15	1.15	1.15	1.15	1.16	1.16
	.84	.84	.83	.83	.83	.83	.83	.83	.83	.83	.83	.83	.83	.84	.84	.84	.84	.85	.85	.85	.85	.85	.85	.85
55-65S 01	15.15	16.20	16.84	16.97	16.59	15.81	14.79	13.74	12.82	12.15	11.76	11.60	11.57	11.55	11.44	11.21	10.87	10.53	10.30	10.33	10.71	11.47	12.57	13.86
	1.16	1.18	1.19	1.20	1.20	1.19	1.18	1.16	1.15	1.14	1.13	1.12	1.12	1.13	1.13	1.13	1.13	1.13	1.12	1.12	1.12	1.12	1.13	1.15
	.81	.79	.78	.78	.79	.80	.81	.83	.84	.84	.85	.85	.84	.85	.85	.85	.86	.86	.87	.87	.86	.85	.84	.82

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 08	13.39	14.03	14.33	14.27	13.91	13.36	12.73	12.14	11.65	11.28	11.00	10.76	10.48	10.14	9.72	9.28	8.88	8.63	8.63	8.92	9.53	10.40	11.43	12.47
	1.16	1.17	1.18	1.18	1.18	1.18	1.17	1.16	1.16	1.15	1.15	1.15	1.14	1.13	1.13	1.12	1.11	1.11	1.10	1.10	1.11	1.12	1.13	1.15
	.82	.82	.82	.82	.83	.84	.85	.86	.86	.87	.87	.87	.88	.88	.88	.89	.89	.89	.89	.88	.88	.86	.85	.83
45-55N 08	13.30	13.54	13.63	13.59	13.47	13.30	13.12	12.92	12.71	12.46	12.16	11.80	11.37	10.93	10.51	10.19	10.01	10.02	10.23	10.63	11.16	11.76	12.36	12.90
	1.16	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.15	1.15	1.14	1.13	1.13	1.12	1.12	1.12	1.13	1.13	1.14	1.15	1.15
	.83	.83	.83	.83	.84	.84	.85	.85	.85	.85	.86	.86	.86	.86	.87	.87	.87	.87	.87	.86	.86	.85	.84	.84
35-45N 08	10.17	10.34	10.48	10.59	10.66	10.71	10.74	10.74	10.70	10.63	10.51	10.35	10.15	9.92	9.70	9.48	9.32	9.21	9.18	9.23	9.35	9.53	9.74	9.96
	1.11	1.12	1.12	1.12	1.12	1.13	1.13	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.13	1.13	1.13	1.13	1.13	1.12	1.12	1.12	1.11
	.87	.86	.86	.86	.86	.86	.86	.86	.86	.86	.86	.87	.87	.88	.89	.89	.90	.90	.90	.89	.89	.88	.88	.87
25-35N																								
15-25N 08	20.98	21.26	21.15	20.66	19.85	18.82	17.66	16.49	15.38	14.40	13.58	12.92	12.41	12.07	11.93	12.03	12.42	13.12	14.12	15.35	16.71	18.07	19.31	20.31
	1.32	1.32	1.31	1.30	1.28	1.27	1.25	1.23	1.22	1.20	1.19	1.18	1.17	1.16	1.15	1.15	1.15	1.16	1.18	1.21	1.24	1.26	1.29	1.31
	.80	.80	.79	.79	.79	.80	.80	.81	.82	.83	.84	.84	.85	.85	.85	.85	.85	.85	.84	.84	.83	.82	.82	.81
5-15N																								
5N-5S 02	14.88	17.11	19.01	20.24	20.54	19.81	18.19	15.96	13.51	11.23	9.44	8.29	7.78	7.76	8.01	8.33	8.55	8.63	8.61	8.64	8.93	9.66	10.92	12.71
	1.19	1.22	1.25	1.26	1.27	1.26	1.24	1.22	1.19	1.16	1.13	1.12	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.10	1.11	1.12	1.13	1.16
	.81	.78	.76	.74	.74	.75	.78	.81	.84	.87	.90	.92	.92	.92	.92	.91	.90	.90	.89	.89	.89	.88	.86	.84
5-15S 02	20.31	21.71	22.60	22.80	22.21	20.86	18.89	16.57	14.16	11.97	10.20	8.96	8.27	8.06	8.22	8.66	9.29	10.08	11.02	12.16	13.51	15.07	16.80	18.59
	1.28	1.30	1.32	1.32	1.31	1.30	1.27	1.24	1.20	1.17	1.14	1.12	1.11	1.11	1.11	1.12	1.13	1.15	1.16	1.18	1.20	1.22	1.24	1.26
	.74	.73	.72	.73	.74	.76	.79	.82	.85	.87	.89	.89	.90	.90	.90	.90	.90	.89	.88	.87	.85	.83	.80	.77
15-25S 02	11.41	11.62	12.01	12.54	13.13	13.68	14.08	14.22	14.07	13.62	12.94	12.16	11.42	10.82	10.46	10.36	10.48	10.74	11.03	11.27	11.40	11.43	11.38	11.35
	1.16	1.16	1.17	1.17	1.18	1.19	1.19	1.19	1.19	1.18	1.17	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.14	1.15	1.15	1.15	1.15	1.15
	.87	.87	.86	.86	.85	.84	.84	.84	.84	.84	.85	.86	.86	.87	.87	.87	.87	.86	.86	.86	.86	.86	.87	.87
25-35S 02	14.24	14.62	14.89	15.02	14.93	14.62	14.10	13.42	12.66	11.92	11.28	10.80	10.51	10.42	10.51	10.74	11.07	11.45	11.85	12.24	12.63	13.02	13.42	13.83
	1.16	1.17	1.18	1.19	1.20	1.19	1.19	1.18	1.16	1.14	1.13	1.12	1.11	1.11	1.11	1.12	1.12	1.13	1.13	1.13	1.14	1.14	1.15	1.15
	.82	.81	.81	.81	.81	.82	.83	.84	.84	.85	.86	.86	.86	.86	.85	.85	.84	.84	.83	.83	.83	.82	.82	.82
35-45S 02	11.87	12.24	12.67	13.10	13.50	13.81	14.00	14.03	13.93	13.69	13.36	12.99	12.59	12.22	11.89	11.63	11.42	11.28	11.19	11.16	11.17	11.25	11.38	11.58
	1.15	1.16	1.16	1.16	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.15	1.14	1.14	1.14	1.14	1.13	1.13	1.14	1.14	1.14	1.14	1.15	1.15
	.86	.85	.85	.84	.83	.83	.82	.82	.82	.82	.83	.83	.83	.84	.84	.85	.85	.86	.86	.87	.87	.87	.87	.87
45-55S 02	14.01	14.30	14.52	14.65	14.67	14.61	14.51	14.36	14.24	14.12	14.03	13.95	13.86	13.75	13.59	13.42	13.23	13.06	12.93	12.89	12.95	13.11	13.37	13.68
	1.17	1.17	1.17	1.17	1.18	1.18	1.18	1.18	1.18	1.17	1.17	1.17	1.16	1.16	1.15	1.15	1.15	1.14	1.14	1.14	1.15	1.15	1.15	1.16
	.81	.81	.81	.81	.82	.82	.82	.83	.83	.83	.82	.82	.82	.82	.81	.82	.82	.82	.82	.82	.82	.82	.81	.82
55-65S 02	16.66	17.41	17.81	17.83	17.48	16.82	15.97	15.06	14.20	13.48	12.91	12.47	12.13	11.85	11.59	11.38	11.25	11.26	11.47	11.92	12.62	13.54	14.59	15.68
	1.18	1.19	1.20	1.20	1.20	1.19	1.18	1.17	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.13	1.13	1.12	1.12	1.12	1.12	1.13	1.15	1.16
	.75	.74	.75	.75	.76	.77	.79	.80	.81	.81	.82	.83	.83	.83	.84	.84	.84	.83	.83	.81	.80	.78	.77	.76

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 09	17.60	18.02	17.99	17.56	16.86	16.02	15.22	14.53	14.02	13.67	13.41	13.14	12.81	12.37	11.86	11.37	11.03	10.97	11.27	11.96	13.00	14.27	15.58	16.74
	1.20	1.20	1.21	1.21	1.20	1.19	1.18	1.17	1.17	1.17	1.16	1.16	1.16	1.16	1.15	1.14	1.14	1.13	1.13	1.13	1.14	1.15	1.17	1.18
	.76	.76	.76	.76	.78	.79	.80	.81	.82	.83	.84	.84	.84	.85	.86	.86	.87	.87	.85	.85	.83	.81	.79	.77
45-55N 09	14.52	14.65	14.71	14.74	14.74	14.70	14.62	14.49	14.27	13.99	13.63	13.23	12.83	12.47	12.19	12.05	12.06	12.22	12.51	12.89	13.30	13.70	14.05	14.33
	1.18	1.18	1.18	1.18	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.15	1.15	1.14	1.14	1.15	1.15	1.16	1.17	1.18	1.18	1.19
	.82	.82	.81	.81	.81	.81	.81	.81	.82	.82	.83	.83	.84	.85	.85	.85	.85	.85	.84	.84	.83	.83	.83	.83
35-45N 09	13.28	13.05	12.80	12.59	12.43	12.33	12.23	12.08	11.85	11.49	11.03	10.52	10.02	9.64	9.45	9.53	9.88	10.46	11.19	11.94	12.62	13.11	13.38	13.42
	1.17	1.16	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.13	1.13	1.12	1.12	1.11	1.11	1.11	1.12	1.13	1.14	1.15	1.16	1.16	1.17	1.17
	.83	.83	.84	.84	.85	.85	.85	.84	.85	.85	.85	.86	.87	.88	.88	.88	.87	.87	.86	.84	.84	.83	.82	.83
25-35N																								
15-25N 09	28.11	28.41	27.94	26.69	24.75	22.27	19.47	16.64	14.01	11.80	10.15	9.12	8.71	8.87	9.57	10.74	12.32	14.26	16.47	18.84	21.24	23.53	25.54	27.11
	1.44	1.45	1.45	1.43	1.40	1.35	1.30	1.25	1.20	1.16	1.13	1.11	1.10	1.11	1.12	1.14	1.16	1.19	1.23	1.27	1.31	1.35	1.39	1.42
	.74	.74	.75	.76	.78	.80	.82	.83	.85	.86	.87	.88	.88	.88	.87	.86	.85	.83	.82	.80	.78	.77	.75	.75
5-15N																								
5N-5S 03	15.24	16.50	17.44	17.89	17.75	17.04	15.90	14.50	13.08	11.83	10.86	10.22	9.87	9.72	9.68	9.68	9.68	9.71	9.83	10.11	10.63	11.45	12.54	13.85
	1.21	1.24	1.26	1.27	1.27	1.26	1.24	1.21	1.18	1.16	1.14	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.12	1.13	1.14	1.16	1.18
	.83	.83	.82	.82	.83	.83	.84	.85	.85	.86	.87	.88	.89	.89	.90	.90	.89	.89	.88	.87	.86	.85	.84	.84
5-15S 03	18.96	20.74	21.95	22.39	21.97	20.69	18.71	16.28	13.72	11.31	9.30	7.82	6.89	6.47	6.43	6.67	7.12	7.74	8.56	9.64	11.02	12.74	14.73	16.86
	1.21	1.25	1.28	1.30	1.30	1.29	1.26	1.23	1.18	1.14	1.11	1.09	1.08	1.07	1.08	1.08	1.09	1.09	1.09	1.09	1.10	1.12	1.14	1.17
	.74	.73	.73	.74	.75	.77	.79	.82	.84	.86	.88	.89	.91	.91	.92	.92	.91	.89	.88	.85	.82	.80	.77	.75
15-25S 03	15.93	15.88	16.05	16.31	16.48	16.40	15.92	15.03	13.80	12.42	11.14	10.17	9.73	9.89	10.64	11.84	13.29	14.73	15.92	16.71	17.03	16.95	16.61	16.21
	1.19	1.19	1.20	1.20	1.20	1.20	1.20	1.19	1.18	1.16	1.15	1.14	1.13	1.13	1.14	1.15	1.16	1.18	1.19	1.20	1.20	1.20	1.19	1.19
	.78	.79	.79	.79	.79	.79	.80	.82	.83	.85	.87	.88	.89	.88	.87	.86	.84	.82	.80	.78	.77	.77	.77	.78
25-35S 03	12.98	13.54	14.03	14.39	14.54	14.45	14.09	13.51	12.74	11.90	11.05	10.31	9.73	9.36	9.20	9.23	9.42	9.71	10.07	10.48	10.90	11.36	11.86	12.40
	1.16	1.17	1.18	1.19	1.19	1.20	1.19	1.18	1.17	1.15	1.14	1.12	1.11	1.10	1.10	1.10	1.10	1.11	1.11	1.12	1.13	1.13	1.14	1.15
	.84	.83	.83	.83	.83	.83	.84	.84	.85	.86	.87	.88	.89	.89	.89	.89	.88	.88	.87	.86	.86	.85	.85	.84
35-45S 03	9.92	10.23	10.63	11.08	11.53	11.93	12.19	12.25	12.09	11.73	11.19	10.57	9.94	9.41	9.02	8.79	8.72	8.77	8.91	9.06	9.22	9.36	9.51	9.69
	1.12	1.12	1.13	1.13	1.14	1.15	1.15	1.15	1.15	1.14	1.14	1.13	1.12	1.12	1.12	1.11	1.11	1.12	1.12	1.12	1.11	1.11	1.11	1.12
	.87	.86	.86	.86	.85	.85	.85	.85	.85	.85	.86	.87	.88	.88	.88	.89	.89	.89	.88	.88	.88	.88	.87	.87
45-55S 03	11.50	11.64	11.84	12.10	12.45	12.88	13.35	13.83	14.27	14.61	14.81	14.83	14.67	14.35	13.90	13.38	12.85	12.36	11.97	11.67	11.49	11.39	11.37	11.41
	1.13	1.13	1.14	1.14	1.15	1.15	1.16	1.17	1.17	1.18	1.18	1.18	1.17	1.17	1.16	1.15	1.15	1.14	1.13	1.13	1.13	1.13	1.13	1.13
	.85	.85	.85	.84	.84	.84	.83	.83	.82	.82	.81	.81	.81	.82	.82	.83	.83	.84	.84	.85	.85	.85	.85	.86
55-65S 03	15.83	16.98	17.77	18.11	18.01	17.57	16.97	16.37	15.93	15.71	15.68	15.73	15.74	15.56	15.11	14.39	13.50	12.60	11.87	11.50	11.59	12.19	13.21	14.49
	1.18	1.19	1.20	1.20	1.20	1.21	1.21	1.21	1.22	1.23	1.23	1.23	1.23	1.22	1.21	1.19	1.17	1.15	1.14	1.14	1.14	1.15	1.16	1.17
	.78	.76	.75	.75	.75	.76	.78	.80	.81	.83	.83	.83	.83	.83	.83	.83	.83	.84	.84	.85	.84	.84	.82	.80

MONTH		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	10	18.75	18.86	18.77	18.53	18.19	17.75	17.23	16.61	15.89	15.08	14.21	13.32	12.50	11.83	11.41	11.33	11.63	12.32	13.32	14.51	15.74	16.86	17.77	18.40
		1.23	1.23	1.23	1.23	1.23	1.22	1.21	1.20	1.19	1.17	1.16	1.15	1.14	1.13	1.13	1.13	1.13	1.14	1.16	1.17	1.19	1.20	1.22	1.22
		.75	.75	.75	.76	.76	.77	.77	.78	.79	.80	.81	.82	.83	.84	.85	.85	.85	.84	.83	.81	.79	.78	.77	.76
45-55N	10	15.54	15.15	14.76	14.45	14.22	14.06	13.91	13.73	13.47	13.13	12.72	12.28	11.91	11.68	11.67	11.93	12.46	13.20	14.05	14.85	15.50	15.90	16.01	15.86
		1.20	1.19	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.15	1.14	1.14	1.13	1.13	1.13	1.14	1.15	1.16	1.18	1.19	1.20	1.20	1.21	1.20
		.82	.82	.82	.82	.82	.82	.82	.82	.82	.83	.84	.85	.85	.85	.86	.85	.85	.84	.83	.83	.82	.82	.82	.82
35-45N	10	13.87	13.26	12.63	12.08	11.62	11.23	10.89	10.53	10.13	9.67	9.20	8.78	8.50	8.47	8.74	9.35	10.24	11.32	12.43	13.45	14.20	14.61	14.66	14.38
		1.19	1.18	1.17	1.17	1.16	1.15	1.14	1.13	1.13	1.12	1.12	1.11	1.11	1.12	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.19	1.19
		.84	.85	.86	.87	.87	.87	.87	.87	.88	.88	.89	.90	.90	.90	.90	.89	.88	.86	.85	.83	.82	.83	.82	.84
25-35N																									
15-25N	10	28.60	28.00	26.80	25.04	22.85	20.39	17.88	15.54	13.54	12.04	11.10	10.72	10.88	11.54	12.67	14.22	16.13	18.31	20.62	22.90	24.97	26.68	27.91	28.56
		1.46	1.45	1.43	1.40	1.37	1.33	1.28	1.24	1.21	1.18	1.16	1.15	1.15	1.16	1.17	1.20	1.23	1.27	1.31	1.35	1.39	1.42	1.44	1.46
		.74	.74	.76	.78	.80	.83	.85	.87	.88	.88	.88	.88	.87	.86	.85	.84	.83	.82	.80	.79	.77	.76	.74	.74
5-15N																									
5N-5S	04	15.88	17.68	19.03	19.61	19.30	18.14	16.38	14.41	12.62	11.34	10.71	10.71	11.16	11.76	12.25	12.43	12.24	11.76	11.18	10.76	10.72	11.24	12.35	13.97
		1.22	1.24	1.26	1.27	1.26	1.25	1.22	1.20	1.18	1.16	1.16	1.16	1.16	1.17	1.17	1.17	1.17	1.16	1.15	1.14	1.14	1.15	1.17	1.19
		.80	.78	.76	.76	.76	.77	.80	.82	.85	.87	.89	.90	.90	.90	.89	.89	.89	.89	.88	.88	.88	.87	.85	.83
5-15S	04	15.93	18.55	20.72	22.09	22.41	21.63	19.88	17.47	14.79	12.23	10.11	8.61	7.72	7.33	7.24	7.26	7.24	7.17	7.14	7.32	7.92	9.09	10.90	13.25
		1.17	1.21	1.24	1.27	1.28	1.28	1.26	1.23	1.20	1.16	1.13	1.10	1.09	1.07	1.07	1.06	1.06	1.06	1.06	1.06	1.07	1.08	1.10	1.13
		.77	.74	.71	.70	.71	.72	.75	.79	.82	.85	.88	.89	.90	.90	.89	.89	.89	.89	.90	.89	.88	.87	.84	.81
15-25S	04	25.46	25.36	25.20	24.87	24.21	23.11	21.56	19.64	17.56	15.57	13.97	13.02	12.86	13.55	14.97	16.92	19.11	21.24	23.05	24.40	25.22	25.59	25.66	25.57
		1.30	1.29	1.29	1.29	1.28	1.27	1.26	1.24	1.21	1.19	1.17	1.16	1.16	1.17	1.19	1.22	1.26	1.29	1.31	1.33	1.33	1.33	1.32	1.31
		.79	.79	.78	.78	.78	.79	.80	.82	.83	.84	.85	.85	.84	.83	.82	.81	.80	.79	.79	.79	.80	.80	.80	.80
25-35S	04	17.46	17.51	17.04	16.12	14.88	13.49	12.11	10.90	9.94	9.26	8.84	8.61	8.51	8.48	8.53	8.70	9.05	9.65	10.55	11.73	13.11	14.54	15.86	16.88
		1.25	1.25	1.24	1.23	1.21	1.19	1.17	1.15	1.13	1.12	1.11	1.10	1.10	1.10	1.10	1.10	1.11	1.12	1.14	1.16	1.18	1.21	1.23	1.24
		.80	.80	.81	.82	.84	.85	.87	.88	.88	.89	.89	.88	.88	.88	.88	.88	.88	.88	.87	.86	.85	.83	.82	.81
35-45S	04	12.89	13.07	13.16	13.15	13.01	12.72	12.32	11.81	11.25	10.69	10.19	9.78	9.53	9.42	9.47	9.65	9.95	10.34	10.77	11.22	11.65	12.03	12.37	12.66
		1.17	1.17	1.17	1.17	1.18	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.12	1.13	1.13	1.14	1.15	1.15	1.16	1.16
		.84	.85	.85	.85	.85	.86	.86	.87	.87	.87	.88	.88	.88	.88	.88	.88	.87	.87	.86	.86	.85	.85	.85	.84
45-55S	04	15.69	15.64	15.46	15.17	14.77	14.29	13.73	13.09	12.42	11.73	11.08	10.52	10.12	9.93	9.97	10.27	10.80	11.53	12.38	13.25	14.07	14.75	15.25	15.57
		1.19	1.20	1.19	1.19	1.18	1.17	1.16	1.15	1.14	1.13	1.11	1.10	1.10	1.10	1.10	1.10	1.11	1.12	1.14	1.15	1.17	1.18	1.19	1.19
		.81	.81	.81	.81	.81	.82	.82	.83	.84	.86	.87	.88	.88	.88	.88	.88	.87	.86	.85	.84	.83	.82	.82	.81
55-65S	04	18.25	19.45	20.32	20.74	20.66	20.11	19.21	18.09	16.94	15.89	15.01	14.34	13.85	13.47	13.15	12.88	12.65	12.52	12.56	12.85	13.44	14.35	15.53	16.88
		1.22	1.24	1.26	1.27	1.27	1.26	1.24	1.22	1.19	1.17	1.14	1.13	1.12	1.11	1.11	1.11	1.12	1.12	1.13	1.14	1.15	1.16	1.18	1.20
		.79	.77	.77	.76	.77	.77	.78	.78	.79	.79	.80	.80	.80	.80	.81	.82	.82	.83	.83	.83	.83	.82	.81	.80

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 11	19.12	18.94	19.10	19.48	19.83	19.92	19.52	18.54	17.07	15.28	13.52	12.12	11.37	11.46	12.39	13.99	15.97	17.95	19.60	20.68	21.07	20.88	20.31	19.64
	1.25	1.25	1.24	1.25	1.26	1.26	1.26	1.25	1.23	1.21	1.18	1.17	1.16	1.15	1.17	1.20	1.23	1.26	1.28	1.30	1.31	1.30	1.28	1.27
	.81	.80	.80	.79	.78	.78	.78	.79	.81	.83	.85	.86	.86	.87	.86	.85	.83	.82	.81	.80	.79	.80	.80	.81
45-55N 11	16.31	16.11	16.01	15.94	15.78	15.44	14.84	13.98	12.92	11.83	10.88	10.23	10.04	10.36	11.16	12.31	13.63	14.92	16.00	16.75	17.11	17.13	16.92	16.60
	1.22	1.21	1.21	1.21	1.20	1.20	1.19	1.18	1.16	1.15	1.13	1.12	1.12	1.13	1.14	1.16	1.18	1.20	1.22	1.23	1.24	1.24	1.23	1.23
	.81	.82	.82	.82	.81	.82	.83	.84	.85	.86	.87	.88	.88	.88	.87	.86	.85	.84	.83	.82	.82	.82	.82	.82
35-45N 11	12.69	12.09	11.88	12.01	12.33	12.67	12.84	12.74	12.35	11.75	11.12	10.64	10.49	10.80	11.58	12.73	14.04	15.27	16.17	16.56	16.38	15.71	14.70	13.62
	1.18	1.17	1.16	1.16	1.17	1.17	1.18	1.17	1.16	1.16	1.15	1.15	1.14	1.15	1.16	1.18	1.19	1.21	1.22	1.23	1.22	1.21	1.20	1.19
	.87	.87	.87	.87	.86	.86	.85	.86	.86	.87	.87	.87	.88	.87	.87	.86	.85	.84	.84	.83	.84	.84	.85	.86
25-35N																								
15-25N 11	29.33	31.27	32.53	32.64	31.32	28.55	24.65	20.18	15.83	12.25	9.93	9.09	9.68	11.40	13.78	16.33	18.63	20.42	21.66	22.49	23.20	24.11	25.45	27.24
	1.40	1.42	1.43	1.43	1.41	1.37	1.31	1.26	1.20	1.15	1.12	1.12	1.13	1.16	1.20	1.24	1.28	1.31	1.34	1.35	1.36	1.36	1.37	1.39
	.73	.73	.73	.75	.78	.80	.83	.86	.88	.89	.89	.88	.87	.85	.84	.82	.81	.80	.79	.78	.77	.76	.75	.73
5-15N																								
5N-5S 05	0.00	0.00	21.80	20.67	23.28	26.63	10.50	7.08	6.85	7.78	9.98	11.77	12.15	11.80	13.35	14.03	12.95	13.42	12.87	13.37	13.30	15.35	0.00	0.00
	0.00	0.00	1.30	1.28	1.29	1.35	1.14	1.09	1.08	1.08	1.10	1.17	1.18	1.17	1.21	1.22	1.18	1.18	1.16	1.19	1.17	1.22	0.00	0.00
	0.00	0.00	.76	.78	.73	.73	.92	.93	.92	.90	.86	.86	.87	.87	.88	.87	.84	.85	.84	.85	.85	.81	0.00	0.00
5-15S 05	24.85	25.46	25.41	24.68	23.34	21.53	19.46	17.35	15.41	13.79	12.57	11.77	11.35	11.24	11.41	11.83	12.53	13.52	14.83	16.44	18.26	20.19	22.05	23.65
	1.30	1.32	1.34	1.34	1.33	1.31	1.28	1.24	1.22	1.19	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.11	1.12	1.14	1.18	1.22	1.26
	.69	.70	.71	.72	.73	.75	.77	.79	.81	.83	.84	.85	.85	.84	.83	.81	.79	.77	.75	.73	.71	.70	.69	.69
15-25S 05	18.12	17.66	17.23	16.87	16.58	16.37	16.23	16.14	16.10	16.10	16.16	16.29	16.50	16.79	17.16	17.58	18.04	18.47	18.84	19.10	19.21	19.14	18.92	18.56
	1.23	1.23	1.24	1.24	1.24	1.23	1.23	1.23	1.22	1.22	1.22	1.22	1.23	1.24	1.25	1.26	1.27	1.27	1.26	1.26	1.25	1.25	1.24	1.24
	.78	.80	.81	.82	.83	.83	.83	.82	.81	.81	.80	.80	.80	.80	.80	.80	.80	.80	.79	.78	.77	.77	.77	.77
25-35S 05	16.30	15.34	14.29	13.30	12.47	11.84	11.40	11.09	10.85	10.62	10.39	10.17	10.04	10.08	10.37	10.98	11.90	13.07	14.36	15.59	16.58	17.20	17.34	17.02
	1.21	1.20	1.19	1.18	1.17	1.16	1.15	1.15	1.14	1.14	1.13	1.13	1.13	1.13	1.13	1.14	1.15	1.16	1.18	1.20	1.21	1.22	1.22	1.22
	.85	.85	.86	.86	.86	.86	.87	.87	.87	.88	.88	.88	.88	.88	.87	.87	.86	.85	.84	.84	.84	.84	.84	.84
35-45S 05	13.70	13.46	13.24	13.05	12.86	12.64	12.33	11.95	11.50	11.02	10.60	10.30	10.17	10.26	10.57	11.08	11.73	12.43	13.09	13.63	13.99	14.14	14.11	13.94
	1.17	1.17	1.16	1.15	1.15	1.16	1.16	1.15	1.15	1.15	1.14	1.14	1.13	1.13	1.13	1.13	1.14	1.15	1.16	1.17	1.18	1.18	1.18	1.17
	.85	.85	.85	.84	.84	.84	.84	.85	.86	.87	.88	.88	.88	.88	.87	.87	.86	.86	.85	.85	.85	.85	.85	.85
45-55S 05	15.28	15.19	15.06	14.83	14.47	13.94	13.25	12.42	11.53	10.71	10.03	9.62	9.50	9.71	10.22	10.96	11.85	12.78	13.64	14.35	14.87	15.17	15.32	15.34
	1.20	1.19	1.18	1.18	1.17	1.17	1.16	1.15	1.15	1.14	1.14	1.13	1.13	1.13	1.13	1.14	1.16	1.17	1.18	1.20	1.21	1.21	1.21	1.20
	.82	.82	.81	.81	.81	.82	.83	.84	.85	.87	.88	.88	.88	.88	.87	.87	.86	.85	.84	.84	.84	.84	.83	.83
55-65S 05	20.54	21.69	22.42	22.58	22.07	20.92	19.23	17.23	15.16	13.27	11.77	10.75	10.22	10.13	10.37	10.83	11.44	12.15	12.97	13.92	15.02	16.28	17.68	19.14
	1.30	1.32	1.34	1.34	1.33	1.31	1.28	1.24	1.20	1.16	1.13	1.11	1.10	1.10	1.10	1.11	1.12	1.14	1.15	1.17	1.19	1.22	1.24	1.27
	.80	.80	.80	.80	.80	.81	.81	.82	.84	.85	.86	.87	.87	.87	.87	.86	.85	.84	.83	.82	.81	.81	.80	.80

	MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	12	20.05	20.67	21.16	21.35	21.09	20.30	19.00	17.28	15.35	13.48	11.92	10.88	10.48	10.73	11.50	12.62	13.89	15.13	16.20	17.05	17.72	18.28	18.82	19.40
		1.26	1.28	1.29	1.30	1.30	1.29	1.28	1.25	1.22	1.18	1.16	1.14	1.13	1.14	1.15	1.17	1.19	1.21	1.22	1.23	1.24	1.24	1.24	1.25
		.81	.80	.79	.79	.80	.81	.82	.83	.85	.86	.87	.88	.88	.88	.87	.86	.86	.85	.84	.84	.83	.83	.82	.81
45-55N	12	17.50	17.30	17.03	16.67	16.17	15.51	14.67	13.67	12.61	11.59	10.74	10.17	9.99	10.24	10.87	11.84	13.00	14.23	15.37	16.32	17.02	17.44	17.63	17.62
		1.23	1.23	1.23	1.22	1.22	1.21	1.20	1.18	1.17	1.15	1.14	1.13	1.13	1.13	1.14	1.16	1.18	1.19	1.21	1.22	1.23	1.24	1.24	1.23
		.81	.80	.80	.81	.81	.82	.83	.84	.86	.87	.88	.88	.89	.89	.88	.88	.87	.86	.84	.84	.83	.82	.82	.81
35-45N	12	12.61	12.41	12.57	12.99	13.47	13.81	13.86	13.54	12.88	12.01	11.14	10.51	10.29	10.58	11.36	12.48	13.72	14.81	15.54	15.77	15.50	14.84	13.99	13.18
		1.17	1.17	1.17	1.18	1.18	1.19	1.19	1.19	1.18	1.17	1.16	1.15	1.14	1.14	1.15	1.17	1.18	1.19	1.21	1.21	1.21	1.20	1.19	1.18
		.87	.87	.86	.86	.85	.85	.84	.85	.86	.87	.88	.88	.89	.88	.88	.87	.86	.85	.84	.84	.84	.85	.86	.86
25-35N																									
15-25N	12	30.42	31.87	32.51	32.04	30.37	27.63	24.19	20.55	17.24	14.73	13.30	13.02	13.74	15.14	16.85	18.54	19.97	21.09	21.95	22.76	23.72	25.01	26.66	28.55
		1.45	1.48	1.50	1.50	1.47	1.43	1.37	1.31	1.25	1.20	1.17	1.17	1.18	1.21	1.24	1.27	1.30	1.32	1.33	1.33	1.34	1.36	1.38	1.41
		.75	.74	.74	.75	.77	.78	.80	.82	.84	.84	.84	.84	.83	.82	.81	.81	.80	.80	.80	.80	.79	.78	.77	.76
5-15N																									
5N-5S	06	0.00	0.00	0.00	0.00	22.58	25.90	9.48	6.35	6.10	6.98	10.18	12.32	12.97	13.30	13.00	12.15	11.02	10.57	11.47	11.68	13.07	15.60	0.00	0.00
		0.00	0.00	0.00	0.00	1.25	1.35	1.12	1.08	1.08	1.07	1.09	1.12	1.16	1.21	1.20	1.18	1.16	1.13	1.15	1.14	1.17	1.25	0.00	0.00
		0.00	0.00	0.00	0.00	.63	.70	.89	.92	.93	.90	.82	.80	.83	.86	.85	.85	.87	.86	.86	.84	.84	.81	0.00	0.00
5-15S	06	24.03	25.08	25.58	25.37	24.43	22.83	20.77	18.52	16.36	14.54	13.23	12.48	12.24	12.38	12.78	13.33	13.98	14.73	15.61	16.67	17.95	19.42	21.01	22.60
		1.30	1.32	1.33	1.33	1.33	1.31	1.29	1.26	1.23	1.21	1.19	1.17	1.17	1.17	1.17	1.17	1.18	1.18	1.19	1.21	1.22	1.24	1.26	1.28
		.68	.68	.69	.70	.72	.75	.78	.80	.83	.84	.85	.85	.85	.84	.83	.82	.81	.80	.79	.77	.75	.73	.71	.69
15-25S	06	16.86	16.38	15.85	15.36	14.96	14.69	14.55	14.54	14.61	14.71	14.82	14.89	14.92	14.92	14.94	15.01	15.19	15.51	15.94	16.43	16.88	17.20	17.31	17.19
		1.26	1.25	1.24	1.22	1.21	1.20	1.20	1.20	1.20	1.21	1.21	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.23	1.24	1.25	1.26	1.27	1.27
		.86	.87	.87	.86	.86	.86	.85	.85	.85	.86	.86	.86	.86	.86	.85	.85	.84	.83	.83	.83	.83	.84	.85	.85
25-35S	06	14.23	14.22	14.21	14.16	14.01	13.72	13.26	12.67	12.01	11.37	10.84	10.50	10.41	10.59	11.00	11.59	12.27	12.95	13.53	13.97	14.23	14.33	14.33	14.28
		1.19	1.19	1.20	1.20	1.20	1.20	1.19	1.19	1.18	1.17	1.16	1.15	1.15	1.14	1.15	1.15	1.16	1.17	1.18	1.19	1.19	1.20	1.20	1.20
		.85	.85	.85	.86	.86	.86	.87	.88	.89	.89	.89	.90	.89	.89	.88	.88	.87	.86	.86	.86	.86	.85	.85	.85
35-45S	06	14.45	14.39	14.30	14.14	13.89	13.51	12.98	12.34	11.64	10.96	10.40	10.03	9.92	10.08	10.49	11.09	11.81	12.55	13.23	13.77	14.17	14.39	14.49	14.49
		1.19	1.19	1.19	1.19	1.19	1.18	1.18	1.17	1.16	1.15	1.15	1.15	1.14	1.15	1.15	1.16	1.17	1.18	1.18	1.19	1.19	1.19	1.19	1.19
		.85	.85	.84	.84	.84	.85	.85	.86	.87	.88	.89	.89	.90	.89	.89	.88	.88	.87	.87	.87	.86	.86	.86	.85
45-55S	06	15.14	15.14	15.04	14.82	14.43	13.86	13.13	12.25	11.31	10.41	9.64	9.10	8.84	8.89	9.25	9.86	10.66	11.55	12.44	13.27	13.95	14.48	14.84	15.05
		1.18	1.18	1.18	1.17	1.18	1.17	1.17	1.16	1.15	1.14	1.13	1.13	1.12	1.12	1.12	1.13	1.14	1.16	1.17	1.18	1.18	1.19	1.19	1.19
		.82	.81	.81	.81	.81	.83	.84	.85	.87	.88	.89	.89	.90	.89	.89	.88	.88	.87	.87	.86	.85	.84	.83	.82
55-65S	06	21.87	23.33	24.24	24.45	23.85	22.49	20.52	18.18	15.78	13.59	11.83	10.61	9.94	9.75	9.94	10.37	10.97	11.70	12.58	13.64	14.95	16.50	18.25	20.10
		1.32	1.35	1.36	1.37	1.36	1.34	1.31	1.27	1.22	1.18	1.15	1.13	1.12	1.11	1.12	1.13	1.14	1.15	1.17	1.19	1.21	1.23	1.26	1.29
		.80	.78	.78	.78	.78	.79	.80	.82	.84	.85	.87	.88	.88	.89	.89	.88	.88	.87	.86	.86	.85	.83	.82	.81

********** QUIET MAGNETIC - HIGH SOLAR **********

MONTH		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	01	17.95	17.82	17.89	18.06	18.15	17.98	17.38	16.29	14.80	13.08	11.41	10.07	9.33	9.33	10.09	11.48	13.25	15.12	16.76	17.99	18.66	18.83	18.63	18.27
		1.25	1.25	1.25	1.25	1.25	1.25	1.24	1.23	1.21	1.17	1.15	1.13	1.11	1.11	1.12	1.15	1.17	1.20	1.23	1.25	1.26	1.27	1.27	1.26
		.83	.83	.84	.84	.84	.84	.84	.85	.85	.86	.87	.87	.88	.88	.87	.86	.84	.82	.81	.80	.80	.80	.81	.82
45-55N	01	16.19	15.65	15.12	14.63	14.18	13.71	13.16	12.49	11.69	10.80	9.93	9.19	8.73	8.68	9.08	9.95	11.17	12.60	14.04	15.30	16.23	16.75	16.86	16.63
		1.23	1.22	1.21	1.20	1.19	1.18	1.17	1.16	1.15	1.13	1.13	1.11	1.11	1.11	1.11	1.13	1.15	1.16	1.19	1.21	1.23	1.23	1.24	1.23
		.82	.83	.83	.83	.84	.84	.84	.85	.86	.87	.88	.88	.89	.89	.89	.88	.86	.85	.84	.83	.82	.82	.82	.82
35-45N	01	15.25	14.93	14.68	14.49	14.29	13.98	13.49	12.78	11.85	10.82	9.81	9.00	8.54	8.52	8.99	9.89	11.10	12.45	13.74	14.79	15.50	15.83	15.83	15.59
		1.23	1.22	1.22	1.21	1.20	1.20	1.19	1.17	1.16	1.14	1.13	1.12	1.11	1.11	1.11	1.13	1.15	1.17	1.19	1.21	1.23	1.24	1.24	1.24
		.86	.87	.87	.86	.86	.86	.86	.86	.86	.87	.88	.89	.89	.90	.89	.88	.87	.86	.85	.84	.84	.85	.85	.86
25-35N																									
15-25N	01	27.13	28.01	28.55	28.47	27.56	25.72	23.07	19.88	16.54	13.52	11.20	9.85	9.57	10.29	11.80	13.83	16.07	18.25	20.19	21.79	23.09	24.16	25.14	26.13
		1.39	1.40	1.41	1.41	1.40	1.38	1.34	1.29	1.24	1.19	1.15	1.13	1.13	1.14	1.17	1.21	1.25	1.28	1.32	1.34	1.35	1.36	1.37	1.38
		.73	.72	.72	.73	.74	.76	.79	.82	.84	.86	.88	.88	.88	.87	.86	.85	.83	.82	.81	.79	.78	.77	.75	.74
5-15N																									
5N-5S	07	0.00	0.00	13.90	14.82	17.82	24.87	12.88	7.07	5.63	6.62	9.83	12.15	13.03	12.95	12.28	11.90	10.75	9.78	10.83	13.63	16.07	14.30	0.00	0.00
		0.00	0.00	1.19	1.16	1.18	1.31	1.19	1.09	1.07	1.07	1.09	1.14	1.19	1.20	1.17	1.19	1.16	1.13	1.13	1.18	1.21	1.24	0.00	0.00
		0.00	0.00	.81	.79	.75	.66	.85	.93	.93	.91	.84	.84	.86	.87	.87	.88	.87	.87	.85	.81	.80	.89	0.00	0.00
5-15S	07	14.53	17.68	20.48	22.45	23.26	22.82	21.28	19.00	16.43	13.99	11.97	10.52	9.61	9.13	8.90	8.80	8.76	8.80	9.00	9.49	10.39	11.75	13.57	15.74
		.91	1.02	1.13	1.23	1.28	1.30	1.29	1.26	1.21	1.17	1.14	1.13	1.12	1.12	1.11	1.11	1.10	1.10	1.10	1.10	1.11	1.12	1.14	1.17
		.56	.59	.63	.67	.71	.74	.76	.78	.80	.82	.84	.86	.87	.88	.88	.87	.87	.87	.86	.86	.85	.84	.82	.79
15-25S	07	16.10	16.07	15.86	15.44	14.83	14.09	13.30	12.56	11.98	11.61	11.49	11.60	11.90	12.33	12.81	13.29	13.74	14.14	14.51	14.84	15.16	15.47	15.75	15.97
		1.20	1.20	1.20	1.19	1.18	1.17	1.16	1.16	1.15	1.15	1.16	1.17	1.18	1.19	1.19	1.20	1.20	1.21	1.20	1.20	1.20	1.20	1.20	1.20
		.84	.84	.83	.83	.83	.83	.83	.84	.85	.86	.88	.88	.89	.88	.87	.86	.85	.84	.84	.83	.83	.83	.84	.84
25-35S	07	14.24	13.54	12.70	11.85	11.11	10.54	10.16	9.94	9.81	9.69	9.53	9.32	9.10	8.94	8.94	9.20	9.75	10.57	11.59	12.67	13.64	14.35	14.71	14.66
		1.19	1.18	1.17	1.15	1.14	1.13	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.11	1.11	1.12	1.13	1.14	1.15	1.17	1.18	1.19	1.20	1.20
		.84	.84	.85	.86	.86	.86	.87	.87	.87	.88	.88	.88	.89	.89	.89	.89	.88	.87	.86	.85	.84	.84	.83	.83
35-45S	07	12.57	12.45	12.26	12.00	11.69	11.37	11.03	10.70	10.35	10.03	9.70	9.44	9.22	9.11	9.11	9.26	9.55	9.98	10.51	11.07	11.60	12.06	12.38	12.55
		1.17	1.17	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.14	1.14	1.14	1.13	1.13	1.13	1.13	1.13	1.13	1.14	1.15	1.16	1.16	1.17	1.17
		.85	.85	.85	.85	.86	.87	.87	.88	.88	.89	.89	.89	.90	.90	.90	.89	.89	.89	.88	.88	.87	.86	.85	.85
45-55S	07	12.50	12.48	12.46	12.41	12.27	11.98	11.53	10.91	10.17	9.39	8.68	8.12	7.81	7.78	8.05	8.58	9.28	10.07	10.84	11.50	12.00	12.31	12.47	12.51
		1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.11	1.12	1.12	1.14	1.15	1.16	1.17	1.18	1.18	1.17	1.17
		.85	.85	.85	.86	.86	.87	.87	.88	.89	.90	.91	.91	.91	.90	.90	.90	.89	.88	.87	.87	.86	.86	.86	.85
55-65S	07	15.82	16.43	16.64	16.39	15.71	14.67	13.41	12.09	10.85	9.81	9.04	8.55	8.30	8.25	8.34	8.55	8.86	9.29	9.88	10.64	11.58	12.66	13.80	14.90
		1.22	1.23	1.23	1.22	1.21	1.19	1.18	1.16	1.15	1.14	1.13	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.13	1.14	1.16	1.18	1.20	1.21
		.82	.81	.80	.80	.81	.82	.84	.86	.88	.89	.91	.91	.92	.91	.91	.90	.89	.89	.88	.88	.87	.86	.85	.83

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 02	20.20	20.18	20.02	19.76	19.42	18.98	18.37	17.56	16.50	15.24	13.87	12.51	11.35	10.54	10.24	10.50	11.31	12.57	14.12	15.74	17.27	18.53	19.44	19.98
	1.27	1.27	1.27	1.27	1.26	1.26	1.24	1.23	1.20	1.18	1.16	1.14	1.12	1.11	1.11	1.12	1.13	1.15	1.17	1.20	1.22	1.24	1.26	1.27
	.77	.77	.78	.78	.79	.79	.79	.79	.79	.80	.81	.82	.83	.84	.85	.86	.85	.84	.82	.81	.79	.78	.77	.76
45-55N 02	16.98	16.97	16.84	16.61	16.26	15.77	15.08	14.19	13.11	11.91	10.69	9.59	8.75	8.29	8.28	8.73	9.60	10.79	12.14	13.50	14.72	15.70	16.40	16.81
	1.24	1.23	1.23	1.22	1.22	1.21	1.20	1.18	1.16	1.14	1.12	1.11	1.10	1.09	1.09	1.10	1.12	1.13	1.16	1.18	1.20	1.22	1.23	1.23
	.81	.80	.81	.81	.82	.82	.83	.84	.85	.86	.87	.88	.89	.90	.90	.89	.88	.87	.86	.84	.83	.82	.81	.81
35-45N 02	15.62	15.27	14.90	14.55	14.19	13.75	13.15	12.34	11.30	10.12	8.92	7.87	7.14	6.86	7.10	7.86	9.05	10.52	12.08	13.52	14.69	15.47	15.84	15.86
	1.22	1.21	1.20	1.20	1.19	1.18	1.17	1.16	1.15	1.13	1.11	1.10	1.08	1.08	1.08	1.09	1.11	1.13	1.15	1.18	1.20	1.21	1.22	1.23
	.83	.83	.83	.83	.83	.84	.84	.85	.86	.88	.89	.90	.91	.90	.90	.89	.87	.86	.85	.84	.83	.83	.83	.83
25-35N																								
15-25N 02	31.22	32.43	32.88	32.34	30.69	27.94	24.31	20.17	15.99	12.27	9.40	7.61	6.99	7.43	8.74	10.66	12.97	15.45	17.98	20.48	22.90	25.23	27.45	29.48
	1.49	1.50	1.49	1.47	1.43	1.38	1.33	1.27	1.22	1.17	1.13	1.10	1.09	1.09	1.11	1.13	1.17	1.21	1.26	1.31	1.36	1.41	1.44	1.47
	.73	.72	.71	.72	.73	.76	.79	.83	.87	.89	.91	.91	.91	.89	.87	.85	.83	.81	.80	.79	.78	.77	.75	.74
5-15N																								
5N-5S 08	17.82	18.50	18.78	18.53	17.71	16.41	14.79	13.12	11.66	10.61	10.09	10.09	10.49	11.13	11.82	12.43	12.89	13.23	13.53	13.89	14.39	15.09	15.96	16.91
	1.26	1.26	1.25	1.24	1.22	1.21	1.18	1.17	1.15	1.14	1.13	1.14	1.14	1.16	1.17	1.18	1.19	1.20	1.21	1.22	1.23	1.24	1.25	1.26
	.81	.79	.78	.78	.78	.80	.82	.84	.86	.88	.88	.88	.88	.87	.86	.86	.86	.86	.87	.87	.87	.86	.85	.83
5-15S 08	13.50	19.13	20.97	22.43	27.67	32.10	33.57	14.77	9.90	8.60	9.60	9.50	9.40	17.03	7.73	6.33	7.15	7.50	7.87	8.85	0.00	0.00	0.00	0.00
	1.07	1.19	1.27	1.32	1.37	1.50	1.45	1.23	1.16	1.08	1.10	1.09	1.09	1.18	1.07	1.07	1.05	1.06	1.05	1.09	0.00	0.00	0.00	0.00
	.75	.70	.73	.72	.68	.70	.72	.83	.90	.88	.86	.84	.86	.89	.91	.91	.88	.86	.84	.84	0.00	0.00	0.00	0.00
15-25S 08	17.79	17.81	17.87	17.93	17.91	17.74	17.36	16.78	16.04	15.24	14.51	13.94	13.63	13.62	13.91	14.45	15.15	15.91	16.62	17.20	17.59	17.79	17.84	17.82
	1.25	1.25	1.26	1.26	1.27	1.27	1.26	1.25	1.23	1.21	1.19	1.18	1.17	1.18	1.19	1.20	1.22	1.24	1.25	1.26	1.26	1.26	1.25	1.25
	.81	.81	.81	.82	.82	.83	.84	.84	.84	.85	.84	.84	.84	.83	.83	.83	.82	.82	.82	.82	.82	.81	.81	.81
25-35S 08	18.87	18.77	18.26	17.42	16.34	15.14	13.92	12.75	11.70	10.79	10.04	9.47	9.08	8.90	8.98	9.34	10.02	11.02	12.28	13.73	15.22	16.60	17.75	18.53
	1.24	1.25	1.24	1.24	1.22	1.21	1.19	1.17	1.16	1.14	1.13	1.12	1.11	1.11	1.12	1.12	1.13	1.15	1.16	1.18	1.20	1.21	1.23	1.24
	.77	.77	.78	.79	.81	.82	.84	.85	.86	.87	.88	.88	.88	.89	.89	.88	.87	.86	.84	.82	.80	.79	.77	.77
35-45S 08	15.21	15.17	14.99	14.72	14.38	13.97	13.47	12.86	12.17	11.41	10.62	9.89	9.30	8.92	8.81	9.01	9.52	10.28	11.23	12.26	13.24	14.08	14.70	15.07
	1.20	1.21	1.20	1.20	1.19	1.19	1.18	1.17	1.16	1.15	1.14	1.13	1.13	1.12	1.12	1.13	1.13	1.14	1.15	1.17	1.18	1.19	1.20	1.20
	.82	.82	.82	.82	.83	.83	.84	.85	.86	.87	.88	.88	.89	.90	.90	.89	.88	.88	.86	.85	.84	.82	.82	.82
45-55S 08	14.66	14.51	14.25	13.94	13.59	13.18	12.70	12.14	11.47	10.72	9.95	9.22	8.64	8.28	8.23	8.51	9.11	9.97	11.00	12.07	13.05	13.84	14.37	14.63
	1.19	1.18	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.11	1.11	1.12	1.13	1.14	1.16	1.17	1.18	1.19	1.19
	.82	.82	.83	.83	.84	.84	.85	.86	.86	.87	.88	.88	.89	.89	.89	.89	.88	.88	.87	.85	.84	.83	.82	.82
55-65S 08	17.39	17.91	18.20	18.23	17.97	17.41	16.55	15.45	14.20	12.91	11.70	10.67	9.93	9.51	9.43	9.68	10.20	10.94	11.85	12.85	13.88	14.90	15.85	16.69
	1.21	1.22	1.23	1.23	1.23	1.22	1.21	1.19	1.17	1.15	1.13	1.12	1.11	1.11	1.11	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.19	1.20
	.78	.77	.77	.77	.77	.78	.79	.80	.81	.82	.84	.85	.86	.86	.87	.87	.87	.86	.85	.84	.82	.81	.80	.78

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 03	13.43	13.92	14.26	14.44	14.43	14.20	13.70	12.90	11.81	10.50	9.08	7.69	6.48	5.57	5.08	5.03	5.42	6.20	7.25	8.46	9.70	10.88	11.91	12.76
	1.17	1.17	1.17	1.18	1.18	1.18	1.17	1.16	1.15	1.13	1.10	1.08	1.06	1.04	1.04	1.03	1.04	1.05	1.07	1.09	1.11	1.13	1.15	1.16
	.83	.83	.83	.83	.83	.83	.84	.84	.85	.87	.88	.90	.91	.93	.93	.93	.93	.92	.90	.89	.87	.85	.84	.84
45-55N 03	11.03	11.54	11.94	12.18	12.24	12.08	11.69	11.12	10.39	9.59	8.78	8.05	7.45	7.02	6.78	6.74	6.86	7.14	7.54	8.03	8.59	9.20	9.83	10.45
	1.15	1.16	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.09	1.08	1.07	1.05	1.05	1.05	1.05	1.05	1.06	1.07	1.09	1.10	1.12	1.13	1.14
	.87	.86	.86	.85	.85	.85	.86	.87	.88	.89	.90	.91	.92	.93	.93	.93	.93	.93	.92	.91	.90	.90	.89	.88
35-45N 03	13.65	13.82	13.64	13.13	12.33	11.31	10.14	8.90	7.68	6.59	5.69	5.04	4.67	4.58	4.76	5.19	5.85	6.71	7.73	8.89	10.10	11.28	12.32	13.14
	1.20	1.20	1.20	1.18	1.17	1.15	1.13	1.12	1.10	1.08	1.07	1.06	1.05	1.04	1.04	1.04	1.05	1.06	1.08	1.10	1.13	1.15	1.18	1.19
	.85	.84	.84	.84	.85	.86	.87	.88	.90	.91	.92	.93	.93	.93	.92	.91	.91	.90	.89	.88	.87	.87	.86	.86
25-35N																								
15-25N 03	24.33	26.73	28.68	29.77	29.64	28.14	25.33	21.53	17.25	13.05	9.50	6.95	5.60	5.38	6.10	7.46	9.13	10.88	12.57	14.19	15.81	17.57	19.57	21.85
	1.32	1.38	1.42	1.44	1.45	1.43	1.38	1.32	1.25	1.19	1.13	1.09	1.07	1.07	1.07	1.09	1.11	1.12	1.14	1.15	1.17	1.19	1.23	1.27
	.72	.71	.70	.70	.71	.73	.76	.80	.84	.88	.91	.94	.94	.94	.93	.90	.88	.85	.82	.80	.78	.76	.75	.73
5-15N																								
5N-5S 09	10.90	11.30	14.80	22.90	31.70	46.30	33.80	15.00	6.30	5.30	8.80	10.70	9.90	7.40	6.30	7.50	8.90	10.30	12.40	15.80	0.00	0.00	9.20	8.30
	1.10	1.18	1.14	1.32	1.49	1.75	1.58	1.10	1.08	1.04	1.05	1.13	1.13	1.08	1.10	1.13	1.13	1.11	1.18	1.29	0.00	0.00	1.13	1.10
	.86	.92	.76	.72	.70	.53	.91	.93	.93	.93	.87	.85	.88	.90	.93	.94	.90	.84	.87	.89	0.00	0.00	.92	.89
5-15S 09	18.16	20.52	22.14	22.73	22.14	20.46	17.94	14.97	11.99	9.36	7.35	6.04	5.40	5.29	5.56	6.06	6.72	7.51	8.48	9.69	11.19	13.01	15.08	17.28
	1.14	1.22	1.28	1.31	1.32	1.30	1.26	1.20	1.15	1.11	1.08	1.06	1.05	1.05	1.05	1.05	1.06	1.06	1.07	1.09	1.11	1.14	1.17	1.20
	.67	.68	.70	.73	.75	.77	.80	.83	.86	.88	.91	.92	.93	.93	.93	.92	.91	.89	.88	.86	.84	.82	.79	.76
15-25S 09	22.12	21.81	21.39	20.83	20.06	19.03	17.73	16.24	14.68	13.24	12.10	11.43	11.33	11.82	12.84	14.26	15.92	17.62	19.20	20.52	21.48	22.07	22.32	22.31
	1.31	1.31	1.31	1.31	1.30	1.28	1.26	1.24	1.21	1.19	1.17	1.17	1.17	1.18	1.20	1.23	1.25	1.28	1.29	1.30	1.31	1.31	1.31	1.31
	.78	.79	.80	.80	.80	.81	.82	.83	.84	.86	.87	.88	.88	.88	.87	.85	.83	.81	.79	.78	.77	.77	.77	.78
25-35S 09	12.69	13.93	14.94	15.53	15.55	14.95	13.81	12.29	10.63	9.07	7.80	6.95	6.53	6.48	6.67	6.98	7.30	7.60	7.89	8.23	8.69	9.37	10.28	11.42
	1.17	1.19	1.21	1.22	1.22	1.21	1.19	1.16	1.13	1.11	1.09	1.08	1.07	1.07	1.08	1.08	1.09	1.09	1.10	1.10	1.11	1.12	1.13	1.15
	.85	.84	.83	.83	.83	.83	.84	.86	.87	.89	.90	.91	.91	.91	.91	.91	.90	.90	.90	.89	.89	.88	.87	.86
35-45S 09	10.09	10.59	11.10	11.52	11.77	11.77	11.47	10.90	10.12	9.24	8.40	7.71	7.24	7.01	7.02	7.20	7.48	7.82	8.14	8.43	8.70	8.97	9.27	9.64
	1.14	1.15	1.16	1.17	1.16	1.16	1.16	1.14	1.13	1.12	1.11	1.10	1.09	1.09	1.09	1.10	1.10	1.11	1.11	1.12	1.12	1.13	1.13	1.13
	.88	.88	.87	.87	.86	.86	.87	.87	.88	.88	.89	.90	.90	.91	.92	.91	.91	.91	.90	.90	.90	.89	.89	.88
45-55S 09	11.41	11.70	12.02	12.34	12.60	12.77	12.79	12.61	12.23	11.66	10.98	10.25	9.58	9.04	8.70	8.56	8.64	8.90	9.26	9.69	10.12	10.50	10.84	11.13
	1.15	1.16	1.16	1.16	1.16	1.16	1.15	1.14	1.13	1.12	1.10	1.09	1.08	1.07	1.07	1.08	1.09	1.10	1.12	1.12	1.13	1.14	1.14	1.16
	.87	.87	.86	.86	.85	.85	.84	.84	.84	.84	.84	.85	.86	.87	.88	.88	.88	.89	.88	.88	.88	.88	.88	.87
55-65S 09	13.98	15.20	16.26	17.03	17.41	17.39	17.00	16.34	15.53	14.70	13.93	13.28	12.73	12.25	11.80	11.34	10.90	10.50	10.22	10.15	10.35	10.87	11.69	12.76
	1.17	1.19	1.21	1.22	1.23	1.23	1.23	1.21	1.19	1.16	1.14	1.12	1.10	1.09	1.08	1.08	1.09	1.09	1.10	1.10	1.11	1.12	1.13	1.15
	.82	.80	.79	.79	.78	.78	.79	.79	.79	.79	.79	.79	.80	.80	.81	.82	.83	.84	.85	.86	.86	.86	.84	.83

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 04	14.78	15.45	15.97	16.36	16.62	16.78	16.83	16.78	16.60	16.29	15.83	15.22	14.49	13.68	12.87	12.12	11.54	11.17	11.08	11.28	11.74	12.40	13.18	14.01
	1.16	1.18	1.19	1.20	1.21	1.22	1.22	1.22	1.21	1.20	1.19	1.17	1.15	1.15	1.13	1.12	1.11	1.11	1.11	1.11	1.11	1.12	1.13	1.15
	.78	.78	.78	.79	.79	.79	.79	.79	.78	.78	.78	.78	.79	.80	.81	.83	.83	.84	.84	.83	.82	.81	.80	.79
45-55N 04	10.32	10.72	11.25	11.89	12.60	13.35	14.07	14.66	15.07	15.25	15.18	14.87	14.35	13.71	12.98	12.27	11.59	11.00	10.53	10.18	9.96	9.86	9.89	10.04
	1.10	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.16	1.17	1.16	1.16	1.15	1.14	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.10	1.10	1.10
	.86	.85	.84	.84	.83	.82	.80	.79	.78	.78	.78	.78	.78	.80	.81	.82	.83	.85	.86	.86	.87	.87	.87	.86
35-45N 04	9.23	9.50	9.72	9.91	10.04	10.14	10.16	10.10	9.93	9.64	9.25	8.79	8.29	7.82	7.41	7.11	6.95	6.95	7.09	7.36	7.72	8.13	8.53	8.90
	1.10	1.10	1.11	1.11	1.11	1.11	1.11	1.10	1.09	1.09	1.08	1.08	1.07	1.06	1.06	1.07	1.07	1.07	1.07	1.08	1.08	1.09	1.09	1.10
	.88	.88	.87	.87	.86	.86	.86	.87	.87	.88	.90	.91	.91	.92	.93	.93	.93	.93	.92	.92	.91	.91	.90	.89
25-35N																								
15-25N 04	17.54	17.74	17.56	16.98	16.01	14.71	13.16	11.49	9.85	8.40	7.26	6.52	6.20	6.29	6.73	7.48	8.47	9.65	10.96	12.33	13.70	14.99	16.10	16.97
	1.23	1.23	1.23	1.22	1.21	1.20	1.18	1.16	1.14	1.12	1.11	1.10	1.09	1.09	1.10	1.11	1.13	1.14	1.16	1.18	1.20	1.21	1.22	1.23
	.81	.81	.80	.80	.81	.82	.84	.86	.88	.90	.92	.93	.94	.94	.93	.92	.91	.90	.88	.87	.86	.84	.83	.82
5-15N																								
5N-5S 10	14.10	14.95	15.67	16.08	16.01	15.39	14.24	12.72	11.05	9.52	8.33	7.64	7.45	7.71	8.27	8.97	9.68	10.30	10.82	11.25	11.64	12.07	12.61	13.29
	1.19	1.20	1.20	1.21	1.21	1.20	1.18	1.16	1.14	1.12	1.11	1.10	1.10	1.11	1.12	1.13	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.18
	.82	.82	.81	.82	.82	.84	.86	.88	.90	.91	.92	.92	.92	.92	.91	.90	.89	.88	.88	.87	.86	.85	.84	.83
5-15S 10	14.96	16.40	17.35	17.63	17.20	16.08	14.42	12.44	10.41	8.56	7.05	5.98	5.32	5.03	4.99	5.13	5.39	5.80	6.38	7.21	8.33	9.76	11.44	13.23
	1.16	1.19	1.21	1.22	1.22	1.21	1.19	1.16	1.13	1.11	1.09	1.07	1.07	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.07	1.08	1.10	1.13
	.79	.78	.77	.77	.78	.80	.82	.84	.87	.89	.92	.93	.94	.95	.95	.95	.94	.93	.91	.89	.87	.85	.83	.81
15-25S 10	14.69	15.15	15.47	15.54	15.29	14.66	13.66	12.39	10.99	9.62	8.47	7.65	7.26	7.29	7.70	8.38	9.23	10.14	11.01	11.79	12.47	13.07	13.62	14.16
	1.19	1.20	1.20	1.20	1.19	1.19	1.17	1.16	1.14	1.12	1.11	1.10	1.09	1.09	1.10	1.11	1.12	1.14	1.15	1.16	1.17	1.18	1.19	1.19
	.83	.83	.82	.81	.81	.81	.82	.84	.86	.88	.90	.91	.91	.91	.90	.89	.88	.87	.86	.86	.86	.85	.85	.84
25-35S 10	10.30	10.81	11.22	11.50	11.63	11.59	11.41	11.12	10.74	10.33	9.90	9.48	9.08	8.72	8.39	8.13	7.96	7.88	7.91	8.07	8.35	8.74	9.22	9.75
	1.12	1.14	1.15	1.15	1.15	1.14	1.13	1.11	1.10	1.08	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.08	1.08	1.09	1.10	1.11
	.87	.87	.87	.87	.87	.86	.86	.86	.85	.85	.85	.86	.86	.87	.88	.88	.89	.89	.89	.89	.88	.88	.87	.87
35-45S 10	9.49	9.90	10.39	10.92	11.43	11.88	12.21	12.38	12.36	12.18	11.84	11.40	10.91	10.43	10.00	9.62	9.32	9.09	8.93	8.83	8.80	8.84	8.96	9.18
	1.11	1.12	1.12	1.13	1.13	1.13	1.13	1.12	1.11	1.10	1.09	1.09	1.09	1.09	1.09	1.09	1.10	1.10	1.10	1.10	1.10	1.09	1.10	1.10
	.89	.88	.88	.87	.85	.84	.84	.83	.82	.82	.83	.83	.84	.85	.86	.87	.88	.88	.89	.89	.90	.90	.89	.89
45-55S 10	11.12	11.33	11.67	12.14	12.74	13.42	14.10	14.70	15.15	15.38	15.37	15.14	14.73	14.18	13.59	13.01	12.49	12.05	11.69	11.43	11.23	11.10	11.03	11.03
	1.13	1.13	1.14	1.14	1.15	1.16	1.16	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.11	1.11	1.11	1.11	1.12	1.12	1.12	1.12	1.12
	.86	.86	.85	.85	.84	.83	.82	.80	.79	.77	.76	.76	.75	.76	.77	.78	.79	.81	.83	.84	.85	.86	.86	.86
55-65S 10	13.89	14.87	15.75	16.45	16.94	17.23	17.36	17.39	17.33	17.22	17.02	16.72	16.28	15.68	14.92	14.06	13.16	12.31	11.64	11.23	11.16	11.44	12.05	12.90
	1.14	1.15	1.16	1.17	1.18	1.20	1.21	1.23	1.24	1.24	1.24	1.23	1.22	1.20	1.18	1.16	1.14	1.13	1.12	1.12	1.12	1.13	1.13	1.14
	.82	.81	.79	.78	.77	.77	.78	.79	.79	.80	.80	.80	.79	.79	.79	.79	.80	.81	.83	.84	.85	.85	.85	.84

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 05	12.29	12.68	13.23	13.92	14.70	15.50	16.22	16.80	17.16	17.23	17.04	16.62	16.02	15.33	14.61	13.95	13.37	12.89	12.52	12.24	12.06	11.95	11.94	12.05
	1.12	1.13	1.15	1.16	1.18	1.19	1.20	1.21	1.22	1.22	1.21	1.21	1.19	1.18	1.17	1.17	1.16	1.15	1.15	1.14	1.13	1.13	1.13	1.12
	.81	.81	.81	.81	.81	.80	.80	.79	.78	.78	.77	.77	.77	.78	.79	.81	.82	.83	.83	.83	.83	.83	.82	.82
45-55N 05	9.36	9.82	10.56	11.51	12.59	13.69	14.69	15.50	16.05	16.32	16.29	16.02	15.57	14.98	14.32	13.62	12.91	12.19	11.47	10.78	10.15	9.63	9.29	9.18
	1.10	1.10	1.11	1.12	1.14	1.15	1.17	1.18	1.19	1.19	1.19	1.19	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.10	1.10	1.10
	.87	.86	.86	.84	.83	.81	.80	.79	.78	.77	.77	.77	.78	.78	.79	.80	.82	.83	.84	.85	.86	.87	.87	.87
35-45N 05	7.36	7.70	8.24	8.91	9.65	10.35	10.90	11.22	11.29	11.12	10.76	10.30	9.82	9.40	9.07	8.84	8.67	8.50	8.31	8.06	7.78	7.51	7.30	7.24
	1.09	1.09	1.10	1.10	1.10	1.11	1.11	1.11	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.09	1.09	1.09	1.08	1.08	1.08
	.90	.89	.88	.87	.86	.85	.84	.84	.84	.84	.85	.86	.87	.87	.88	.88	.88	.89	.89	.89	.89	.90	.90	.90
25-35N																								
15-25N 05	13.75	13.39	12.86	12.26	11.65	11.09	10.62	10.24	9.93	9.68	9.46	9.29	9.16	9.11	9.17	9.40	9.80	10.38	11.11	11.90	12.67	13.31	13.73	13.88
	1.20	1.19	1.18	1.17	1.15	1.14	1.13	1.12	1.11	1.11	1.10	1.10	1.10	1.10	1.10	1.11	1.12	1.13	1.15	1.16	1.18	1.19	1.20	1.20
	.85	.85	.86	.86	.86	.87	.87	.88	.88	.89	.89	.89	.89	.89	.89	.88	.88	.87	.87	.86	.86	.85	.85	.85
5-15N																								
5N-5S 11	12.95	14.16	15.17	15.71	15.60	14.78	13.34	11.54	9.69	8.12	7.08	6.67	6.86	7.49	8.33	9.15	9.77	10.12	10.22	10.19	10.19	10.40	10.92	11.79
	1.17	1.19	1.21	1.22	1.22	1.21	1.19	1.17	1.14	1.11	1.09	1.09	1.09	1.10	1.11	1.13	1.14	1.14	1.14	1.13	1.13	1.13	1.14	1.15
	.85	.84	.84	.84	.85	.86	.88	.90	.91	.92	.92	.92	.92	.91	.90	.89	.88	.88	.88	.87	.87	.87	.87	.86
5-15S 11	12.23	13.37	14.24	14.71	14.68	14.13	13.12	11.75	10.21	8.68	7.30	6.20	5.41	4.95	4.76	4.81	5.05	5.44	5.98	6.66	7.52	8.53	9.69	10.95
	1.15	1.17	1.17	1.18	1.17	1.16	1.15	1.13	1.12	1.10	1.08	1.07	1.06	1.06	1.05	1.05	1.05	1.05	1.06	1.07	1.08	1.10	1.12	1.14
	.85	.83	.82	.81	.80	.81	.82	.84	.86	.88	.90	.91	.93	.93	.94	.94	.93	.93	.92	.91	.90	.89	.88	.86
15-25S 11	9.63	9.51	9.48	9.52	9.59	9.66	9.68	9.64	9.54	9.40	9.26	9.16	9.16	9.27	9.49	9.78	10.10	10.38	10.56	10.61	10.52	10.33	10.08	9.83
	1.11	1.11	1.11	1.11	1.12	1.12	1.11	1.11	1.11	1.10	1.09	1.09	1.08	1.08	1.09	1.09	1.10	1.10	1.11	1.11	1.11	1.11	1.11	1.11
	.89	.89	.89	.89	.89	.88	.88	.88	.89	.89	.90	.90	.91	.91	.91	.91	.90	.90	.89	.89	.89	.89	.89	.89
25-35S 11	9.17	9.39	9.62	9.84	10.03	10.19	10.29	10.32	10.27	10.14	9.96	9.73	9.48	9.22	8.98	8.77	8.61	8.50	8.44	8.45	8.51	8.63	8.78	8.96
	1.10	1.10	1.11	1.11	1.11	1.11	1.11	1.11	1.10	1.10	1.09	1.08	1.08	1.07	1.07	1.07	1.07	1.07	1.08	1.08	1.08	1.09	1.09	1.09
	.87	.87	.87	.86	.86	.86	.85	.85	.85	.85	.85	.85	.86	.86	.87	.87	.87	.88	.88	.88	.87	.87	.87	.87
35-45S 11	9.27	9.59	10.10	10.76	11.50	12.25	12.90	13.38	13.61	13.59	13.33	12.89	12.35	11.80	11.27	10.82	10.43	10.12	9.84	9.59	9.37	9.19	9.10	9.11
	1.12	1.12	1.13	1.13	1.14	1.14	1.14	1.14	1.14	1.13	1.12	1.12	1.11	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.11	1.11	1.11	1.11
	.88	.88	.87	.86	.84	.83	.82	.80	.79	.79	.79	.79	.80	.82	.83	.83	.84	.85	.86	.87	.88	.88	.88	.88
45-55S 11	9.94	10.22	10.72	11.43	12.31	13.28	14.25	15.13	15.80	16.21	16.32	16.15	15.72	15.12	14.42	13.68	12.96	12.28	11.66	11.12	10.64	10.26	9.99	9.88
	1.11	1.11	1.12	1.13	1.14	1.16	1.18	1.20	1.21	1.22	1.21	1.20	1.19	1.17	1.15	1.14	1.13	1.13	1.12	1.12	1.12	1.12	1.12	1.12
	.87	.86	.85	.84	.84	.83	.82	.82	.80	.79	.79	.78	.78	.78	.78	.79	.79	.81	.83	.84	.86	.86	.87	.87
55-65S 11	13.01	13.72	14.29	14.70	14.96	15.10	15.15	15.17	15.17	15.14	15.05	14.86	14.53	14.05	13.42	12.70	11.95	11.28	10.79	10.54	10.59	10.93	11.51	12.24
	1.14	1.15	1.16	1.17	1.18	1.18	1.19	1.20	1.21	1.21	1.21	1.20	1.20	1.19	1.17	1.16	1.15	1.14	1.13	1.12	1.12	1.12	1.13	1.13
	.82	.81	.80	.80	.80	.81	.81	.82	.82	.82	.82	.82	.82	.82	.82	.82	.83	.84	.85	.86	.86	.86	.85	.84

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 06	10.88	11.49	12.11	12.71	13.24	13.65	13.90	13.96	13.82	13.49	13.01	12.40	11.73	11.06	10.43	9.89	9.47	9.18	9.04	9.04	9.18	9.44	9.84	10.32
	1.11	1.12	1.12	1.13	1.14	1.15	1.16	1.16	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.10	1.10	1.09	1.09	1.10	1.10	1.10	1.11
	.83	.83	.82	.81	.81	.81	.80	.81	.80	.81	.82	.82	.83	.83	.84	.85	.86	.86	.87	.87	.86	.86	.85	.84
45-55N 06	9.40	9.89	10.52	11.26	12.04	12.77	13.39	13.82	14.04	14.02	13.79	13.39	12.88	12.30	11.72	11.17	10.66	10.20	9.78	9.44	9.16	8.99	8.96	9.09
	1.11	1.11	1.12	1.13	1.15	1.16	1.17	1.17	1.18	1.18	1.18	1.18	1.17	1.16	1.15	1.14	1.13	1.13	1.12	1.11	1.11	1.11	1.11	1.11
	.88	.87	.86	.85	.84	.83	.82	.82	.82	.83	.83	.83	.84	.84	.85	.85	.86	.86	.87	.88	.88	.88	.88	.88
35-45N 06	8.84	9.13	9.55	10.08	10.67	11.26	11.78	12.15	12.34	12.33	12.12	11.76	11.31	10.82	10.36	9.96	9.63	9.36	9.14	8.96	8.81	8.71	8.66	8.69
	1.09	1.10	1.10	1.11	1.11	1.11	1.11	1.11	1.11	1.10	1.10	1.10	1.09	1.09	1.09	1.10	1.10	1.10	1.09	1.09	1.09	1.09	1.09	1.09
	.88	.88	.87	.86	.85	.84	.83	.82	.81	.82	.82	.82	.84	.85	.85	.86	.87	.87	.88	.88	.88	.88	.88	.88
25-35N																								
15-25N 06	13.19	13.18	13.24	13.33	13.38	13.32	13.11	12.73	12.22	11.66	11.16	10.80	10.65	10.75	11.07	11.56	12.13	12.69	13.14	13.44	13.56	13.53	13.41	13.28
	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.17	1.17	1.17
	.84	.84	.84	.83	.83	.83	.83	.84	.85	.85	.86	.87	.87	.88	.88	.87	.87	.87	.86	.86	.85	.85	.85	.84
5-15N																								
5N-5S 12	12.97	14.51	15.87	16.76	16.97	16.41	15.14	13.37	11.39	9.54	8.07	7.13	6.74	6.81	7.16	7.62	8.04	8.35	8.54	8.71	8.97	9.47	10.31	11.50
	1.17	1.19	1.21	1.23	1.23	1.23	1.21	1.19	1.16	1.13	1.11	1.09	1.09	1.09	1.09	1.10	1.10	1.11	1.11	1.11	1.12	1.12	1.13	1.15
	.84	.83	.81	.81	.81	.82	.83	.85	.87	.89	.91	.92	.92	.92	.91	.91	.90	.90	.90	.89	.89	.88	.87	.86
5-15S 12	16.59	17.69	18.33	18.41	17.90	16.83	15.33	13.56	11.72	9.99	8.54	7.44	6.71	6.34	6.27	6.46	6.86	7.47	8.30	9.35	10.62	12.07	13.63	15.18
	1.22	1.24	1.26	1.26	1.26	1.24	1.22	1.19	1.15	1.12	1.09	1.07	1.06	1.05	1.05	1.06	1.07	1.08	1.09	1.11	1.12	1.15	1.17	1.20
	.80	.79	.78	.79	.80	.81	.83	.85	.87	.89	.90	.90	.91	.91	.91	.91	.90	.90	.90	.89	.87	.86	.84	.82
15-25S 12	9.19	9.23	9.28	9.28	9.19	8.96	8.61	8.18	7.75	7.41	7.24	7.30	7.58	8.05	8.63	9.21	9.69	10.00	10.11	10.04	9.84	9.59	9.37	9.23
	1.12	1.12	1.12	1.12	1.11	1.11	1.10	1.09	1.09	1.08	1.08	1.08	1.09	1.10	1.11	1.12	1.13	1.13	1.13	1.13	1.13	1.12	1.12	1.12
	.89	.89	.89	.89	.89	.90	.90	.90	.91	.91	.91	.91	.91	.91	.90	.90	.90	.89	.89	.89	.89	.89	.89	.89
25-35S 12	9.92	10.43	11.05	11.70	12.29	12.74	13.02	13.10	12.99	12.76	12.44	12.11	11.79	11.52	11.28	11.05	10.81	10.54	10.23	9.91	9.64	9.46	9.42	9.58
	1.10	1.11	1.12	1.13	1.13	1.13	1.13	1.12	1.12	1.11	1.10	1.09	1.09	1.09	1.09	1.10	1.10	1.10	1.10	1.09	1.09	1.09	1.09	1.09
	.86	.85	.85	.85	.84	.83	.82	.81	.81	.80	.80	.80	.81	.81	.82	.83	.83	.84	.84	.85	.85	.85	.85	.85
35-45S 12	9.55	10.07	10.74	11.51	12.31	13.05	13.65	14.05	14.22	14.14	13.85	13.41	12.87	12.28	11.70	11.16	10.65	10.19	9.78	9.44	9.18	9.03	9.03	9.20
	1.12	1.12	1.13	1.14	1.14	1.16	1.16	1.17	1.17	1.16	1.15	1.14	1.13	1.13	1.12	1.11	1.12	1.12	1.12	1.12	1.12	1.11	1.11	1.12
	.88	.87	.86	.86	.84	.83	.82	.81	.80	.80	.80	.80	.81	.82	.82	.83	.84	.86	.87	.87	.88	.88	.88	.88
45-55S 12	9.47	10.06	10.78	11.58	12.35	13.03	13.56	13.90	14.04	14.00	13.80	13.50	13.11	12.67	12.20	11.69	11.16	10.61	10.07	9.58	9.18	8.94	8.89	9.07
	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.14	1.14	1.13	1.13	1.12	1.12	1.11	1.11	1.11
	.88	.88	.87	.85	.84	.83	.83	.83	.82	.82	.83	.83	.83	.83	.84	.84	.85	.86	.87	.88	.88	.89	.89	.89
55-65S 12	10.93	11.62	12.26	12.80	13.19	13.43	13.53	13.50	13.37	13.16	12.87	12.51	12.09	11.62	11.09	10.55	10.01	9.54	9.18	8.98	8.99	9.22	9.65	10.24
	1.11	1.12	1.13	1.14	1.16	1.17	1.17	1.18	1.17	1.17	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.10	1.10	1.10	1.10	1.10
	.85	.84	.83	.83	.83	.83	.83	.83	.83	.83	.83	.83	.83	.83	.84	.85	.86	.87	.88	.89	.89	.88	.87	.86

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 07	11.49	12.59	13.55	14.27	14.71	14.85	14.73	14.39	13.91	13.33	12.69	12.01	11.31	10.58	9.85	9.15	8.51	8.00	7.70	7.65	7.91	8.48	9.32	10.36
	1.14	1.15	1.17	1.18	1.19	1.19	1.19	1.18	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.09	1.09	1.09	1.10	1.11	1.12
	.86	.84	.83	.83	.82	.82	.82	.82	.83	.84	.85	.86	.87	.88	.88	.89	.90	.90	.90	.90	.90	.89	.88	.87
45-55N 07	10.54	11.06	11.59	12.11	12.58	12.99	13.31	13.50	13.55	13.45	13.19	12.79	12.29	11.71	11.11	10.54	10.03	9.62	9.34	9.21	9.22	9.38	9.67	10.06
	1.14	1.15	1.15	1.16	1.17	1.18	1.18	1.18	1.18	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.11	1.12	1.12	1.13
	.88	.87	.87	.86	.86	.85	.84	.84	.84	.84	.84	.84	.84	.85	.85	.86	.87	.87	.88	.88	.88	.88	.88	.88
35-45N 07	9.59	10.09	10.62	11.18	11.72	12.19	12.52	12.68	12.63	12.37	11.93	11.34	10.67	9.99	9.36	8.83	8.43	8.18	8.08	8.11	8.26	8.48	8.79	9.16
	1.12	1.13	1.14	1.15	1.15	1.15	1.15	1.15	1.14	1.13	1.13	1.12	1.11	1.11	1.11	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.11	1.11
	.88	.88	.88	.87	.86	.85	.84	.83	.82	.82	.83	.84	.85	.86	.87	.88	.89	.89	.89	.89	.89	.89	.88	.88
25-35N																								
15-25N 07	12.57	12.84	13.18	13.50	13.72	13.75	13.53	13.06	12.38	11.60	10.83	10.18	9.75	9.59	9.70	10.04	10.51	11.03	11.51	11.88	12.11	12.24	12.31	12.40
	1.17	1.17	1.17	1.18	1.18	1.18	1.18	1.16	1.15	1.13	1.12	1.10	1.10	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.16	1.16	1.16
	.85	.85	.85	.84	.84	.84	.85	.85	.86	.87	.88	.89	.89	.89	.89	.88	.88	.87	.87	.86	.86	.86	.86	.86
5-15N																								
5N-5S 01	13.44	15.18	16.66	17.60	17.79	17.16	15.81	13.98	11.98	10.13	8.67	7.74	7.33	7.33	7.55	7.85	8.07	8.20	8.25	8.36	8.65	9.27	10.30	11.73
	1.17	1.19	1.20	1.21	1.21	1.21	1.19	1.17	1.15	1.13	1.11	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.11	1.11	1.13	1.14
	.83	.80	.79	.78	.78	.79	.81	.84	.87	.89	.91	.92	.92	.91	.91	.90	.90	.90	.90	.89	.89	.88	.87	.85
5-15S 01	14.15	15.79	17.07	17.74	17.67	16.86	15.41	13.55	11.57	9.73	8.26	7.26	6.71	6.54	6.59	6.76	6.94	7.13	7.37	7.76	8.41	9.40	10.75	12.38
	1.17	1.19	1.22	1.24	1.24	1.24	1.22	1.19	1.16	1.12	1.10	1.08	1.07	1.06	1.07	1.07	1.08	1.08	1.08	1.09	1.09	1.10	1.12	1.14
	.81	.80	.79	.79	.80	.82	.84	.87	.89	.90	.91	.91	.92	.92	.92	.92	.93	.93	.92	.92	.90	.88	.86	.84
15-25S 01	11.24	11.85	12.47	12.95	13.13	12.92	12.31	11.39	10.32	9.28	8.47	8.02	7.98	8.31	8.89	9.56	10.17	10.60	10.79	10.78	10.65	10.54	10.55	10.78
	1.14	1.14	1.15	1.16	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.10	1.11	1.11	1.12	1.13	1.14	1.14	1.14	1.14	1.13	1.13	1.13
	.87	.86	.86	.85	.85	.85	.85	.86	.87	.88	.89	.89	.89	.89	.88	.88	.87	.87	.87	.87	.87	.87	.87	.87
25-35S 01	10.16	10.75	11.37	11.93	12.30	12.43	12.29	11.89	11.31	10.65	10.02	9.51	9.17	9.03	9.05	9.17	9.31	9.41	9.43	9.39	9.32	9.30	9.41	9.70
	1.12	1.13	1.14	1.15	1.16	1.16	1.16	1.15	1.13	1.12	1.10	1.09	1.08	1.08	1.08	1.08	1.09	1.10	1.10	1.10	1.10	1.11	1.11	1.11
	.87	.87	.86	.86	.85	.85	.85	.85	.85	.86	.86	.87	.87	.87	.87	.87	.87	.86	.86	.87	.87	.87	.87	.87
35-45S 01	9.06	9.55	10.15	10.82	11.49	12.09	12.59	12.91	13.03	12.93	12.67	12.25	11.73	11.17	10.61	10.08	9.60	9.20	8.87	8.60	8.44	8.39	8.47	8.69
	1.12	1.13	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.15	1.14	1.13	1.13	1.12	1.12	1.12	1.12	1.11	1.11	1.11	1.11	1.11	1.11	1.11
	.89	.88	.88	.87	.86	.85	.84	.83	.82	.82	.82	.82	.83	.84	.85	.86	.87	.88	.88	.89	.89	.89	.89	.89
45-55S 01	10.35	10.71	11.15	11.61	12.05	12.42	12.69	12.85	12.88	12.78	12.60	12.33	12.01	11.67	11.32	10.98	10.66	10.37	10.14	9.96	9.86	9.83	9.90	10.07
	1.12	1.13	1.13	1.14	1.15	1.16	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.14	1.13	1.13	1.13	1.12	1.12	1.12	1.11	1.11	1.11	1.11
	.86	.85	.85	.85	.84	.84	.84	.84	.83	.83	.83	.83	.84	.84	.85	.86	.86	.86	.87	.87	.87	.87	.86	.86
55-65S 01	11.15	12.06	12.81	13.32	13.56	13.55	13.35	13.04	12.69	12.35	12.04	11.73	11.39	11.00	10.52	9.98	9.40	8.86	8.45	8.25	8.32	8.69	9.34	10.19
	1.12	1.13	1.14	1.14	1.15	1.15	1.16	1.16	1.16	1.16	1.16	1.15	1.15	1.14	1.13	1.13	1.12	1.11	1.11	1.10	1.10	1.10	1.11	1.11
	.84	.83	.82	.81	.81	.81	.82	.83	.84	.84	.85	.86	.86	.87	.87	.88	.88	.89	.89	.89	.89	.88	.87	.85

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 08	12.80	13.27	13.55	13.65	13.61	13.50	13.38	13.30	13.25	13.21	13.12	12.92	12.59	12.11	11.53	10.91	10.36	9.95	9.77	9.87	10.22	10.78	11.47	12.18
	1.14	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.15	1.14	1.13	1.11	1.10	1.10	1.09	1.10	1.10	1.11	1.12
	.83	.82	.82	.82	.83	.83	.83	.83	.84	.83	.83	.83	.84	.84	.85	.85	.86	.86	.86	.86	.85	.85	.84	.83
45-55N 08	11.54	11.84	12.18	12.60	13.11	13.69	14.32	14.91	15.39	15.67	15.68	15.40	14.86	14.11	13.26	12.42	11.67	11.09	10.72	10.56	10.58	10.74	10.97	11.25
	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.21	1.21	1.21	1.21	1.20	1.18	1.17	1.16	1.14	1.13	1.13	1.12	1.12	1.12	1.13	1.13
	.85	.85	.84	.84	.83	.82	.82	.81	.81	.81	.81	.81	.81	.82	.83	.83	.84	.85	.85	.86	.85	.86	.86	.85
35-45N 08	8.79	9.05	9.37	9.73	10.13	10.51	10.84	11.07	11.16	11.09	10.87	10.53	10.10	9.64	9.20	8.82	8.52	8.31	8.20	8.17	8.20	8.28	8.41	8.58
	1.11	1.12	1.12	1.12	1.13	1.13	1.13	1.12	1.12	1.12	1.11	1.11	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
	.89	.89	.89	.89	.88	.87	.86	.85	.84	.84	.84	.84	.85	.86	.87	.88	.89	.89	.89	.89	.89	.89	.89	.89
25-35N																								
15-25N 08	20.77	20.54	19.97	19.13	18.09	16.91	15.67	14.45	13.31	12.33	11.55	11.00	10.71	10.71	11.01	11.61	12.53	13.71	15.08	16.54	17.94	19.16	20.08	20.62
	1.29	1.28	1.27	1.25	1.24	1.22	1.20	1.19	1.17	1.16	1.14	1.13	1.13	1.13	1.14	1.15	1.17	1.20	1.22	1.25	1.27	1.29	1.30	1.30
	.80	.80	.80	.80	.80	.80	.81	.82	.83	.84	.85	.86	.87	.87	.86	.86	.85	.84	.83	.82	.82	.81	.81	.81
5-15N																								
5N-5S 02	13.68	15.41	16.96	18.06	18.51	18.22	17.25	15.80	14.12	12.49	11.13	10.16	9.57	9.29	9.19	9.14	9.07	8.96	8.86	8.87	9.11	9.68	10.66	12.02
	1.18	1.21	1.23	1.24	1.25	1.24	1.22	1.20	1.17	1.15	1.13	1.12	1.11	1.11	1.12	1.12	1.12	1.13	1.12	1.12	1.12	1.13	1.14	1.16
	.84	.82	.81	.80	.79	.80	.80	.82	.83	.85	.86	.88	.89	.89	.90	.90	.90	.90	.90	.90	.89	.88	.87	.86
5-15S 02	18.92	19.33	19.34	18.98	18.31	17.39	16.26	15.00	13.66	12.33	11.07	9.94	9.00	8.30	7.90	7.86	8.23	9.03	10.26	11.80	13.53	15.27	16.83	18.07
	1.22	1.23	1.23	1.23	1.23	1.22	1.21	1.19	1.18	1.16	1.14	1.12	1.11	1.10	1.10	1.10	1.11	1.12	1.13	1.15	1.17	1.18	1.20	1.21
	.75	.75	.75	.76	.78	.79	.81	.83	.85	.86	.87	.88	.89	.90	.91	.91	.91	.90	.89	.87	.84	.81	.78	.76
15-25S 02	11.03	10.98	11.10	11.29	11.41	11.34	10.99	10.36	9.53	8.64	7.87	7.39	7.32	7.68	8.44	9.44	10.52	11.47	12.14	12.45	12.41	12.11	11.68	11.28
	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.12	1.12	1.11	1.10	1.09	1.08	1.08	1.09	1.10	1.11	1.13	1.14	1.14	1.15	1.15	1.14	1.14
	.87	.87	.87	.86	.85	.85	.86	.87	.88	.89	.90	.90	.90	.89	.88	.87	.85	.84	.84	.84	.85	.86	.87	.87
25-35S 02	11.67	11.92	12.10	12.21	12.22	12.12	11.92	11.64	11.29	10.91	10.55	10.23	9.99	9.84	9.78	9.81	9.89	10.01	10.17	10.36	10.58	10.83	11.10	11.39
	1.13	1.13	1.14	1.14	1.14	1.14	1.14	1.13	1.12	1.11	1.10	1.09	1.09	1.09	1.08	1.08	1.09	1.09	1.09	1.09	1.10	1.10	1.11	1.12
	.84	.84	.84	.84	.84	.84	.84	.84	.84	.84	.85	.86	.87	.88	.88	.88	.88	.88	.87	.86	.86	.85	.85	.84
35-45S 02	9.41	9.62	10.01	10.56	11.24	11.98	12.68	13.26	13.61	13.72	13.56	13.19	12.66	12.07	11.51	11.00	10.60	10.28	10.05	9.85	9.67	9.51	9.39	9.35
	1.11	1.12	1.12	1.13	1.13	1.13	1.14	1.14	1.14	1.13	1.13	1.12	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.10	1.10	1.10
	.88	.88	.88	.87	.86	.84	.83	.81	.80	.79	.79	.79	.80	.81	.82	.84	.85	.86	.87	.87	.87	.88	.88	.88
45-55S 02	11.14	11.39	11.78	12.28	12.86	13.49	14.10	14.65	15.10	15.41	15.56	15.53	15.36	15.05	14.64	14.16	13.64	13.10	12.58	12.08	11.65	11.32	11.11	11.05
	1.13	1.13	1.15	1.15	1.16	1.17	1.18	1.18	1.19	1.19	1.18	1.18	1.17	1.16	1.15	1.14	1.14	1.13	1.13	1.13	1.12	1.12	1.13	1.13
	.85	.85	.85	.84	.84	.83	.82	.80	.80	.79	.79	.79	.79	.79	.80	.80	.80	.82	.82	.83	.84	.84	.85	.85
55-65S 02	11.96	12.74	13.53	14.28	14.92	15.43	15.79	16.03	16.13	16.12	15.99	15.73	15.35	14.83	14.20	13.47	12.71	11.96	11.30	10.81	10.54	10.53	10.78	11.28
	1.13	1.14	1.16	1.17	1.18	1.19	1.19	1.19	1.19	1.19	1.18	1.18	1.17	1.16	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.12
	.84	.83	.82	.81	.80	.79	.79	.78	.78	.78	.79	.79	.80	.80	.81	.82	.82	.83	.84	.84	.85	.85	.85	.85

	MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	09	13.69	14.11	14.42	14.61	14.72	14.77	14.79	14.76	14.68	14.53	14.27	13.88	13.37	12.78	12.15	11.57	11.12	10.84	10.80	10.99	11.38	11.93	12.53	13.14
		1.16	1.17	1.18	1.19	1.19	1.20	1.20	1.20	1.20	1.19	1.19	1.18	1.17	1.16	1.15	1.14	1.13	1.13	1.13	1.12	1.13	1.13	1.14	1.15
		.83	.82	.82	.83	.83	.83	.83	.83	.82	.82	.82	.83	.83	.84	.85	.85	.87	.87	.87	.86	.86	.85	.84	.83
45-55N	09	10.95	11.14	11.44	11.87	12.42	13.04	13.67	14.25	14.68	14.92	14.95	14.75	14.36	13.85	13.28	12.71	12.20	11.77	11.44	11.19	11.02	10.91	10.85	10.86
		1.12	1.13	1.14	1.14	1.15	1.16	1.16	1.16	1.17	1.17	1.17	1.16	1.16	1.15	1.14	1.14	1.13	1.13	1.12	1.12	1.12	1.12	1.12	1.12
		.86	.86	.86	.85	.84	.83	.82	.81	.81	.80	.80	.80	.80	.81	.82	.83	.83	.84	.85	.85	.86	.86	.86	.86
35-45N	09	8.56	8.45	8.39	8.43	8.56	8.72	8.86	8.90	8.79	8.51	8.08	7.57	7.07	6.67	6.45	6.45	6.68	7.07	7.55	8.02	8.40	8.64	8.72	8.68
		1.11	1.11	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.09	1.08	1.08	1.08	1.08	1.08	1.09	1.10	1.10	1.11	1.12	1.11	1.11
		.90	.90	.90	.90	.89	.89	.88	.88	.88	.88	.89	.90	.91	.91	.91	.92	.91	.91	.90	.90	.90	.90	.90	.90
25-35N																									
15-25N	09	26.26	26.60	26.17	25.00	23.21	20.93	18.39	15.79	13.35	11.23	9.54	8.34	7.65	7.46	7.77	8.59	9.90	11.68	13.86	16.31	18.87	21.33	23.51	25.20
		1.40	1.41	1.40	1.38	1.35	1.31	1.27	1.23	1.19	1.15	1.12	1.10	1.09	1.09	1.10	1.12	1.15	1.18	1.22	1.26	1.30	1.33	1.37	1.39
		.78	.77	.78	.78	.80	.81	.83	.85	.87	.89	.90	.90	.91	.91	.90	.89	.88	.87	.86	.84	.82	.81	.79	.78
5-15N																									
5N-5S	03	14.22	15.34	16.35	17.03	17.23	16.86	15.96	14.68	13.23	11.85	10.72	9.97	9.60	9.56	9.75	10.05	10.36	10.63	10.84	11.05	11.31	11.70	12.31	13.16
		1.19	1.21	1.22	1.22	1.23	1.22	1.21	1.19	1.18	1.17	1.16	1.15	1.15	1.15	1.15	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.18
		.84	.83	.82	.81	.81	.82	.83	.84	.86	.87	.89	.90	.91	.91	.92	.92	.91	.91	.90	.89	.89	.88	.86	.85
5-15S	03	0.00	0.00	0.00	0.00	0.00	11.20	16.70	13.70	8.10	9.00	7.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	1.08	1.26	1.09	1.14	1.13	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	.85	.79	.77	.91	.92	.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-25S	03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-35S	03	6.52	7.32	8.19	8.98	9.56	9.81	9.65	9.09	8.22	7.16	6.08	5.14	4.46	4.09	4.01	4.14	4.38	4.63	4.83	4.95	5.04	5.17	5.43	5.87
		1.08	1.09	1.10	1.11	1.13	1.13	1.14	1.13	1.12	1.10	1.09	1.07	1.06	1.05	1.05	1.05	1.06	1.06	1.07	1.07	1.07	1.07	1.07	1.07
		.92	.91	.90	.89	.89	.89	.90	.91	.92	.93	.94	.94	.95	.95	.95	.94	.94	.94	.94	.94	.94	.94	.93	.93
35-45S	03	7.18	7.61	8.02	8.38	8.65	8.79	8.77	8.56	8.17	7.63	7.00	6.35	5.74	5.23	4.87	4.67	4.64	4.73	4.95	5.23	5.56	5.93	6.32	6.75
		1.09	1.10	1.10	1.11	1.11	1.11	1.11	1.11	1.11	1.10	1.10	1.09	1.09	1.08	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.08	1.08	1.09
		.92	.91	.90	.89	.89	.88	.89	.89	.90	.91	.93	.94	.95	.95	.95	.95	.95	.94	.94	.94	.94	.93	.92	.92
45-55S	03	6.41	6.42	6.61	5.81	7.60	8.30	9.00	9.58	9.94	10.00	9.78	9.32	8.73	8.12	7.60	7.23	7.02	6.96	6.97	6.98	6.95	6.85	6.70	6.52
		1.08	1.08	1.08	1.07	1.08	1.09	1.10	1.10	1.10	1.11	1.10	1.10	1.09	1.08	1.07	1.07	1.07	1.07	1.07	1.07	1.08	1.08	1.08	1.08
		.92	.92	.91	.92	.89	.88	.87	.86	.85	.85	.85	.86	.86	.87	.88	.89	.90	.90	.91	.91	.91	.92	.92	.92
55-65S	03	6.93	7.09	7.48	8.13	9.03	10.13	11.33	12.52	13.55	14.31	14.72	14.76	14.45	13.84	13.03	12.11	11.16	10.25	9.41	8.68	8.06	7.57	7.20	6.98
		1.07	1.07	1.08	1.09	1.10	1.11	1.13	1.14	1.15	1.16	1.16	1.16	1.16	1.15	1.14	1.12	1.11	1.10	1.09	1.08	1.08	1.07	1.07	1.07
		.91	.91	.91	.90	.89	.88	.86	.85	.83	.82	.80	.80	.79	.79	.80	.80	.82	.83	.84	.86	.87	.89	.90	.91

MONTH		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	10	16.36	16.71	16.87	16.87	16.76	16.57	16.33	16.09	15.82	15.53	15.17	14.73	14.23	13.70	13.18	12.76	12.51	12.49	12.70	13.14	13.76	14.47	15.19	15.84
		1.18	1.19	1.20	1.20	1.20	1.20	1.19	1.19	1.18	1.17	1.17	1.16	1.15	1.14	1.14	1.14	1.14	1.14	1.15	1.15	1.16	1.16	1.17	1.18
		.78	.77	.78	.78	.78	.78	.78	.78	.77	.77	.78	.78	.79	.80	.81	.82	.83	.84	.83	.83	.82	.81	.79	.79
45-55N	10	12.60	12.91	13.18	13.40	13.57	13.70	13.75	13.70	13.55	13.26	12.85	12.34	11.77	11.21	10.71	10.33	10.13	10.10	10.26	10.55	10.94	11.38	11.82	12.23
		1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.15	1.14	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.11	1.11	1.12	1.13	1.14	1.14	1.15	1.15
		.84	.84	.84	.83	.82	.82	.82	.81	.81	.81	.81	.82	.82	.84	.85	.85	.86	.87	.86	.86	.86	.86	.86	.85
35-45N	10	11.24	11.26	11.19	11.05	10.84	10.57	10.20	9.73	9.15	8.49	7.79	7.11	6.54	6.15	6.00	6.13	6.52	7.15	7.92	8.75	9.55	10.24	10.76	11.08
		1.15	1.15	1.15	1.15	1.14	1.14	1.13	1.12	1.11	1.10	1.09	1.08	1.08	1.08	1.07	1.08	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15
		.88	.87	.87	.87	.87	.87	.87	.87	.88	.88	.89	.90	.91	.92	.92	.92	.91	.91	.90	.89	.88	.87	.87	.87
25-35N																									
15-25N	10	25.46	27.25	28.18	27.98	26.60	24.15	20.94	17.41	14.01	11.14	9.04	7.80	7.35	7.53	8.14	9.00	10.03	11.19	12.51	14.07	15.94	18.13	20.58	23.10
		1.37	1.40	1.41	1.41	1.39	1.35	1.30	1.25	1.19	1.15	1.11	1.09	1.08	1.09	1.10	1.11	1.13	1.15	1.17	1.19	1.22	1.26	1.30	1.33
		.74	.74	.74	.76	.78	.81	.83	.86	.88	.89	.90	.91	.91	.91	.90	.90	.89	.88	.86	.84	.82	.80	.77	.75
5-15N																									
5N-5S	04	13.89	15.51	16.85	17.58	17.53	16.66	15.15	13.31	11.50	10.05	9.18	8.92	9.18	9.73	10.32	10.76	10.91	10.78	10.46	10.14	10.02	10.29	11.06	12.30
		1.21	1.23	1.24	1.25	1.25	1.23	1.21	1.18	1.16	1.14	1.13	1.13	1.14	1.15	1.16	1.17	1.18	1.18	1.17	1.17	1.16	1.17	1.18	1.19
		.86	.84	.82	.81	.81	.81	.83	.85	.87	.89	.90	.91	.91	.91	.90	.90	.90	.90	.90	.91	.91	.90	.89	.88
5-15S	04	0.00	0.00	0.00	15.20	20.00	21.90	21.10	10.25	8.70	10.20	5.50	5.70	6.20	4.80	0.00	3.00	4.70	2.40	3.80	3.50	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	1.16	1.18	1.16	1.31	1.16	1.13	1.07	1.07	1.09	1.10	1.07	0.00	1.04	1.06	1.02	1.02	1.03	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	.81	.76	.71	.77	.95	.86	.83	.95	.94	.91	.92	0.00	.97	.95	.96	.93	.93	0.00	0.00	0.00	0.00
15-25S	04	23.14	22.67	21.98	21.03	19.81	18.34	16.70	15.02	13.45	12.17	11.31	10.98	11.23	12.02	13.30	14.92	16.72	18.52	20.16	21.52	22.51	23.12	23.40	23.39
		1.34	1.34	1.33	1.32	1.30	1.28	1.25	1.21	1.18	1.15	1.13	1.13	1.14	1.15	1.18	1.22	1.26	1.29	1.32	1.33	1.34	1.35	1.35	1.34
		.78	.77	.78	.78	.79	.80	.81	.82	.83	.84	.84	.84	.84	.84	.84	.84	.84	.84	.83	.82	.81	.80	.79	.78
25-35S	04	13.24	14.63	15.69	16.22	16.10	15.28	13.86	12.02	10.03	8.16	6.64	5.60	5.06	4.96	5.17	5.54	5.96	6.38	6.83	7.37	8.10	9.07	10.29	11.72
		1.17	1.19	1.20	1.21	1.21	1.21	1.19	1.17	1.15	1.12	1.10	1.08	1.07	1.06	1.06	1.07	1.07	1.08	1.09	1.09	1.11	1.12	1.14	1.15
		.83	.81	.81	.81	.82	.83	.85	.88	.90	.92	.93	.94	.94	.94	.94	.93	.93	.92	.92	.91	.90	.88	.87	.85
35-45S	04	10.70	11.30	11.77	12.08	12.12	11.86	11.31	10.48	9.46	8.39	7.38	6.53	5.94	5.61	5.57	5.73	6.08	6.52	7.04	7.60	8.18	8.79	9.42	10.07
		1.14	1.15	1.16	1.17	1.17	1.17	1.17	1.16	1.14	1.13	1.11	1.10	1.09	1.08	1.08	1.08	1.08	1.08	1.09	1.10	1.11	1.12	1.12	1.13
		.86	.85	.85	.86	.86	.87	.88	.88	.90	.91	.92	.93	.94	.94	.94	.93	.93	.92	.91	.90	.89	.88	.88	.87
45-55S	04	11.69	11.91	12.22	12.52	12.72	12.68	12.30	11.53	10.44	9.15	7.86	6.74	5.99	5.69	5.88	6.49	7.40	8.45	9.45	10.29	10.89	11.26	11.44	11.56
		1.18	1.18	1.19	1.19	1.19	1.19	1.17	1.15	1.13	1.11	1.09	1.07	1.05	1.05	1.05	1.06	1.07	1.09	1.11	1.12	1.14	1.15	1.16	1.17
		.87	.87	.87	.87	.87	.87	.88	.88	.89	.90	.91	.93	.93	.94	.93	.92	.91	.89	.88	.88	.87	.87	.87	.87
55-65S	04	11.88	12.63	13.27	13.77	14.07	14.15	14.02	13.69	13.21	12.62	11.96	11.29	10.63	10.02	9.48	9.06	8.76	8.61	8.63	8.83	9.19	9.72	10.37	11.11
		1.16	1.16	1.17	1.17	1.17	1.17	1.16	1.14	1.13	1.11	1.10	1.09	1.08	1.08	1.07	1.08	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15
		.87	.86	.85	.84	.83	.81	.80	.80	.80	.80	.81	.82	.83	.85	.86	.87	.88	.89	.89	.89	.88	.88	.88	.87

MONTH		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	11	24.10	23.59	23.21	22.98	22.78	22.45	21.76	20.58	18.90	16.83	14.61	12.62	11.19	10.60	11.03	12.43	14.59	17.19	19.80	22.06	23.71	24.62	24.86	24.61
		1.31	1.30	1.30	1.30	1.30	1.31	1.30	1.28	1.26	1.22	1.19	1.16	1.13	1.12	1.12	1.14	1.17	1.21	1.25	1.28	1.30	1.31	1.32	1.31
		.70	.72	.73	.75	.76	.76	.77	.78	.79	.81	.82	.84	.85	.85	.85	.83	.81	.78	.74	.72	.70	.69	.69	.69
45-55N	11	17.54	17.06	16.56	16.10	15.65	15.14	14.48	13.59	12.47	11.17	9.83	8.64	7.81	7.49	7.77	8.67	10.09	11.82	13.65	15.33	16.67	17.53	17.92	17.88
		1.22	1.22	1.21	1.20	1.20	1.19	1.18	1.17	1.15	1.13	1.12	1.10	1.09	1.08	1.09	1.10	1.11	1.14	1.16	1.18	1.21	1.22	1.22	1.23
		.78	.79	.79	.80	.80	.81	.82	.83	.84	.86	.88	.89	.90	.90	.89	.88	.87	.84	.82	.80	.78	.77	.77	.77
35-45N	11	17.56	16.76	16.05	15.51	15.11	14.73	14.24	13.53	12.57	11.39	10.15	9.06	8.33	8.16	8.64	9.77	11.41	13.35	15.30	16.98	18.17	18.76	18.76	18.30
		1.24	1.23	1.22	1.21	1.21	1.20	1.19	1.17	1.16	1.14	1.13	1.11	1.10	1.10	1.10	1.12	1.14	1.16	1.19	1.21	1.23	1.24	1.25	1.25
		.79	.80	.81	.82	.82	.83	.83	.83	.84	.86	.87	.88	.89	.89	.88	.87	.85	.83	.80	.79	.77	.77	.77	.78
25-35N																									
15-25N	11	29.84	31.01	31.29	30.48	28.55	25.62	21.97	18.01	14.20	10.96	8.58	7.21	6.84	7.35	8.54	10.20	12.15	14.26	16.47	18.76	21.11	23.49	25.85	28.03
		1.44	1.46	1.47	1.46	1.43	1.39	1.33	1.26	1.20	1.15	1.11	1.09	1.08	1.09	1.10	1.13	1.16	1.19	1.22	1.25	1.29	1.33	1.37	1.41
		.68	.68	.69	.70	.73	.75	.79	.82	.85	.88	.89	.90	.90	.89	.88	.86	.84	.82	.80	.77	.75	.73	.71	.69
5-15N																									
5N-5S	05	11.50	9.80	14.20	13.78	19.85	25.97	8.82	5.35	4.47	4.65	6.60	9.72	11.03	11.63	11.43	11.38	11.77	12.43	12.43	11.78	13.92	14.43	0.00	0.00
		1.16	1.09	1.16	1.17	1.26	1.40	1.14	1.08	1.05	1.05	1.06	1.08	1.13	1.17	1.17	1.15	1.16	1.20	1.21	1.19	1.21	1.23	0.00	0.00
		.86	.86	.82	.80	.80	.71	.92	.95	.95	.94	.91	.84	.85	.87	.89	.87	.85	.86	.90	.91	.87	.86	0.00	0.00
5-15S	05	7.40	9.90	17.30	19.30	16.15	15.05	15.90	9.95	5.65	7.75	6.10	7.80	8.65	7.10	7.70	6.10	5.75	6.40	6.95	0.00	0.00	0.00	5.40	0.00
		1.02	1.15	1.12	1.16	1.20	1.17	1.22	1.15	1.06	1.11	1.06	1.12	1.14	1.09	1.12	1.09	1.07	1.07	1.13	0.00	0.00	0.00	1.07	0.00
		.85	.91	.76	.78	.79	.79	.79	.91	.91	.93	.92	.90	.88	.90	.93	.94	.93	.90	.95	0.00	0.00	0.00	.93	0.00
15-25S	05	13.48	13.42	13.43	13.44	13.41	13.31	13.09	12.77	12.37	11.96	11.62	11.43	11.43	11.66	12.06	12.59	13.14	13.63	13.96	14.12	14.11	13.98	13.78	13.60
		1.19	1.19	1.19	1.19	1.18	1.18	1.17	1.17	1.16	1.15	1.14	1.13	1.13	1.14	1.14	1.15	1.16	1.17	1.17	1.18	1.18	1.18	1.18	1.19
		.84	.84	.84	.84	.84	.84	.84	.84	.84	.84	.84	.84	.84	.84	.84	.84	.84	.83	.83	.83	.83	.83	.83	.83
25-35S	05	16.03	16.45	16.28	15.54	14.32	12.78	11.14	9.60	8.31	7.35	6.74	6.43	6.35	6.44	6.63	6.92	7.33	7.90	8.69	9.73	10.99	12.40	13.83	15.10
		1.20	1.21	1.21	1.21	1.19	1.17	1.15	1.13	1.11	1.09	1.09	1.08	1.08	1.08	1.08	1.09	1.09	1.09	1.10	1.11	1.13	1.15	1.17	1.19
		.79	.80	.81	.83	.85	.87	.88	.90	.91	.91	.92	.92	.92	.92	.92	.91	.91	.90	.88	.86	.84	.82	.81	.79
35-45S	05	12.86	13.17	13.23	13.00	12.52	11.83	11.00	10.11	9.25	8.49	7.88	7.44	7.19	7.10	7.16	7.36	7.69	8.14	8.70	9.35	10.09	10.88	11.65	12.33
		1.16	1.17	1.17	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.09	1.09	1.10	1.10	1.10	1.11	1.12	1.12	1.13	1.14	1.15
		.85	.85	.85	.86	.87	.88	.88	.88	.89	.89	.90	.90	.91	.91	.91	.90	.90	.89	.88	.88	.87	.86	.85	.85
45-55S	05	13.56	13.54	13.24	12.69	11.95	11.08	10.13	9.16	8.20	7.34	6.57	5.98	5.58	5.39	5.46	5.80	6.40	7.26	8.32	9.48	10.67	11.75	12.64	13.26
		1.18	1.19	1.18	1.17	1.16	1.15	1.13	1.12	1.10	1.09	1.08	1.07	1.06	1.06	1.06	1.07	1.08	1.09	1.10	1.12	1.13	1.15	1.17	1.18
		.85	.85	.85	.86	.87	.87	.88	.89	.90	.91	.91	.92	.93	.93	.93	.92	.91	.90	.89	.88	.87	.86	.86	.85
55-65S	05	15.68	16.42	16.85	16.90	16.59	15.92	14.95	13.75	12.41	11.03	9.71	8.54	7.60	6.93	6.58	6.56	6.88	7.51	8.41	9.53	10.80	12.13	13.45	14.66
		1.18	1.19	1.20	1.20	1.20	1.20	1.18	1.16	1.14	1.12	1.10	1.09	1.07	1.07	1.07	1.07	1.08	1.08	1.10	1.11	1.12	1.13	1.15	1.16
		.78	.77	.77	.77	.77	.78	.80	.82	.84	.86	.88	.90	.91	.92	.93	.93	.92	.91	.90	.88	.86	.84	.82	.80

MONTH		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	12	18.58	18.31	18.16	18.06	17.91	17.54	16.85	15.78	14.42	12.90	11.45	10.34	9.75	9.85	10.62	11.97	13.67	15.48	17.10	18.34	19.09	19.36	19.26	18.94
		1.27	1.27	1.25	1.25	1.24	1.23	1.22	1.20	1.18	1.16	1.14	1.13	1.12	1.12	1.13	1.15	1.18	1.21	1.24	1.26	1.28	1.28	1.28	1.28
		.82	.82	.83	.83	.83	.83	.83	.84	.85	.86	.87	.87	.88	.88	.87	.86	.85	.83	.82	.81	.80	.80	.81	.82
45-55N	12	15.81	15.34	14.92	14.58	14.26	13.89	13.38	12.68	11.81	10.82	9.86	9.08	8.64	8.65	9.16	10.13	11.42	12.86	14.26	15.41	16.20	16.57	16.56	16.26
		1.21	1.20	1.19	1.19	1.18	1.17	1.17	1.16	1.15	1.13	1.12	1.11	1.10	1.11	1.12	1.13	1.15	1.17	1.19	1.21	1.22	1.22	1.22	1.22
		.81	.82	.82	.83	.83	.83	.84	.85	.86	.87	.88	.89	.89	.89	.89	.88	.87	.85	.83	.82	.81	.81	.80	.81
35-45N	12	13.65	13.26	13.08	13.09	13.17	13.20	13.03	12.58	11.83	10.86	9.84	8.95	8.40	8.32	8.76	9.68	10.92	12.27	13.52	14.44	14.94	14.99	14.68	14.18
		1.20	1.19	1.18	1.18	1.18	1.18	1.17	1.17	1.16	1.14	1.13	1.12	1.11	1.11	1.11	1.13	1.14	1.16	1.18	1.20	1.21	1.22	1.21	1.20
		.85	.86	.86	.86	.86	.85	.85	.85	.86	.87	.88	.89	.89	.90	.89	.88	.87	.85	.84	.84	.83	.83	.84	.85
25-35N																									
15-25N	12	28.60	29.55	29.84	29.32	27.92	25.69	22.82	19.61	16.42	13.60	11.44	10.10	9.63	9.95	10.91	12.33	14.04	15.91	17.83	19.78	21.72	23.64	25.48	27.18
		1.42	1.43	1.43	1.42	1.39	1.35	1.30	1.25	1.21	1.17	1.14	1.12	1.12	1.13	1.14	1.17	1.19	1.22	1.25	1.28	1.31	1.34	1.37	1.40
		.72	.72	.73	.74	.76	.78	.81	.83	.85	.86	.87	.87	.87	.87	.87	.86	.85	.83	.82	.80	.79	.77	.75	.74	.73
5-15N																									
5N-5S	06	13.82	14.07	14.13	13.91	13.35	12.47	11.39	10.28	9.34	8.73	8.54	8.77	9.32	10.04	10.78	11.43	11.92	12.24	12.45	12.59	12.73	12.91	13.17	13.48
		1.20	1.20	1.19	1.18	1.17	1.16	1.14	1.12	1.11	1.10	1.09	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.20
		.86	.85	.84	.83	.83	.84	.85	.86	.87	.88	.88	.87	.86	.85	.84	.84	.84	.84	.85	.86	.87	.88	.88	.87
5-15S	06	14.17	16.81	19.21	20.91	21.58	21.11	19.61	17.43	15.01	12.79	11.07	10.01	9.56	9.53	9.69	9.81	9.78	9.60	9.37	9.30	9.60	10.43	11.87	13.85
		1.01	1.07	1.14	1.20	1.24	1.26	1.25	1.22	1.19	1.16	1.13	1.11	1.11	1.11	1.11	1.11	1.11	1.10	1.10	1.10	1.11	1.12	1.15	1.17
		.67	.65	.65	.67	.69	.72	.75	.78	.81	.83	.85	.86	.86	.86	.85	.85	.85	.86	.87	.88	.88	.88	.87	.84
15-25S	06	14.84	14.76	14.76	14.80	14.84	14.82	14.68	14.42	14.06	13.66	13.30	13.07	13.04	13.23	13.63	14.16	14.72	15.22	15.57	15.73	15.70	15.53	15.28	15.03
		1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.20	1.20	1.19	1.19	1.18	1.18	1.18	1.19	1.19	1.20	1.20	1.21	1.21	1.21	1.21	1.21	1.21
		.83	.83	.84	.84	.85	.85	.86	.86	.86	.86	.86	.86	.85	.85	.85	.85	.84	.84	.83	.83	.82	.82	.82	.82
25-35S	06	13.72	13.52	13.24	12.90	12.49	12.02	11.47	10.85	10.18	9.52	8.91	8.43	8.15	8.10	8.33	8.82	9.53	10.39	11.30	12.15	12.87	13.39	13.70	13.79
		1.18	1.18	1.18	1.18	1.17	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.11	1.11	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.18	1.18
		.84	.85	.85	.86	.86	.87	.87	.88	.88	.89	.89	.89	.90	.90	.89	.89	.88	.87	.86	.86	.85	.84	.84	.84
35-45S	06	12.69	12.55	12.37	12.18	11.98	11.72	11.41	11.00	10.50	9.94	9.39	8.91	8.56	8.43	8.52	8.86	9.40	10.08	10.82	11.51	12.09	12.50	12.72	12.77
		1.17	1.17	1.16	1.16	1.15	1.15	1.15	1.15	1.13	1.13	1.13	1.12	1.11	1.11	1.12	1.12	1.12	1.14	1.15	1.16	1.17	1.17	1.18	1.17
		.86	.86	.86	.86	.86	.86	.87	.87	.88	.88	.89	.89	.90	.90	.90	.89	.88	.88	.87	.87	.86	.86	.86	.86
45-55S	06	12.85	12.65	12.47	12.30	12.10	11.81	11.39	10.82	10.13	9.39	8.69	8.14	7.83	7.83	8.14	8.74	9.56	10.47	11.36	12.14	12.70	13.01	13.10	13.02
		1.17	1.17	1.17	1.17	1.16	1.15	1.15	1.14	1.14	1.12	1.11	1.11	1.10	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.17	1.17	1.17
		.85	.86	.86	.86	.86	.86	.86	.87	.88	.89	.89	.90	.90	.90	.90	.89	.88	.87	.86	.86	.85	.85	.85	.85
55-65S	06	19.71	19.93	19.60	18.78	17.58	16.13	14.59	13.11	11.79	10.70	9.85	9.25	8.87	8.70	8.74	9.02	9.59	10.45	11.63	13.06	14.66	16.28	17.77	18.96
		1.31	1.31	1.30	1.28	1.25	1.22	1.19	1.17	1.15	1.13	1.12	1.11	1.10	1.10	1.10	1.11	1.11	1.13	1.15	1.18	1.21	1.24	1.27	1.30
		.82	.82	.81	.81	.81	.82	.83	.84	.86	.87	.88	.89	.89	.89	.89	.89	.88	.88	.87	.86	.85	.85	.84	.83

********** ACTIVE MAGNETIC - LOW SOLAR **********

	MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	03	20.84	20.28	19.61	18.99	18.50	18.14	17.86	17.54	17.09	16.43	15.55	14.53	13.49	12.64	12.16	12.22	12.87	14.07	15.66	17.39	18.99	20.23	20.95	21.13
		1.28	1.26	1.25	1.24	1.23	1.23	1.23	1.23	1.22	1.22	1.20	1.19	1.18	1.16	1.16	1.15	1.17	1.18	1.21	1.23	1.26	1.27	1.28	1.29
		.75	.75	.76	.77	.77	.78	.79	.79	.80	.81	.82	.83	.84	.85	.85	.85	.84	.83	.82	.80	.78	.76	.75	.75
45-55N	03	17.69	17.66	17.57	17.44	17.24	16.97	16.58	16.10	15.53	14.92	14.30	13.75	13.32	13.06	13.03	13.26	13.73	14.38	15.15	15.91	16.60	17.13	17.47	17.65
		1.21	1.20	1.20	1.20	1.20	1.20	1.21	1.21	1.20	1.19	1.18	1.17	1.16	1.16	1.16	1.17	1.18	1.19	1.20	1.21	1.22	1.22	1.22	1.22
		.79	.79	.79	.79	.79	.80	.80	.81	.81	.82	.82	.83	.83	.83	.84	.84	.84	.84	.83	.83	.82	.81	.80	.79
35-45N	03	12.58	12.03	11.76	11.82	12.15	12.63	13.11	13.44	13.53	13.34	12.93	12.41	11.91	11.57	11.51	11.76	12.30	13.01	13.73	14.28	14.53	14.41	13.95	13.28
		1.17	1.16	1.16	1.16	1.16	1.17	1.18	1.19	1.19	1.19	1.18	1.17	1.17	1.16	1.15	1.16	1.16	1.17	1.18	1.19	1.20	1.20	1.19	1.18
		.87	.87	.87	.87	.86	.85	.85	.85	.85	.86	.87	.88	.89	.89	.89	.88	.88	.87	.86	.85	.85	.85	.85	.86
25-35N																									
15-25N	03	23.10	22.83	22.35	21.55	20.35	18.79	16.99	15.17	13.57	12.44	11.94	12.15	13.03	14.44	16.20	18.07	19.84	21.33	22.42	23.10	23.42	23.48	23.41	23.27
		1.32	1.32	1.31	1.30	1.29	1.26	1.24	1.21	1.18	1.16	1.14	1.15	1.16	1.19	1.22	1.25	1.29	1.32	1.34	1.34	1.35	1.34	1.34	1.33
		.78	.78	.78	.79	.80	.81	.83	.84	.85	.85	.85	.85	.84	.82	.81	.80	.79	.79	.79	.78	.78	.78	.78	.78
5-15N																									
5N-5S	09	19.56	22.29	24.29	25.12	24.57	22.73	19.97	16.83	13.88	11.59	10.23	9.80	10.09	10.75	11.41	11.79	11.79	11.45	11.00	10.76	11.06	12.12	14.02	16.61
		1.25	1.30	1.33	1.34	1.34	1.31	1.28	1.23	1.19	1.16	1.14	1.14	1.14	1.15	1.16	1.16	1.16	1.15	1.14	1.13	1.13	1.15	1.17	1.21
		.77	.74	.72	.72	.73	.75	.78	.82	.86	.88	.90	.90	.90	.89	.88	.87	.86	.86	.86	.86	.85	.84	.82	.79
5-15S	09	35.87	37.65	37.96	36.55	33.48	29.12	24.07	19.04	14.71	11.58	9.87	9.52	10.26	11.69	13.39	15.07	16.61	18.05	19.56	21.38	23.69	26.53	29.76	33.04
		1.52	1.55	1.55	1.53	1.49	1.42	1.34	1.26	1.19	1.13	1.10	1.09	1.09	1.12	1.15	1.18	1.22	1.25	1.28	1.32	1.35	1.40	1.44	1.49
		.65	.66	.67	.70	.74	.78	.82	.85	.87	.87	.87	.86	.85	.84	.82	.81	.80	.79	.78	.76	.73	.71	.68	.66
15-25S	09	28.97	29.05	28.50	27.43	26.05	24.64	23.45	22.66	22.33	22.37	22.61	22.86	22.95	22.79	22.41	21.96	21.62	21.58	21.97	22.84	24.10	25.59	27.06	28.27
		1.39	1.41	1.42	1.41	1.38	1.35	1.33	1.31	1.30	1.31	1.32	1.34	1.36	1.37	1.36	1.35	1.32	1.30	1.28	1.27	1.27	1.29	1.33	1.36
		.76	.76	.77	.78	.79	.80	.80	.81	.81	.81	.80	.80	.80	.80	.80	.80	.81	.80	.80	.79	.78	.77	.77	.76
25-35S	09	17.63	17.08	16.37	15.59	14.86	14.24	13.80	13.56	13.49	13.55	13.68	13.83	13.97	14.09	14.24	14.46	14.80	15.28	15.88	16.55	17.18	17.68	17.95	17.93
		1.25	1.25	1.24	1.22	1.21	1.20	1.19	1.19	1.18	1.19	1.19	1.19	1.20	1.20	1.20	1.20	1.21	1.21	1.22	1.23	1.24	1.25	1.25	1.26
		.81	.81	.82	.82	.83	.84	.84	.85	.85	.86	.86	.87	.87	.87	.87	.87	.87	.86	.85	.84	.83	.82	.81	.81
35-45S	09	14.85	14.75	14.68	14.65	14.63	14.58	14.44	14.19	13.82	13.34	12.81	12.28	11.85	11.57	11.51	11.68	12.10	12.67	13.33	13.95	14.46	14.80	14.94	14.93
		1.20	1.19	1.18	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.15	1.16	1.16	1.18	1.18	1.20	1.21	1.21	1.22	1.21
		.85	.84	.83	.82	.82	.82	.83	.84	.85	.86	.87	.88	.88	.88	.88	.88	.88	.87	.87	.87	.87	.86	.86	.85
45-55S	09	18.76	19.36	19.55	19.28	18.61	17.65	16.58	15.54	14.67	14.04	13.65	13.44	13.35	13.28	13.20	13.11	13.07	13.12	13.36	13.86	14.61	15.60	16.72	17.82
		1.21	1.22	1.22	1.23	1.23	1.23	1.22	1.21	1.20	1.19	1.18	1.17	1.16	1.16	1.16	1.16	1.17	1.17	1.18	1.18	1.19	1.19	1.19	1.20
		.80	.79	.79	.78	.79	.79	.80	.81	.82	.82	.83	.83	.84	.84	.85	.85	.85	.85	.85	.85	.85	.84	.83	.81
55-65S	09	20.60	20.61	20.10	19.16	17.96	16.66	15.44	14.41	13.63	13.09	12.74	12.49	12.27	12.08	11.94	11.93	12.16	12.71	13.61	14.82	16.25	17.72	19.05	20.05
		1.28	1.29	1.28	1.27	1.26	1.24	1.21	1.20	1.18	1.17	1.17	1.17	1.16	1.16	1.16	1.15	1.16	1.16	1.17	1.18	1.20	1.23	1.25	1.27
		.81	.82	.84	.85	.86	.87	.87	.87	.86	.85	.85	.85	.85	.85	.86	.86	.86	.85	.84	.83	.81	.80	.80	.80

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 04	20.43	20.66	20.25	19.36	18.22	17.08	16.14	15.53	15.24	15.19	15.20	15.10	14.76	14.16	13.38	12.60	12.02	11.86	12.26	13.24	14.70	16.43	18.14	19.55
	1.27	1.28	1.28	1.27	1.25	1.23	1.21	1.20	1.19	1.18	1.17	1.17	1.17	1.15	1.15	1.14	1.13	1.14	1.14	1.16	1.18	1.21	1.23	1.26
	.76	.76	.76	.77	.78	.79	.80	.80	.80	.79	.79	.78	.79	.80	.81	.82	.83	.83	.83	.82	.81	.79	.78	.76
45-55N 04	18.39	18.85	19.04	18.94	18.58	18.05	17.48	16.97	16.61	16.43	16.39	16.44	16.48	16.44	16.28	16.00	15.69	15.42	15.29	15.38	15.71	16.26	16.97	17.72
	1.21	1.21	1.22	1.22	1.22	1.23	1.23	1.23	1.23	1.24	1.23	1.23	1.23	1.22	1.21	1.20	1.19	1.19	1.18	1.18	1.19	1.20	1.20	1.21
	.75	.75	.75	.77	.78	.79	.80	.81	.82	.81	.81	.80	.80	.79	.80	.80	.80	.80	.80	.79	.78	.77	.76	.75
35-45N 04	14.72	14.60	14.43	14.23	13.99	13.70	13.34	12.92	12.49	12.06	11.71	11.46	11.35	11.39	11.59	11.92	12.36	12.86	13.39	13.88	14.29	14.59	14.75	14.78
	1.19	1.19	1.18	1.18	1.17	1.17	1.16	1.15	1.14	1.14	1.14	1.14	1.14	1.14	1.15	1.16	1.16	1.17	1.18	1.18	1.19	1.19	1.20	1.20
	.83	.83	.83	.83	.82	.82	.82	.82	.83	.84	.85	.85	.86	.86	.87	.86	.85	.85	.84	.83	.83	.83	.83	.83
25-35N																								
15-25N 04	29.02	28.36	27.30	25.88	24.17	22.29	20.38	18.59	17.09	16.01	15.42	15.36	15.78	16.63	17.85	19.33	20.99	22.74	24.46	26.05	27.40	28.42	29.05	29.25
	1.40	1.40	1.39	1.37	1.35	1.32	1.28	1.25	1.22	1.19	1.18	1.17	1.17	1.18	1.21	1.23	1.26	1.29	1.32	1.35	1.37	1.38	1.40	1.40
	.75	.76	.77	.78	.78	.79	.79	.79	.79	.79	.79	.79	.78	.77	.76	.75	.74	.73	.72	.72	.72	.72	.73	.74
5-15N																								
5N-5S 10	22.00	25.47	28.15	29.52	29.28	27.42	24.28	20.45	16.61	13.36	11.12	10.00	9.84	10.28	10.90	11.34	11.44	11.23	10.92	10.86	11.41	12.83	15.20	18.38
	1.33	1.40	1.46	1.48	1.48	1.45	1.39	1.33	1.26	1.20	1.17	1.15	1.15	1.15	1.16	1.16	1.16	1.14	1.13	1.12	1.13	1.15	1.20	1.26
	.77	.76	.76	.77	.79	.81	.84	.86	.88	.90	.90	.90	.90	.90	.90	.89	.89	.88	.87	.86	.84	.82	.80	.78
5-15S 10	29.47	31.20	32.16	32.12	30.97	28.77	25.72	22.17	18.53	15.21	12.54	10.72	9.81	9.72	10.32	11.39	12.79	14.38	16.13	18.04	20.13	22.41	24.82	27.24
	1.44	1.48	1.51	1.52	1.50	1.46	1.40	1.33	1.26	1.19	1.14	1.11	1.10	1.10	1.12	1.14	1.16	1.19	1.21	1.23	1.26	1.30	1.34	1.39
	.70	.70	.71	.72	.74	.75	.77	.79	.81	.83	.85	.87	.88	.88	.87	.86	.85	.82	.80	.78	.75	.73	.72	.71
15-25S 10	16.55	16.72	17.01	17.31	17.48	17.39	16.98	16.28	15.38	14.43	13.60	13.05	12.88	13.13	13.75	14.60	15.51	16.32	16.90	17.18	17.18	16.98	16.73	16.56
	1.24	1.23	1.22	1.22	1.22	1.23	1.23	1.23	1.22	1.20	1.18	1.17	1.15	1.15	1.15	1.17	1.19	1.22	1.24	1.26	1.27	1.27	1.26	1.25
	.83	.82	.81	.79	.79	.79	.79	.80	.81	.82	.83	.83	.83	.82	.81	.81	.81	.81	.82	.82	.83	.84	.84	.84
25-35S 10	17.48	18.32	18.85	18.99	18.73	18.16	17.43	16.72	16.18	15.87	15.80	15.91	16.07	16.18	16.13	15.91	15.53	15.07	14.67	14.44	14.50	14.89	15.59	16.50
	1.24	1.25	1.26	1.27	1.27	1.26	1.25	1.23	1.22	1.20	1.19	1.19	1.19	1.19	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.21	1.22
	.80	.79	.79	.79	.79	.80	.80	.81	.81	.81	.80	.80	.80	.80	.80	.81	.81	.82	.83	.83	.83	.83	.82	.81
35-45S 10	15.39	16.03	16.75	17.41	17.88	18.08	17.94	17.51	16.85	16.10	15.38	14.80	14.44	14.30	14.35	14.51	14.71	14.83	14.86	14.80	14.68	14.61	14.67	14.92
	1.18	1.18	1.19	1.20	1.21	1.22	1.23	1.23	1.22	1.21	1.20	1.19	1.19	1.18	1.19	1.19	1.19	1.20	1.20	1.20	1.20	1.19	1.19	1.18
	.80	.79	.78	.77	.77	.77	.77	.78	.79	.80	.81	.82	.83	.84	.84	.84	.84	.84	.83	.83	.82	.82	.81	.81
45-55S 10	16.65	17.10	17.38	17.48	17.42	17.28	17.14	17.07	17.13	17.30	17.53	17.74	17.85	17.79	17.53	17.07	16.50	15.92	15.42	15.11	15.04	15.23	15.61	16.13
	1.21	1.22	1.23	1.23	1.24	1.24	1.25	1.25	1.25	1.25	1.25	1.26	1.26	1.26	1.25	1.25	1.24	1.24	1.23	1.22	1.21	1.21	1.21	1.21
	.78	.78	.77	.78	.79	.80	.81	.82	.82	.81	.81	.80	.80	.81	.82	.83	.84	.84	.85	.85	.84	.83	.82	.80
55-65S 10	19.36	19.37	18.84	17.91	16.81	15.79	15.08	14.80	14.95	15.41	15.98	16.43	16.60	16.42	15.92	15.25	14.61	14.21	14.21	14.68	15.55	16.68	17.85	18.81
	1.26	1.26	1.26	1.26	1.25	1.24	1.24	1.24	1.25	1.26	1.27	1.27	1.27	1.26	1.25	1.24	1.22	1.21	1.20	1.20	1.21	1.22	1.23	1.25
	.78	.78	.80	.82	.84	.86	.87	.87	.87	.86	.85	.84	.83	.83	.84	.84	.85	.85	.84	.83	.82	.80	.79	.78

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 09	20.98	21.08	20.68	19.88	18.81	17.67	16.60	15.68	14.97	14.43	13.99	13.57	13.11	12.63	12.19	11.92	11.95	12.38	13.26	14.53	16.08	17.70	19.18	20.31
	1.28	1.29	1.29	1.28	1.26	1.24	1.22	1.20	1.19	1.18	1.17	1.17	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.16	1.18	1.21	1.24	1.26
	.75	.76	.77	.78	.79	.80	.81	.81	.82	.82	.82	.83	.84	.85	.86	.85	.85	.84	.82	.80	.78	.76	.75	.75
45-55N 09	19.77	19.74	19.45	18.96	18.35	17.68	17.02	16.43	15.92	15.49	15.13	14.81	14.53	14.29	14.16	14.17	14.39	14.85	15.54	16.39	17.32	18.22	18.98	19.50
	1.24	1.24	1.24	1.23	1.23	1.22	1.21	1.20	1.20	1.19	1.19	1.19	1.18	1.18	1.18	1.19	1.19	1.19	1.20	1.21	1.22	1.22	1.23	1.23
	.73	.73	.74	.74	.75	.76	.77	.78	.79	.80	.81	.82	.82	.83	.84	.83	.83	.82	.81	.79	.77	.75	.74	.73
35-45N 09	13.89	13.96	14.06	14.17	14.26	14.30	14.23	14.02	13.66	13.17	12.59	12.00	11.48	11.11	10.94	11.00	11.27	11.70	12.21	12.72	13.16	13.49	13.70	13.82
	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.17	1.17	1.16	1.15	1.14	1.14	1.14	1.15	1.15	1.16	1.17	1.18	1.18	1.18	1.18
	.83	.83	.83	.83	.83	.83	.83	.84	.84	.85	.86	.87	.87	.88	.89	.88	.88	.87	.86	.85	.84	.83	.83	.83
25-35N																								
15-25N 09	27.99	27.12	26.18	25.11	23.86	22.41	20.81	19.17	17.64	16.41	15.64	15.46	15.93	17.04	18.72	20.82	23.10	25.32	27.23	28.63	29.43	29.63	29.36	28.76
	1.39	1.37	1.35	1.32	1.30	1.28	1.26	1.24	1.22	1.20	1.19	1.17	1.17	1.18	1.20	1.23	1.27	1.32	1.36	1.40	1.42	1.43	1.43	1.41
	.77	.77	.77	.77	.78	.79	.80	.81	.81	.81	.80	.79	.77	.74	.72	.71	.70	.70	.71	.72	.73	.75	.76	.77
5-15N																								
5N-5S 03	17.62	18.82	19.73	20.09	19.77	18.78	17.26	15.49	13.80	12.46	11.67	11.49	11.82	12.47	13.23	13.88	14.30	14.46	14.42	14.33	14.36	14.68	15.35	16.37
	1.22	1.25	1.27	1.29	1.29	1.28	1.26	1.23	1.19	1.16	1.14	1.14	1.14	1.16	1.18	1.19	1.20	1.21	1.20	1.20	1.19	1.18	1.19	1.20
	.79	.78	.77	.77	.78	.79	.80	.82	.83	.83	.83	.83	.83	.83	.83	.83	.83	.83	.83	.83	.83	.82	.81	.80
5-15S 03	23.96	25.85	27.14	27.57	26.96	25.33	22.89	19.97	16.98	14.32	12.27	10.97	10.42	10.49	10.97	11.68	12.47	13.27	14.11	15.08	16.29	17.81	19.67	21.78
	1.31	1.34	1.37	1.38	1.38	1.35	1.32	1.27	1.23	1.19	1.15	1.14	1.13	1.13	1.14	1.15	1.16	1.17	1.18	1.18	1.20	1.21	1.24	1.27
	.71	.70	.70	.71	.72	.74	.76	.78	.81	.83	.85	.86	.87	.87	.87	.87	.85	.84	.82	.80	.77	.75	.73	.72
15-25S 03	19.34	19.30	19.25	19.05	18.59	17.86	16.95	16.03	15.31	14.97	15.10	15.73	16.76	18.05	19.39	20.58	21.47	21.96	22.01	21.69	21.12	20.47	19.90	19.51
	1.27	1.27	1.26	1.26	1.26	1.25	1.24	1.23	1.22	1.22	1.23	1.24	1.25	1.27	1.29	1.31	1.32	1.33	1.33	1.32	1.31	1.30	1.29	1.28
	.77	.77	.76	.77	.78	.79	.80	.82	.83	.84	.84	.83	.83	.82	.81	.80	.80	.80	.79	.79	.79	.79	.78	.77
25-35S 03	13.39	13.49	13.63	13.76	13.80	13.74	13.60	13.43	13.28	13.22	13.29	13.49	13.78	14.13	14.46	14.73	14.87	14.86	14.71	14.44	14.11	13.78	13.52	13.39
	1.20	1.19	1.19	1.19	1.18	1.18	1.18	1.18	1.17	1.18	1.18	1.18	1.18	1.18	1.18	1.19	1.19	1.19	1.19	1.19	1.20	1.20	1.20	1.20
	.86	.85	.85	.84	.83	.83	.83	.83	.83	.83	.83	.83	.83	.83	.82	.82	.82	.83	.83	.84	.85	.86	.86	.86
35-45S 03	12.33	12.17	12.14	12.23	12.44	12.75	13.10	13.49	13.86	14.18	14.45	14.64	14.75	14.79	14.76	14.69	14.56	14.40	14.18	13.93	13.63	13.29	12.93	12.60
	1.16	1.15	1.15	1.15	1.15	1.16	1.16	1.16	1.17	1.18	1.18	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.18	1.18	1.17	1.16
	.85	.85	.85	.85	.85	.84	.84	.83	.83	.82	.83	.83	.83	.83	.84	.84	.85	.85	.85	.85	.84	.85	.85	.85
45-55S 03	15.08	15.11	15.20	15.31	15.40	15.44	15.43	15.40	15.38	15.38	15.44	15.58	15.76	15.96	16.15	16.28	16.35	16.31	16.19	15.99	15.74	15.49	15.27	15.14
	1.19	1.19	1.19	1.19	1.19	1.19	1.20	1.19	1.19	1.19	1.18	1.18	1.18	1.18	1.19	1.19	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.19
	.82	.81	.81	.80	.80	.81	.81	.81	.81	.81	.81	.81	.81	.80	.80	.80	.80	.81	.81	.81	.82	.82	.82	.82
55-65S 03	18.43	18.43	18.12	17.60	17.02	16.52	16.20	16.13	16.26	16.52	16.77	16.90	16.81	16.49	16.00	15.43	14.95	14.68	14.73	15.12	15.79	16.62	17.43	18.08
	1.25	1.26	1.26	1.25	1.25	1.25	1.24	1.24	1.24	1.24	1.24	1.24	1.23	1.23	1.21	1.20	1.19	1.19	1.19	1.19	1.20	1.22	1.23	1.24
	.78	.79	.81	.82	.84	.85	.85	.85	.84	.83	.82	.81	.81	.81	.81	.81	.82	.82	.81	.81	.80	.79	.78	.78

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 10	21.31	20.46	19.74	19.25	18.99	18.87	18.74	18.45	17.91	17.09	16.06	14.97	14.06	13.52	13.53	14.19	15.43	17.10	18.92	20.59	21.84	22.51	22.56	22.09
	1.31	1.29	1.27	1.26	1.26	1.27	1.27	1.27	1.26	1.25	1.23	1.22	1.20	1.19	1.18	1.20	1.22	1.24	1.28	1.30	1.32	1.33	1.33	1.32
	.78	.78	.78	.78	.78	.79	.79	.79	.80	.81	.82	.83	.83	.84	.84	.84	.82	.81	.80	.79	.78	.77	.77	.77
45-55N 10	19.55	18.76	18.18	17.88	17.82	17.92	18.04	18.07	17.94	17.62	17.19	16.73	16.40	16.33	16.63	17.31	18.31	19.45	20.55	21.38	21.79	21.72	21.23	20.44
	1.26	1.24	1.23	1.23	1.22	1.23	1.23	1.23	1.22	1.22	1.21	1.20	1.20	1.20	1.21	1.23	1.25	1.27	1.29	1.31	1.31	1.31	1.29	1.28
	.78	.78	.77	.77	.76	.76	.76	.75	.75	.75	.75	.76	.77	.78	.79	.79	.79	.79	.79	.79	.79	.78	.78	.78
35-45N 10	16.59	16.11	15.82	15.71	15.71	15.70	15.59	15.29	14.82	14.22	13.61	13.12	12.89	13.01	13.53	14.38	15.44	16.54	17.49	18.13	18.39	18.25	17.80	17.20
	1.23	1.21	1.21	1.20	1.20	1.20	1.20	1.19	1.19	1.18	1.16	1.16	1.15	1.16	1.17	1.18	1.20	1.21	1.23	1.24	1.25	1.25	1.25	1.24
	.84	.85	.85	.85	.84	.84	.85	.85	.85	.86	.87	.88	.88	.88	.87	.86	.84	.83	.82	.81	.81	.82	.82	.83
25-35N																								
15-25N 10	30.24	30.47	30.04	28.81	26.75	24.03	20.96	17.92	15.31	13.43	12.48	12.47	13.32	14.84	16.79	18.92	21.01	22.89	24.47	25.77	26.86	27.83	28.75	29.60
	1.40	1.40	1.40	1.39	1.37	1.34	1.30	1.25	1.21	1.18	1.16	1.15	1.16	1.18	1.21	1.25	1.29	1.32	1.35	1.37	1.38	1.38	1.39	1.39
	.73	.73	.73	.75	.76	.79	.81	.83	.85	.85	.85	.84	.82	.80	.78	.77	.76	.76	.76	.76	.75	.75	.75	.74
5-15N																								
5N-5S 04	17.05	20.35	23.13	24.81	25.05	23.79	21.30	18.11	14.88	12.17	10.38	9.63	9.76	10.41	11.16	11.62	11.59	11.06	10.23	9.47	9.19	9.73	11.30	13.83
	1.23	1.26	1.28	1.29	1.29	1.27	1.24	1.21	1.19	1.17	1.16	1.16	1.17	1.18	1.18	1.18	1.17	1.16	1.15	1.14	1.14	1.15	1.16	1.19
	.81	.78	.74	.72	.72	.73	.76	.80	.83	.87	.89	.90	.90	.90	.88	.87	.87	.87	.87	.88	.88	.88	.87	.84
5-15S 04	27.33	30.19	32.04	32.56	31.60	29.31	26.02	22.26	18.57	15.43	13.14	11.77	11.21	11.20	11.45	11.74	11.98	12.25	12.72	13.64	15.22	17.55	20.54	23.93
	1.35	1.39	1.42	1.43	1.41	1.38	1.33	1.28	1.22	1.18	1.15	1.13	1.12	1.12	1.13	1.13	1.13	1.14	1.14	1.15	1.17	1.21	1.25	1.30
	.64	.64	.64	.67	.71	.75	.78	.81	.83	.84	.84	.83	.83	.83	.83	.83	.84	.84	.83	.81	.78	.75	.71	.67
15-25S 04	18.49	18.42	18.20	17.76	17.16	16.53	16.11	16.10	16.65	17.81	19.46	21.36	23.20	24.66	25.51	25.64	25.09	24.01	22.66	21.28	20.09	19.24	18.74	18.53
	1.27	1.26	1.24	1.21	1.20	1.19	1.19	1.20	1.23	1.27	1.31	1.36	1.39	1.42	1.43	1.43	1.41	1.39	1.36	1.34	1.32	1.31	1.30	1.28
	.82	.82	.81	.80	.80	.81	.81	.82	.82	.83	.82	.82	.81	.81	.80	.80	.81	.81	.82	.83	.83	.83	.83	.83
25-35S 04	17.36	16.31	15.21	14.20	13.40	12.85	12.57	12.53	12.67	12.92	13.20	13.45	13.66	13.85	14.09	14.44	14.98	15.73	16.61	17.50	18.23	18.64	18.63	18.17
	1.24	1.22	1.20	1.19	1.18	1.17	1.17	1.18	1.18	1.18	1.19	1.19	1.18	1.18	1.18	1.19	1.20	1.22	1.24	1.25	1.27	1.27	1.27	1.26
	.83	.84	.84	.85	.86	.86	.87	.87	.87	.86	.86	.85	.84	.83	.82	.82	.81	.81	.81	.81	.82	.82	.83	.83
35-45S 04	15.03	14.75	14.56	14.43	14.35	14.23	14.05	13.79	13.46	13.14	12.87	12.73	12.76	12.99	13.40	13.92	14.52	15.09	15.57	15.88	16.00	15.92	15.69	15.36
	1.20	1.19	1.19	1.19	1.19	1.18	1.18	1.18	1.18	1.17	1.17	1.18	1.18	1.19	1.20	1.21	1.22	1.22	1.22	1.22	1.22	1.22	1.21	1.20
	.86	.86	.85	.85	.84	.84	.83	.84	.84	.85	.85	.85	.86	.85	.85	.84	.84	.84	.84	.84	.84	.85	.86	.86
45-55S 04	15.70	15.45	15.43	15.60	15.88	16.15	16.31	16.29	16.10	15.77	15.41	15.11	14.97	15.06	15.38	15.88	16.48	17.04	17.46	17.64	17.54	17.19	16.69	16.15
	1.18	1.18	1.19	1.19	1.20	1.21	1.21	1.21	1.19	1.18	1.17	1.16	1.16	1.16	1.18	1.19	1.20	1.22	1.22	1.23	1.22	1.21	1.20	1.18
	.80	.80	.80	.80	.80	.81	.81	.81	.81	.81	.80	.81	.82	.81	.81	.81	.81	.81	.80	.80	.79	.79	.79	.79
55-65S 04	21.83	22.01	22.18	22.29	22.26	22.03	21.55	20.87	20.04	19.19	18.44	17.88	17.57	17.54	17.75	18.18	18.74	19.36	19.98	20.53	20.97	21.29	21.51	21.67
	1.26	1.28	1.29	1.31	1.33	1.33	1.33	1.31	1.29	1.27	1.25	1.24	1.23	1.23	1.24	1.25	1.25	1.26	1.26	1.26	1.25	1.25	1.25	1.25
	.72	.73	.76	.78	.80	.81	.81	.81	.80	.79	.79	.78	.78	.78	.78	.78	.78	.77	.76	.74	.73	.71	.71	.71

********** ACTIVE MAGNETIC -- SOLAR RANGE 41- 109 **********

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 03	21.53	21.64	21.42	20.97	20.40	19.83	19.30	18.86	18.46	18.06	17.58	16.99	16.29	15.55	14.88	14.42	14.32	14.63	15.37	16.45	17.73	19.04	20.18	21.04
	1.28	1.28	1.28	1.28	1.27	1.27	1.27	1.26	1.25	1.24	1.22	1.21	1.19	1.17	1.16	1.15	1.16	1.17	1.19	1.21	1.23	1.26	1.27	1.28
	.76	.76	.76	.77	.77	.78	.78	.78	.78	.78	.78	.78	.78	.78	.79	.80	.80	.80	.80	.79	.78	.78	.77	.76
45-55N 03	18.11	18.41	18.53	18.49	18.35	18.17	17.99	17.84	17.72	17.59	17.40	17.12	16.74	16.25	15.73	15.24	14.88	14.72	14.81	15.14	15.67	16.32	17.00	17.62
	1.22	1.23	1.23	1.23	1.23	1.22	1.22	1.21	1.20	1.19	1.18	1.17	1.15	1.15	1.15	1.15	1.15	1.15	1.16	1.17	1.18	1.20	1.21	1.21
	.79	.79	.78	.78	.78	.78	.77	.76	.75	.75	.74	.74	.74	.75	.76	.77	.78	.79	.79	.79	.79	.79	.79	.79
35-45N 03	13.64	13.26	13.04	12.99	13.03	13.07	12.97	12.66	12.10	11.34	10.51	9.75	9.22	9.06	9.32	9.99	10.96	12.07	13.14	13.99	14.51	14.66	14.48	14.09
	1.20	1.19	1.18	1.18	1.17	1.17	1.17	1.16	1.15	1.14	1.13	1.13	1.12	1.12	1.12	1.13	1.15	1.17	1.18	1.20	1.21	1.21	1.21	1.21
	.87	.87	.86	.86	.85	.84	.84	.84	.85	.86	.87	.88	.89	.90	.89	.89	.88	.87	.87	.86	.85	.86	.86	.86
25-35N																								
15-25N 03	30.30	31.31	31.89	31.85	30.97	29.14	26.41	22.96	19.16	15.43	12.23	9.89	8.63	8.52	9.45	11.24	13.60	16.27	18.98	21.54	23.83	25.82	27.54	29.02
	1.49	1.49	1.48	1.45	1.41	1.36	1.31	1.25	1.20	1.16	1.14	1.12	1.11	1.11	1.13	1.14	1.17	1.21	1.25	1.29	1.34	1.39	1.43	1.47
	.75	.76	.77	.77	.78	.80	.81	.83	.85	.87	.89	.90	.90	.90	.88	.86	.83	.80	.78	.76	.75	.74	.74	.75
5-15N																								
5N-5S 09	15.95	18.75	21.38	23.31	24.12	23.63	21.91	19.33	16.39	13.62	11.47	10.15	9.67	9.85	10.38	10.93	11.26	11.27	10.98	10.59	10.38	10.66	11.66	13.45
	1.22	1.27	1.31	1.35	1.37	1.36	1.34	1.30	1.25	1.20	1.17	1.14	1.14	1.14	1.15	1.16	1.17	1.17	1.16	1.15	1.15	1.15	1.16	1.18
	.80	.78	.75	.74	.74	.76	.78	.81	.84	.87	.88	.89	.90	.89	.89	.88	.88	.88	.88	.88	.88	.87	.85	.83
5-15S 09	0.00	18.80	20.00	27.40	26.20	30.00	24.30	9.90	10.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	1.20	1.23	1.21	1.39	1.42	1.39	1.12	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	.73	.76	.56	.67	.83	.78	.85	.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-25S 09	27.19	25.57	23.87	22.25	20.73	19.32	17.96	16.62	15.31	14.10	13.10	12.46	12.33	12.84	14.07	15.99	18.47	21.27	24.06	26.50	28.29	29.22	29.25	28.51
	1.28	1.29	1.29	1.29	1.28	1.27	1.25	1.22	1.19	1.17	1.15	1.15	1.15	1.16	1.17	1.19	1.21	1.22	1.24	1.25	1.26	1.26	1.27	1.28
	.77	.77	.77	.78	.78	.79	.80	.82	.83	.84	.84	.84	.83	.82	.81	.79	.78	.77	.77	.77	.77	.77	.77	.77
25-35S 09	16.54	16.73	16.80	16.70	16.39	15.83	15.03	14.04	12.93	11.82	10.82	10.05	9.59	9.49	9.74	10.31	11.11	12.05	13.02	13.93	14.72	15.37	15.87	16.26
	1.21	1.22	1.23	1.24	1.25	1.24	1.23	1.21	1.19	1.16	1.14	1.12	1.11	1.11	1.12	1.13	1.15	1.17	1.18	1.19	1.19	1.19	1.20	1.20
	.78	.79	.80	.82	.83	.84	.85	.86	.86	.87	.87	.88	.89	.89	.89	.89	.88	.87	.85	.83	.81	.80	.79	.78
35-45S 09	15.40	15.64	15.81	15.89	15.85	15.65	15.28	14.75	14.10	13.37	12.67	12.03	11.53	11.22	11.11	11.22	11.52	11.97	12.53	13.14	13.74	14.27	14.73	15.10
	1.20	1.19	1.19	1.18	1.18	1.18	1.18	1.18	1.18	1.17	1.17	1.15	1.14	1.15	1.14	1.14	1.15	1.16	1.17	1.19	1.20	1.20	1.20	1.20
	.80	.78	.78	.77	.78	.78	.79	.80	.82	.84	.85	.87	.88	.88	.89	.89	.88	.88	.87	.86	.85	.84	.82	.81
45-55S 09	18.04	18.74	19.22	19.44	19.41	19.11	18.56	17.78	16.83	15.78	14.72	13.70	12.82	12.13	11.66	11.45	11.51	11.84	12.42	13.20	14.14	15.17	16.19	17.18
	1.20	1.20	1.21	1.21	1.20	1.20	1.19	1.18	1.17	1.16	1.14	1.13	1.12	1.11	1.11	1.11	1.11	1.12	1.13	1.14	1.16	1.16	1.18	1.19
	.75	.73	.72	.72	.72	.72	.73	.75	.76	.78	.80	.82	.83	.84	.85	.85	.86	.85	.84	.83	.82	.80	.78	.76
55-65S 09	22.19	22.45	22.04	21.07	19.75	18.30	16.93	15.78	14.89	14.25	13.75	13.29	12.80	12.25	11.71	11.33	11.25	11.63	12.55	13.99	15.82	17.82	19.72	21.24
	1.31	1.31	1.30	1.28	1.26	1.23	1.20	1.18	1.17	1.16	1.15	1.15	1.14	1.14	1.13	1.13	1.14	1.15	1.16	1.19	1.22	1.25	1.28	1.30
	.76	.75	.75	.75	.76	.76	.77	.78	.79	.79	.80	.81	.82	.83	.84	.85	.86	.86	.85	.84	.82	.80	.79	.77

	MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	04	21.46	21.66	21.53	21.18	20.80	20.52	20.43	20.51	20.66	20.75	20.62	20.18	19.39	18.34	17.18	16.12	15.38	15.11	15.36	16.13	17.27	18.57	19.83	20.83
		1.25	1.25	1.26	1.27	1.27	1.28	1.28	1.29	1.29	1.29	1.29	1.27	1.26	1.23	1.21	1.19	1.18	1.17	1.17	1.18	1.19	1.21	1.22	1.24
		.69	.70	.71	.73	.75	.76	.77	.77	.77	.76	.76	.75	.76	.76	.77	.77	.78	.78	.77	.76	.74	.73	.71	.70
45-55N	04	18.69	19.04	19.29	19.48	19.62	19.77	19.94	20.13	20.30	20.39	20.33	20.09	19.65	19.05	18.35	17.65	17.05	16.64	16.46	16.52	16.79	17.22	17.73	18.23
		1.21	1.22	1.23	1.24	1.25	1.26	1.27	1.27	1.28	1.28	1.28	1.27	1.27	1.26	1.24	1.23	1.22	1.21	1.20	1.20	1.19	1.20	1.20	1.21
		.74	.74	.74	.75	.75	.76	.76	.77	.77	.77	.77	.77	.77	.77	.77	.78	.78	.79	.78	.78	.77	.76	.76	.75
35-45N	04	11.74	11.84	12.12	12.57	13.08	13.54	13.82	13.83	13.54	12.98	12.25	11.47	10.79	10.33	10.15	10.26	10.59	11.06	11.53	11.90	12.08	12.09	11.97	11.82
		1.14	1.14	1.14	1.14	1.15	1.15	1.15	1.15	1.14	1.14	1.13	1.12	1.11	1.11	1.11	1.11	1.12	1.13	1.14	1.14	1.15	1.14	1.14	1.14
		.85	.85	.84	.83	.82	.81	.81	.81	.82	.82	.83	.84	.85	.86	.86	.86	.86	.86	.85	.85	.85	.86	.86	.86
25-35N																									
15-25N	04	23.25	23.61	23.57	23.04	22.00	20.48	18.59	16.51	14.44	12.59	11.15	10.21	9.85	10.03	10.69	11.75	13.09	14.59	16.16	17.70	19.15	20.47	21.61	22.56
		1.31	1.32	1.33	1.32	1.31	1.29	1.26	1.23	1.19	1.16	1.14	1.12	1.11	1.11	1.12	1.14	1.16	1.19	1.21	1.23	1.25	1.27	1.29	1.30
		.75	.75	.76	.77	.78	.79	.81	.83	.85	.86	.87	.88	.88	.88	.87	.86	.85	.83	.82	.80	.78	.77	.76	.75
5-15N																									
5N-5S	10	17.89	20.11	21.96	23.07	23.16	22.16	20.20	17.60	14.81	12.26	10.29	9.07	8.58	8.69	9.14	9.70	10.20	10.55	10.80	11.08	11.57	12.45	13.82	15.68
		1.26	1.30	1.33	1.34	1.34	1.33	1.29	1.25	1.21	1.16	1.13	1.11	1.11	1.11	1.12	1.14	1.15	1.15	1.16	1.16	1.17	1.18	1.20	1.23
		.81	.80	.78	.78	.78	.79	.81	.83	.85	.87	.89	.90	.90	.90	.90	.89	.89	.88	.88	.87	.87	.86	.84	.83
5-15S	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-25S	10	19.55	20.24	20.72	20.86	20.52	19.62	18.17	16.29	14.17	12.05	10.19	8.79	7.98	7.82	8.25	9.17	10.43	11.86	13.31	14.67	15.88	16.94	17.88	18.75
		1.24	1.25	1.26	1.26	1.25	1.25	1.23	1.21	1.19	1.16	1.14	1.12	1.10	1.10	1.10	1.11	1.12	1.14	1.16	1.18	1.20	1.21	1.23	1.24
		.80	.80	.80	.80	.80	.81	.82	.84	.86	.88	.89	.90	.91	.91	.90	.89	.87	.86	.84	.83	.82	.82	.81	.80
25-35S	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.80	10.40	10.20	11.50	9.60	10.00	8.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	1.09	1.09	1.12	1.12	1.14	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.93	.88	.86	.90	.88	.84	.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35-45S	10	11.18	12.95	14.81	16.43	17.55	18.01	17.83	17.14	16.22	15.35	14.77	14.63	14.91	15.43	15.92	16.10	15.74	14.76	13.28	11.59	10.05	9.06	8.87	9.56
		1.10	1.11	1.11	1.13	1.14	1.16	1.17	1.17	1.17	1.16	1.14	1.13	1.12	1.11	1.11	1.11	1.11	1.11	1.10	1.09	1.08	1.08	1.07	1.08
		.82	.78	.74	.71	.70	.71	.74	.78	.82	.85	.86	.86	.84	.81	.78	.76	.76	.76	.78	.81	.84	.86	.86	.85
45-55S	10	16.67	17.35	17.88	18.21	18.35	18.30	18.11	17.85	17.55	17.25	16.98	16.74	16.50	16.24	15.94	15.57	15.17	14.78	14.47	14.31	14.39	14.71	15.25	15.94
		1.16	1.17	1.18	1.19	1.21	1.22	1.23	1.23	1.23	1.23	1.21	1.20	1.18	1.16	1.15	1.14	1.13	1.13	1.13	1.13	1.13	1.14	1.14	1.16
		.77	.76	.76	.76	.76	.77	.78	.78	.78	.78	.77	.76	.75	.74	.74	.74	.75	.76	.77	.78	.79	.79	.79	.78
55-65S	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 09	17.96	18.13	17.98	17.58	17.05	16.54	16.15	15.96	15.95	16.06	16.19	16.23	16.09	15.76	15.28	14.75	14.30	14.04	14.07	14.41	15.04	15.86	16.71	17.45
	1.19	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.19	1.19	1.19	1.18	1.17	1.16	1.15	1.14	1.14	1.14	1.14	1.15	1.16	1.17	1.18
	.77	.76	.76	.77	.78	.79	.80	.80	.80	.80	.81	.80	.80	.80	.81	.82	.82	.82	.82	.82	.81	.80	.79	.78
45-55N 09	16.41	16.63	17.11	17.54	17.60	17.25	17.18	17.21	17.69	18.32	18.23	18.43	17.29	16.90	16.37	15.97	14.37	14.29	15.44	15.49	15.71	16.04	16.42	16.78
	1.16	1.16	1.19	1.19	1.21	1.21	1.21	1.18	1.17	1.18	1.17	1.18	1.19	1.18	1.19	1.19	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.16
	.76	.75	.76	.76	.76	.77	.77	.75	.74	.73	.72	.72	.75	.76	.78	.80	.81	.81	.79	.79	.78	.77	.76	.76
35-45N 09	13.34	13.42	13.50	13.56	13.61	13.64	13.65	13.61	13.53	13.39	13.20	12.96	12.70	12.47	12.29	12.20	12.19	12.27	12.43	12.61	12.79	12.96	13.11	13.24
	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.13	1.13	1.13	1.12	1.12	1.12	1.13	1.13	1.13	1.13	1.13	1.14
	.83	.84	.84	.83	.83	.82	.82	.81	.82	.82	.82	.84	.84	.85	.85	.86	.85	.85	.84	.84	.84	.83	.83	.84
25-35N																								
15-25N 09	23.86	23.44	22.67	21.60	20.29	18.82	17.30	15.83	14.51	13.44	12.68	12.28	12.27	12.65	13.41	14.51	15.88	17.42	19.00	20.51	21.83	22.87	23.57	23.91
	1.36	1.35	1.33	1.31	1.29	1.26	1.23	1.20	1.17	1.15	1.13	1.12	1.11	1.12	1.13	1.16	1.19	1.22	1.26	1.30	1.33	1.35	1.36	1.37
	.78	.78	.79	.79	.80	.80	.81	.82	.83	.84	.85	.86	.85	.85	.84	.83	.81	.80	.79	.78	.78	.77	.77	.78
5-15N																								
5N-5S 03	14.69	15.55	16.25	16.62	16.51	15.88	14.76	13.29	11.69	10.21	9.06	8.39	8.22	8.51	9.10	9.83	10.54	11.14	11.58	11.91	12.22	12.60	13.13	13.84
	1.21	1.21	1.21	1.20	1.19	1.17	1.15	1.13	1.11	1.10	1.09	1.10	1.11	1.13	1.15	1.17	1.18	1.19	1.19	1.19	1.19	1.20	1.20	1.20
	.84	.82	.80	.79	.78	.78	.79	.81	.83	.85	.88	.90	.91	.91	.92	.91	.91	.90	.90	.89	.89	.88	.87	.86
5-15S 03	19.83	22.04	23.71	24.57	24.46	23.38	21.48	19.07	16.47	14.02	11.98	10.50	9.58	9.14	9.05	9.14	9.34	9.61	10.02	10.68	11.70	13.19	15.13	17.42
	1.23	1.27	1.31	1.33	1.34	1.33	1.30	1.26	1.22	1.18	1.14	1.11	1.10	1.09	1.09	1.10	1.10	1.10	1.10	1.10	1.11	1.13	1.16	1.19
	.73	.71	.70	.70	.71	.73	.76	.79	.82	.84	.87	.88	.89	.90	.89	.89	.88	.87	.86	.84	.82	.79	.77	.75
15-25S 03	17.26	17.23	17.38	17.57	17.65	17.47	16.97	16.14	15.10	14.04	13.13	12.56	12.42	12.75	13.48	14.50	15.64	16.73	17.59	18.12	18.30	18.16	17.84	17.49
	1.18	1.18	1.20	1.21	1.23	1.24	1.24	1.23	1.22	1.20	1.19	1.17	1.17	1.17	1.18	1.19	1.21	1.22	1.23	1.23	1.22	1.21	1.20	1.18
	.76	.76	.78	.79	.81	.83	.84	.85	.86	.86	.86	.85	.84	.83	.82	.82	.81	.80	.79	.78	.77	.76	.75	.75
25-35S 03	16.56	16.54	16.44	16.25	15.99	15.66	15.26	14.82	14.36	13.90	13.48	13.16	12.97	12.94	13.10	13.41	13.85	14.37	14.90	15.39	15.81	16.14	16.37	16.51
	1.21	1.21	1.21	1.20	1.20	1.19	1.18	1.17	1.15	1.14	1.12	1.11	1.10	1.10	1.10	1.11	1.13	1.15	1.17	1.18	1.19	1.20	1.21	1.21
	.80	.80	.80	.80	.80	.80	.81	.81	.82	.82	.82	.82	.82	.82	.81	.81	.80	.80	.80	.80	.80	.80	.80	.80
35-45S 03	12.62	12.90	13.41	14.06	14.76	15.40	15.84	16.03	15.93	15.58	15.08	14.52	14.03	13.67	13.48	13.43	13.48	13.52	13.51	13.40	13.19	12.92	12.69	12.56
	1.17	1.17	1.17	1.17	1.18	1.18	1.18	1.18	1.18	1.17	1.16	1.15	1.15	1.15	1.15	1.15	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.17
	.87	.86	.85	.83	.81	.80	.78	.77	.77	.78	.79	.80	.81	.82	.83	.83	.82	.82	.83	.83	.84	.85	.86	.87
45-55S 03	16.65	17.03	17.42	17.81	18.15	18.46	18.74	18.99	19.25	19.47	19.64	19.71	19.66	19.45	19.10	18.62	18.06	17.48	16.94	16.51	16.22	16.09	16.14	16.34
	1.20	1.21	1.20	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.20	1.20	1.20	1.20	1.20	1.20	1.20
	.79	.78	.76	.76	.75	.74	.73	.72	.71	.70	.70	.69	.69	.69	.70	.71	.73	.75	.76	.78	.79	.80	.80	.79
55-65S 03	22.84	23.73	23.93	23.46	22.45	21.15	19.86	18.84	18.23	18.06	18.22	18.52	18.75	18.72	18.38	17.75	16.99	16.33	15.99	16.15	16.90	18.16	19.77	21.43
	1.27	1.28	1.29	1.28	1.27	1.25	1.24	1.23	1.22	1.22	1.22	1.23	1.23	1.23	1.22	1.21	1.20	1.20	1.19	1.20	1.20	1.22	1.24	1.26
	.70	.69	.69	.69	.71	.73	.74	.76	.76	.76	.75	.74	.74	.74	.74	.75	.77	.79	.80	.80	.79	.77	.75	.72

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 10	24.36	23.35	22.60	22.29	22.48	23.13	24.06	25.03	25.80	26.19	26.09	25.57	24.79	23.99	23.39	23.19	23.45	24.11	24.98	25.83	26.40	26.54	26.18	25.39
	1.27	1.26	1.26	1.26	1.28	1.30	1.32	1.34	1.34	1.34	1.33	1.31	1.28	1.27	1.25	1.25	1.25	1.26	1.28	1.30	1.30	1.30	1.30	1.28
	.65	.67	.68	.69	.70	.70	.69	.68	.67	.66	.66	.65	.66	.66	.67	.67	.67	.66	.65	.63	.62	.62	.62	.64
45-55N 10	21.65	22.01	22.43	22.87	23.28	23.57	23.66	23.48	23.02	22.29	21.37	20.38	19.44	18.69	18.20	18.03	18.17	18.55	19.07	19.65	20.19	20.64	21.01	21.33
	1.25	1.25	1.25	1.26	1.27	1.28	1.28	1.28	1.27	1.25	1.22	1.20	1.18	1.17	1.17	1.18	1.20	1.22	1.24	1.26	1.27	1.27	1.27	1.26
	.70	.69	.68	.68	.68	.68	.68	.68	.69	.68	.69	.69	.70	.71	.73	.75	.76	.77	.77	.77	.76	.75	.73	.71
35-45N 10	12.92	15.14	13.85	15.53	15.59	16.74	16.59	16.17	13.67	15.82	14.17	12.75	11.68	11.62	11.50	11.82	11.07	15.70	15.83	15.22	16.94	16.74	16.90	14.07
	1.16	1.19	1.18	1.19	1.17	1.19	1.19	1.12	1.15	1.13	1.13	1.11	1.10	1.11	1.08	1.08	1.08	1.12	1.13	1.15	1.17	1.19	1.21	1.17
	.83	.77	.82	.77	.81	.77	.77	.82	.85	.78	.84	.85	.88	.89	.86	.83	.84	.78	.76	.78	.77	.75	.75	.78
25-35N																								
15-25N 10	31.85	33.88	35.37	35.98	35.47	33.74	30.93	27.37	23.50	19.84	16.82	14.72	13.66	13.57	14.26	15.50	17.02	18.65	20.29	21.92	23.61	25.42	27.43	29.61
	1.50	1.52	1.53	1.54	1.52	1.49	1.43	1.37	1.30	1.23	1.16	1.12	1.09	1.08	1.09	1.11	1.15	1.20	1.25	1.30	1.35	1.39	1.43	1.47
	.73	.73	.72	.73	.73	.75	.78	.80	.83	.86	.87	.88	.87	.85	.83	.81	.79	.77	.76	.75	.75	.75	.74	.74
5-15N																								
5N-5S 04	18.85	20.96	22.46	23.02	22.48	20.95	18.72	16.23	13.94	12.23	11.25	11.00	11.26	11.75	12.18	12.37	12.25	11.91	11.57	11.46	11.82	12.80	14.41	16.52
	1.24	1.26	1.27	1.27	1.26	1.24	1.21	1.18	1.16	1.14	1.13	1.14	1.15	1.16	1.17	1.18	1.18	1.17	1.17	1.17	1.17	1.18	1.19	1.22
	.81	.79	.77	.76	.76	.77	.79	.81	.83	.85	.86	.87	.87	.86	.86	.86	.86	.86	.87	.87	.87	.86	.85	.83
5-15S 04	21.37	23.81	25.52	26.22	25.78	24.22	21.77	18.77	15.65	12.78	10.46	8.83	7.90	7.52	7.51	7.71	8.01	8.41	9.01	9.96	11.38	13.34	15.80	18.57
	1.25	1.29	1.32	1.34	1.35	1.33	1.30	1.26	1.21	1.17	1.13	1.11	1.09	1.08	1.08	1.08	1.08	1.07	1.08	1.08	1.10	1.12	1.16	1.20
	.73	.71	.70	.70	.71	.73	.76	.79	.82	.85	.87	.89	.90	.90	.91	.91	.91	.90	.89	.87	.85	.82	.79	.76
15-25S 04	24.07	24.76	25.13	25.03	24.36	23.11	21.38	19.38	17.38	15.68	14.50	13.96	14.04	14.63	15.55	16.60	17.62	18.55	19.35	20.08	20.80	21.55	22.37	23.23
	1.38	1.39	1.40	1.39	1.38	1.36	1.32	1.29	1.25	1.22	1.20	1.19	1.19	1.20	1.21	1.23	1.25	1.26	1.28	1.29	1.31	1.32	1.34	1.36
	.77	.76	.75	.75	.76	.77	.79	.81	.83	.84	.85	.85	.84	.83	.82	.81	.80	.80	.80	.80	.80	.79	.79	.78
25-35S 04	19.93	19.87	19.33	18.38	17.12	15.67	14.14	12.63	11.22	9.97	8.93	8.15	7.66	7.49	7.68	8.24	9.19	10.49	12.06	13.80	15.57	17.20	18.55	19.49
	1.29	1.28	1.26	1.24	1.21	1.19	1.17	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.08	1.09	1.10	1.12	1.15	1.18	1.22	1.25	1.27	1.29
	.80	.80	.80	.81	.82	.83	.84	.86	.87	.88	.89	.90	.90	.90	.90	.89	.88	.87	.85	.84	.83	.82	.81	.80
35-45S 04	14.99	15.03	15.05	15.06	15.02	14.91	14.69	14.31	13.80	13.18	12.52	11.89	11.39	11.07	11.00	11.17	11.58	12.14	12.80	13.44	14.02	14.45	14.75	14.91
	1.21	1.21	1.20	1.19	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.15	1.14	1.14	1.13	1.14	1.15	1.16	1.17	1.18	1.20	1.21	1.21	1.21
	.85	.84	.84	.83	.83	.82	.83	.83	.84	.85	.86	.87	.88	.88	.88	.88	.87	.86	.85	.85	.85	.84	.85	.85
45-55S 04	17.09	17.35	17.60	17.78	17.85	17.76	17.47	17.00	16.35	15.60	14.83	14.13	13.57	13.22	13.11	13.23	13.55	14.02	14.57	15.14	15.66	16.11	16.49	16.80
	1.22	1.22	1.22	1.23	1.23	1.23	1.22	1.21	1.19	1.17	1.15	1.13	1.12	1.12	1.12	1.13	1.15	1.16	1.17	1.19	1.20	1.21	1.21	1.21
	.79	.79	.78	.77	.77	.77	.77	.77	.77	.77	.77	.78	.79	.79	.80	.82	.82	.82	.82	.82	.81	.80	.80	.79
55-65S 04	22.72	23.72	24.33	24.48	24.16	23.47	22.56	21.60	20.75	20.09	19.65	19.37	19.16	18.91	18.56	18.12	17.66	17.30	17.18	17.38	17.97	18.92	20.13	21.45
	1.29	1.31	1.32	1.33	1.32	1.31	1.29	1.26	1.24	1.21	1.19	1.18	1.17	1.16	1.16	1.16	1.17	1.17	1.18	1.19	1.21	1.22	1.25	1.27
	.75	.74	.73	.73	.73	.73	.73	.73	.72	.71	.70	.68	.67	.67	.68	.69	.71	.73	.75	.76	.77	.77	.76	.76

********** ACTIVE MAGNETIC - HIGH SOLAR **********

	MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	03	18.17	18.47	18.64	18.74	18.86	19.05	19.30	19.54	19.67	19.59	19.20	18.48	17.49	16.34	15.20	14.25	13.63	13.43	13.67	14.27	15.11	16.04	16.92	17.65
		1.22	1.23	1.23	1.24	1.24	1.25	1.24	1.24	1.23	1.22	1.19	1.17	1.15	1.13	1.11	1.11	1.11	1.11	1.13	1.14	1.16	1.18	1.20	1.22
		.76	.76	.75	.76	.75	.75	.74	.73	.73	.71	.71	.71	.72	.73	.75	.76	.78	.79	.80	.80	.79	.79	.78	.77
45-55N	03	12.60	13.08	13.67	14.34	15.07	15.78	16.39	16.81	16.98	16.85	16.44	15.78	14.97	14.08	13.24	12.52	11.98	11.62	11.45	11.43	11.52	11.69	11.92	12.22
		1.14	1.15	1.16	1.16	1.16	1.17	1.16	1.15	1.14	1.13	1.11	1.10	1.09	1.08	1.07	1.07	1.07	1.07	1.08	1.09	1.10	1.11	1.12	1.13
		.83	.82	.82	.81	.79	.77	.75	.74	.73	.72	.72	.72	.74	.75	.76	.78	.79	.80	.81	.81	.81	.82	.82	.82
35-45N	03	11.40	11.67	11.80	11.79	11.63	11.34	10.90	10.31	9.58	8.74	7.86	7.01	6.28	5.75	5.47	5.47	5.76	6.30	7.03	7.88	8.77	9.62	10.36	10.96
		1.15	1.15	1.16	1.16	1.16	1.15	1.13	1.12	1.10	1.08	1.06	1.06	1.05	1.04	1.04	1.05	1.05	1.06	1.07	1.08	1.09	1.11	1.12	1.13
		.86	.86	.85	.86	.86	.86	.87	.87	.88	.90	.91	.92	.93	.95	.95	.95	.95	.94	.92	.91	.89	.88	.87	.86
25-35N																									
15-25N	03	19.07	20.69	21.67	21.83	21.11	19.55	17.33	14.71	12.01	9.52	7.47	5.98	5.09	4.73	4.79	5.18	5.82	6.67	7.76	9.11	10.76	12.69	14.83	17.02
		1.28	1.30	1.31	1.31	1.30	1.28	1.25	1.21	1.17	1.13	1.10	1.08	1.06	1.06	1.06	1.07	1.09	1.11	1.13	1.15	1.18	1.20	1.23	1.26
		.81	.79	.78	.77	.78	.79	.81	.84	.87	.89	.91	.93	.94	.94	.94	.93	.93	.92	.91	.90	.89	.87	.85	.83
5-15N																									
5N-5S	09	14.15	15.36	16.28	16.71	16.50	15.62	14.20	12.45	10.66	9.12	8.03	7.48	7.42	7.73	8.22	8.73	9.16	9.46	9.69	9.93	10.31	10.91	11.79	12.90
		1.21	1.24	1.25	1.26	1.26	1.25	1.22	1.19	1.16	1.14	1.12	1.10	1.10	1.11	1.12	1.13	1.13	1.14	1.14	1.14	1.15	1.16	1.17	1.19
		.85	.84	.83	.83	.83	.84	.85	.86	.88	.90	.91	.91	.91	.91	.91	.90	.90	.90	.90	.89	.89	.89	.88	.87
5-15S	09	0.00	0.00	26.20	34.30	32.60	41.60	49.20	22.40	18.80	15.80	14.10	7.10	6.20	11.20	7.60	8.70	8.00	6.70	7.20	4.60	5.50	0.00	0.00	0.00
		0.00	0.00	1.44	1.49	1.46	1.65	1.82	1.40	1.10	1.11	1.09	1.09	1.09	1.06	1.11	1.08	1.06	1.05	1.05	1.04	1.05	0.00	0.00	0.00
		0.00	0.00	.71	.73	.67	.61	.75	.84	.75	.89	.87	.95	.95	.90	.93	.93	.92	.92	.88	.94	.92	0.00	0.00	0.00
15-25S	09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-35S	09	16.53	17.53	18.42	19.01	19.08	18.50	17.26	15.48	13.37	11.26	9.43	8.14	7.53	7.60	8.24	9.25	10.40	11.51	12.44	13.17	13.74	14.26	14.86	15.61
		1.21	1.23	1.25	1.26	1.26	1.25	1.22	1.19	1.15	1.12	1.09	1.07	1.07	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.13	1.15	1.16	1.18
		.82	.82	.82	.82	.82	.83	.83	.84	.85	.87	.88	.89	.90	.91	.91	.90	.89	.88	.86	.85	.84	.83	.82	.82
35-45S	09	12.69	13.45	14.28	15.08	15.69	16.01	15.99	15.64	15.02	14.26	13.49	12.82	12.33	12.05	11.94	11.93	11.97	11.97	11.91	11.79	11.68	11.65	11.77	12.11
		1.15	1.16	1.16	1.16	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.10	1.10	1.10	1.11	1.12	1.13	1.13	1.13	1.14	1.14	1.15	1.15
		.85	.83	.83	.81	.80	.79	.79	.80	.80	.82	.83	.84	.85	.85	.85	.85	.86	.85	.86	.86	.86	.86	.86	.86
45-55S	09	18.97	19.28	19.82	19.44	19.98	20.15	19.66	18.78	19.84	19.95	18.94	17.87	17.38	16.47	16.27	15.23	15.75	14.72	15.53	13.44	13.83	15.68	18.13	17.06
		1.13	1.11	1.15	1.16	1.18	1.18	1.17	1.16	1.19	1.12	1.12	1.12	1.09	1.10	1.10	1.08	1.13	1.11	1.11	1.12	1.13	1.12	1.18	1.17
		.70	.66	.71	.76	.71	.73	.72	.72	.68	.63	.65	.70	.72	.74	.71	.77	.73	.79	.73	.81	.81	.74	.77	.75
55-65S	09	23.35	23.84	24.30	24.66	24.88	24.91	24.71	24.28	23.64	22.86	22.03	21.24	20.58	20.14	19.93	19.94	20.14	20.45	20.83	21.22	21.61	22.01	22.42	22.87
		1.20	1.22	1.25	1.27	1.28	1.29	1.28	1.27	1.24	1.21	1.18	1.16	1.14	1.13	1.13	1.13	1.14	1.14	1.15	1.15	1.16	1.16	1.17	1.18
		.67	.67	.67	.68	.68	.68	.67	.67	.66	.65	.64	.64	.63	.63	.63	.64	.64	.65	.65	.66	.66	.66	.67	.67

MONTH		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	04	18.15	18.42	18.82	19.41	20.23	21.20	22.21	23.10	23.69	23.85	23.52	22.73	21.57	20.25	18.94	17.83	17.04	16.62	16.53	16.70	17.01	17.36	17.67	17.93
		1.19	1.21	1.22	1.24	1.26	1.28	1.31	1.32	1.33	1.32	1.30	1.27	1.24	1.21	1.18	1.16	1.15	1.14	1.15	1.15	1.16	1.17	1.18	1.18
		.73	.74	.74	.74	.74	.74	.74	.73	.72	.71	.70	.69	.69	.70	.71	.72	.73	.74	.75	.75	.75	.74	.74	.74
45-55N	04	15.09	15.59	16.26	17.12	18.16	19.31	20.48	21.53	22.31	22.72	22.67	22.17	21.27	20.11	18.83	17.58	16.48	15.60	14.98	14.60	14.42	14.40	14.51	14.74
		1.14	1.15	1.16	1.18	1.20	1.22	1.24	1.25	1.25	1.25	1.23	1.21	1.19	1.16	1.15	1.14	1.13	1.13	1.13	1.12	1.13	1.13	1.13	1.13
		.77	.77	.76	.75	.75	.74	.73	.72	.70	.70	.69	.69	.69	.70	.71	.72	.73	.75	.76	.78	.78	.78	.78	.78
35-45N	04	10.31	10.61	10.98	11.41	11.88	12.33	12.68	12.88	12.86	12.61	12.14	11.52	10.83	10.16	9.61	9.21	9.01	8.97	9.06	9.23	9.43	9.64	9.85	10.06
		1.11	1.12	1.12	1.13	1.13	1.12	1.12	1.11	1.10	1.09	1.08	1.07	1.06	1.06	1.06	1.06	1.07	1.07	1.07	1.08	1.09	1.09	1.10	1.10
		.86	.86	.85	.84	.83	.82	.81	.80	.80	.80	.81	.82	.83	.85	.85	.86	.87	.87	.86	.86	.86	.86	.86	.86
25-35N																									
15-25N	04	18.63	18.98	18.89	18.34	17.38	16.09	14.64	13.17	11.84	10.77	10.01	9.58	9.45	9.56	9.85	10.29	10.87	11.58	12.45	13.45	14.57	15.75	16.89	17.89
		1.26	1.27	1.27	1.26	1.25	1.22	1.19	1.17	1.14	1.12	1.10	1.09	1.09	1.09	1.10	1.11	1.12	1.14	1.15	1.17	1.19	1.21	1.23	1.25
		.79	.79	.80	.81	.82	.84	.85	.86	.87	.88	.89	.89	.89	.89	.89	.89	.88	.88	.86	.85	.83	.82	.81	.79
5-15N																									
5N-5S	10	14.62	15.37	15.98	16.31	16.21	15.61	14.56	13.18	11.70	10.32	9.25	8.61	8.41	8.60	9.08	9.70	10.35	10.96	11.48	11.92	12.32	12.75	13.26	13.89
		1.19	1.21	1.22	1.23	1.24	1.23	1.22	1.20	1.17	1.15	1.13	1.11	1.10	1.11	1.11	1.13	1.14	1.15	1.16	1.17	1.17	1.18	1.18	1.18
		.84	.83	.82	.82	.82	.84	.85	.87	.88	.90	.90	.90	.90	.90	.89	.88	.88	.88	.88	.88	.87	.87	.86	.85
5-15S	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.00	9.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26	1.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	.88	.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-25S	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-35S	10	8.10	6.90	8.40	8.80	7.30	9.80	9.80	0.00	15.00	11.50	10.05	6.60	9.20	10.50	8.15	8.80	4.90	6.00	5.10	4.60	0.00	5.10	0.00	0.00
		1.11	1.08	1.12	1.15	1.07	1.13	1.13	0.00	1.05	1.09	1.07	1.09	1.02	1.04	1.06	1.09	1.07	1.11	1.07	1.05	0.00	1.07	0.00	0.00
		.90	.93	.89	.92	.89	.87	.90	0.00	.70	.80	.83	.92	.92	.95	.92	.92	.93	.95	.95	.95	0.00	.94	0.00	0.00
35-45S	10	7.05	8.13	7.59	8.59	9.33	9.74	10.13	13.86	13.86	13.54	12.83	11.88	10.86	9.94	9.26	8.88	8.76	8.82	8.96	9.07	9.08	8.99	8.83	8.70
		1.10	1.08	1.10	1.11	1.12	1.12	1.08	1.14	1.10	1.10	1.09	1.08	1.08	1.07	1.07	1.07	1.07	1.08	1.08	1.08	1.09	1.09	1.09	1.10
		.90	.92	.89	.90	.88	.86	.85	.81	.77	.78	.79	.80	.82	.84	.86	.87	.88	.88	.89	.89	.89	.90	.90	.90
45-55S	10	10.32	11.67	11.35	11.26	12.95	13.55	13.74	17.62	19.37	20.28	21.76	20.43	20.58	22.69	19.80	16.92	15.38	13.89	11.81	11.62	10.99	10.35	9.40	9.63
		1.09	1.12	1.11	1.11	1.10	1.12	1.14	1.23	1.21	1.25	1.29	1.25	1.25	1.33	1.26	1.12	1.13	1.13	1.11	1.08	1.08	1.08	1.10	1.10
		.84	.82	.81	.84	.80	.82	.84	.81	.73	.75	.75	.75	.76	.80	.79	.74	.77	.82	.84	.84	.85	.86	.89	.86
55-65S	10	16.46	16.69	16.88	17.12	17.52	18.12	18.92	19.84	20.74	21.44	21.80	21.71	21.16	20.21	19.03	17.77	16.62	15.73	15.17	14.95	15.05	15.35	15.76	16.15
		1.11	1.11	1.12	1.14	1.17	1.21	1.24	1.27	1.30	1.32	1.32	1.31	1.29	1.26	1.23	1.20	1.18	1.16	1.14	1.13	1.12	1.12	1.11	1.11
		.70	.69	.69	.70	.71	.73	.74	.74	.75	.75	.75	.75	.75	.76	.77	.77	.78	.79	.79	.78	.76	.74	.72	.71

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 09	19.31	19.17	18.95	18.74	18.65	18.77	19.11	19.61	20.17	20.65	20.92	20.88	20.53	19.90	19.14	18.38	17.77	17.43	17.41	17.65	18.09	18.58	19.00	19.26
	1.18	1.18	1.18	1.18	1.19	1.19	1.19	1.20	1.20	1.21	1.21	1.21	1.21	1.20	1.20	1.19	1.18	1.17	1.17	1.17	1.16	1.17	1.17	1.18
	.71	.71	.71	.72	.72	.71	.71	.70	.70	.69	.69	.69	.70	.72	.73	.75	.76	.76	.76	.75	.74	.72	.71	.71
45-55N 09	16.76	16.85	17.04	17.35	17.82	18.42	19.11	19.83	20.47	20.93	21.15	21.10	20.78	20.24	19.57	18.87	18.22	17.67	17.26	16.99	16.83	16.75	16.72	16.73
	1.16	1.16	1.16	1.17	1.18	1.19	1.19	1.20	1.20	1.21	1.20	1.20	1.19	1.18	1.17	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.15
	.75	.75	.75	.74	.74	.72	.71	.70	.69	.68	.67	.66	.67	.68	.68	.70	.71	.72	.73	.74	.74	.75	.75	.75
35-45N 09	9.98	10.16	10.66	11.48	12.51	13.57	14.46	15.00	15.05	14.61	13.75	12.64	11.50	10.53	9.87	9.58	9.64	9.90	10.24	10.51	10.61	10.52	10.30	10.08
	1.10	1.10	1.10	1.11	1.13	1.14	1.15	1.16	1.16	1.16	1.16	1.15	1.15	1.14	1.14	1.13	1.13	1.14	1.13	1.13	1.12	1.12	1.11	1.11
	.87	.86	.85	.84	.83	.81	.80	.79	.80	.81	.82	.84	.86	.87	.88	.89	.89	.88	.87	.87	.87	.87	.87	.87
25-35N																								
15-25N 09	27.28	27.22	26.69	25.76	24.55	23.20	21.88	20.72	19.83	19.23	18.91	18.80	18.82	18.90	19.02	19.22	19.57	20.15	21.01	22.14	23.44	24.77	25.96	26.83
	1.39	1.39	1.38	1.36	1.33	1.31	1.27	1.24	1.21	1.18	1.15	1.13	1.11	1.10	1.11	1.12	1.14	1.17	1.20	1.25	1.29	1.33	1.36	1.38
	.70	.71	.72	.73	.73	.74	.74	.75	.75	.75	.75	.74	.73	.72	.71	.70	.69	.69	.68	.68	.68	.69	.69	.70
5-15N																								
5N-5S 03	16.72	17.98	18.90	19.24	18.89	17.84	16.26	14.38	12.53	10.97	9.92	9.42	9.43	9.80	10.32	10.84	11.26	11.54	11.75	12.01	12.43	13.12	14.11	15.35
	1.25	1.26	1.27	1.27	1.26	1.25	1.22	1.19	1.17	1.15	1.14	1.13	1.14	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.18	1.19	1.21	1.23
	.81	.80	.80	.80	.81	.82	.84	.86	.87	.89	.90	.90	.90	.90	.90	.90	.90	.90	.90	.89	.88	.86	.85	.83
5-15S 03	6.30	7.00	9.40	10.50	16.80	17.70	28.90	15.90	5.90	3.30	2.10	0.00	4.30	4.60	0.00	2.90	3.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.02	1.09	1.12	1.10	1.18	1.19	1.54	1.27	1.07	1.03	1.03	0.00	1.07	1.08	0.00	1.00	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	.92	.92	.84	.88	.71	.72	.79	.88	.92	.96	.98	0.00	.95	.98	0.00	.94	.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-25S 03	12.58	13.02	13.18	13.01	12.54	11.82	10.93	9.99	9.11	8.37	7.83	7.49	7.32	7.29	7.35	7.48	7.67	7.95	8.35	8.88	9.55	10.32	11.14	11.92
	1.16	1.17	1.18	1.17	1.16	1.14	1.13	1.11	1.11	1.10	1.11	1.11	1.12	1.12	1.12	1.12	1.11	1.11	1.10	1.10	1.11	1.12	1.13	1.15
	.85	.85	.85	.85	.86	.86	.87	.88	.90	.91	.92	.93	.93	.93	.93	.92	.91	.90	.89	.88	.87	.87	.86	.86
25-35S 03	10.44	10.89	11.22	11.40	11.42	11.28	11.01	10.63	10.19	9.72	9.24	8.78	8.37	8.01	7.73	7.55	7.48	7.52	7.68	7.96	8.35	8.83	9.36	9.91
	1.12	1.14	1.15	1.16	1.16	1.15	1.14	1.12	1.10	1.08	1.07	1.06	1.05	1.05	1.05	1.06	1.06	1.06	1.06	1.07	1.07	1.08	1.09	1.10
	.85	.85	.85	.85	.85	.85	.85	.85	.86	.86	.86	.87	.87	.87	.88	.88	.88	.88	.88	.88	.87	.87	.86	.86
35-45S 03	8.66	8.86	9.34	10.03	10.90	11.81	12.60	13.15	13.33	13.14	12.61	11.85	11.03	10.28	9.70	9.33	9.17	9.14	9.17	9.17	9.11	8.97	8.80	8.67
	1.09	1.09	1.09	1.10	1.11	1.11	1.12	1.12	1.12	1.11	1.10	1.10	1.09	1.08	1.07	1.07	1.08	1.07	1.08	1.08	1.08	1.08	1.09	1.09
	.87	.87	.86	.85	.84	.82	.80	.80	.79	.80	.81	.83	.84	.86	.87	.87	.87	.87	.87	.86	.86	.87	.87	.87
45-55S 03	10.91	10.10	12.29	11.73	12.36	14.17	17.37	19.37	18.63	19.71	19.66	18.70	18.50	16.67	16.43	16.15	15.49	15.32	14.78	15.35	14.43	13.46	12.52	9.83
	1.14	1.12	1.16	1.14	1.13	1.18	1.20	1.25	1.13	1.18	1.15	1.12	1.14	1.13	1.12	1.12	1.12	1.16	1.13	1.14	1.14	1.12	1.11	1.10
	.87	.87	.84	.85	.83	.83	.76	.74	.68	.66	.64	.67	.68	.73	.74	.75	.77	.79	.79	.77	.78	.80	.81	.86
55-65S 03	16.52	17.81	19.21	20.56	21.71	22.58	23.14	23.42	23.47	23.33	23.07	22.70	22.22	21.61	20.86	19.96	18.93	17.83	16.73	15.78	15.08	14.76	14.90	15.50
	1.16	1.19	1.22	1.25	1.28	1.30	1.32	1.32	1.32	1.31	1.30	1.29	1.27	1.26	1.25	1.23	1.21	1.19	1.17	1.15	1.14	1.13	1.13	1.14
	.77	.76	.75	.74	.73	.73	.72	.72	.71	.71	.70	.70	.70	.70	.71	.72	.73	.75	.76	.77	.78	.78	.78	.77

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 10	15.18	14.91	14.73	14.72	14.94	15.37	15.94	16.52	17.00	17.25	17.20	16.85	16.26	15.56	14.89	14.40	14.16	14.19	14.44	14.81	15.19	15.44	15.52	15.42
	1.17	1.17	1.17	1.18	1.18	1.18	1.18	1.18	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.12	1.12	1.13	1.14	1.14	1.15	1.16	1.16	1.17
	.79	.80	.81	.81	.80	.80	.78	.76	.75	.73	.72	.72	.73	.74	.76	.77	.78	.79	.79	.79	.79	.78	.78	.78
45-55N 10	11.05	11.41	11.85	12.39	12.96	13.52	13.99	14.28	14.33	14.11	13.64	12.98	12.22	11.45	10.77	10.25	9.92	9.78	9.80	9.93	10.11	10.32	10.53	10.77
	1.13	1.13	1.15	1.15	1.15	1.15	1.15	1.14	1.13	1.12	1.11	1.10	1.10	1.09	1.09	1.09	1.09	1.09	1.09	1.10	1.10	1.11	1.11	1.12
	.88	.87	.86	.85	.84	.83	.82	.81	.80	.81	.81	.82	.83	.85	.86	.87	.87	.88	.88	.88	.88	.88	.88	.88
35-45N 10	12.40	12.46	12.33	12.05	11.66	11.21	10.67	10.05	9.34	8.54	7.67	6.81	6.03	5.42	5.09	5.09	5.47	6.18	7.18	8.33	9.52	10.60	11.47	12.08
	1.17	1.18	1.17	1.17	1.16	1.15	1.13	1.12	1.10	1.09	1.08	1.07	1.06	1.05	1.05	1.06	1.06	1.07	1.08	1.10	1.12	1.14	1.16	1.17
	.85	.86	.85	.85	.86	.86	.87	.87	.88	.89	.90	.91	.92	.93	.93	.93	.92	.91	.89	.88	.87	.86	.86	.85
25-35N																								
15-25N 10	19.77	21.93	23.70	24.70	24.64	23.40	21.07	17.95	14.46	11.12	8.33	6.41	5.44	5.37	5.99	7.04	8.26	9.47	10.58	11.62	12.72	14.01	15.62	17.58
	1.23	1.26	1.30	1.33	1.34	1.33	1.31	1.26	1.21	1.16	1.12	1.08	1.07	1.07	1.08	1.10	1.12	1.13	1.14	1.15	1.15	1.16	1.17	1.20
	.79	.77	.76	.75	.76	.77	.79	.82	.85	.88	.90	.92	.93	.93	.93	.92	.91	.90	.89	.87	.86	.84	.82	.80
5-15N																								
5N-5S 04	16.14	17.91	19.26	19.89	19.60	18.39	16.45	14.11	11.79	9.87	8.59	8.03	8.08	8.53	9.12	9.64	9.97	10.12	10.17	10.31	10.69	11.46	12.68	14.30
	1.22	1.25	1.27	1.29	1.28	1.27	1.24	1.20	1.16	1.12	1.09	1.08	1.08	1.09	1.11	1.13	1.14	1.15	1.16	1.16	1.16	1.17	1.18	1.20
	.82	.80	.79	.79	.80	.81	.83	.85	.87	.88	.88	.88	.88	.88	.88	.89	.89	.90	.90	.90	.89	.88	.86	.84
5-15S 04	0.00	11.20	16.40	23.90	21.65	23.85	27.97	17.97	8.30	4.50	7.80	7.70	7.80	7.90	0.00	4.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	1.04	1.21	1.30	1.35	1.37	1.26	1.29	1.05	1.07	1.12	1.13	1.12	1.10	0.00	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	.79	.80	.71	.77	.68	.66	.88	.88	.95	.91	.91	.95	.89	0.00	.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-25S 04	20.75	21.06	21.18	21.06	20.60	19.77	18.54	17.01	15.30	13.59	12.06	10.90	10.21	10.06	10.46	11.31	12.52	13.93	15.38	16.76	17.95	18.93	19.71	20.30
	1.25	1.26	1.27	1.27	1.26	1.25	1.23	1.20	1.17	1.15	1.13	1.12	1.11	1.12	1.13	1.14	1.16	1.17	1.19	1.20	1.21	1.22	1.23	1.24
	.79	.78	.77	.76	.76	.76	.77	.79	.80	.82	.84	.86	.87	.87	.87	.87	.87	.86	.85	.84	.83	.82	.81	.80
25-35S 04	12.40	13.29	13.80	13.84	13.38	12.47	11.21	9.75	8.29	6.96	5.90	5.13	4.67	4.46	4.43	4.56	4.81	5.21	5.78	6.55	7.53	8.69	9.96	11.24
	1.15	1.16	1.17	1.18	1.18	1.17	1.16	1.14	1.12	1.09	1.07	1.06	1.05	1.04	1.04	1.05	1.05	1.06	1.07	1.08	1.09	1.10	1.12	1.13
	.84	.83	.82	.83	.84	.85	.87	.89	.90	.92	.92	.93	.93	.93	.93	.93	.93	.93	.92	.91	.90	.88	.87	.85
35-45S 04	10.80	11.27	11.67	11.94	12.02	11.86	11.44	10.79	9.97	9.07	8.19	7.45	6.90	6.59	6.51	6.65	6.94	7.34	7.81	8.29	8.79	9.29	9.79	10.30
	1.13	1.14	1.15	1.15	1.15	1.15	1.14	1.13	1.12	1.11	1.09	1.08	1.08	1.07	1.07	1.07	1.08	1.08	1.09	1.09	1.10	1.11	1.12	1.12
	.85	.85	.84	.84	.84	.85	.85	.86	.88	.88	.89	.91	.91	.91	.91	.91	.91	.90	.89	.88	.88	.87	.87	.86
45-55S 04	13.95	13.33	13.84	14.25	13.35	14.13	15.98	14.93	14.98	13.31	11.84	11.27	8.07	7.26	5.99	8.29	8.33	8.71	10.29	10.80	11.23	10.87	13.51	13.86
	1.16	1.14	1.14	1.14	1.14	1.15	1.16	1.13	1.13	1.07	1.06	1.07	1.05	1.04	1.04	1.05	1.04	1.06	1.08	1.09	1.10	1.12	1.11	1.14
	.81	.81	.79	.79	.80	.82	.77	.78	.75	.78	.83	.81	.88	.91	.92	.88	.89	.88	.86	.85	.85	.87	.80	.82
55-65S 04	14.35	15.40	16.45	17.40	18.14	18.62	18.82	18.78	18.54	18.17	17.72	17.22	16.69	16.11	15.50	14.84	14.15	13.49	12.91	12.48	12.28	12.36	12.75	13.43
	1.14	1.15	1.16	1.17	1.19	1.20	1.21	1.21	1.21	1.20	1.18	1.16	1.14	1.12	1.11	1.10	1.09	1.10	1.10	1.11	1.12	1.12	1.13	1.13
	.79	.77	.75	.74	.73	.73	.73	.73	.74	.75	.75	.75	.75	.75	.75	.76	.77	.78	.79	.81	.82	.82	.82	.81

********** AP LESS THAN 20 -- SOLAR RANGE 0 - 40 **********

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 03	17.29	17.07	16.71	16.29	15.87	15.45	14.98	14.42	13.72	12.87	11.89	10.87	9.92	9.18	8.80	8.88	9.46	10.50	11.87	13.39	14.83	16.02	16.84	17.25
	1.22	1.21	1.21	1.20	1.20	1.19	1.19	1.18	1.17	1.16	1.15	1.13	1.12	1.11	1.11	1.11	1.12	1.13	1.15	1.16	1.19	1.20	1.21	1.22
	.78	.79	.79	.80	.80	.81	.81	.82	.83	.84	.85	.87	.88	.89	.90	.90	.88	.87	.85	.83	.81	.80	.79	.79
45-55N 03	15.20	14.96	14.64	14.28	13.93	13.57	13.21	12.83	12.40	11.93	11.44	10.96	10.55	10.28	10.22	10.43	10.91	11.63	12.49	13.39	14.20	14.81	15.18	15.30
	1.19	1.18	1.17	1.17	1.17	1.16	1.16	1.16	1.15	1.15	1.14	1.14	1.13	1.13	1.13	1.14	1.14	1.15	1.17	1.18	1.19	1.19	1.20	1.19
	.82	.81	.82	.82	.82	.82	.82	.83	.84	.85	.85	.86	.87	.88	.88	.88	.88	.87	.86	.85	.84	.83	.82	.82
35-45N 03	13.16	12.78	12.43	12.17	11.99	11.86	11.75	11.58	11.35	11.03	10.65	10.25	9.91	9.71	9.72	9.99	10.51	11.22	12.02	12.77	13.33	13.65	13.69	13.50
	1.18	1.18	1.18	1.17	1.17	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.14	1.14	1.14	1.14	1.15	1.16	1.17	1.17	1.18	1.19	1.19	1.19
	.86	.87	.87	.87	.87	.87	.87	.87	.87	.88	.89	.89	.90	.90	.90	.89	.89	.88	.87	.86	.85	.85	.85	.86
25-35N																								
15-25N 03	20.52	20.16	19.91	19.60	19.02	18.06	16.70	15.06	13.37	11.91	10.97	10.74	11.33	12.70	14.66	16.93	19.19	21.10	22.43	23.07	23.06	22.56	21.82	21.08
	1.28	1.27	1.27	1.26	1.26	1.25	1.23	1.21	1.18	1.16	1.14	1.14	1.14	1.17	1.20	1.24	1.28	1.31	1.33	1.34	1.34	1.33	1.31	1.30
	.80	.80	.80	.80	.81	.82	.83	.85	.86	.87	.87	.87	.86	.85	.83	.81	.80	.79	.78	.78	.78	.79	.79	.79
5-15N																								
5N-5S 09	17.50	20.92	23.78	25.50	25.70	24.36	21.78	18.51	15.21	12.49	10.72	10.00	10.15	10.81	11.54	11.96	11.88	11.29	10.41	9.62	9.33	9.91	11.54	14.17
	1.23	1.29	1.34	1.37	1.38	1.36	1.33	1.28	1.23	1.19	1.16	1.15	1.15	1.16	1.17	1.17	1.16	1.15	1.13	1.12	1.11	1.12	1.14	1.18
	.79	.76	.74	.73	.74	.76	.80	.83	.87	.89	.90	.91	.90	.89	.88	.87	.87	.87	.87	.88	.88	.87	.85	.82
5-15S 09	34.39	35.72	35.61	33.90	30.74	26.52	21.83	17.32	13.56	10.96	9.67	9.60	10.46	11.88	13.50	15.06	16.46	17.79	19.21	20.97	23.21	25.95	28.99	31.96
	1.53	1.55	1.55	1.53	1.48	1.41	1.33	1.26	1.19	1.14	1.11	1.10	1.11	1.13	1.15	1.17	1.20	1.23	1.26	1.29	1.34	1.38	1.44	1.49
	.67	.67	.69	.71	.75	.78	.82	.85	.87	.88	.87	.86	.85	.83	.81	.80	.79	.78	.77	.76	.74	.72	.70	.68
15-25S 09	17.37	17.98	18.34	18.28	17.75	16.87	15.89	15.10	14.79	15.10	16.04	17.43	18.99	20.39	21.34	21.68	21.36	20.51	19.34	18.12	17.12	16.53	16.43	16.76
	1.26	1.26	1.26	1.26	1.25	1.24	1.23	1.23	1.24	1.25	1.27	1.29	1.31	1.33	1.34	1.34	1.33	1.32	1.31	1.29	1.27	1.26	1.26	1.25
	.85	.84	.83	.83	.83	.83	.84	.85	.86	.87	.87	.87	.86	.85	.84	.84	.83	.84	.84	.85	.86	.86	.86	.86
25-35S 09	16.51	16.31	15.81	15.11	14.30	13.52	12.88	12.44	12.21	12.16	12.21	12.27	12.31	12.29	12.26	12.28	12.42	12.73	13.24	13.90	14.65	15.39	16.01	16.40
	1.24	1.24	1.23	1.22	1.20	1.19	1.18	1.17	1.17	1.17	1.17	1.18	1.18	1.18	1.18	1.17	1.17	1.18	1.18	1.19	1.21	1.22	1.23	1.24
	.83	.83	.84	.84	.85	.86	.86	.86	.86	.86	.86	.87	.87	.87	.87	.88	.87	.87	.87	.86	.85	.84	.83	.83
35-45S 09	12.64	12.88	13.15	13.35	13.43	13.30	12.95	12.40	11.73	11.04	10.42	9.95	9.71	9.69	9.89	10.25	10.70	11.19	11.61	11.93	12.16	12.27	12.36	12.47
	1.17	1.17	1.17	1.18	1.17	1.17	1.16	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.17
	.86	.85	.85	.85	.85	.85	.85	.86	.87	.88	.89	.90	.90	.90	.90	.90	.89	.88	.88	.87	.87	.87	.87	.86
45-55S 09	15.70	16.11	16.26	16.08	15.57	14.79	13.82	12.78	11.83	11.05	10.53	10.25	10.20	10.33	10.58	10.89	11.23	11.61	12.04	12.53	13.10	13.75	14.43	15.12
	1.19	1.19	1.19	1.20	1.19	1.19	1.18	1.17	1.16	1.14	1.13	1.12	1.12	1.12	1.13	1.13	1.14	1.15	1.15	1.16	1.17	1.17	1.18	1.18
	.83	.83	.82	.82	.82	.82	.83	.84	.85	.86	.87	.88	.88	.88	.88	.88	.87	.87	.87	.86	.86	.85	.84	.84
55-65S 09	17.37	17.22	16.77	16.11	15.30	14.43	13.55	12.72	11.95	11.25	10.65	10.14	9.76	9.53	9.51	9.75	10.28	11.10	12.16	13.37	14.61	15.73	16.61	17.17
	1.25	1.25	1.25	1.24	1.22	1.21	1.19	1.17	1.16	1.15	1.14	1.13	1.13	1.12	1.12	1.12	1.13	1.14	1.15	1.17	1.19	1.21	1.23	1.24
	.82	.83	.85	.86	.86	.87	.87	.87	.87	.87	.87	.87	.88	.88	.88	.87	.86	.85	.84	.82	.81	.80	.80	.81

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 04	18.68	18.97	18.74	18.07	17.13	16.10	15.13	14.31	13.69	13.21	12.81	12.40	11.91	11.35	10.78	10.32	10.12	10.30	10.94	12.02	13.44	15.04	16.58	17.85
	1.22	1.23	1.23	1.22	1.22	1.20	1.19	1.18	1.17	1.16	1.15	1.14	1.14	1.13	1.12	1.12	1.11	1.11	1.12	1.13	1.15	1.16	1.19	1.20
	.75	.75	.75	.77	.78	.80	.81	.82	.82	.83	.83	.84	.84	.85	.86	.87	.87	.86	.85	.84	.81	.79	.77	.75
45-55N 04	15.73	15.85	15.78	15.56	15.20	14.76	14.29	13.85	13.45	13.13	12.86	12.65	12.48	12.35	12.28	12.28	12.38	12.60	12.95	13.40	13.94	14.49	15.01	15.44
	1.18	1.18	1.18	1.18	1.19	1.18	1.18	1.18	1.17	1.17	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.15	1.15	1.16	1.17	1.17	1.18	1.18
	.79	.79	.79	.80	.81	.82	.82	.83	.83	.84	.84	.84	.84	.84	.85	.85	.85	.84	.84	.83	.82	.81	.80	.80
35-45N 04	13.65	13.37	13.02	12.65	12.30	11.98	11.72	11.51	11.35	11.23	11.13	11.05	10.99	10.98	11.03	11.18	11.44	11.82	12.29	12.79	13.25	13.60	13.79	13.80
	1.17	1.16	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.16	1.16	1.16	1.17	1.17
	.82	.82	.83	.83	.84	.84	.85	.85	.85	.86	.87	.87	.88	.88	.88	.88	.87	.86	.85	.83	.82	.82	.81	.82
25-35N																								
15-25N 04	24.57	24.22	23.55	22.57	21.31	19.82	18.20	16.59	15.14	13.97	13.19	12.86	13.00	13.59	14.55	15.81	17.27	18.81	20.32	21.70	22.86	23.75	24.33	24.60
	1.36	1.35	1.34	1.32	1.30	1.28	1.25	1.22	1.20	1.18	1.17	1.16	1.16	1.17	1.18	1.19	1.22	1.24	1.27	1.29	1.32	1.34	1.35	1.36
	.77	.77	.78	.78	.79	.80	.81	.82	.83	.84	.84	.84	.84	.83	.81	.80	.78	.77	.76	.75	.75	.75	.76	.76
5-15N																								
5N-5S 10	20.20	22.98	25.04	25.94	25.50	23.76	21.07	17.94	14.93	12.52	10.99	10.37	10.47	10.96	11.48	11.78	11.73	11.40	11.02	10.90	11.32	12.52	14.53	17.20
	1.28	1.32	1.36	1.38	1.38	1.35	1.31	1.26	1.22	1.18	1.15	1.14	1.14	1.14	1.15	1.15	1.15	1.14	1.13	1.13	1.13	1.15	1.18	1.23
	.76	.74	.72	.72	.73	.76	.79	.82	.85	.88	.89	.90	.89	.89	.88	.87	.87	.87	.87	.87	.86	.85	.82	.79
5-15S 10	25.53	26.94	27.56	27.22	25.87	23.64	20.78	17.64	14.58	11.94	9.96	8.72	8.22	8.33	8.91	9.80	10.90	12.15	13.57	15.20	17.05	19.13	21.36	23.56
	1.35	1.38	1.40	1.41	1.40	1.37	1.32	1.27	1.22	1.17	1.13	1.11	1.10	1.09	1.10	1.11	1.13	1.14	1.16	1.18	1.21	1.24	1.27	1.31
	.70	.69	.69	.70	.73	.76	.79	.82	.85	.88	.89	.90	.90	.89	.89	.87	.86	.85	.83	.81	.79	.76	.74	.72
15-25S 10	22.52	22.76	22.73	22.31	21.45	20.20	18.70	17.14	15.76	14.75	14.23	14.24	14.73	15.58	16.63	17.71	18.70	19.51	20.13	20.59	20.96	21.32	21.70	22.12
	1.28	1.28	1.29	1.29	1.29	1.28	1.26	1.24	1.22	1.20	1.19	1.19	1.19	1.20	1.21	1.23	1.24	1.25	1.26	1.27	1.27	1.27	1.27	1.27
	.73	.73	.73	.74	.75	.77	.79	.81	.83	.83	.83	.82	.81	.80	.78	.77	.76	.75	.75	.75	.75	.75	.74	.74
25-35S 10	17.79	18.07	17.97	17.47	16.62	15.57	14.51	13.63	13.07	12.92	13.13	13.63	14.25	14.84	15.27	15.49	15.51	15.41	15.31	15.32	15.54	15.98	16.58	17.24
	1.23	1.24	1.24	1.23	1.22	1.21	1.20	1.18	1.17	1.17	1.17	1.17	1.18	1.19	1.21	1.22	1.22	1.23	1.22	1.22	1.22	1.22	1.22	1.23
	.79	.79	.80	.81	.82	.83	.84	.84	.84	.84	.83	.82	.82	.82	.82	.82	.82	.83	.83	.83	.83	.82	.81	.80
35-45S 10	14.75	15.03	15.20	15.21	15.03	14.66	14.14	13.56	12.99	12.51	12.17	12.00	11.98	12.09	12.27	12.51	12.75	12.98	13.19	13.39	13.59	13.83	14.11	14.43
	1.20	1.21	1.21	1.21	1.21	1.20	1.19	1.19	1.17	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.17	1.18	1.18	1.18	1.18	1.19	1.19	1.20
	.83	.83	.83	.83	.83	.83	.83	.84	.84	.85	.85	.85	.86	.86	.86	.86	.86	.85	.85	.85	.84	.84	.84	.83
45-55S 10	15.38	15.41	15.30	15.03	14.64	14.16	13.65	13.18	12.80	12.53	12.41	12.38	12.44	12.54	12.68	12.85	13.06	13.30	13.59	13.92	14.28	14.63	14.95	15.21
	1.21	1.21	1.21	1.20	1.19	1.18	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.18	1.18	1.19	1.19	1.20	1.20	1.21
	.83	.82	.82	.82	.82	.83	.84	.84	.84	.85	.85	.85	.85	.85	.85	.85	.85	.85	.84	.84	.84	.84	.83	.83
55-65S 10	20.57	20.59	20.01	18.95	17.58	16.13	14.80	13.75	13.03	12.62	12.44	12.36	12.29	12.16	12.01	11.92	12.01	12.41	13.19	14.35	15.80	17.36	18.82	19.95
	1.31	1.31	1.31	1.29	1.27	1.24	1.22	1.20	1.18	1.17	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.16	1.17	1.19	1.22	1.24	1.27	1.29
	.78	.79	.80	.82	.84	.85	.86	.86	.86	.85	.85	.84	.84	.84	.85	.85	.85	.85	.84	.82	.81	.79	.78	.78

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 09	17.63	17.61	17.21	16.54	15.73	14.89	14.11	13.43	12.85	12.32	11.81	11.26	10.69	10.15	9.71	9.51	9.65	10.20	11.13	12.38	13.80	15.19	16.38	17.22
	1.23	1.22	1.22	1.21	1.20	1.19	1.18	1.17	1.17	1.16	1.15	1.15	1.13	1.12	1.12	1.11	1.12	1.12	1.14	1.16	1.18	1.20	1.21	1.22
	.77	.78	.78	.79	.80	.82	.83	.84	.84	.85	.86	.86	.87	.88	.88	.89	.88	.87	.86	.84	.82	.81	.79	.78
45-55N 09	16.18	15.95	15.59	15.18	14.76	14.33	13.88	13.42	12.91	12.34	11.75	11.17	10.67	10.33	10.24	10.45	10.99	11.80	12.78	13.83	14.78	15.53	16.02	16.23
	1.21	1.21	1.20	1.19	1.19	1.18	1.17	1.16	1.15	1.15	1.14	1.13	1.12	1.12	1.12	1.13	1.13	1.15	1.17	1.18	1.19	1.21	1.21	1.21
	.81	.82	.82	.83	.83	.83	.83	.84	.84	.85	.85	.86	.86	.87	.87	.87	.87	.86	.85	.84	.83	.82	.81	.81
35-45N 09	13.19	13.00	12.78	12.56	12.36	12.16	11.95	11.72	11.45	11.14	10.81	10.47	10.18	10.00	9.97	10.12	10.47	10.98	11.57	12.17	12.69	13.07	13.27	13.30
	1.18	1.18	1.18	1.17	1.17	1.17	1.16	1.16	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.14	1.14	1.15	1.16	1.16	1.17	1.18	1.18	1.18
	.85	.86	.86	.86	.87	.87	.87	.87	.87	.87	.88	.89	.89	.90	.90	.90	.89	.89	.88	.86	.85	.85	.85	.85
25-35N																								
15-25N 09	24.15	23.72	23.07	22.18	21.07	19.78	18.39	17.01	15.76	14.72	13.99	13.62	13.65	14.09	14.92	16.11	17.55	19.12	20.66	22.04	23.13	23.87	24.27	24.35
	1.35	1.34	1.34	1.33	1.31	1.30	1.28	1.26	1.23	1.21	1.20	1.19	1.18	1.18	1.19	1.21	1.23	1.25	1.28	1.30	1.32	1.34	1.34	1.35
	.80	.81	.81	.81	.82	.82	.83	.83	.84	.84	.84	.84	.84	.83	.82	.80	.79	.78	.77	.76	.77	.78	.78	.79
5-15N																								
5N-5S 03	18.03	20.06	21.55	22.20	21.87	20.61	18.64	16.32	14.04	12.12	10.76	10.03	9.82	9.95	10.21	10.41	10.48	10.44	10.41	10.57	11.11	12.17	13.77	15.80
	1.24	1.27	1.29	1.30	1.30	1.28	1.26	1.23	1.20	1.17	1.15	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.15	1.16	1.18	1.21
	.79	.77	.75	.74	.74	.76	.78	.81	.84	.86	.88	.89	.89	.89	.88	.88	.88	.87	.87	.87	.86	.85	.84	.81
5-15S 03	25.86	27.67	28.61	28.44	27.08	24.65	21.49	18.04	14.76	12.05	10.16	9.15	8.94	9.35	10.13	11.08	12.07	13.08	14.15	15.40	16.95	18.87	21.12	23.54
	1.35	1.38	1.40	1.41	1.39	1.36	1.31	1.26	1.20	1.16	1.13	1.11	1.10	1.11	1.12	1.13	1.15	1.16	1.18	1.19	1.21	1.24	1.27	1.31
	.70	.69	.69	.70	.72	.74	.78	.81	.84	.87	.88	.89	.89	.89	.88	.86	.85	.83	.82	.80	.78	.76	.74	.72
15-25S 03	20.14	19.79	19.32	18.70	17.92	17.01	16.06	15.18	14.49	14.07	13.97	14.19	14.70	15.42	16.29	17.22	18.13	18.97	19.66	20.16	20.47	20.58	20.54	20.39
	1.27	1.26	1.25	1.25	1.24	1.23	1.22	1.22	1.21	1.20	1.20	1.21	1.21	1.22	1.24	1.25	1.27	1.28	1.29	1.29	1.29	1.29	1.28	1.27
	.79	.79	.80	.80	.81	.82	.83	.84	.85	.85	.85	.85	.84	.83	.82	.81	.81	.80	.79	.79	.79	.79	.79	.79
25-35S 03	14.79	14.71	14.52	14.26	13.92	13.55	13.17	12.82	12.54	12.33	12.20	12.15	12.16	12.23	12.36	12.54	12.79	13.10	13.46	13.82	14.17	14.46	14.67	14.78
	1.21	1.21	1.20	1.20	1.19	1.18	1.18	1.17	1.16	1.16	1.15	1.15	1.15	1.15	1.15	1.16	1.16	1.17	1.17	1.18	1.19	1.20	1.20	1.21
	.84	.84	.84	.84	.85	.85	.85	.85	.85	.85	.85	.85	.85	.85	.84	.84	.84	.84	.84	.84	.84	.84	.84	.84
35-45S 03	12.71	12.57	12.49	12.45	12.49	12.55	12.61	12.66	12.67	12.64	12.59	12.51	12.45	12.42	12.44	12.51	12.63	12.80	12.96	13.09	13.15	13.13	13.03	12.88
	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.17	1.16	1.16	1.16	1.17	1.17	1.17	1.17	1.18	1.18	1.18	1.18	1.17	1.17	1.17	1.17	1.17
	.87	.87	.87	.86	.86	.86	.86	.86	.85	.85	.85	.85	.86	.86	.86	.86	.86	.86	.86	.87	.86	.86	.87	.87
45-55S 03	13.81	13.95	14.01	13.97	13.83	13.59	13.27	12.91	12.56	12.27	12.06	11.94	11.89	11.90	11.94	12.02	12.13	12.27	12.44	12.66	12.90	13.15	13.39	13.61
	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.16	1.16	1.15	1.15	1.15	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.17
	.82	.83	.83	.83	.83	.83	.84	.84	.85	.85	.85	.86	.86	.87	.87	.87	.86	.86	.85	.85	.84	.84	.83	.83
55-65S 03	17.47	17.72	17.55	17.00	16.18	15.24	14.33	13.55	12.98	12.62	12.40	12.26	12.10	11.89	11.64	11.41	11.29	11.39	11.80	12.52	13.52	14.67	15.82	16.80
	1.21	1.21	1.21	1.21	1.20	1.19	1.18	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.15	1.15	1.15	1.15	1.16	1.16	1.18	1.19	1.20
	.76	.76	.76	.77	.79	.80	.82	.83	.84	.84	.85	.85	.85	.86	.86	.87	.87	.87	.86	.85	.83	.81	.79	.77

MONTH		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	10	16.98	16.78	16.54	16.32	16.10	15.85	15.53	15.10	14.53	13.84	13.07	12.32	11.69	11.28	11.18	11.45	12.07	12.98	14.03	15.09	15.99	16.65	17.01	17.09
		1.22	1.22	1.22	1.21	1.21	1.21	1.21	1.20	1.19	1.18	1.17	1.16	1.15	1.14	1.14	1.14	1.15	1.17	1.18	1.20	1.21	1.22	1.23	1.23
		.80	.80	.80	.81	.81	.81	.82	.82	.83	.83	.84	.85	.85	.86	.86	.86	.85	.85	.84	.82	.82	.81	.80	.80
45-55N	10	15.22	15.06	14.94	14.84	14.74	14.58	14.34	14.00	13.59	13.13	12.69	12.34	12.13	12.11	12.30	12.70	13.25	13.87	14.48	14.99	15.34	15.50	15.50	15.38
		1.19	1.19	1.19	1.19	1.19	1.19	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.15	1.16	1.17	1.18	1.19	1.20	1.20	1.21	1.21	1.21	1.20
		.82	.82	.82	.82	.82	.82	.83	.83	.83	.84	.85	.85	.86	.86	.86	.86	.85	.85	.84	.84	.83	.83	.82	.82
35-45N	10	12.95	12.63	12.49	12.49	12.57	12.63	12.58	12.37	12.01	11.52	11.01	10.59	10.37	10.44	10.82	11.48	12.30	13.15	13.87	14.33	14.48	14.30	13.91	13.42
		1.18	1.18	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.15	1.16	1.18	1.19	1.20	1.20	1.20	1.19	1.19
		.87	.87	.88	.87	.87	.86	.86	.87	.87	.87	.88	.88	.88	.88	.88	.87	.86	.85	.85	.84	.84	.85	.85	.86
25-35N																									
15-25N	10	22.36	22.00	21.36	20.41	19.15	17.65	16.08	14.60	13.40	12.64	12.38	12.66	13.43	14.56	15.94	17.40	18.80	20.03	21.01	21.72	22.18	22.43	22.54	22.52
		1.31	1.31	1.30	1.29	1.27	1.25	1.23	1.20	1.18	1.16	1.16	1.16	1.16	1.18	1.21	1.23	1.26	1.28	1.30	1.31	1.32	1.32	1.32	1.32
		.79	.79	.80	.80	.81	.82	.83	.84	.85	.85	.85	.84	.83	.82	.81	.80	.79	.79	.79	.79	.79	.80	.80	.80
5-15N																									
5N-5S	04	16.07	18.62	20.77	22.08	22.27	21.35	19.53	17.23	14.96	13.13	12.01	11.62	11.81	12.28	12.70	12.82	12.52	11.86	11.02	10.29	10.00	10.39	11.60	13.56
		1.21	1.25	1.29	1.31	1.32	1.31	1.28	1.24	1.20	1.18	1.16	1.15	1.16	1.17	1.18	1.19	1.18	1.17	1.15	1.14	1.13	1.13	1.14	1.17
		.81	.79	.77	.77	.77	.78	.79	.81	.83	.85	.86	.86	.87	.87	.87	.87	.87	.87	.87	.87	.87	.86	.85	.83
5-15S	04	29.75	31.49	32.14	31.51	29.64	26.75	23.23	19.57	16.21	13.51	11.65	10.65	10.35	10.56	11.06	11.72	12.51	13.50	14.79	16.51	18.72	21.37	24.29	27.20
		1.40	1.44	1.46	1.46	1.44	1.40	1.34	1.28	1.22	1.17	1.14	1.13	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.20	1.23	1.26	1.31	1.35
		.67	.67	.69	.71	.74	.78	.81	.83	.85	.86	.86	.86	.86	.86	.85	.85	.84	.83	.81	.79	.76	.73	.70	.68
15-25S	04	17.61	17.97	18.34	18.59	18.64	18.47	18.14	17.77	17.50	17.45	17.66	18.12	18.74	19.40	19.95	20.28	20.32	20.06	19.56	18.91	18.26	17.73	17.42	17.39
		1.25	1.26	1.26	1.27	1.26	1.26	1.26	1.25	1.26	1.26	1.27	1.29	1.30	1.31	1.32	1.32	1.31	1.30	1.28	1.26	1.25	1.25	1.24	1.25
		.83	.83	.82	.82	.82	.82	.82	.83	.83	.83	.84	.83	.83	.83	.82	.82	.82	.82	.82	.82	.83	.83	.83	.83
25-35S	04	16.15	15.73	15.22	14.66	14.05	13.44	12.85	12.34	11.95	11.73	11.67	11.79	12.07	12.47	12.98	13.57	14.22	14.89	15.52	16.05	16.44	16.64	16.64	16.47
		1.22	1.21	1.20	1.19	1.18	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.18	1.19	1.20	1.21	1.22	1.23	1.23	1.23	1.23	1.23
		.84	.84	.84	.84	.85	.85	.86	.86	.86	.87	.86	.86	.86	.85	.85	.84	.84	.84	.84	.84	.84	.84	.84	.84
35-45S	04	14.08	13.83	13.72	13.69	13.69	13.63	13.45	13.17	12.81	12.43	12.12	11.95	11.99	12.26	12.75	13.38	14.07	14.71	15.20	15.45	15.46	15.24	14.86	14.44
		1.18	1.18	1.18	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.18	1.19	1.20	1.21	1.22	1.22	1.21	1.20	1.19
		.86	.85	.85	.84	.84	.84	.85	.85	.86	.87	.87	.87	.88	.88	.87	.86	.86	.85	.85	.85	.85	.85	.86	.86
45-55S	04	14.48	14.26	14.18	14.17	14.17	14.09	13.85	13.46	12.95	12.42	11.95	11.68	11.67	11.93	12.48	13.21	14.02	14.78	15.38	15.72	15.78	15.59	15.24	14.83
		1.18	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.15	1.14	1.14	1.14	1.14	1.15	1.16	1.18	1.19	1.20	1.21	1.21	1.20	1.20	1.19
		.83	.83	.83	.83	.83	.83	.83	.84	.85	.85	.86	.86	.86	.86	.86	.85	.85	.84	.83	.82	.82	.82	.82	.83
55-65S	04	20.75	21.04	21.12	20.93	20.41	19.56	18.41	17.07	15.66	14.34	13.24	12.47	12.08	12.09	12.46	13.14	14.04	15.07	16.16	17.21	18.17	19.01	19.72	20.31
		1.28	1.29	1.29	1.29	1.29	1.28	1.26	1.23	1.21	1.18	1.16	1.15	1.14	1.14	1.14	1.16	1.17	1.19	1.21	1.23	1.24	1.25	1.26	1.27
		.76	.76	.77	.78	.79	.80	.81	.82	.83	.84	.84	.84	.85	.85	.84	.84	.83	.82	.81	.80	.79	.77	.76	.76

********** AP LESS THAN 20 -- SOLAR RANGE 41 - 109 **********

	MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	03	18.76	19.14	19.22	19.07	18.74	18.30	17.78	17.21	16.58	15.86	15.05	14.17	13.25	12.39	11.66	11.21	11.12	11.43	12.15	13.21	14.48	15.81	17.04	18.05
		1.24	1.25	1.25	1.24	1.24	1.24	1.23	1.22	1.21	1.20	1.18	1.17	1.15	1.14	1.13	1.12	1.13	1.14	1.15	1.17	1.19	1.21	1.23	1.24
		.77	.77	.76	.77	.77	.77	.78	.79	.79	.79	.80	.80	.81	.83	.83	.84	.85	.85	.85	.84	.82	.81	.80	.78
45-55N	03	14.71	14.79	14.77	14.68	14.57	14.43	14.25	14.01	13.68	13.22	12.66	12.02	11.37	10.80	10.38	10.19	10.27	10.63	11.20	11.93	12.71	13.44	14.04	14.47
		1.19	1.19	1.19	1.19	1.19	1.18	1.17	1.16	1.16	1.14	1.13	1.12	1.12	1.11	1.10	1.10	1.11	1.12	1.13	1.15	1.16	1.17	1.18	1.19
		.82	.82	.82	.82	.82	.82	.82	.81	.82	.82	.82	.83	.84	.84	.85	.86	.86	.86	.85	.85	.85	.84	.83	.83
35-45N	03	12.41	12.23	12.04	11.85	11.65	11.39	11.03	10.54	9.92	9.20	8.49	7.87	7.44	7.30	7.47	7.95	8.68	9.57	10.48	11.30	11.94	12.36	12.55	12.55
		1.17	1.17	1.17	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.09	1.09	1.09	1.10	1.11	1.12	1.14	1.15	1.16	1.17	1.17	1.17
		.86	.86	.87	.87	.87	.87	.87	.88	.88	.89	.90	.91	.91	.91	.91	.91	.90	.89	.88	.87	.86	.86	.86	.86
25-35N																									
15-25N	03	29.52	30.57	30.50	29.23	26.87	23.67	20.01	16.32	12.98	10.31	8.46	7.44	7.17	7.49	8.25	9.33	10.70	12.35	14.33	16.65	19.29	22.14	24.98	27.55
		1.46	1.48	1.47	1.44	1.39	1.34	1.27	1.21	1.16	1.13	1.11	1.10	1.10	1.11	1.12	1.13	1.15	1.17	1.20	1.24	1.28	1.34	1.39	1.43
		.75	.75	.75	.76	.77	.79	.82	.84	.87	.89	.91	.91	.92	.91	.90	.89	.87	.85	.83	.82	.80	.78	.77	.76
5-15N																									
5N-5S	09	16.14	17.93	19.45	20.34	20.38	19.51	17.87	15.76	13.57	11.66	10.32	9.65	9.59	9.97	10.54	11.09	11.45	11.59	11.56	11.51	11.62	12.09	13.01	14.40
		1.22	1.24	1.26	1.27	1.27	1.26	1.24	1.21	1.18	1.16	1.15	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.17	1.17	1.18	1.20
		.80	.78	.76	.75	.75	.76	.79	.82	.85	.87	.89	.90	.90	.90	.89	.88	.87	.87	.87	.87	.87	.86	.85	.83
5-15S	09	21.32	23.51	24.97	25.41	24.69	22.87	20.21	17.09	13.97	11.23	9.17	7.90	7.37	7.41	7.81	8.34	8.90	9.45	10.10	10.98	12.26	14.01	16.23	18.76
		1.26	1.30	1.34	1.36	1.36	1.33	1.29	1.24	1.19	1.14	1.10	1.08	1.07	1.07	1.08	1.09	1.09	1.09	1.10	1.10	1.11	1.13	1.17	1.21
		.73	.71	.70	.71	.72	.75	.78	.81	.84	.87	.88	.89	.90	.89	.89	.88	.87	.87	.86	.84	.83	.81	.78	.75
15-25S	09	25.13	24.75	24.18	23.38	22.33	21.02	19.53	17.97	16.51	15.31	14.52	14.23	14.46	15.19	16.33	17.75	19.31	20.87	22.30	23.51	24.41	24.99	25.28	25.31
		1.32	1.32	1.32	1.31	1.31	1.30	1.28	1.26	1.23	1.21	1.20	1.19	1.19	1.20	1.22	1.24	1.26	1.28	1.30	1.31	1.32	1.32	1.32	1.32
		.78	.77	.77	.77	.78	.79	.80	.81	.82	.83	.83	.83	.82	.81	.80	.79	.79	.79	.78	.78	.79	.79	.78	.78
25-35S	09	15.10	15.74	16.04	15.91	15.37	14.47	13.36	12.18	11.10	10.24	9.67	9.39	9.34	9.43	9.59	9.77	9.95	10.16	10.47	10.91	11.53	12.33	13.26	14.23
		1.20	1.21	1.22	1.22	1.22	1.20	1.18	1.16	1.15	1.13	1.12	1.12	1.12	1.12	1.12	1.13	1.13	1.13	1.13	1.13	1.14	1.15	1.17	1.18
		.82	.81	.82	.82	.83	.84	.85	.86	.87	.88	.88	.89	.89	.89	.89	.89	.88	.88	.87	.86	.85	.84	.83	.82
35-45S	09	13.15	13.51	13.82	14.04	14.12	14.03	13.74	13.26	12.63	11.91	11.17	10.51	9.98	9.63	9.49	9.54	9.76	10.12	10.56	11.03	11.50	11.95	12.37	12.77
		1.17	1.17	1.18	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.14	1.14	1.13	1.13	1.13	1.13	1.14	1.14	1.15	1.15	1.16	1.17	1.17	1.17
		.84	.83	.83	.83	.83	.83	.83	.84	.85	.86	.87	.88	.88	.89	.89	.89	.89	.88	.88	.87	.87	.86	.85	.85
45-55S	09	15.04	15.44	15.71	15.81	15.72	15.44	15.01	14.45	13.81	13.15	12.52	11.98	11.53	11.23	11.06	11.01	11.12	11.36	11.74	12.20	12.76	13.35	13.96	14.53
		1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.15	1.14	1.14	1.13	1.12	1.12	1.12	1.12	1.12	1.13	1.13	1.14	1.15	1.15	1.16	1.16	1.17
		.79	.79	.78	.78	.78	.79	.79	.80	.81	.82	.83	.84	.85	.85	.85	.86	.86	.85	.85	.85	.84	.83	.82	.81
55-65S	09	21.10	21.92	22.20	21.92	21.14	19.99	18.66	17.33	16.14	15.19	14.48	13.99	13.62	13.32	13.05	12.83	12.73	12.85	13.29	14.11	15.29	16.74	18.32	19.84
		1.25	1.27	1.28	1.29	1.28	1.27	1.25	1.22	1.20	1.18	1.16	1.15	1.14	1.14	1.14	1.14	1.14	1.14	1.15	1.16	1.17	1.19	1.21	1.23
		.72	.71	.72	.73	.74	.76	.77	.79	.79	.79	.79	.79	.79	.80	.80	.81	.82	.82	.82	.81	.79	.77	.75	.73

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 04	17.11	17.57	17.67	17.46	17.02	16.48	15.96	15.53	15.22	14.99	14.79	14.53	14.16	13.66	13.08	12.51	12.05	11.83	11.94	12.40	13.19	14.21	15.30	16.32
	1.18	1.19	1.20	1.20	1.20	1.19	1.18	1.18	1.17	1.16	1.15	1.15	1.14	1.13	1.13	1.12	1.11	1.11	1.11	1.12	1.13	1.14	1.15	1.17
	.76	.75	.76	.76	.77	.78	.79	.79	.79	.79	.80	.79	.80	.81	.81	.82	.83	.83	.83	.82	.81	.80	.78	.76
45-55N 04	12.93	13.14	13.36	13.61	13.89	14.19	14.51	14.83	15.10	15.31	15.38	15.32	15.12	14.78	14.35	13.88	13.41	13.01	12.70	12.50	12.43	12.46	12.56	12.73
	1.14	1.14	1.14	1.15	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.16	1.15	1.15	1.14	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.14	1.14
	.83	.82	.81	.81	.80	.80	.80	.79	.79	.78	.78	.77	.77	.78	.78	.79	.80	.81	.82	.83	.84	.84	.83	.83
35-45N 04	10.90	11.10	11.37	11.70	12.01	12.23	12.27	12.10	11.71	11.15	10.50	9.87	9.33	8.98	8.85	8.92	9.17	9.52	9.89	10.22	10.47	10.62	10.71	10.79
	1.14	1.13	1.13	1.13	1.14	1.14	1.14	1.13	1.13	1.12	1.11	1.10	1.09	1.08	1.09	1.09	1.10	1.10	1.11	1.12	1.13	1.13	1.13	1.14
	.86	.86	.85	.85	.84	.84	.83	.83	.84	.85	.86	.87	.88	.88	.89	.88	.88	.88	.87	.87	.87	.87	.87	.87
25-35N																								
15-25N 04	21.05	21.75	22.00	21.69	20.77	19.28	17.31	15.07	12.79	10.71	9.04	7.91	7.36	7.37	7.86	8.73	9.88	11.22	12.68	14.20	15.75	17.27	18.70	19.99
	1.28	1.28	1.28	1.28	1.27	1.25	1.22	1.19	1.16	1.14	1.11	1.10	1.09	1.09	1.10	1.12	1.14	1.16	1.18	1.20	1.22	1.24	1.26	1.27
	.76	.76	.76	.76	.77	.79	.81	.84	.86	.88	.89	.90	.91	.91	.91	.90	.89	.88	.86	.85	.83	.81	.79	.78
5-15N																								
5N-5S 10	16.26	18.25	19.87	20.81	20.86	19.97	18.31	16.18	13.96	12.01	10.57	9.74	9.47	9.59	9.88	10.16	10.30	10.31	10.25	10.28	10.59	11.32	12.56	14.26
	1.20	1.23	1.26	1.28	1.28	1.28	1.26	1.23	1.20	1.18	1.16	1.14	1.13	1.13	1.13	1.13	1.12	1.12	1.11	1.11	1.11	1.12	1.14	1.17
	.81	.79	.79	.78	.79	.80	.81	.83	.86	.87	.89	.89	.89	.89	.88	.88	.87	.86	.86	.85	.85	.84	.83	.82
5-15S 10	18.07	19.90	21.09	21.43	20.85	19.41	17.33	14.90	12.43	10.20	8.42	7.17	6.45	6.15	6.16	6.35	6.68	7.12	7.75	8.66	9.93	11.62	13.65	15.88
	1.22	1.26	1.28	1.30	1.30	1.28	1.25	1.21	1.17	1.14	1.11	1.09	1.08	1.07	1.07	1.07	1.07	1.08	1.08	1.09	1.10	1.12	1.15	1.19
	.77	.76	.75	.75	.77	.78	.81	.83	.86	.88	.90	.91	.92	.92	.92	.91	.91	.90	.89	.87	.85	.83	.81	.79
15-25S 10	18.39	18.48	18.46	18.26	17.79	17.02	15.97	14.74	13.48	12.36	11.54	11.12	11.16	11.62	12.42	13.44	14.54	15.58	16.48	17.16	17.64	17.94	18.14	18.27
	1.24	1.24	1.24	1.24	1.24	1.23	1.21	1.20	1.18	1.16	1.15	1.15	1.15	1.15	1.16	1.18	1.19	1.21	1.22	1.23	1.24	1.24	1.24	1.24
	.81	.81	.80	.80	.80	.80	.81	.83	.84	.85	.86	.86	.86	.86	.85	.84	.83	.82	.82	.82	.82	.82	.82	.81
25-35S 10	13.78	14.79	15.51	15.78	15.53	14.79	13.66	12.33	11.02	9.91	9.13	8.73	8.66	8.82	9.09	9.36	9.55	9.66	9.75	9.91	10.24	10.80	11.63	12.66
	1.19	1.21	1.22	1.22	1.22	1.21	1.19	1.16	1.14	1.12	1.11	1.10	1.10	1.10	1.10	1.11	1.11	1.12	1.12	1.12	1.13	1.14	1.15	1.17
	.84	.83	.83	.83	.83	.84	.85	.86	.87	.88	.88	.88	.88	.88	.88	.88	.88	.88	.88	.88	.88	.87	.86	.85
35-45S 10	12.77	13.38	13.91	14.30	14.49	14.46	14.20	13.78	13.23	12.64	12.08	11.59	11.21	10.94	10.76	10.65	10.59	10.57	10.60	10.68	10.88	11.19	11.62	12.16
	1.16	1.17	1.18	1.19	1.18	1.18	1.17	1.17	1.16	1.14	1.13	1.12	1.12	1.12	1.12	1.12	1.12	1.13	1.13	1.13	1.13	1.13	1.14	1.15
	.85	.84	.83	.83	.82	.82	.82	.82	.83	.83	.84	.85	.86	.86	.87	.87	.87	.87	.87	.87	.86	.86	.86	.85
45-55S 10	13.72	14.10	14.41	14.60	14.71	14.75	14.75	14.74	14.70	14.66	14.57	14.42	14.17	13.83	13.42	12.98	12.56	12.22	12.02	11.99	12.13	12.42	12.82	13.26
	1.17	1.17	1.17	1.18	1.18	1.18	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.14	1.14	1.13	1.13	1.13	1.14	1.14	1.15	1.15	1.16	1.16
	.83	.82	.82	.82	.82	.81	.81	.80	.80	.80	.80	.80	.80	.80	.80	.82	.83	.84	.85	.85	.85	.85	.84	.84
55-65S 10	17.22	18.05	18.45	18.35	17.81	16.99	16.06	15.22	14.60	14.27	14.18	14.23	14.28	14.22	13.99	13.58	13.07	12.62	12.36	12.42	12.88	13.71	14.83	16.07
	1.19	1.20	1.21	1.21	1.21	1.21	1.20	1.20	1.19	1.19	1.19	1.19	1.18	1.18	1.17	1.16	1.16	1.15	1.15	1.15	1.15	1.16	1.17	1.18
	.76	.75	.74	.75	.76	.78	.79	.81	.82	.83	.83	.82	.82	.81	.81	.82	.82	.83	.83	.83	.82	.81	.80	.78

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 09	18.12	18.41	18.30	17.85	17.18	16.43	15.74	15.18	14.78	14.50	14.27	14.00	13.64	13.17	12.66	12.19	11.89	11.88	12.23	12.96	13.98	15.18	16.39	17.41
	1.20	1.21	1.21	1.21	1.20	1.20	1.19	1.18	1.17	1.17	1.17	1.16	1.16	1.16	1.15	1.14	1.14	1.13	1.13	1.14	1.15	1.16	1.18	1.19
	.76	.75	.75	.76	.77	.78	.79	.80	.81	.81	.82	.82	.83	.84	.84	.85	.85	.85	.84	.83	.81	.80	.78	.76
45-55N 09	15.40	15.54	15.58	15.57	15.51	15.43	15.35	15.27	15.15	14.99	14.75	14.45	14.08	13.68	13.31	13.03	12.88	12.90	13.10	13.44	13.87	14.34	14.78	15.14
	1.18	1.18	1.18	1.18	1.18	1.18	1.17	1.18	1.18	1.17	1.17	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.17	1.17
	.79	.79	.79	.78	.79	.79	.79	.79	.79	.80	.80	.81	.81	.82	.83	.83	.84	.84	.84	.83	.82	.82	.81	.80
35-45N 09	12.88	12.75	12.62	12.51	12.44	12.39	12.32	12.19	11.98	11.65	11.24	10.79	10.36	10.03	9.88	9.94	10.22	10.67	11.24	11.82	12.33	12.70	12.91	12.95
	1.16	1.15	1.15	1.15	1.15	1.14	1.14	1.14	1.14	1.13	1.13	1.13	1.12	1.12	1.12	1.12	1.12	1.13	1.14	1.14	1.15	1.15	1.16	1.16
	.84	.84	.84	.84	.84	.84	.84	.84	.84	.85	.85	.86	.87	.87	.87	.88	.87	.86	.86	.85	.84	.83	.83	.83
25-35N																								
15-25N 09	25.99	26.17	25.79	24.82	23.30	21.35	19.13	16.85	14.72	12.90	11.54	10.69	10.39	10.60	11.28	12.36	13.79	15.46	17.29	19.18	21.03	22.73	24.18	25.30
	1.40	1.41	1.40	1.39	1.36	1.32	1.28	1.24	1.20	1.16	1.14	1.12	1.12	1.12	1.13	1.15	1.18	1.21	1.25	1.28	1.31	1.34	1.36	1.39
	.75	.76	.76	.77	.78	.80	.81	.83	.84	.85	.86	.86	.86	.86	.85	.84	.83	.82	.81	.79	.78	.77	.76	.76
5-15N																								
5N-5S 03	15.58	16.97	18.09	18.72	18.72	18.06	16.85	15.27	13.60	12.06	10.86	10.08	9.71	9.67	9.83	10.06	10.27	10.43	10.59	10.81	11.22	11.89	12.87	14.14
	1.21	1.24	1.26	1.27	1.27	1.26	1.24	1.21	1.18	1.16	1.14	1.13	1.13	1.13	1.13	1.14	1.14	1.15	1.15	1.15	1.15	1.16	1.17	1.19
	.82	.81	.80	.80	.80	.80	.81	.83	.84	.86	.87	.88	.89	.89	.89	.89	.89	.88	.88	.88	.87	.86	.85	.84
5-15S 03	19.60	21.36	22.50	22.84	22.32	20.99	19.01	16.64	14.14	11.80	9.81	8.29	7.27	6.70	6.50	6.59	6.93	7.52	8.38	9.58	11.13	13.04	15.20	17.46
	1.22	1.26	1.29	1.31	1.31	1.30	1.27	1.23	1.19	1.15	1.11	1.09	1.08	1.07	1.07	1.08	1.08	1.08	1.08	1.09	1.10	1.12	1.14	1.18
	.73	.72	.72	.73	.75	.77	.79	.82	.84	.86	.88	.89	.90	.91	.92	.91	.91	.89	.87	.85	.82	.79	.77	.74
15-25S 03	16.60	16.69	16.87	17.03	17.02	16.71	16.01	14.93	13.57	12.13	10.82	9.85	9.40	9.53	10.20	11.30	12.64	14.00	15.19	16.07	16.59	16.77	16.75	16.65
	1.21	1.21	1.22	1.22	1.22	1.21	1.20	1.19	1.17	1.16	1.14	1.13	1.13	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.20	1.21	1.21
	.79	.79	.79	.78	.79	.79	.81	.82	.84	.86	.88	.89	.90	.89	.88	.87	.85	.83	.82	.80	.79	.79	.79	.79
25-35S 03	12.93	13.45	13.95	14.35	14.58	14.58	14.33	13.82	13.11	12.27	11.40	10.61	9.98	9.56	9.39	9.43	9.65	9.97	10.36	10.75	11.15	11.54	11.96	12.42
	1.17	1.17	1.18	1.19	1.19	1.19	1.19	1.18	1.17	1.15	1.13	1.11	1.10	1.09	1.09	1.09	1.10	1.11	1.11	1.12	1.13	1.14	1.15	1.16
	.84	.84	.83	.83	.83	.83	.83	.84	.84	.85	.86	.87	.88	.88	.88	.87	.87	.87	.86	.86	.85	.85	.85	.85
35-45S 03	10.31	10.66	11.11	11.64	12.17	12.62	12.92	13.00	12.82	12.40	11.80	11.11	10.44	9.87	9.45	9.24	9.18	9.24	9.37	9.52	9.66	9.78	9.90	10.07
	1.14	1.14	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.14	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.12	1.12	1.12	1.13	1.13	1.13	1.13
	.87	.87	.86	.86	.85	.84	.83	.83	.83	.84	.84	.86	.87	.88	.88	.88	.88	.88	.88	.88	.88	.87	.87	.87
45-55S 03	11.85	12.01	12.27	12.60	13.00	13.47	13.97	14.47	14.92	15.29	15.51	15.57	15.45	15.17	14.75	14.25	13.70	13.17	12.69	12.30	12.01	11.82	11.74	11.75
	1.14	1.14	1.14	1.15	1.15	1.16	1.17	1.17	1.18	1.18	1.18	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.14
	.85	.84	.84	.83	.83	.82	.82	.80	.79	.79	.79	.78	.78	.79	.79	.81	.82	.83	.83	.84	.84	.84	.84	.85
55-65S 03	16.42	17.60	18.43	18.78	18.67	18.20	17.54	16.88	16.39	16.13	16.10	16.19	16.25	16.15	15.77	15.12	14.26	13.35	12.60	12.18	12.22	12.77	13.77	15.05
	1.18	1.19	1.20	1.21	1.21	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.21	1.19	1.18	1.17	1.15	1.14	1.14	1.14	1.15	1.16	1.17
	.77	.75	.74	.74	.74	.76	.78	.79	.81	.81	.81	.81	.81	.80	.80	.80	.81	.82	.83	.83	.83	.82	.81	.79

MONTH		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	10	19.30	19.26	19.01	18.63	18.19	17.75	17.31	16.86	16.37	15.80	15.15	14.42	13.68	13.02	12.57	12.42	12.64	13.24	14.17	15.31	16.50	17.60	18.48	19.05
		1.22	1.22	1.22	1.22	1.22	1.22	1.21	1.21	1.20	1.19	1.18	1.16	1.15	1.14	1.13	1.13	1.14	1.15	1.16	1.18	1.19	1.21	1.21	1.22
		.76	.77	.77	.77	.77	.78	.78	.78	.78	.79	.80	.81	.82	.82	.83	.83	.82	.82	.81	.79	.78	.77	.77	.76
45-55N	10	15.74	15.50	15.25	15.03	14.84	14.66	14.48	14.26	13.96	13.59	13.16	12.73	12.34	12.09	12.03	12.20	12.61	13.21	13.92	14.63	15.24	15.67	15.88	15.89
		1.20	1.19	1.18	1.18	1.17	1.17	1.17	1.16	1.16	1.15	1.14	1.13	1.13	1.12	1.13	1.13	1.14	1.15	1.16	1.18	1.19	1.20	1.20	1.20
		.80	.80	.80	.80	.80	.80	.80	.81	.81	.82	.83	.84	.84	.84	.84	.84	.84	.83	.82	.82	.82	.81	.81	.81
35-45N	10	13.85	13.28	12.73	12.26	11.88	11.55	11.22	10.83	10.36	9.79	9.19	8.65	8.28	8.19	8.44	9.06	9.98	11.11	12.28	13.33	14.11	14.53	14.59	14.33
		1.18	1.18	1.17	1.16	1.15	1.15	1.14	1.13	1.13	1.12	1.11	1.11	1.10	1.10	1.11	1.11	1.12	1.14	1.15	1.17	1.18	1.18	1.19	1.19
		.84	.85	.86	.86	.87	.87	.87	.87	.87	.88	.88	.89	.90	.90	.90	.89	.88	.86	.85	.84	.83	.83	.83	.84
25-35N																									
15-25N	10	28.21	28.18	27.50	26.15	24.17	21.72	19.01	16.33	13.92	12.01	10.72	10.11	10.14	10.76	11.87	13.39	15.21	17.25	19.37	21.48	23.45	25.20	26.63	27.66
		1.43	1.43	1.42	1.40	1.37	1.33	1.29	1.24	1.20	1.17	1.14	1.13	1.13	1.14	1.15	1.18	1.21	1.25	1.28	1.32	1.35	1.38	1.40	1.42
		.73	.74	.75	.77	.79	.82	.84	.86	.87	.88	.88	.88	.87	.86	.85	.84	.83	.82	.80	.79	.77	.76	.74	.74
5-15N																									
5N-5S	04	15.50	17.19	18.46	19.01	18.70	17.60	15.94	14.05	12.33	11.07	10.44	10.41	10.80	11.36	11.84	12.04	11.90	11.49	11.00	10.63	10.62	11.12	12.18	13.71
		1.21	1.23	1.25	1.26	1.25	1.24	1.21	1.19	1.17	1.16	1.15	1.15	1.16	1.17	1.17	1.17	1.17	1.16	1.15	1.14	1.14	1.15	1.16	1.19
		.81	.79	.77	.76	.76	.77	.80	.82	.85	.87	.89	.90	.90	.90	.89	.89	.89	.89	.89	.89	.88	.88	.86	.84
5-15S	04	16.90	19.34	21.19	22.15	22.07	20.96	19.02	16.56	13.96	11.55	9.60	8.23	7.40	6.98	6.80	6.71	6.63	6.58	6.69	7.13	8.07	9.60	11.70	14.22
		1.20	1.23	1.26	1.28	1.28	1.27	1.25	1.22	1.18	1.15	1.12	1.10	1.09	1.08	1.07	1.06	1.06	1.06	1.06	1.07	1.08	1.10	1.13	1.16
		.77	.74	.72	.71	.72	.74	.77	.80	.83	.86	.88	.90	.90	.90	.90	.90	.90	.90	.91	.91	.90	.89	.87	.84	.81
15-25S	04	25.46	25.36	25.20	24.87	24.21	23.11	21.56	19.64	17.56	15.57	13.97	13.02	12.86	13.55	14.97	16.92	19.11	21.24	23.05	24.40	25.22	25.59	25.66	25.57
		1.30	1.29	1.29	1.29	1.28	1.27	1.26	1.24	1.21	1.19	1.17	1.16	1.16	1.17	1.19	1.22	1.26	1.29	1.31	1.33	1.33	1.33	1.32	1.31
		.79	.79	.78	.78	.78	.79	.80	.82	.83	.84	.85	.85	.84	.83	.82	.81	.80	.79	.79	.79	.80	.80	.80	.80
25-35S	04	17.68	17.68	17.20	16.32	15.15	13.85	12.54	11.36	10.38	9.63	9.11	8.77	8.58	8.51	8.58	8.81	9.26	9.99	11.00	12.25	13.64	15.04	16.28	17.20
		1.24	1.24	1.23	1.22	1.21	1.19	1.17	1.15	1.13	1.12	1.11	1.10	1.10	1.10	1.10	1.11	1.12	1.13	1.15	1.17	1.19	1.21	1.22	1.24
		.79	.79	.80	.81	.83	.85	.86	.87	.88	.88	.89	.89	.89	.89	.89	.89	.88	.88	.87	.85	.83	.82	.80	.79
35-45S	04	13.09	13.31	13.44	13.44	13.30	12.99	12.53	11.96	11.33	10.69	10.14	9.69	9.41	9.30	9.34	9.55	9.87	10.28	10.74	11.20	11.66	12.09	12.47	12.80
		1.16	1.17	1.17	1.18	1.18	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.12	1.12	1.13	1.14	1.15	1.15	1.16	1.16
		.83	.84	.84	.84	.84	.85	.86	.86	.87	.87	.88	.88	.88	.88	.88	.88	.87	.87	.86	.86	.85	.85	.84	.84
45-55S	04	15.80	15.81	15.69	15.49	15.19	14.80	14.31	13.73	13.07	12.37	11.68	11.05	10.58	10.30	10.28	10.52	11.02	11.71	12.53	13.39	14.19	14.86	15.35	15.66
		1.19	1.19	1.19	1.19	1.18	1.18	1.17	1.15	1.14	1.13	1.12	1.11	1.11	1.10	1.10	1.11	1.11	1.12	1.14	1.15	1.16	1.18	1.18	1.19
		.80	.80	.80	.80	.80	.80	.81	.82	.84	.85	.86	.87	.88	.88	.88	.87	.86	.85	.84	.83	.82	.81	.80	.80
55-65S	04	18.97	20.10	20.89	21.22	21.07	20.48	19.56	18.48	17.40	16.44	15.67	15.09	14.66	14.31	13.99	13.70	13.44	13.28	13.31	13.61	14.22	15.14	16.32	17.65
		1.22	1.24	1.26	1.28	1.28	1.27	1.26	1.23	1.21	1.18	1.16	1.14	1.13	1.12	1.12	1.12	1.12	1.12	1.13	1.13	1.14	1.16	1.17	1.20
		.77	.76	.75	.75	.76	.76	.77	.78	.78	.79	.79	.78	.78	.78	.79	.79	.80	.81	.81	.81	.81	.80	.79	.78

********** AP LESS THAN 20 -- SOALR RANGE 110 - 200 **********

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 03	18.76	19.14	19.22	19.07	18.74	18.30	17.78	17.21	16.58	15.86	15.05	14.17	13.25	12.39	11.66	11.21	11.12	11.43	12.15	13.21	14.48	15.81	17.04	18.05
	1.24	1.25	1.25	1.24	1.24	1.24	1.23	1.22	1.21	1.20	1.18	1.17	1.15	1.14	1.13	1.12	1.13	1.14	1.15	1.17	1.19	1.21	1.23	1.24
	.77	.77	.76	.77	.77	.77	.78	.79	.79	.79	.80	.80	.81	.83	.83	.84	.85	.85	.85	.84	.82	.81	.80	.78
45-55N 03	14.71	14.79	14.77	14.68	14.57	14.43	14.25	14.01	13.68	13.22	12.66	12.02	11.37	10.80	10.38	10.19	10.27	10.63	11.20	11.93	12.71	13.44	14.04	14.47
	1.19	1.19	1.19	1.19	1.19	1.18	1.17	1.16	1.16	1.14	1.13	1.12	1.12	1.11	1.10	1.10	1.11	1.12	1.13	1.15	1.16	1.17	1.18	1.19
	.82	.82	.82	.82	.82	.82	.82	.81	.82	.82	.82	.83	.84	.84	.85	.86	.86	.86	.85	.85	.85	.84	.83	.83
35-45N 03	12.41	12.23	12.04	11.85	11.65	11.39	11.03	10.54	9.92	9.20	8.49	7.87	7.44	7.30	7.47	7.95	8.68	9.57	10.48	11.30	11.94	12.36	12.55	12.55
	1.17	1.17	1.17	1.16	1.16	1.15	1.14	1.13	1.12	1.11	1.10	1.09	1.09	1.09	1.09	1.10	1.11	1.12	1.14	1.15	1.16	1.17	1.17	1.17
	.86	.86	.87	.87	.87	.87	.87	.88	.88	.89	.90	.91	.91	.91	.91	.91	.90	.89	.88	.87	.86	.86	.86	.86
25-35N																								
15-25N 03	29.52	30.57	30.50	29.23	26.87	23.67	20.01	16.32	12.98	10.31	8.46	7.44	7.17	7.49	8.25	9.33	10.70	12.35	14.33	16.65	19.29	22.14	24.98	27.55
	1.46	1.48	1.47	1.44	1.39	1.34	1.27	1.21	1.16	1.13	1.11	1.10	1.10	1.11	1.12	1.13	1.15	1.17	1.20	1.24	1.28	1.34	1.39	1.43
	.75	.75	.75	.76	.77	.79	.82	.84	.87	.89	.91	.91	.92	.91	.90	.89	.87	.85	.83	.82	.80	.78	.77	.76
5-15N																								
5N-5S 09	16.14	17.93	19.45	20.34	20.38	19.51	17.87	15.76	13.57	11.66	10.32	9.65	9.59	9.97	10.54	11.09	11.45	11.59	11.56	11.51	11.62	12.09	13.01	14.40
	1.22	1.24	1.26	1.27	1.27	1.26	1.24	1.21	1.18	1.16	1.15	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.17	1.17	1.18	1.20
	.80	.78	.76	.75	.75	.76	.79	.82	.85	.87	.89	.90	.90	.90	.89	.88	.87	.87	.87	.87	.87	.86	.85	.83
5-15S 09	21.32	23.51	24.97	25.41	24.69	22.87	20.21	17.09	13.97	11.23	9.17	7.90	7.37	7.41	7.81	8.34	8.90	9.45	10.10	10.98	12.26	14.01	16.23	18.76
	1.26	1.30	1.34	1.36	1.36	1.33	1.29	1.24	1.19	1.14	1.10	1.08	1.07	1.07	1.08	1.09	1.09	1.09	1.10	1.10	1.11	1.13	1.17	1.21
	.73	.71	.70	.71	.72	.75	.78	.81	.84	.87	.88	.89	.90	.89	.89	.88	.87	.87	.86	.84	.83	.81	.78	.75
15-25S 09	25.13	24.75	24.18	23.38	22.33	21.02	19.53	17.97	16.51	15.31	14.52	14.23	14.46	15.19	16.33	17.75	19.31	20.87	22.30	23.51	24.41	24.99	25.28	25.31
	1.32	1.32	1.32	1.31	1.31	1.30	1.28	1.26	1.23	1.21	1.20	1.19	1.19	1.20	1.22	1.24	1.26	1.28	1.30	1.31	1.32	1.32	1.32	1.32
	.78	.77	.77	.77	.78	.79	.80	.81	.82	.83	.83	.83	.82	.81	.80	.79	.79	.79	.78	.78	.79	.79	.78	.78
25-35S 09	15.10	15.74	16.04	15.91	15.37	14.47	13.36	12.18	11.10	10.24	9.67	9.39	9.34	9.43	9.59	9.77	9.95	10.16	10.47	10.91	11.53	12.33	13.26	14.23
	1.20	1.21	1.22	1.22	1.22	1.20	1.18	1.16	1.15	1.13	1.12	1.12	1.12	1.12	1.12	1.13	1.13	1.13	1.13	1.13	1.14	1.15	1.17	1.18
	.82	.81	.82	.82	.83	.84	.85	.86	.87	.88	.88	.89	.89	.89	.89	.89	.88	.88	.87	.86	.85	.84	.83	.82
35-45S 09	13.15	13.51	13.82	14.04	14.12	14.03	13.74	13.26	12.63	11.91	11.17	10.51	9.98	9.63	9.49	9.54	9.76	10.12	10.56	11.03	11.50	11.95	12.37	12.77
	1.17	1.17	1.18	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.14	1.14	1.13	1.13	1.13	1.13	1.14	1.14	1.15	1.15	1.16	1.17	1.17	1.17
	.84	.83	.83	.83	.83	.83	.83	.84	.85	.86	.87	.88	.88	.89	.89	.89	.89	.88	.88	.87	.87	.86	.85	.85
45-55S 09	15.04	15.44	15.71	15.81	15.72	15.44	15.01	14.45	13.81	13.15	12.52	11.98	11.53	11.23	11.06	11.01	11.12	11.36	11.74	12.20	12.76	13.35	13.96	14.53
	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.15	1.14	1.14	1.13	1.12	1.12	1.12	1.12	1.12	1.13	1.13	1.14	1.15	1.15	1.16	1.16	1.17
	.79	.79	.78	.78	.78	.79	.79	.80	.81	.82	.83	.84	.85	.85	.85	.86	.86	.85	.85	.85	.84	.83	.82	.81
55-65S 09	21.10	21.92	22.20	21.92	21.14	19.99	18.66	17.33	16.14	15.19	14.48	13.99	13.62	13.32	13.05	12.83	12.73	12.85	13.29	14.11	15.29	16.74	18.32	19.84
	1.25	1.27	1.28	1.29	1.28	1.27	1.25	1.22	1.20	1.18	1.16	1.15	1.14	1.14	1.14	1.14	1.14	1.14	1.15	1.16	1.17	1.19	1.21	1.23
	.72	.71	.72	.73	.74	.76	.77	.79	.79	.79	.79	.79	.79	.80	.80	.81	.82	.82	.82	.81	.79	.77	.75	.73

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 04	17.11	17.57	17.67	17.46	17.02	16.48	15.96	15.53	15.22	14.99	14.79	14.53	14.16	13.66	13.08	12.51	12.05	11.83	11.94	12.40	13.19	14.21	15.30	16.32
	1.18	1.19	1.20	1.20	1.20	1.19	1.18	1.18	1.17	1.16	1.15	1.15	1.14	1.13	1.13	1.12	1.11	1.11	1.11	1.12	1.13	1.14	1.15	1.17
	.76	.75	.76	.76	.77	.78	.79	.79	.79	.79	.80	.79	.80	.81	.81	.82	.83	.83	.83	.82	.81	.80	.78	.76
45-55N 04	12.93	13.14	13.36	13.61	13.89	14.19	14.51	14.83	15.10	15.31	15.38	15.32	15.12	14.78	14.35	13.88	13.41	13.01	12.70	12.50	12.43	12.46	12.56	12.73
	1.14	1.14	1.14	1.15	1.15	1.16	1.16	1.17	1.17	1.17	1.17	1.16	1.15	1.15	1.14	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.14	1.14
	.83	.82	.81	.81	.80	.80	.80	.79	.79	.78	.78	.77	.77	.78	.78	.79	.80	.81	.82	.83	.84	.84	.83	.83
35-45N 04	10.90	11.10	11.37	11.70	12.01	12.23	12.27	12.10	11.71	11.15	10.50	9.87	9.33	8.98	8.85	8.92	9.17	9.52	9.89	10.22	10.47	10.62	10.71	10.79
	1.14	1.13	1.13	1.13	1.14	1.14	1.14	1.13	1.13	1.12	1.11	1.10	1.09	1.08	1.09	1.09	1.10	1.10	1.11	1.12	1.13	1.13	1.13	1.14
	.86	.86	.85	.85	.84	.84	.83	.83	.84	.85	.86	.87	.88	.88	.89	.88	.88	.88	.87	.87	.87	.87	.87	.87
25-35N																								
15-25N 04	21.05	21.75	22.00	21.69	20.77	19.28	17.31	15.07	12.79	10.71	9.04	7.91	7.36	7.37	7.86	8.73	9.88	11.22	12.68	14.20	15.75	17.27	18.70	19.99
	1.28	1.28	1.28	1.28	1.27	1.25	1.22	1.19	1.16	1.14	1.11	1.10	1.09	1.09	1.10	1.12	1.14	1.16	1.18	1.20	1.22	1.24	1.26	1.27
	.76	.76	.76	.76	.77	.79	.81	.84	.86	.88	.89	.90	.91	.91	.91	.90	.89	.88	.86	.85	.83	.81	.79	.78
5-15N																								
5N-5S 10	16.26	18.25	19.87	20.81	20.86	19.97	18.31	16.18	13.96	12.01	10.57	9.74	9.47	9.59	9.88	10.16	10.30	10.31	10.25	10.28	10.59	11.32	12.56	14.26
	1.20	1.23	1.26	1.28	1.28	1.28	1.26	1.23	1.20	1.18	1.16	1.14	1.13	1.13	1.13	1.13	1.12	1.12	1.11	1.11	1.11	1.12	1.14	1.17
	.81	.79	.79	.78	.79	.80	.81	.83	.86	.87	.89	.89	.89	.89	.88	.88	.87	.86	.86	.85	.85	.84	.83	.82
5-15S 10	18.07	19.90	21.09	21.43	20.85	19.41	17.33	14.90	12.43	10.20	8.42	7.17	6.45	6.15	6.16	6.35	6.68	7.12	7.75	8.66	9.93	11.62	13.65	15.88
	1.22	1.26	1.28	1.30	1.30	1.28	1.25	1.21	1.17	1.14	1.11	1.09	1.08	1.07	1.07	1.07	1.07	1.08	1.08	1.09	1.10	1.12	1.15	1.19
	.77	.76	.75	.75	.77	.78	.81	.83	.86	.88	.90	.91	.92	.92	.92	.91	.91	.90	.89	.87	.85	.83	.81	.79
15-25S 10	18.39	18.48	18.46	18.26	17.79	17.02	15.97	14.74	13.48	12.36	11.54	11.12	11.16	11.62	12.42	13.44	14.54	15.58	16.48	17.16	17.64	17.94	18.14	18.27
	1.24	1.24	1.24	1.24	1.24	1.23	1.21	1.20	1.18	1.16	1.15	1.15	1.15	1.15	1.16	1.18	1.19	1.21	1.22	1.23	1.24	1.24	1.24	1.24
	.81	.81	.80	.80	.80	.80	.81	.83	.84	.85	.86	.86	.86	.86	.85	.84	.83	.82	.82	.82	.82	.82	.82	.81
25-35S 10	13.78	14.79	15.51	15.78	15.53	14.79	13.66	12.33	11.02	9.91	9.13	8.73	8.66	8.82	9.09	9.36	9.55	9.66	9.75	9.91	10.24	10.80	11.63	12.66
	1.19	1.21	1.22	1.22	1.22	1.21	1.19	1.16	1.14	1.12	1.11	1.10	1.10	1.10	1.10	1.11	1.11	1.12	1.12	1.12	1.13	1.14	1.15	1.17
	.84	.83	.83	.83	.83	.84	.85	.86	.87	.88	.88	.88	.88	.88	.88	.88	.88	.88	.88	.88	.88	.87	.86	.85
35-45S 10	12.77	13.38	13.91	14.30	14.49	14.46	14.20	13.78	13.23	12.64	12.08	11.59	11.21	10.94	10.76	10.65	10.59	10.57	10.60	10.68	10.88	11.19	11.62	12.16
	1.16	1.17	1.18	1.19	1.18	1.18	1.17	1.17	1.16	1.14	1.13	1.12	1.12	1.12	1.12	1.12	1.12	1.13	1.13	1.13	1.13	1.13	1.14	1.15
	.85	.84	.83	.83	.82	.82	.82	.82	.83	.83	.84	.85	.86	.86	.87	.87	.87	.87	.87	.87	.86	.86	.86	.85
45-55S 10	13.72	14.10	14.41	14.60	14.71	14.75	14.75	14.74	14.70	14.66	14.57	14.42	14.17	13.83	13.42	12.98	12.56	12.22	12.02	11.99	12.13	12.42	12.82	13.26
	1.17	1.17	1.17	1.18	1.18	1.18	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.14	1.14	1.13	1.13	1.13	1.14	1.14	1.15	1.15	1.16	1.16
	.83	.82	.82	.82	.82	.81	.81	.80	.80	.80	.80	.80	.80	.80	.80	.82	.83	.84	.85	.85	.85	.85	.84	.84
55-65S 10	17.22	18.05	18.45	18.35	17.81	16.99	16.06	15.22	14.60	14.27	14.18	14.23	14.28	14.22	13.99	13.58	13.07	12.62	12.36	12.42	12.88	13.71	14.83	16.07
	1.19	1.20	1.21	1.21	1.21	1.21	1.20	1.20	1.19	1.19	1.19	1.19	1.18	1.18	1.17	1.16	1.16	1.15	1.15	1.15	1.15	1.16	1.17	1.18
	.76	.75	.74	.75	.76	.78	.79	.81	.82	.83	.83	.82	.82	.81	.81	.82	.82	.83	.83	.83	.82	.81	.80	.78

MONTH	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N 09	18.12	18.41	18.30	17.85	17.18	16.43	15.74	15.18	14.78	14.50	14.27	14.00	13.64	13.17	12.66	12.19	11.89	11.88	12.23	12.96	13.98	15.18	16.39	17.41
	1.20	1.21	1.21	1.21	1.20	1.20	1.19	1.18	1.17	1.17	1.17	1.16	1.16	1.16	1.15	1.14	1.14	1.13	1.13	1.14	1.15	1.16	1.18	1.19
	.76	.75	.75	.76	.77	.78	.79	.80	.81	.81	.82	.82	.83	.84	.84	.85	.85	.85	.84	.83	.81	.80	.78	.76
45-55N 09	15.40	15.54	15.58	15.57	15.51	15.43	15.35	15.27	15.15	14.99	14.75	14.45	14.08	13.68	13.31	13.03	12.88	12.90	13.10	13.44	13.87	14.34	14.78	15.14
	1.18	1.18	1.18	1.18	1.18	1.18	1.17	1.18	1.18	1.17	1.17	1.17	1.17	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.17	1.17	1.17	1.17
	.79	.79	.79	.78	.79	.79	.79	.79	.79	.80	.80	.81	.81	.82	.83	.83	.84	.84	.84	.83	.82	.82	.81	.80
35-45N 09	12.88	12.75	12.62	12.51	12.44	12.39	12.32	12.19	11.98	11.65	11.24	10.79	10.36	10.03	9.88	9.94	10.22	10.67	11.24	11.82	12.33	12.70	12.91	12.95
	1.16	1.15	1.15	1.15	1.15	1.14	1.14	1.14	1.14	1.13	1.13	1.13	1.12	1.12	1.12	1.12	1.12	1.13	1.14	1.14	1.15	1.15	1.16	1.16
	.84	.84	.84	.84	.84	.84	.84	.84	.84	.85	.85	.86	.87	.87	.87	.88	.87	.86	.86	.85	.84	.83	.83	.83
25-35N																								
15-25N 09	25.99	26.17	25.79	24.82	23.30	21.35	19.13	16.85	14.72	12.90	11.54	10.69	10.39	10.60	11.28	12.36	13.79	15.46	17.29	19.18	21.03	22.73	24.18	25.30
	1.40	1.41	1.40	1.39	1.36	1.32	1.28	1.24	1.20	1.16	1.14	1.12	1.12	1.12	1.13	1.15	1.18	1.21	1.25	1.28	1.31	1.34	1.36	1.39
	.75	.76	.76	.77	.78	.80	.81	.83	.84	.85	.86	.86	.86	.86	.85	.84	.83	.82	.81	.79	.78	.77	.76	.76
5-15N																								
5N-5S 03	15.58	16.97	18.09	18.72	18.72	18.06	16.85	15.27	13.60	12.06	10.86	10.08	9.71	9.67	9.83	10.06	10.27	10.43	10.59	10.81	11.22	11.89	12.87	14.14
	1.21	1.24	1.26	1.27	1.27	1.26	1.24	1.21	1.18	1.16	1.14	1.13	1.13	1.13	1.13	1.14	1.14	1.15	1.15	1.15	1.15	1.16	1.17	1.19
	.82	.81	.80	.80	.80	.80	.81	.83	.84	.86	.87	.88	.89	.89	.89	.89	.89	.88	.88	.88	.87	.86	.85	.84
5-15S 03	19.60	21.36	22.50	22.84	22.32	20.99	19.01	16.64	14.14	11.80	9.81	8.29	7.27	6.70	6.50	6.59	6.93	7.52	8.38	9.58	11.13	13.04	15.20	17.46
	1.22	1.26	1.29	1.31	1.31	1.30	1.27	1.23	1.19	1.15	1.11	1.09	1.08	1.07	1.07	1.08	1.08	1.08	1.08	1.09	1.10	1.12	1.14	1.18
	.73	.72	.72	.73	.75	.77	.79	.82	.84	.86	.88	.89	.90	.91	.92	.91	.91	.89	.87	.85	.82	.79	.77	.74
15-25S 03	16.60	16.69	16.87	17.03	17.02	16.71	16.01	14.93	13.57	12.13	10.82	9.85	9.40	9.53	10.20	11.30	12.64	14.00	15.19	16.07	16.59	16.77	16.75	16.65
	1.21	1.21	1.22	1.22	1.22	1.21	1.20	1.19	1.17	1.16	1.14	1.13	1.13	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.20	1.21	1.21
	.79	.79	.79	.78	.79	.79	.81	.82	.84	.86	.88	.89	.90	.89	.88	.87	.85	.83	.82	.80	.79	.79	.79	.79
25-35S 03	12.93	13.45	13.95	14.35	14.58	14.58	14.33	13.82	13.11	12.27	11.40	10.61	9.98	9.56	9.39	9.43	9.65	9.97	10.36	10.75	11.15	11.54	11.96	12.42
	1.17	1.17	1.18	1.19	1.19	1.19	1.19	1.18	1.17	1.15	1.13	1.11	1.10	1.09	1.09	1.09	1.10	1.11	1.11	1.12	1.13	1.14	1.15	1.16
	.84	.84	.83	.83	.83	.83	.83	.84	.84	.85	.86	.87	.88	.88	.88	.87	.87	.87	.86	.86	.85	.85	.85	.85
35-45S 03	10.31	10.66	11.11	11.64	12.17	12.62	12.92	13.00	12.82	12.40	11.80	11.11	10.44	9.87	9.45	9.24	9.18	9.24	9.37	9.52	9.66	9.78	9.90	10.07
	1.14	1.14	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.14	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.12	1.12	1.12	1.13	1.13	1.13	1.13
	.87	.87	.86	.86	.85	.84	.83	.83	.83	.84	.84	.86	.87	.88	.88	.88	.88	.88	.88	.88	.88	.87	.87	.87
45-55S 03	11.85	12.01	12.27	12.60	13.00	13.47	13.97	14.47	14.92	15.29	15.51	15.57	15.45	15.17	14.75	14.25	13.70	13.17	12.69	12.30	12.01	11.82	11.74	11.75
	1.14	1.14	1.14	1.15	1.15	1.16	1.17	1.17	1.18	1.18	1.18	1.18	1.18	1.17	1.17	1.16	1.16	1.15	1.15	1.14	1.14	1.14	1.14	1.14
	.85	.84	.84	.83	.83	.82	.82	.80	.79	.79	.79	.78	.78	.79	.79	.81	.82	.83	.83	.84	.84	.84	.84	.85
55-65S 03	16.42	17.60	18.43	18.78	18.67	18.20	17.54	16.88	16.39	16.13	16.10	16.19	16.25	16.15	15.77	15.12	14.26	13.35	12.60	12.18	12.22	12.77	13.77	15.05
	1.18	1.19	1.20	1.21	1.21	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.21	1.19	1.18	1.17	1.15	1.14	1.14	1.14	1.15	1.16	1.17
	.77	.75	.74	.74	.74	.76	.78	.79	.81	.81	.81	.81	.81	.80	.80	.80	.81	.82	.83	.83	.83	.82	.81	.79

MONTH		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
55-65N	10	19.30	19.26	19.01	18.63	18.19	17.75	17.31	16.86	16.37	15.80	15.15	14.42	13.68	13.02	12.57	12.42	12.64	13.24	14.17	15.31	16.50	17.60	18.48	19.05
		1.22	1.22	1.22	1.22	1.22	1.22	1.21	1.21	1.20	1.19	1.18	1.16	1.15	1.14	1.13	1.13	1.14	1.15	1.16	1.18	1.19	1.21	1.21	1.22
		.76	.77	.77	.77	.77	.78	.78	.78	.78	.79	.80	.81	.82	.82	.83	.83	.82	.82	.81	.79	.78	.77	.77	.76
45-55N	10	15.74	15.50	15.25	15.03	14.84	14.66	14.48	14.26	13.96	13.59	13.16	12.73	12.34	12.09	12.03	12.20	12.61	13.21	13.92	14.63	15.24	15.67	15.88	15.89
		1.20	1.19	1.18	1.18	1.17	1.17	1.17	1.16	1.16	1.15	1.14	1.13	1.13	1.12	1.13	1.13	1.14	1.15	1.16	1.18	1.19	1.20	1.20	1.20
		.80	.80	.80	.80	.80	.80	.80	.81	.81	.82	.83	.84	.84	.84	.84	.84	.84	.83	.82	.82	.82	.81	.81	.81
35-45N	10	13.85	13.28	12.73	12.26	11.88	11.55	11.22	10.83	10.36	9.79	9.19	8.65	8.28	8.19	8.44	9.06	9.98	11.11	12.28	13.33	14.11	14.53	14.59	14.33
		1.18	1.18	1.17	1.16	1.15	1.15	1.14	1.13	1.13	1.12	1.11	1.11	1.10	1.10	1.11	1.11	1.12	1.14	1.15	1.17	1.18	1.18	1.19	1.19
		.84	.85	.86	.86	.87	.87	.87	.87	.87	.88	.88	.89	.90	.90	.90	.89	.88	.86	.85	.84	.83	.83	.83	.84
25-35N																									
15-25N	10	28.21	28.18	27.50	26.15	24.17	21.72	19.01	16.33	13.92	12.01	10.72	10.11	10.14	10.76	11.87	13.39	15.21	17.25	19.37	21.48	23.45	25.20	26.63	27.66
		1.43	1.43	1.42	1.40	1.37	1.33	1.29	1.24	1.20	1.17	1.14	1.13	1.13	1.14	1.15	1.18	1.21	1.25	1.28	1.32	1.35	1.38	1.40	1.42
		.73	.74	.75	.77	.79	.82	.84	.86	.87	.88	.88	.88	.87	.86	.85	.84	.83	.82	.80	.79	.77	.76	.74	.74
5-15N																									
5N-5S	04	15.50	17.19	18.46	19.01	18.70	17.60	15.94	14.05	12.33	11.07	10.44	10.41	10.80	11.36	11.84	12.04	11.90	11.49	11.00	10.63	10.62	11.12	12.18	13.71
		1.21	1.23	1.25	1.26	1.25	1.24	1.21	1.19	1.17	1.16	1.15	1.15	1.16	1.17	1.17	1.17	1.17	1.16	1.15	1.14	1.14	1.15	1.16	1.19
		.81	.79	.77	.76	.76	.77	.80	.82	.85	.87	.89	.90	.90	.90	.89	.89	.89	.89	.89	.89	.88	.88	.86	.84
5-15S	04	16.90	19.34	21.19	22.15	22.07	20.96	19.02	16.56	13.96	11.55	9.60	8.23	7.40	6.98	6.80	6.71	6.63	6.58	6.69	7.13	8.07	9.60	11.70	14.22
		1.20	1.23	1.26	1.28	1.28	1.27	1.25	1.22	1.18	1.15	1.12	1.10	1.09	1.08	1.07	1.06	1.06	1.06	1.06	1.07	1.08	1.10	1.13	1.16
		.77	.74	.72	.71	.72	.74	.77	.80	.83	.86	.88	.90	.90	.90	.90	.90	.90	.91	.91	.90	.89	.87	.84	.81
15-25S	04	25.46	25.36	25.20	24.87	24.21	23.11	21.56	19.64	17.56	15.57	13.97	13.02	12.86	13.55	14.97	16.92	19.11	21.24	23.05	24.40	25.22	25.59	25.66	25.57
		1.30	1.29	1.29	1.29	1.28	1.27	1.26	1.24	1.21	1.19	1.17	1.16	1.16	1.17	1.19	1.22	1.26	1.29	1.31	1.33	1.33	1.33	1.32	1.31
		.79	.79	.78	.78	.78	.79	.80	.82	.83	.84	.85	.85	.84	.83	.82	.81	.80	.79	.79	.79	.80	.80	.80	.80
25-35S	04	17.68	17.68	17.20	16.32	15.15	13.85	12.54	11.36	10.38	9.63	9.11	8.77	8.58	8.51	8.58	8.81	9.26	9.99	11.00	12.25	13.64	15.04	16.28	17.20
		1.24	1.24	1.23	1.22	1.21	1.19	1.17	1.15	1.13	1.12	1.11	1.10	1.10	1.10	1.10	1.11	1.12	1.13	1.15	1.17	1.19	1.21	1.22	1.24
		.79	.79	.80	.81	.83	.85	.86	.87	.88	.88	.89	.89	.89	.89	.89	.89	.88	.88	.87	.85	.83	.82	.80	.79
35-45S	04	13.09	13.31	13.44	13.44	13.30	12.99	12.53	11.96	11.33	10.69	10.14	9.69	9.41	9.30	9.34	9.55	9.87	10.28	10.74	11.20	11.66	12.09	12.47	12.80
		1.16	1.17	1.17	1.18	1.18	1.18	1.17	1.16	1.15	1.14	1.13	1.12	1.12	1.11	1.11	1.11	1.12	1.12	1.13	1.14	1.15	1.15	1.16	1.16
		.83	.84	.84	.84	.84	.85	.86	.86	.87	.87	.88	.88	.88	.88	.88	.88	.87	.87	.86	.86	.85	.85	.84	.84
45-55S	04	15.80	15.81	15.69	15.49	15.19	14.80	14.31	13.73	13.07	12.37	11.68	11.05	10.58	10.30	10.28	10.52	11.02	11.71	12.53	13.39	14.19	14.86	15.35	15.66
		1.19	1.19	1.19	1.19	1.18	1.18	1.17	1.15	1.14	1.13	1.12	1.11	1.11	1.10	1.10	1.11	1.11	1.12	1.14	1.15	1.16	1.18	1.18	1.19
		.80	.80	.80	.80	.80	.80	.81	.82	.84	.85	.86	.87	.88	.88	.88	.87	.86	.85	.84	.83	.82	.81	.80	.80
55-65S	04	18.97	20.10	20.89	21.22	21.07	20.48	19.56	18.48	17.40	16.44	15.67	15.09	14.66	14.31	13.99	13.70	13.44	13.28	13.31	13.61	14.22	15.14	16.32	17.65
		1.22	1.24	1.26	1.28	1.28	1.27	1.26	1.23	1.21	1.18	1.16	1.14	1.13	1.12	1.12	1.12	1.12	1.12	1.13	1.13	1.14	1.16	1.17	1.20
		.77	.76	.75	.75	.76	.76	.77	.78	.78	.79	.79	.78	.78	.78	.79	.79	.80	.81	.81	.81	.81	.80	.79	.78

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15. ABSTRACT *(A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)*

Data from 21 ionospheric sounding stations in the northern and southern hemispheres were used to characterize the day-to-day variation in the critical frequency of the F2 layer of the ionosphere. Variability in the critical frequencies are analyzed monthly and diurnally for quiet magnetic conditions during both low and high solar periods. In addition, variations in the F2 layer critical frequency are presented for active magnetic conditions during equinox periods. Tables of variabilities for each ten degree increment in magnetic latitude are also provided in this report. The dependence of variations in the critical frequency with the solor cycle index IG12 is also discussed.

16. Key Words *(Alphabetical order, separated by semicolons)*

Critical frequency; F2 layer; magnetic latitude; variability

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