NASA Technical Memorandum 100697

Monthly Mean Global Climatology of Temperature, Wind, Geopotential Height, and Pressure for 0-120 km

(NASA-TM-100697) MONTHLY MEAN GLOBAL CLIMATOLOGY OF TEMPERATURE, WIND, GEOPOTENTIAL HEIGHT, AND PRESSURE FOR 0 - 120 KM (NASA) 91 p CSCL 04B N88-22503
Unclas
G3/47 0142325

Eric L. Fleming, Sushil Chandra,
Mark R. Shoeberl, and John J. Barnett

February 1988

NASA

NASA Technical Memorandum 100697

Monthly Mean Global Climatology of Temperature, Wind, Geopotential Height, and Pressure for 0-120 km

Eric L. Fleming
Applied Research Corporation
Landover, Maryland 20785

Sushil Chandra
Goddard Space Flight Center
Greenbelt, Maryland 20771

Mark R. Shoeberl
Goddard Space Flight Center
Greenbelt, Maryland 20771

John J. Barnett
Department of Atmospheric Physics
Clarendon Laboratory
Oxford, Great Britain

NASA
National Aeronautics
and Space Administration

Scientific and Technical
Information Branch

1988

PREFACE

This report presents a monthly mean climatology of temperature, wind, and geopotential height with nearly pole-to-pole coverage (80°S-80°N) for 0-120 km which can be used as a function of altitude and pressure. The purpose of such a climatology is to provide a reference for various atmospheric research and analysis activities.

Data sources and methods of computation are described; in general, hydrostatic and thermal wind balance are maintained at all levels and latitudes. As observed in a series of cross sectional plots, this climatology accurately reproduces most of the characteristic features of the atmosphere such as the equatorial wind and the general structure of the tropopause, stratopause, and mesopause. A series of zonal wind profiles is also presented comparing this climatological wind with monthly mean climatological direct wind measurements in the upper mesosphere and lower thermosphere. The temperature and zonal wind climatology at stratospheric levels is compared with corresponding data from the National Meteorological Center (NMC -- Washington, D.C.), and general agreement is observed between the two data sets.

Tables of the climatological values as a function of latitude and height for each month are contained in Appendix B. These tables are also contained on a floppy computer diskette which can be read by machines compatible with IBM PC's. The diskette is available on request from: Dr. Sushil Chandra, Code 616, NASA/Goddard Space Flight Center, Greenbelt, MD 20771.

LIST OF SYMBOLS AND CONSTANTS

Symbols and constants used in the figures and equations in the text are listed below. Any deviations from this notation are described in the text.

[ ]	brackets denote zonal average
θ	latitude
λ	longitude
Z	geopotential height (m)
z	geometric height (km)
p	pressure (mb)
ρ	density (kg/m^3)
T	temperature (K)
U	zonal wind (m/s)
V	meridional wind (m/s)
Ug	zonal geostrophic wind (m/s)
Vg	meridional geostrophic wind (m/s)
Ueq	zonal wind at the equator (m/s)
Veq	meridional wind at the equator (m/s)
ω	relative angular velocity (s^{-1}) (equation 7)
S	static stability (dimensionless) (equation A-2)
g_0	gravitational acceleration at sea level as a function of latitude taken from *U.S. Standard Atmosphere, 1976* (m/s^2)
$a = 6370$ km	average radius of earth
$\Omega = 7.292E-5$ rad/s	angular velocity of earth
$R = 287\ J\text{-}deg^{-1}\text{-}kg^{-1}$	gas constant for dry air
$C_p = 1004\ J\text{-}deg^{-1}\text{-}kg^{-1}$	specific heat at constant pressure
$\kappa = 0.286 = R/C_p$	ratio of gas constant to specific heat at constant pressure
$T_s = 240$ K	atmospheric reference temperature
$g_s = 9.81\ m/s^2$	global average of gravity at mean sea level
$H = 7$ km	atmospheric scale height (RT_s/g_s)
$p_0 = 1013$ mb	reference pressure
$sh = -\ln(p/p_0)$	log-pressure scale height
$z^* = -H\ln(p/p_0)$	log-pressure altitude (km)
$dx = a\cos\theta d\lambda$	eastward distance increment (km)
$dy = ad\theta$	northward distance increment (km)
$f = 2\Omega\sin\theta$	coriolis parameter (s^{-1})
$\beta = df/dy = (2\Omega/a)\cos\theta$	beta-plane approximation ($m^{-1}\text{-}s^{-1}$)
$M = a\Omega\cos\theta$	tangential velocity associated with the earth's rotation (m/s)

CONTENTS

	Page
Preface	iii
List of Symbols and Constants	iv
1. Introduction	1
2. Data Sets	2
3. The Combined Zonal Mean Climatology	6
A. Zonal Mean Temperature in Constant Altitude Coordinates	8
B. Zonal Mean Pressure in Constant Altitude Coordinates	8
C. Zonal Mean Temperature in Constant Pressure Coordinates	8
D. Zonal Mean Geopotential Height in Constant Pressure Coordinates	8
E. Zonal Mean Zonal Wind in Constant Pressure Coordinates	9
4. Cross Sectional Analyses of the Climatology	12
A. Zonal Mean Temperature	12
B. Zonal Mean Zonal Wind	23
C. Zonal Mean Geopotential Height	35
D. Zonal Mean Pressure	35
5. Analysis of Zonal Wind at 65-120 km	38
6. Longitudinal Variations in the Stratosphere and Mesosphere	45
7. Comparison with NMC Data	51
8. Conclusions and Outlook	56
Acknowledgments	56
Appendix A: Stability Analysis of the Climatology	57
Appendix B: Tables of the Climatological Values	62
References	82

1. INTRODUCTION

Since the publication of the last COSPAR reference atmosphere (CIRA, 1972), numerous satellite and additional ground-based measurements of temperature and atmospheric composition have become available encompassing the entire globe from the ground to the upper thermosphere. This large influx of new data has made CIRA, 1972 somewhat out-of-date and thus created a need for a new climatology. The purpose of this report is to present a current, comprehensive monthly mean climatology of temperature, wind, and geopotential height, with nearly pole-to-pole coverage (80°S-80°N) which can be used as a function of both altitude and pressure. Although data are available up to 1000 km, we confine this climatology to the region below 120 km, encompassing the troposphere, middle atmosphere, and lower thermosphere.

We hope this climatology can be a useful reference for various research and analysis activities, such as the numerical simulation of atmospheric processes and the design and development of satellite instruments for measuring atmospheric parameters. For example, this climatology provides temperature and zonal wind data in the upper mesosphere and lower thermosphere which would aid in the design and development of the Wind Imaging Interferometer (WINDII) and the High Resolution Doppler Imager (HRDI) which are to be flown on the Upper Atmospheric Research Satellite (UARS). It also provides data in both pressure and altitude coordinates which can be used for a variety of applications in theoretical and observational analyses.

We include a series of cross sectional contour plots of the data to illustrate the accuracy of the climatology in reproducing the basic atmospheric structure. We also present a series of zonal wind profiles illustrating the differences between this climatological wind and monthly mean climatological direct wind measurements in the 65-120 km region.

Since monthly mean data from the National Meteorological Center (NMC - Washington, D.C.) is widely used for observational bases and numerical model initialization, we illustrate the general agreement observed between the NMC data and this climatology.

2. DATA SETS

The following global data sets were used in this report:

a) *Global Atmospheric Circulation Statistics, 1958-1973*, compiled by Oort (1983) contains zonally averaged climatological monthly mean temperature and zonal wind values for 80°S-80°N at five degree resolution for the 1000, 950, 900, 850, 700, 500, 400, 300, 200, 100, and 50 mb pressure levels. (Values at 80°S for 1000-850 mb were not included since these levels are within the Antarctic land mass).

These values are based on data for 1963-1973 derived from the National Meteorological Center (NMC, Washington, D.C.), the National Center for Atmospheric Research (NCAR, Boulder, Colorado), Ocean Station Vessels (OSV), the British Meteorological Office (Bracknell, England), and the National Climatic Center (Asheville, N.C.). After erroneous measurements were eliminated, the original input data were interpolated from the irregular station network to a regular global grid using an objective analysis technique referred to as the Conditional Relaxation Analysis Method (CRAM). The following is a brief description of this technique taken from Oort's atlas, originally taken from a report by Harris et al. (1966). "In CRAM, the procedure for interpolating between observations requires that the analyzed grid point values satisfy Poisson's equation, subject to the constraints imposed by the observations and an arbitrarily defined set of boundary values. The observations determine the analysis through their role as internal boundary points in the solution of Poisson's equation. Poisson's equation is solved numerically by a relaxation procedure." A thorough explanation of CRAM is contained in the atlas.

The zonal mean temperature and wind values for our climatology were extracted from tables available on microfiches contained in the atlas.

b) *Middle Atmosphere Program, Handbook for MAP*, Volume 16, (ed. by K. Labitzke, J.J. Barnett, and B. Edwards, 1985) contains global climatological data sets in tabular form as generated at the Atmospheric Physics department, Clarendon Laboratory, Oxford, England (hereafter referred to as MAP data). These data sets are listed in Table 1. For data sets on constant pressure surfaces, log-pressure scale height, defined as $sh = -\ln(p/p_0)$, p_0=1013 mb, was used as the vertical coordinate.[1] These data tables were obtained on magnetic tape from the Oxford laboratory. Details of the data origins and computations as taken from the MAP handbook are described as follows.

"Daily radiance measurements for the complete years 1973-1974 from the Nimbus 5 Selective Chopper Radiometer (SCR -- Ellis et al., 1973) nadir sounder were available for the latitude range 80°S-80°N covering the 100 - 0.3 mb pressure levels. The retrieval method was that due to Crane (1977, 1979a) for the study of a few months of winter SCR data. Its use was extended by Vyas (1984) to the complete years of 1973 and 1974. Channels B12, B34, and A1 of the radiometer were used, these having weighting functions peaking at about 1.5, 8, and 60 mb, respectively. The radiances were Fourier analyzed

[1] The height interval corresponding to one pressure scale height is proportional to absolute temperature, and is 7 km at 240 K.

Table 1. Listing of monthly mean global climatological data available in MAP Handbook #16.

ZONALLY AVERAGED DATA

PARAMETER	VERTICAL COORDINATE	VERTICAL RANGE, RESOLUTION	LATITUDINAL RANGE, RESOLUTION
A) Temperature	altitude	0-80 km, 5 km	80°S-80°N, 10°
B) Pressure	altitude	20-80 km, 5 km	80°S-80°N, 10°
C) Density	altitude	20-80 km, 5 km	80°S-80°N, 10°
D) Temperature	log-pressure	1013-.0062 mb, 0.5 sh* (0.0-12.0 sh)	80°S-80°N, 10°
E) Geopotential height	log-pressure	137-.0062 mb, 0.5 sh (2.0-12.0 sh)	80°S-80°N, 10°
F) Geostrophic zonal wind	log-pressure	137-.0062 mb, 0.5 sh (2.0-12.0 sh)	70°S-20°S, 70°N-20°N, 10°

* sh = $-\ln(p/p_0)$

LONGITUDINALLY VARYING DATA

The MAP Handbook contains monthly mean amplitudes and phases of zonal waves 1 and 2 for temperature and geopotential height. These data are at constant pressure surfaces for 83-.0062 mb (2.5-12.0 sh) at 0.5 sh intervals from 80°S-80°N at 10° resolution.

around latitude circles at four degree resolution into zonal mean and zonal wave components one to four. Each component was retrieved separately to obtain the zonal mean and wave components of the temperature profile. This was done with daily analyses and the resulting retrieved temperature coefficients were averaged over calendar months, with each field containing the mean over the corresponding months in 1973 and 1974.

The Nimbus 6 Pressure Modulator Radiometer (PMR -- Curtis et al., 1974) nadir sounder provided daily radiance measurements from 80°S to 80°N covering the 10-.01 mb pressure levels. Channels 1000, 1015, 2100, and 2115 were used, these being radiances obtained from modulators 1 and 2 at 0° and 14.5° Doppler Scan angles. The radiances were initially available on latitude-longitude grids (at intervals of 4° and 10°, respectively) for each day, and were averaged to give mean fields on the same grid for each month from July 1975 to

June 1978. The data were then retrieved at each grid point separately using a maximum probability estimator as described by Rodgers (1976).

Both the SCR and PMR temperatures were averaged over their respective time periods to obtain one set of monthly means for each. The two data sets were then merged by taking a weighted mean of the two which varies linearly between 6 and 8 sh, approximately 40-56 km, such that:

$$\begin{aligned} T(\mathrm{sh}) &= T(\mathrm{SCR}) && \mathrm{sh} < 6 \\ T(\mathrm{sh}) &= (1-w)T(\mathrm{SCR}) + wT(\mathrm{PMR}) && 6 < \mathrm{sh} < 8 \\ T(\mathrm{sh}) &= T(\mathrm{PMR}) && \mathrm{sh} > 8 \end{aligned}$$

where $w = (\mathrm{sh}-6)/2$ and T is the zonal mean temperature or sine or cosine component of the zonal temperature wave.

The MAP data also contain zonally averaged monthly mean temperatures for 1000-50 mb from Oort's (1983) atlas and 30 mb temperatures from the Berlin analyses (based on radiosonde data). Between 30 and 10 mb, a smooth transition was made to satellite data only so that SCR/PMR data was used exclusively above 10 mb. Also, temperatures for the zonal wave components were derived solely from satellite data.

Geopotential heights were obtained by integrating hydrostatically up and down from the 30 mb monthly mean geopotential height analyses made by the Berlin Free University, based largely on radiosonde data. The geostrophic winds were obtained by differentiating the geopotential height fields over four degree latitudinal intervals. Geostrophic wind values at 80°S and 80°N were not included because geopotential height data were not available nearer to the pole for a gradient to be found. Geostrophic wind between 16°S and 16°N were also not included because the small values of the coriolis parameter near the equator cause the geostrophic wind to be very sensitive to errors in the geopotential height gradient.

Scaling factors from the Smithsonian Meteorological Tables (LIST, 1958) were used to obtain the geometric height from geopotential height in order to derive values on constant altitude surfaces.

The basic grid used for the calculations and interpolation had intervals of 0.2 in log-pressure (sh) and 4° in latitude. Values were interpolated (linearly in log-pressure in the vertical) to a coarser resolution of 10° latitude and 0.5 in log-pressure (sh) and 5 km altitude for the tabulated data.

Data from the Nimbus 7 Stratospheric and Mesospheric Sounder (SAMS), the Nimbus 7 Limb Infrared Monitor of the Stratosphere (LIMS), the Stratospheric Sounder Units (SSU) on the Tiros-N series satellites, and radio/rocketsondes were used as a check that the means were satisfactory. Because these data sets cover different time and space domains (e.g., SAMS only covers the latitude range 50°S-70°N, and LIMS data covers 64°S-84°N for less than a full year), averaging over all available data sets for any point was found to lead to discontinuities at data set boundaries. For this reason only the SCR and PMR data sets were used in the final tabulated values since they both measure nearly pole-to-pole."

c) The MSIS-86 (Hedin, 1987) and MSIS-83 (Hedin, 1983) empirical models of the thermosphere provide pole-to-pole temperature and composition data for the entire thermosphere above 86 km. A wide range of solar and magnetic activities can be implemented. The differences between the two versions are insignificant below 120 km, thus the data for our use will hereafter be referred to as MSIS-86 data.

The data were derived from satellite-based mass spectrometer and EUV absorption measurements (on board the OGO 6, San Marco 3, Aeros-A, AE-C, AE-D, AE-E, and ESRO 4 satellites); rocket-borne mass spectrometer, EUV absorption, pressure gauge, grenade, and falling sphere measurements; and ground-based incoherent scatter radar measurements from stations at Millstone Hill, Massachusetts (42°N,71°W), St. Santin, France (45°N,2°E), Arecibo, Puerto Rico (18°N,67°W), Jicamarca, Peru (12°S, 77°W), and Malvern, England (52°N,2°W).

Excerpts of the MSIS-86 model as taken from Hedin (1987) and discussed in detail by Hedin (1983) are described as follows.

"The temperature profile (based on Bates, 1959) is a function of geopotential height for the upper thermosphere and an inverse polynomial in geopotential height for the lower thermosphere joined at 116.5 km matching the temperature and temperature gradient. These temperature profiles allow exact integration of the hydrostatic equation for a constant mass (e.g., Walker, 1965) to determine a density profile based on a density specified at 120 km as a function of geographical and solar/magnetic parameters. The transition from mixing to diffusive equilibrium near 105 km is handled in a manner similar to that used for Venus by Hedin et al. (1983) where net density is expressed as a root of the sum of diffusive and mixing densities each raised to a power. The density profiles for mixing conditions are calculated using the mean molecular weight for the lower atmosphere with the diffusive and mixing profiles equal at the turbopause. Critical empirical constraints are the known mixing ratios below the turbopause, and these are achieved by explicitly selecting the vertical flow terms to provide the desired density ratios."

For our climatology, monthly mean zonally averaged kinetic temperatures and total densities for each month at 2 km intervals from 86-120 km for 90°S-90°N at 10° latitudinal resolution were generated from the model. Moderate solar and low magnetic activity conditions were used.

Further details of the three data sets described above can be found in the appropriate references. To generate our climatology, these data sets were merged in a manner described in the next section.

3. THE COMBINED ZONAL MEAN CLIMATOLOGY

The data fom Oort's (1983) atlas, MAP, and MSIS-86 were combined to create a comprehensive monthly mean global climatology of zonal mean temperature, pressure, zonal wind, and geopotential height from the ground to approximately 120 km. The computations and methods of combining these data sets to generate this climatology are described in the following subsections. In some instances values were not supplied in the original data sets, e.g., zonal geostrophic wind at low latitudes in the MAP data, and were therefore generated here using basic calculations.

A summary of each combined climatological data set is provided in Table 2. The values of the data sets are listed in tables in Appendix B. In each data set, values at 80°S for 1013 mb or 0 km were omitted since these levels are within the Antarctic land mass. As done in the MAP data (section 2-b), log-pressure scale height, defined as $sh = -\ln(p/p_0)$, p_0 1013 mb, was used as the vertical coordinate for data sets on constant pressure surfaces. Table 3 lists the scale height, pressure, log-pressure altitude, and approximate geometric altitude (from *U.S. Standard Atmosphere, 1976*) of the vertical grid levels for the zonal mean temperature, zonal wind, and geopotential height climatology on constant pressure surfaces. Symbols and constants used in the figures and equations in the text are listed at the beginning of the report.

Table 2. Listing of the parameters, vertical coordinates, and spatial ranges and resolutions of the zonal mean data contained in the climatology.

PARAMETER	VERTICAL COORDINATE	VERTICAL RANGE, RESOLUTION	LATITUDINAL RANGE, RESOLUTION
A) Temperature	altitude	0-120 km, 5 km	80°S-80°N, 10°
B) Pressure	altitude	20-120 km, 5 km	80°S-80°N, 10°
C) Temperature	log-pressure	1013-.000025 mb, .5 sh* (0.0-17.5 sh)	80°S-80°N, 10°
D) Geopotential height	log-pressure	1013-.000025 mb, .5 sh (0.0-17.5 sh)	80°S-80°N, 10°
E) Zonal wind	log-pressure	1013-.000025 mb, .5 sh (0.0-17.5 sh)	80°S-80°N, 10°

* $sh = -\ln(p/p_0)$, p_0=1013 mb

Table 3. Listing of scale height, pressure, log-pressure altitude (used in the cross sectional plots), and approximate geometric altitude (from *U.S. Standard Atmosphere, 1976*) for each level of the constant pressure grid (note that p_0=1013 mb).

Scale Height $sh = -\ln(p/p_0)$	Pressure (mb)	Log-Pressure Altitude (km) $z^* = 7\ (-\ln[p/p_0])$	Approximate Geometric Altitude (km)
0.0	1013	0.0	0.0
0.5	614	3.5	4.0
1.0	373	7.0	7.7
1.5	226	10.5	11.0
2.0	137	14.0	14.2
2.5	83	17.5	17.4
3.0	50	21.0	20.6
3.5	31	24.5	23.7
4.0	19	28.0	26.9
4.5	11	31.5	30.5
5.0	6.8	35.0	33.8
5.5	4.1	38.5	37.4
6.0	2.5	42.0	41.0
6.5	1.5	45.5	45.0
7.0	.92	49.0	48.8
7.5	.56	52.5	52.8
8.0	.34	56.0	56.7
8.5	.21	59.5	60.3
9.0	.13	63.0	63.8
9.5	.076	66.5	67.4
10.0	.046	70.0	70.8
10.5	.028	73.5	74.0
11.0	.017	77.0	77.0
11.5	.010	80.5	80.0
12.0	.0062	84.0	83.0
12.5	.0038	87.5	85.9
13.0	.0023	91.0	88.7
13.5	.0014	94.5	91.5
14.0	.00084	98.0	94.4
14.5	.00051	101.5	97.3
15.0	.00031	105.0	100.2
15.5	.00019	108.5	103.3
16.0	.00011	112.0	106.6
16.5	.000069	115.5	110.2
17.0	.000042	119.0	114.6
17.5	.000025	122.5	120.0

A). ZONAL MEAN TEMPERATURE IN CONSTANT ALTITUDE COORDINATES

In generating the temperature climatology in constant altitude coordinates, MAP data[2] were used up to 80 km, with the 85 km values computed by linearly interpolating between the 80 km values from MAP and the 86 km values from MSIS-86. Only MSIS-86 temperatures were used at 90 km and above. The 95 km values were linearly interpolated from 94 and 96 km, and analogous computations were done for the 105 and 115 km levels. Temperatures at 75, 80, 85, and 90 km were then smoothed once in height using an elemental Gaussian filter having weights of 1/4,1/2,1/4 ("1-2-1 smoothing").

B). ZONAL MEAN PRESSURE IN CONSTANT ALTITUDE COORDINATES

In generating the zonal mean pressure climatology, pressure values for 86 to 120 km at 2 km resolution were first computed from MSIS-86 temperature and density data via the equation of state and taking into account the mean molecular weight variation with height above 86 km[3].

The climatology thus consists of MAP data for 20 to 80 km with the 85 km values computed by linearly interpolating (in log-pressure) between the 80 km values from MAP and the 86 km values derived from MSIS-86. Only MSIS-86 data were used for 90 km and above. Values at 95 km were linearly interpolated in log-pressure from 94 and 96 km values with analogous computations done for 105 and 115 km. No smoothing was done. MAP pressure data was not available below 20 km, therefore this is the bottom level of our climatology.

C). ZONAL MEAN TEMPERATURE IN CONSTANT PRESSURE COORDINATES

The zonally averaged monthly mean temperature climatology in constant pressure coordinates contains MAP data[2] up to 12.0 sh. Values at 12.5 sh and above were computed from MSIS-86 data as follows. MSIS-86 temperatures at constant altitude coordinates were linearly interpolated to the constant pressure surface grid (see Table 3) from the climatology of pressure in constant altitude coordinates (section 3-B above). Values were then 1-2-1 smoothed once in the vertical from 11.5 to 13.0 sh (.0103 - .00229 mb).

D). ZONAL MEAN GEOPOTENTIAL HEIGHT IN CONSTANT PRESSURE COORDINATES

The MAP geopotential height data were used from 2.0 to 12.0 sh; values at 12.5 to 17.5 sh were computed as follows. Lower thermospheric temperatures from MSIS-86 were converted to constant pressure surfaces as described in section 3-C above with a vertical resolution of 0.25 sh extending from 12.25 to 17.5 sh. Geopotential heights were then computed for 12.25 to 17.5 sh at 0.25 sh resolution by integrating upward hydrostatically from the 12.0 sh level (the top level of the MAP data) and taking into account the mean

[2] Note that temperatures at and below 50 mb (and the corresponding levels in altitude coordinates) in the MAP data were taken from Oort (1983).

[3] For simplicity in doing the computations, mean molecular weight values from *U.S. Standard Atmosphere, 1976* were used. These were found to be comparable to those computed from MSIS-86 composition data.

molecular weight variation with height (again values from *U.S. Standard Atmosphere, 1976* were used). Only values from 12.5 to 17.5 sh at 0.5 sh intervals were included in the climatology. For all calculations mentioned above and below, mean layer temperatures were approximated using the trapezoidal rule.

For tropospheric levels (0.0-1.5 sh), the use of geopotential heights from Oort (1983) led to discontinuities when merged with MAP data. Therefore we computed height values by integrating downward hydrostatically from the 2.0 sh level using temperatures at constant pressure surfaces from MAP data. However compared with more detailed climatological data sets of the troposphere, the MAP data has a relatively coarse vertical resolution and in using this technique an incorrect assumption is made that the troposphere is dry. Therefore these geopotential height values are most likely not as accurate as those of more detailed data sets of the lower atmosphere (e.g. Oort, 1983), but are used here for the sake of continuity. (It was found that in the lower troposphere, geostrophic zonal wind values derived from these geopotential heights do not compare well with direct wind measurements.)

E). ZONAL MEAN ZONAL WIND IN CONSTANT PRESSURE COORDINATES

For 0.0 to 1.5 sh (tropospheric levels), zonal wind values from Oort (1983) were linearly interpolated in log-pressure to the vertical grid of our climatology for latitudes 80°S to 80°N. Values at the poles were set equal to zero. No further computations were done for these levels.

For levels at 2.0 sh and above, several computations were involved, described as follows.

a) 20°N-70°N (20°S-70°S). Wind at these latitudes were computed from the zonally averaged zonal momentum equation (e.g., Holton, 1975):

$$\frac{[U]^2 \tan\theta}{a} + 2\Omega[U]\sin\theta = -g_0 \frac{\partial [Z]}{\partial y} \qquad (1)$$

where θ is degrees latitude, a is the earth's radius, g_0 is the gravitational acceleration at sea level, Ω is the angular speed of rotation of the earth, and $[Z]$ is the zonally averaged geopotential height. Solving the quadratic for $[U]$ yields (after rearranging of terms),

$$[U] = -M \pm \sqrt{(M^2 + 2M[Ug])} \qquad (2)$$

where $M = a\Omega\cos\theta$ (the tangential velocity associated with the earth's rotation), and $[Ug]$ is the zonally averaged zonal geostrophic wind speed defined as (e.g., Holton, 1979),

$$[Ug] = -\frac{g_0}{2\Omega\sin\theta} \frac{\partial [Z]}{\partial y} \qquad (3)$$

Only the positive value of the radical in equation (2) gives a physically meaningful result. Values of [Ug] were taken from MAP data for levels 2.0 to 12.0 sh. Geostrophic wind at 20°N-70°N (20°S-70°S) for levels 12.5 to 17.5 sh were computed from geopotential heights differentiated over four degree latitudinal intervals. These heights were computed from MSIS-86 data as was done in section 3-D above, building up hydrostatically from the 12.0 sh level for the correct latitudes (the MAP geopotential heights at 12.0 sh were first linearly interpolated to 72°S, 68°S, 62°S, 58°S, 52°S, 48°S, etc.).

b) Equator. Since the zonal wind at the equator cannot be computed from equations (1) - (3), we derived the zonal wind at the equator by expressing equation (1) in spherical coordinates and differentiating with respect to θ,

$$\frac{\partial}{\partial\theta}\left(\frac{[U]^2\tan\theta}{a}\right) + \frac{\partial}{\partial\theta}(2\Omega[U]\sin\theta) = \frac{\partial}{\partial\theta}\left(-\frac{g_0}{a}\frac{\partial[Z]}{\partial\theta}\right) \tag{4a}$$

yielding,

$$\frac{\tan\theta}{a}\frac{\partial([U]^2)}{\partial\theta} + \frac{[U]^2}{a}\sec^2\theta + 2\Omega\sin\theta\frac{\partial[U]}{\partial\theta} + 2\Omega[U]\cos\theta = -\frac{g_0}{a}\frac{\partial^2[Z]}{\partial\theta^2} \tag{4b}$$

At the equator, equation (4b) reduces to,

$$\frac{[U]^2}{a} + 2\Omega[U] = -\frac{g_0}{a}\frac{\partial^2[Z]}{\partial\theta^2} \tag{5}$$

For monthly mean zonally averaged zonal wind at the equator within the limits of observations (±75 m/s) (e.g., Belmont et al., 1975; Hopkins, 1975; Hirota, 1978; Hamilton, 1982), the first term on the left hand side of equation (5) is one to two orders of magnitude smaller than the other two terms and thus it can be neglected. With $dy \equiv a d\theta$ representing the northward distance increment, equation (5) becomes,

$$[Ueq] = -\frac{g_0}{\beta}\frac{\partial^2[Z]}{\partial y^2} \tag{6}$$

where $\beta \equiv df/dy$ is a constant (beta-plane approximation) defined as $2\Omega/a$ at the equator. The second derivative of [Z] with respect to y was computed using the standard finite difference method for second derivatives using data values at 10°S, equator and 10°N. As will be shown in the analysis of the climatology (section 4) this computation of the monthly mean zonal wind at the equator compares well with monthly mean radiosonde and rocketsonde wind measurements from individual stations. (Equation 6 is a form of the thermal wind equation at the equator, e.g., Dunkerton and Delisi, 1985).

c) 10°N (10°S). Zonal wind at 10°N (10°S) were computed by linearly interpolating between zonal wind at 15°N (15°S) (computed by equation 1) and zonal wind at the equator.

d) 80°N (80°S). Zonal wind at 80°N (80°S) were derived by assuming the relative angular velocity (e.g., Holton, 1975),

$$[\omega] = \frac{[U]}{a\cos\theta} \tag{7}$$

is constant poleward of 70°N (70°S). Thus wind at 80°N (80°S) are,

$$[U]_{80} = [U]_{70} \frac{\cos(80)}{\cos(70)} \tag{8}$$

By equations (7) and (8), [U] varies with the cosine of latitude poleward of 70°N (70°S) and thus [U] goes to zero at the poles. A priori this ensures that at high latitudes, the barotropic stability of the zonal mean flow is maintained (a discussion of the stability of the climatology is contained in appendix A).

The wind at 60°N-80°N and 60°S-80°S were then smoothed 1-2-1 once in the vertical from 11.5 to 13.0 sh.

4. CROSS SECTIONAL ANALYSES OF THE CLIMATOLOGY

In this section, we present various zonal mean cross sectional plots of the zonal mean temperature, zonal wind, geopotential height and pressure climatology in latitude-height, month-height, and month-latitude. Our goal is to illustrate that the climatology presented here accurately reproduces various well known features of the zonally averaged atmospheric state, and to point out any lesser known phenomena. Temperature in constant altitude and constant pressure coordinates reveal very similar plots (with one exception in the lower thermosphere described below), therefore only temperature in pressure coordinates will be discussed here. For cross sections with pressure as the ordinate, the log-pressure altitude, z^* (km) is included on the right hand side of the plots (see Table 3 for a listing of these values). For cross sections which have month as the abscissa, an extra month of values has been included on each side of the plot. For example, in cross sections which run from January to December, the December values have been added to the left edge and the January values to the right edge of the plot. However to avoid confusion, they have not been labeled as such.

To supplement these cross sections, the climatology of temperature and zonal wind in constant pressure coordinates has been Fourier analyzed at each latitude and pressure level. We present the results in the form of latitude-height sections of the annual mean and the amplitudes and phases of the annual, semiannual, and terannual harmonics.

A). ZONAL MEAN TEMPERATURE

Latitude - Height

Figure 1(a-l) shows latitude-height sections of temperature in constant pressure coordinates for each month. Several common features are readily apparent, such as the year-round cold tropical tropopause, the polar temperature minimum (which is 16K colder in the Southern than in the Northern Hemisphere) with midlatitude maximum in the wintertime lower stratosphere, the warm stratopause with maximum temperatures at the summer pole, the cold mesopause with minimum temperatures at the summer pole, and the sharp temperature increase with height in the lower thermosphere. These features are also reflected in the harmonic analysis cross sections in Figure 5(a-g). The equinoctial seasons are noted for their generally weak latitudinal temperature gradients. Other features of note are:

- The winter stratopause at high latitudes (which is in polar night) exhibits an increase in altitude and temperature with increasing latitude. This feature is observed in both hemispheres, although it is more pronounced in the Southern Hemisphere.
- The equatorial tropopause temperature minimum occurs in January/February (197 K) and the maximum occurs in July/August (202 K) (see also Figure 5c). As hypothesized by Reed and Vlcek (1969), "the Hadley cell achieves its greatest intensity during the Northern Hemisphere winter with strongest upwelling and adiabatic cooling in the ascending branch of the meridional circulation occurring at this time."
- The altitude of the mesopause temperature minimum decreases with

ORIGINAL PAGE IS
OF POOR QUALITY

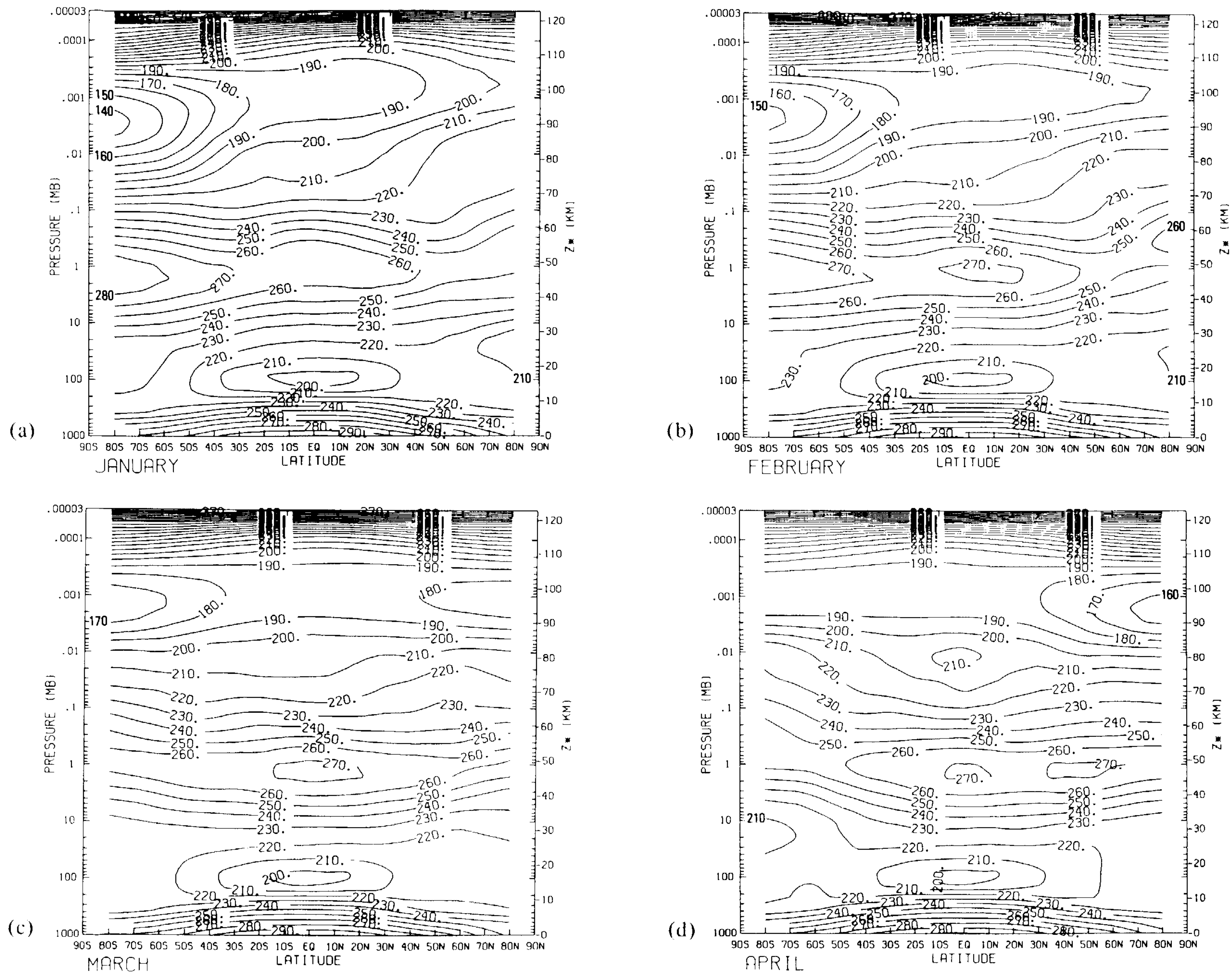


Figure 1. Latitude-height cross sections of zonal mean temperature for the 12 months. Contour interval of 10 K.

ORIGINAL PAGE IS
OF POOR QUALITY

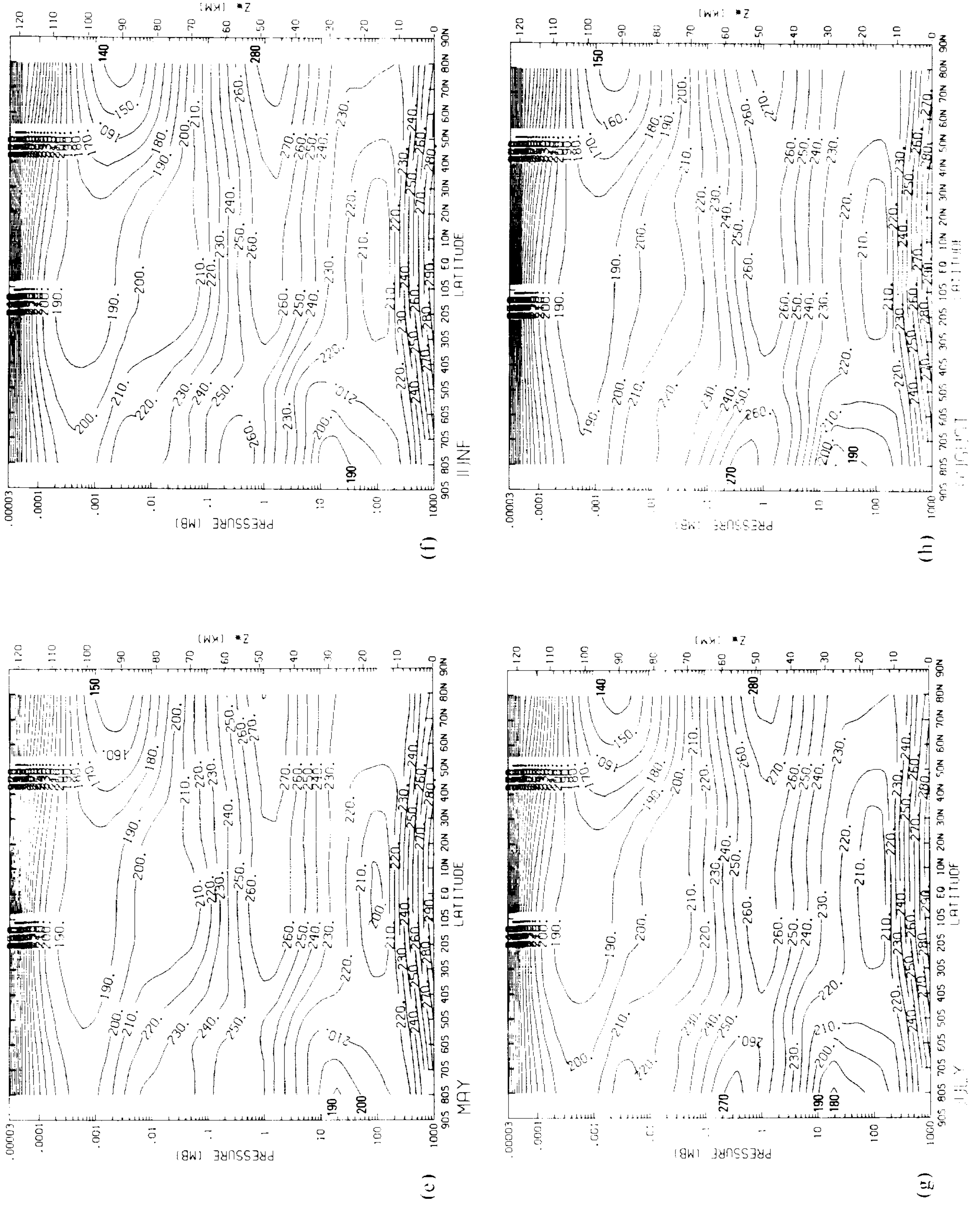


Figure 1. (cont.)

ORIGINAL PAGE IS
OF POOR QUALITY

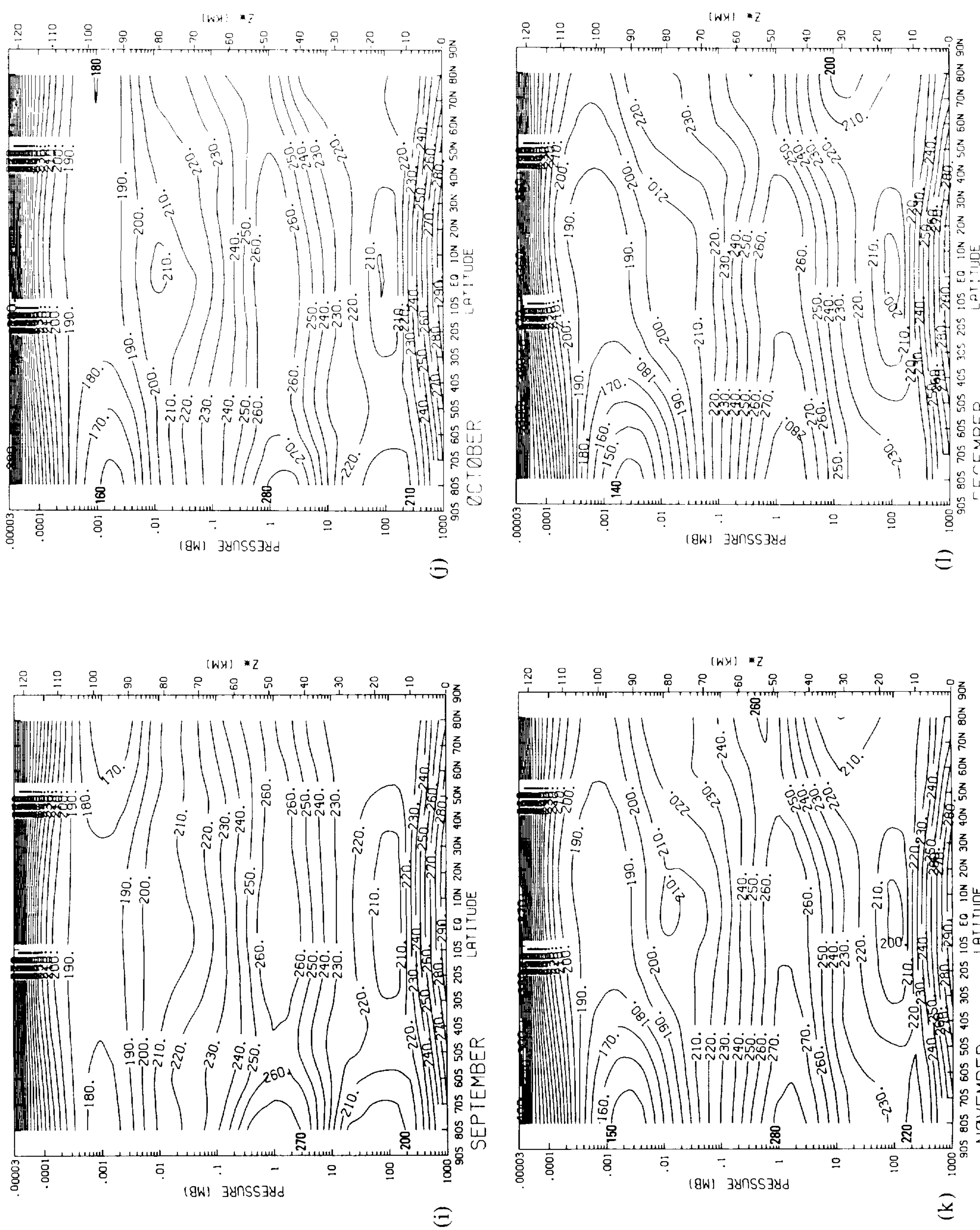


Figure 1 (cont.)

increasing latitude in the summer hemisphere.

Month - Height

Figure 2(a-c) shows month-height plots of temperature at 80°N, 40°N, and the equator, respectively (analogous plots for the Southern Hemisphere are very similar). The seasonal cycles are revealed by these plots, such as the lowering and cooling of the mesopause and the lowering and warming of the stratopause during the summer months at middle and high latitudes. The annual cycle becomes less robust with decreasing latitude, with only a semiannual cycle observed in the stratosphere and mesosphere at the equator (Figure 2c). This semiannual cycle is global in extent and has separate maxima in the equatorial and high latitude regions (see also Figure 5(a-g)). It is associated with the global scale semiannual wind oscillation which will be discussed in a later section.

Month - Latitude

Month-latitude cross sections at 31 mb (24 km), 1.5 mb (45 km), .017 mb (77 km), and .000042 mb (119 km) (log-pressure altitude is indicated in parentheses) are shown in Figure 3(a-d), respectively. In these plots, the Northern Hemisphere values have been phase-shifted by six months so that the months run from July to June, while the Southern latitudes and the equator run from January to December. This procedure facilitates the visual comparison of the two hemispheres under similar conditions. At 31 and 1.5 mb, the normal seasonal cycles are observed with summer maxima/winter minima and largest annual cycle amplitudes at the poles. Note the large hemispheric asymmetry of the winter polar regions in the lower stratosphere; minimum temperatures over the Antarctic are 15K colder than over the Arctic, and the region of isolated cold polar air is larger and longer-lived in the Southern Hemisphere at 31 mb. The winter temperature minimum at high Northern latitudes occurs during December at 31 mb and during November at 1.5 mb, with a secondary minimum during February at 1.5 mb. However at high Southern latitudes, the winter minimum occurs during July/August at 31 mb and May/June at 1.5 mb. This is also observed in the annual cycle phase diagram of Figure 5c. Thus the mechanism (most likely dynamical) responsible for warming up the high latitudes during the polar night commences roughly two months earlier at 1.5 mb than at 31 mb in the Southern Hemisphere, but only one month earlier at 1.5 mb than at 31 mb in the Northern Hemisphere. Note also the equator-to-pole temperature gradient at 1.5 mb in the Southern Hemisphere during winter which reverses in sign at roughly 50°S and again at 70°S (this is most pronounced during August). This feature is related to the polar latitudinal temperature maximum of the winter polar stratopause observed in Figure 1(a-l).

The observed reversal of the seasonal temperature cycle in the upper mesosphere is revealed in Figure 3c (.017 mb) with maximum temperatures in the winter and minimum temperatures in the summer (again see Figure 5c). This phenomenon is observed up to approximately .0003 mb (105 km) above which the seasonal cycle reverses back to maximum summer temperatures and minimum winter temperatures (Figure 3d). Again at .017 mb there is evidence of a hemispheric asymmetry in the annual temperature cycle at high latitudes. The maximum temperature occurs around the solstice (mid-December) in the Northern Hemisphere, but approximately a month earlier (mid-May) in the Southern Hemisphere.

Above approximately .000069 mb (116 km) the amplitude of the annual cycle

ORIGINAL PAGE IS
OF POOR QUALITY

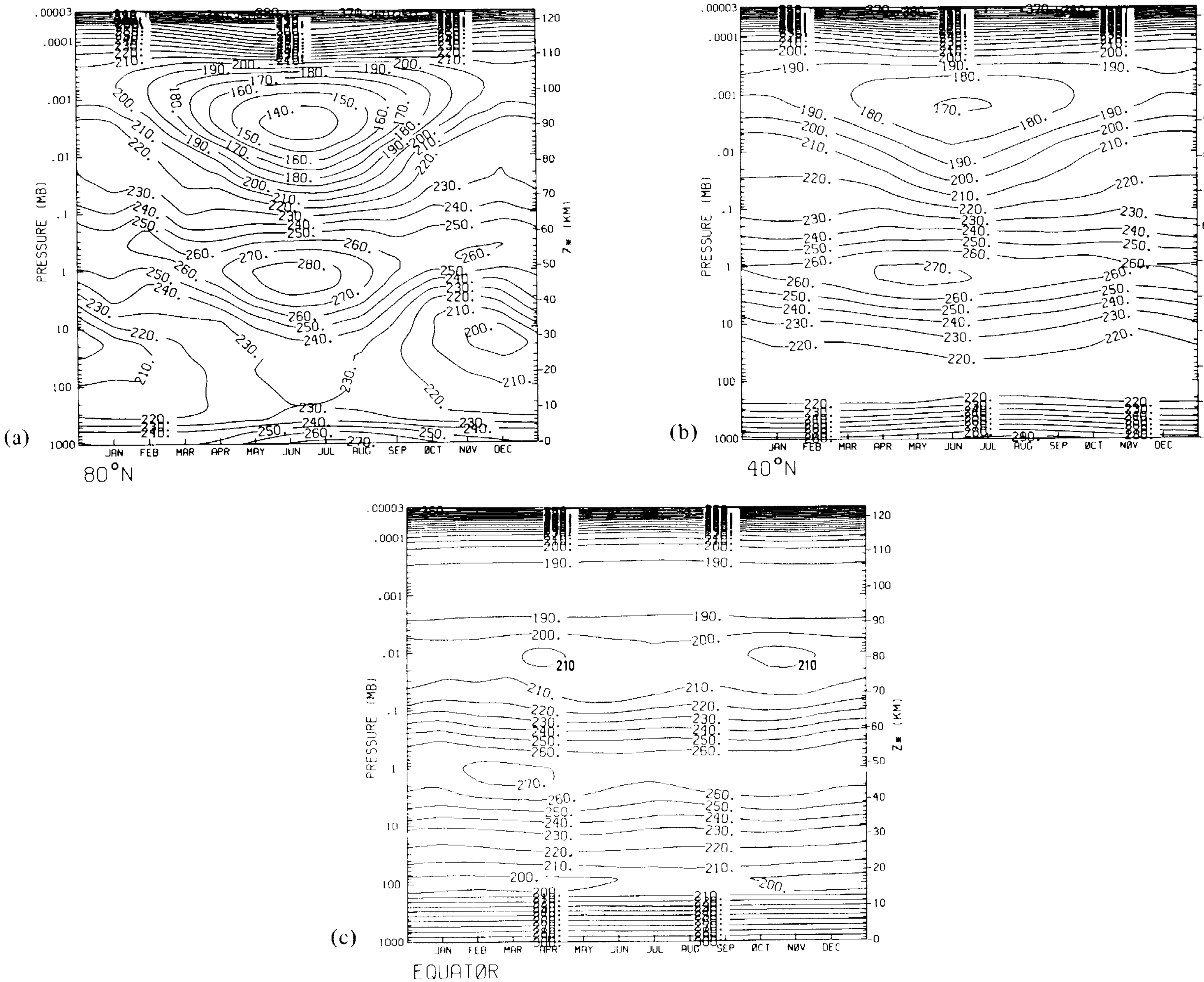


Figure 2. Month-height cross sections of zonal mean temperature for (a) 80°N, (b) 40°N, and (c) the equator. Contour interval of 10 K.

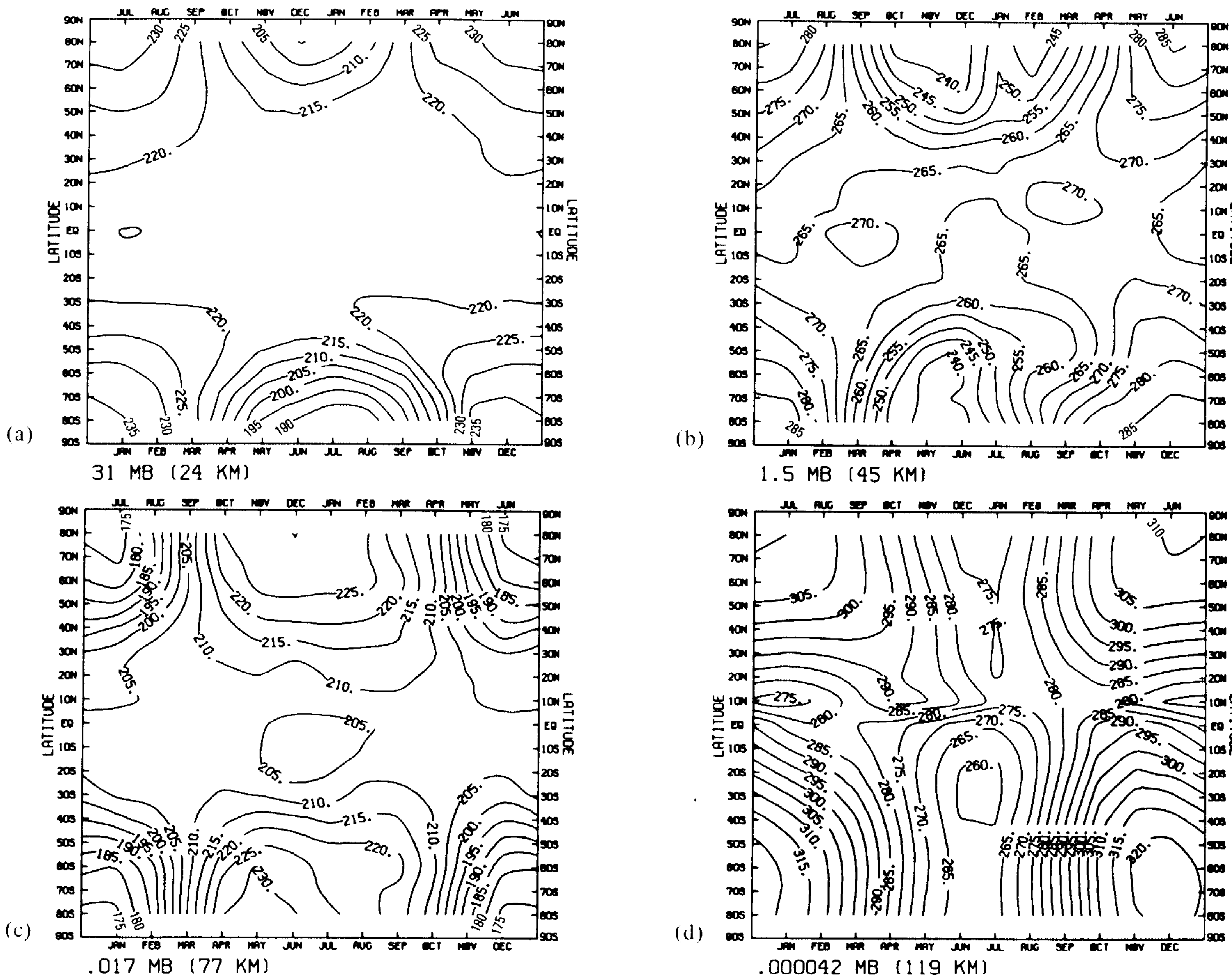


Figure 3. Month-latitude cross sections of zonal mean temperature for (a) 31 mb (24 km), (b) 1.5 mb (45 km), (c) 0.017 mb (77 km), and (d) 0.000042 mb (119 km). Contour interval of 5K. Months run January-December for latitudes 0°-90°S (labels at bottom of plots), and July-June for 10°N - 90°N (labels at top of plots).

(1st harmonic) in temperature is much larger in the Southern than in the Northern Hemisphere (Figure 3d -- see also Figure 5b). This phenomenon is caused by a hemispheric asymmetry in the annual cycle amplitude of total density (and thus pressure), and is therefore not observed in a similar analysis of temperature in constant altitude coordinates. It is not known whether this hemispheric asymmetry is real since there is insufficient global data coverage at these levels to accurately resolve such a feature. (A. Hedin, personal communication). This phenomenon is also observed in cross sections of pressure in constant altitude coordinates which will be discussed later.

Globally Averaged Temperature

Figure 4 shows a month-height cross section of the deviation from the annual mean of the globally averaged temperature (computed by weighting the value at each latitude by the cosine of the latitude) for each pressure level and month. Some features of interest are :

- A dominant annual cycle is observed in the upper stratosphere and lower thermosphere with minima in June/July and maxima in December/January. This is most likely due to the elliptical orbit of the earth, with the earth-sun distance at a maximum and global insolation at a minimum during June/July. The atmosphere would be most sensitive to this phenomenon at levels where direct absorption of solar radiation is most efficient, i.e., the upper stratosphere, and lower thermosphere.
- A dominant mesospheric semiannual cycle is observed with solstitial season maxima in the lower mesosphere and equinoctial season maxima in the upper mesosphere. At these levels it is observed that the deviation of temperature from the annual average reveals a strong annual component poleward of 25° latitude which is roughly equal in amplitude and opposite in phase in the two hemispheres and thus cancels out in the global mean. However a global semiannual oscillation of similar phase in both hemispheres is present with solstitial season maxima in the lower mesosphere and equinoctial season maxima in the upper mesosphere (see Figures 5d and 5e). This phenomenon is thus reflected in the mesospheric features observed in Figure 4. There is evidence of a significant annual cycle in the upper mesosphere with the minimum being less intense in December/January than in June/July. This is again consistent with the annual variation of global insolation caused by the annual cycle of the earth-sun distance.

The stratospheric and mesospheric features just described have been similarly observed by Crane (1979b).

Harmonic Analysis

Many of the features observed in the cross sectional analyses described above are more clearly evident in Fourier analyses of the temperature climatology, as displayed in latitude-height sections in Figure 5(a-g). The annual mean and harmonic amplitudes are expressed in degrees K and the phases are represented by a number corresponding to the time of the first maximum, e.g., -1 = November 15, 0 = December 15, 1 = January 15, etc.

A cold tropical tropopause, warm stratopause, and cold mesopause are characteristic of the annual mean, with stratopause minima observed at 50°S and 60°N.

The amplitude of the annual wave reaches a maximum of 26 K at 80°N at

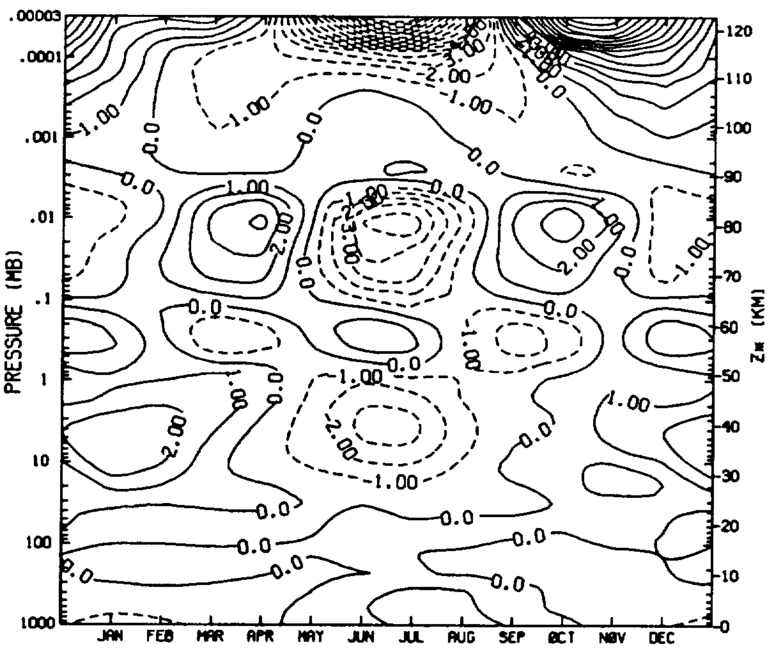


Figure 4. Month-height cross section of the zonal mean globally averaged temperature with the annual average at each level subtracted out. The global average was computed by weighting the zonal average at each latitude by the cosine of the latitude. Contour interval of 1 K. Negative values are dashed.

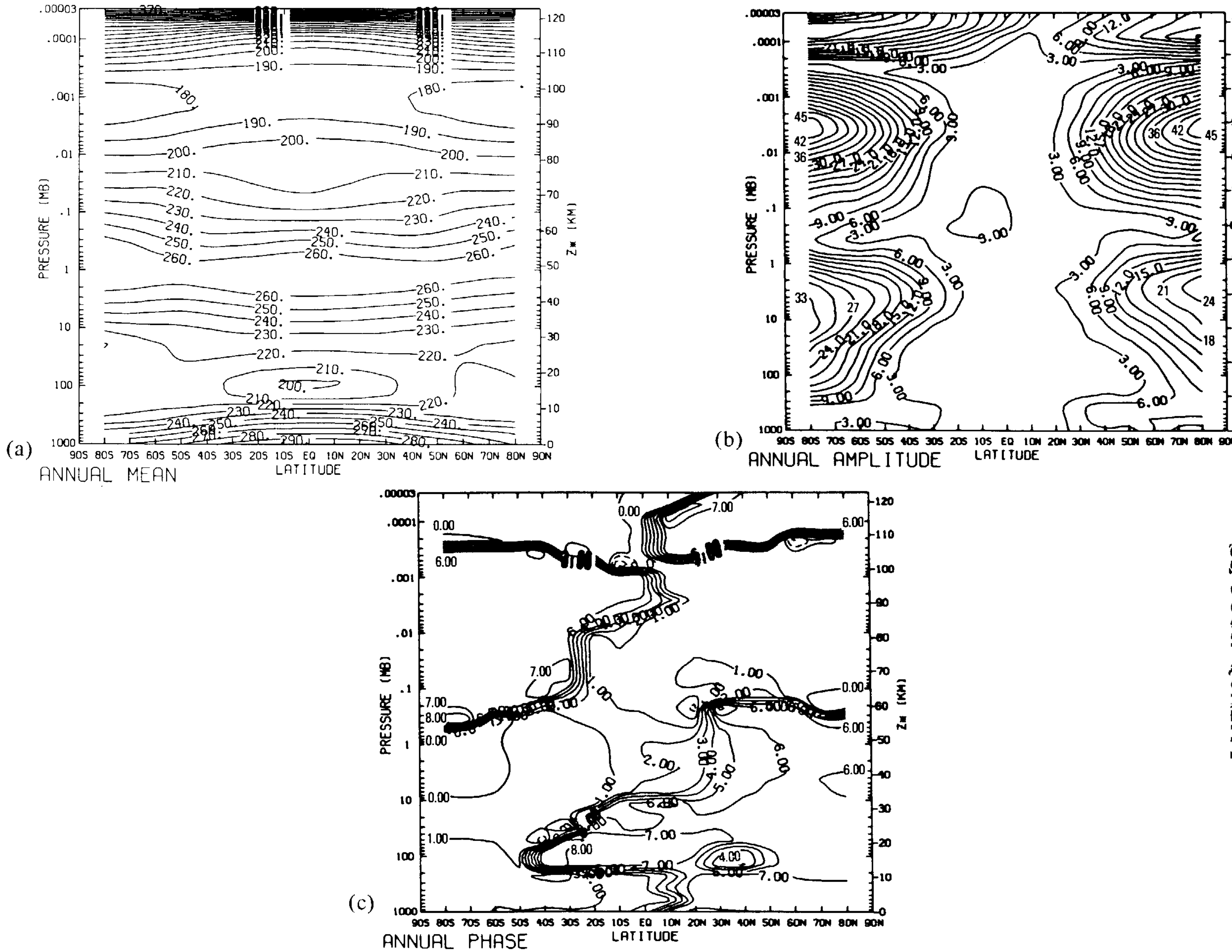


Figure 5. Latitude-height cross sections of Fourier analysis of the zonal mean temperature climatology. (a) annual mean, contour interval of 10 K, (b) annual cycle amplitude, (c) annual cycle phase, (d) semiannual cycle amplitude, (e) semiannual cycle phase, (f) terannual cycle amplitude, (g) terannual cycle phase. Contour interval is 3 K for the annual and semiannual amplitudes, and 1 K for the terannual amplitude. Values in the phase plots correspond to the month of the first maximum and have a contour interval of 1. Negative values are dashed. See text for details.

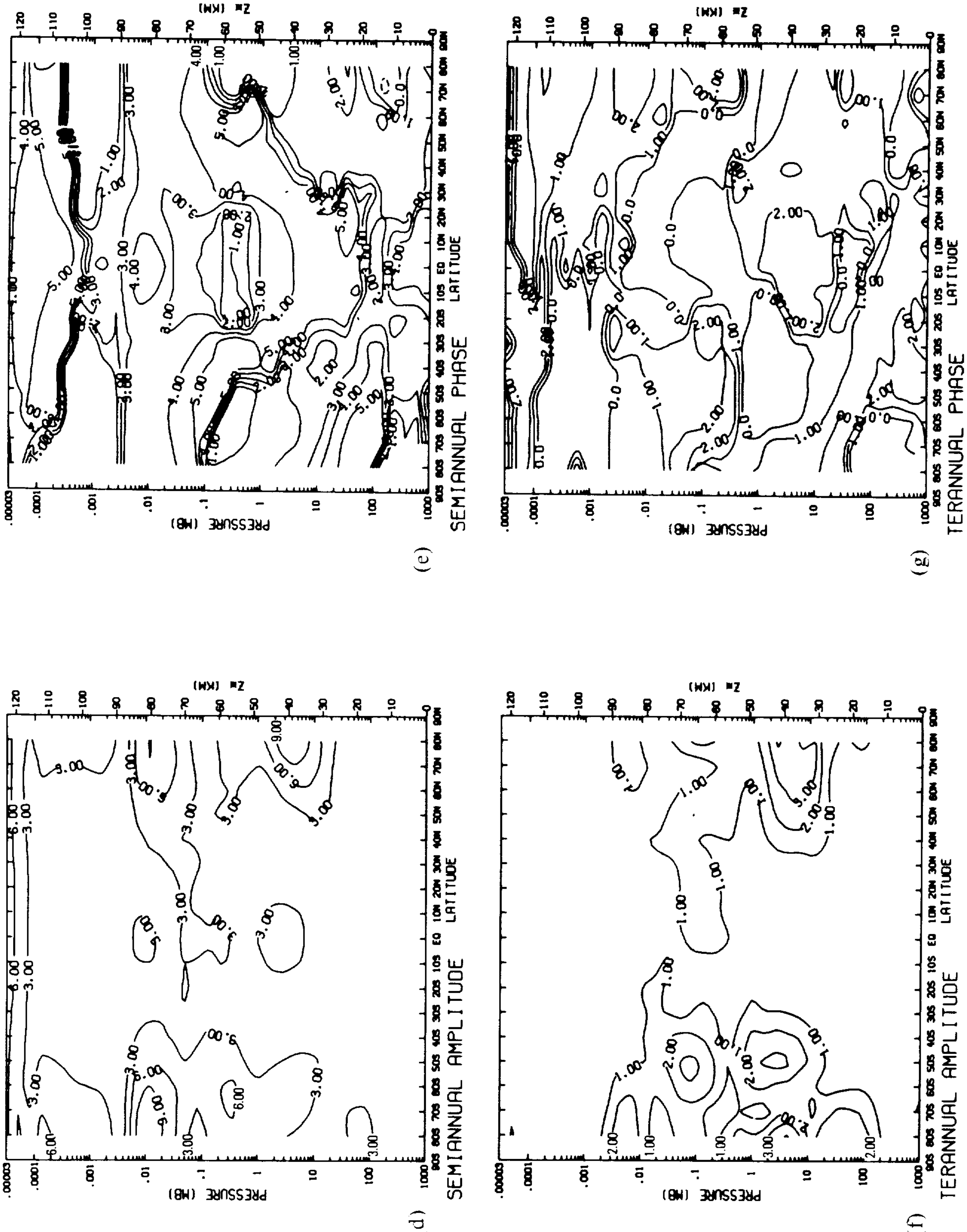


Figure 5. (cont.)

ORIGINAL PAGE IS
OF POOR QUALITY

2.5 mb with the corresponding maximum at 80°S stronger (35 K) and lower in altitude (11 mb). Summer maxima are generally observed in the extratropics from the ground to just above the stratopause. The time of maximum in the stratosphere at high latitudes becomes earlier with increasing height more rapidly in the Southern than in the Northern Hemisphere. These features are consistent with the observations in Figures 3a and 3b. A minimum in amplitude accompanied by a rapid reversal in phase is observed in the lower mesosphere outside of the tropics. Winter maxima are observed at levels from .1 to .0003 mb and the magnitude and altitude of the amplitude maxima at the mesopause are similar in the two hemispheres. The tropics at levels below .0003 mb exhibit relatively small amplitudes. A minimum in amplitude accompanied by a rapid phase reversal back to summer maxima are observed at .0003 mb. The large hemispheric asymmetry in the annual wave amplitude above .000069 mb observed in Figure 3d is more clearly evident in Figure 5b. The amplitude at .00003 mb is 46 K at 80°S as opposed to 19 K at 80°N.

The semiannual cycle amplitude exhibits well known maxima in the tropics from the upper stratosphere to the mesopause. Maxima occur during the equinoxes in the stratosphere, shift gradually with height to solstitial maxima in the lower mesosphere, and shift back to equinoctial maxima at the mesopause (see also Figure 2c). Relatively large amplitudes are also observed at high latitudes from the upper stratosphere to the mesopause. Equinoctial season maxima are observed at the mesopause amplitude maximum, with the phase shifting to generally solstitial season maxima at lower levels. Large amplitudes with maxima at the equinoxes are also observed globally above .0001 mb. These features are generally consistent with those observed in Figures 3(a-d) and 4.

For the sake of completeness we have included the terannual cycle (Figures 5f and 5g) which exhibits significant amplitudes at high Northern latitudes in the upper stratosphere, the Southern Hemisphere upper stratosphere centered at 50°S and the pole, and the Southern Hemisphere middle mesosphere centered at 50°S. Note the phase transitions between regions of large amplitude.

The features described above have been similarly observed in Fourier analyses of Angell and Korshover (1970), McGregor and Chapman (1978), Crane (1979b), Belmont (1985), and MAP Handbook #16 (1985).

B). ZONAL MEAN ZONAL WIND

Latitude - Height

Figure 6(a-l) shows latitude-height cross sections of the zonal wind for each month. Again several well known features are evident:

- The upper tropospheric jet streams in both hemispheres are strongest and are located furthest equatorward during the winter.
- A strong stratospheric/mesospheric zonal circulation is observed during the solstice seasons, with easterlies in the summer and westerlies in the winter hemisphere. Maximum velocities generally occur in the midlatitude mesosphere, with a splitting of the jet streams occasionally observed (e.g., August and September in the Southern Hemisphere). Note the protrusion of easterlies into the stratospheric low latitudes of the winter hemisphere, and the winter westerly (polar night) jet observed in the stratosphere centered near 60° latitude in both hemispheres.

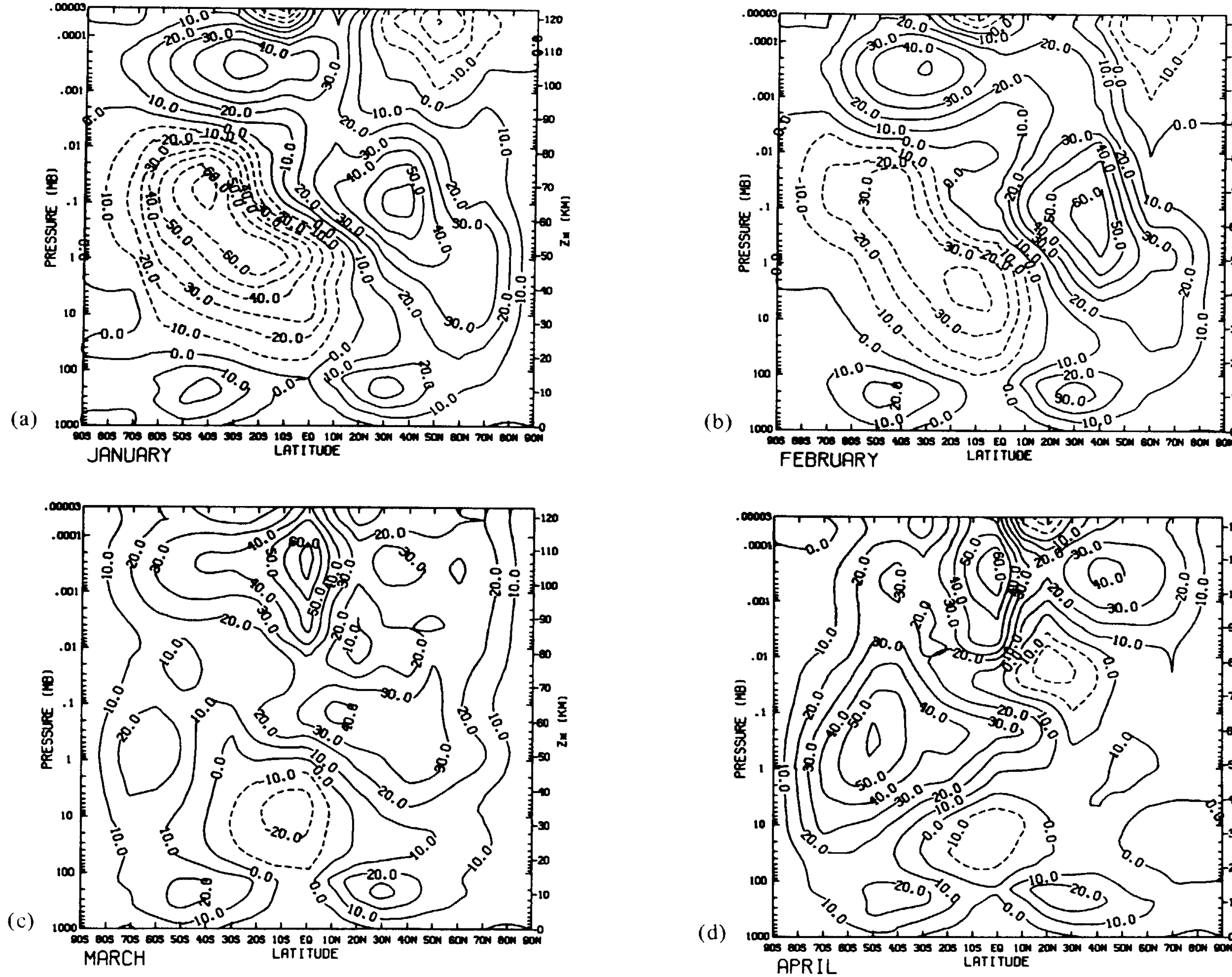


Figure 6. Latitude-height cross sections of zonal mean zonal wind for the 12 months. Contour interval of 10 m/s. Negative (easterly) values are dashed.

ORIGINAL PAGE IS
OF POOR QUALITY

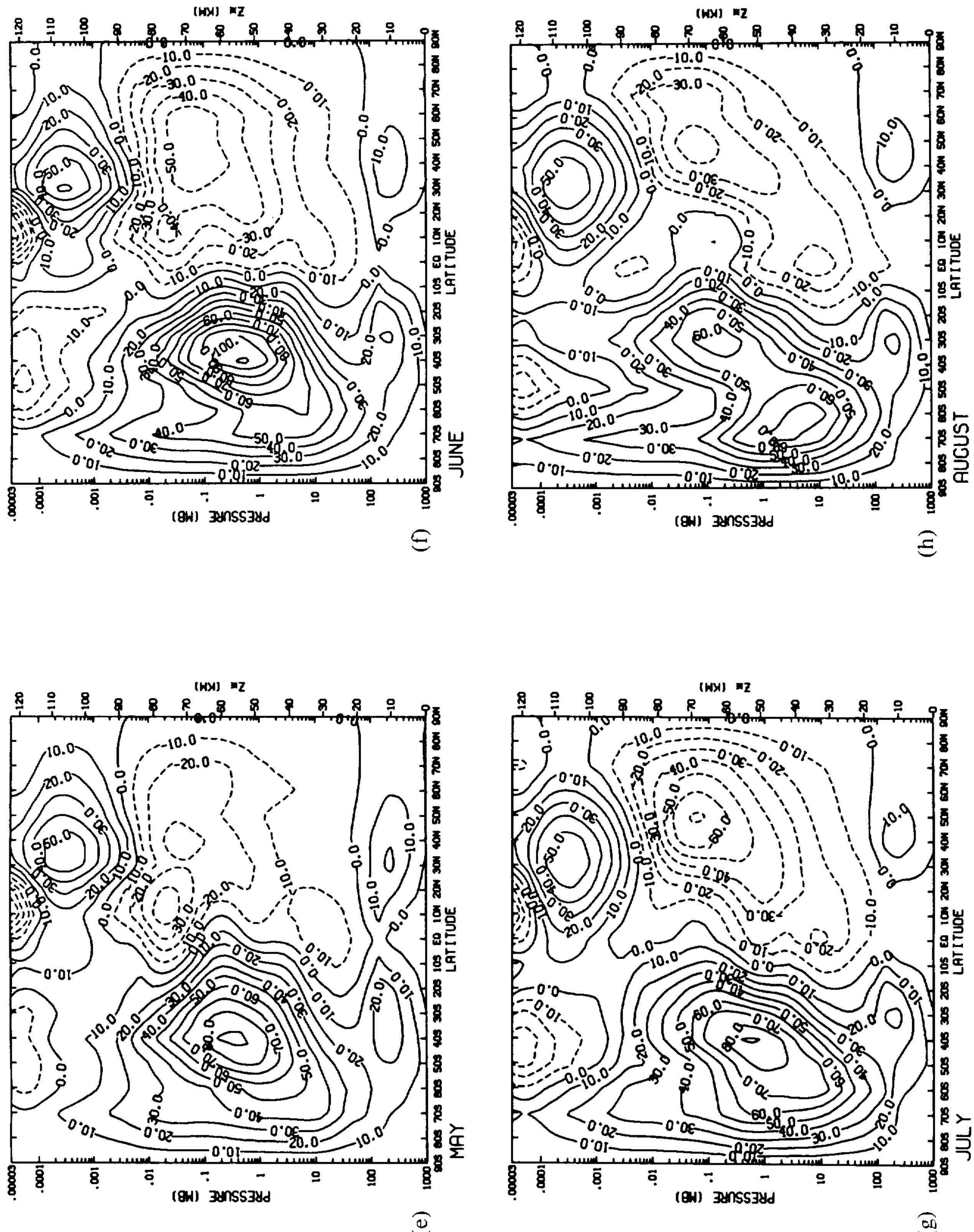


Figure 6. (cont.)

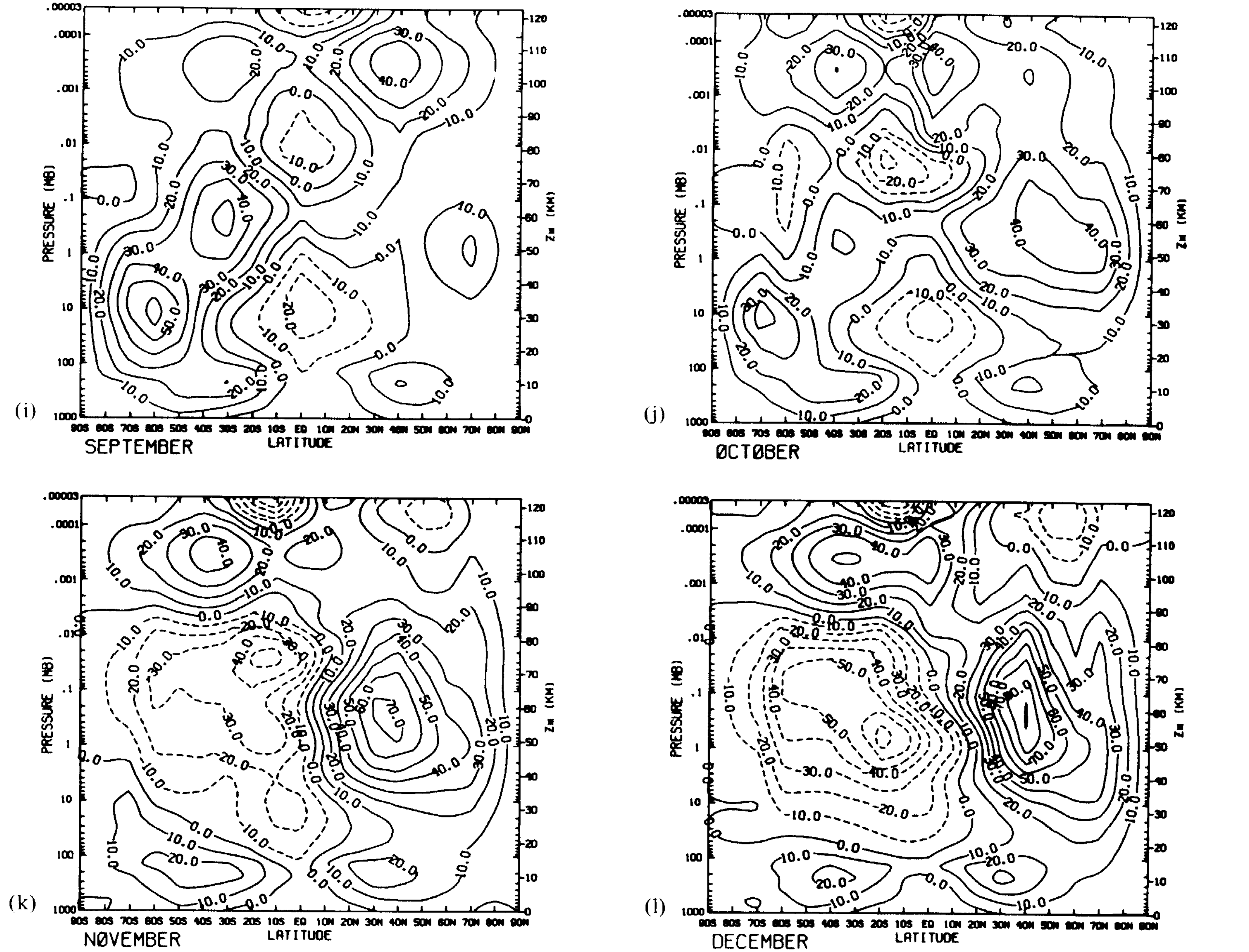


Figure 6. (cont.)

ORIGINAL PAGE IS
OF POOR QUALITY

- The circulation reverses near the mesopause during the solstices, with westerlies during the summer and easterlies during the winter in the lower thermosphere. This reversal occurs at a lower altitude and is more pronounced in the summer hemisphere.
- The equinoctial seasons are characterized by relatively weak global circulation.

Latitude-height sections based on radio/rocketsonde data below 60 km and rocketsonde, falling sphere, grenade, pressure gauge, chemical release, radio-meteor, noctilucent cloud motion, and electron cloud drift measurements above 60 km, such as in Kantor and Cole (1964), Murgatroyd (1969), and CIRA (1972) exhibit similar features below 70-80 km. In the lower thermosphere, all analyses (except for Murgatroyd, 1969 which only extended up to 70 km) exhibit a westerly jet centered at 30°-40° latitude in the summer hemisphere immediately above the mesospheric easterlies, similar to Figure 6(a-1). However at other latitudes of the lower thermosphere, Figure 6(a-1) shows generally poor agreement with the other data sets. A detailed comparison of our climatological zonal wind with direct wind measurements in the upper mesosphere and lower thermosphere will be discussed in section 5.

The winds at tropical latitudes seen in Figure 6(a-1) are similar to cross sectional analyses based on several years of monthly mean radiosonde and rocketsonde wind measurements (e.g. Kantor and Cole, 1964; Reed, 1966; Murgatroyd, 1969; CIRA, 1972; and Hopkins, 1975). Thus in general, the zonal wind at the equator computed by equation (6) gives a good representation of direct measurements of the wind on a monthly mean basis.

Month - Height

Figure 7a shows a month-height cross section for 60°S. Winter westerlies and summer easterlies characterize the stratosphere and mesosphere with a reversal of the circulation in the lower thermosphere. Note the descending westerly "polar night" jet in the lower stratosphere from August through November.

Figures 7b and 7c show month-height cross sections at 40°N and 20°S, respectively, with the months running from July-June. The annual cycle of the tropospheric jet streams is seen, and stratospheric and mesospheric summer easterlies and winter westerlies with a lower thermospheric reversal are again observed. A second reversal back to easterlies occurs above .0001 mb during the summer at 20°S. At 20°S the transition from westerly to easterly flow descends with time from mid-September at the mesopause to late October in the upper stratosphere. Similarly in the fall, the zero wind line is present during mid-February at the mesopause and mid-May in the lower stratosphere. A similar descent is observed during the spring transition at 60°S with less dramatic descents occurring during spring and fall at 40°N (these features are similarly observed in analogous plots for 60°N, 40°S, and 20°N). At 20°S the easterly wind maximum is also observed to descend with time: from the mesopause during mid-October to the lower stratosphere by mid-March. The winter westerly jet maximum at 20°S exhibits a less dramatic descent: from ~.1 mb during mid-August to the the upper stratosphere by mid-October. Kantor and Cole (1964) observed similar descents with time of the zero wind lines and jet maxima in their month-height cross sections for 30°N and 60°N.

In addition to the annual cycle, the seasonal march of the zonal wind exhibits a substantial semiannual oscillation (SAO) (e.g., Reed, 1966; Quiroz and Miller, 1967; Angell and Korshover, 1970; van Loon et al., 1972; Groves,

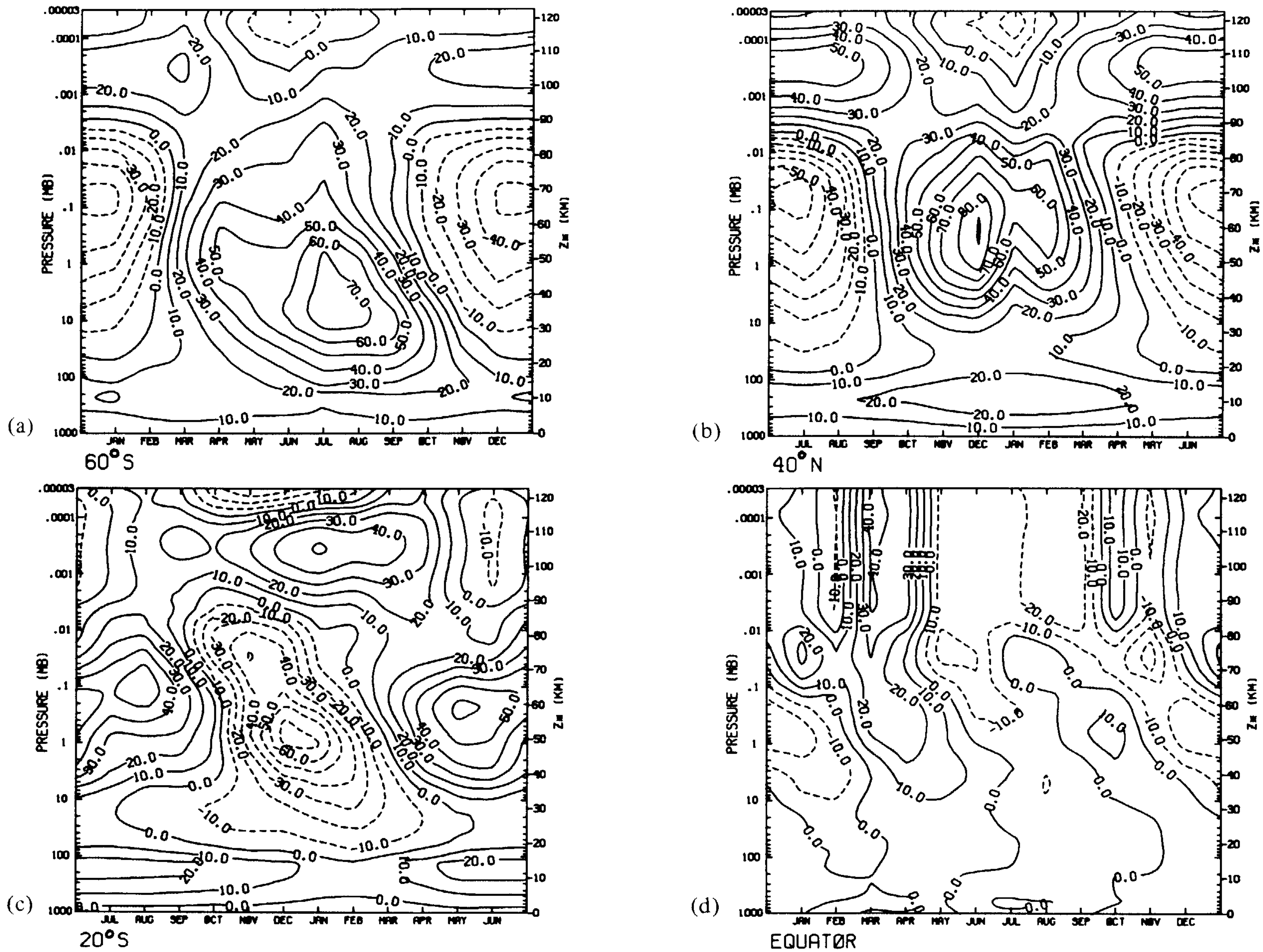


Figure 7. Month-height cross sections of zonal mean zonal wind for (a) 60°S with months running from January to December, (b) 40°N with months running from July to June, (c) 20°S with months running from July to June, and (d) the equator with months running from January to December and the annual mean at each level subtracted out. Contour interval of 10 m/s. Negative (easterly) values are dashed.

1972; Belmont et al., 1974; Hopkins, 1975; McGregor and Chapman, 1978; Hirota, 1978; Hamilton, 1982). The semiannual wind oscillation is global in extent (see the harmonic analysis subsection in the following pages) and is related to the semiannual cycle in temperature. In the equatorial region where the annual cycle is relatively small, the SAO is the dominant zonal wind variation in the upper stratosphere and mesosphere, as seen in Figure 7d (the annual mean at each level has been removed). Separate amplitude maxima occur near the stratopause and mesopause, respectively; westerlies are observed during the equinoxes and easterlies during the solstices near the stratopause maximum with a 180° phase-shift near the mesopause maximum (see also figures 10d,e). This is at least qualitatively similar to representations of the SAO based on monthly mean radiosonde and rocketsonde measurements of the zonal wind from individual stations near the equator (see the references cited above). Figure 7d is also consistent with Hirota (1978) who showed that the SAO in the equatorial region consists of two separate oscillations centered near the stratopause and mesopause, respectively. Again, this illustrates that equation (6) gives a fairly accurate representation of the zonal wind at the equator. The lower stratosphere, which is dominated by the quasi-biennial oscillation, also shows some evidence of a weak semiannual cycle. The troposphere and the lower thermosphere are characterized by rather poorly defined features in this plot.

Month - Latitude

Figure 8(a-c) shows month-latitude zonal wind cross sections at 226 mb (10 km), 31 mb (24 km), and .34 mb (56 km), respectively. Northern Hemisphere values have been shifted by six months with values for 10°N-90°N running from July to June, and values for the equator to 90°S running from January to December. Various well known hemispheric asymmetries of the annual cycle are observed in these plots. The upper tropospheric jet stream undergoes a greater annual variation in the Northern Hemisphere (Figure 8a), while in the lower stratosphere the high latitude winter westerly (polar night) jet is stronger and longer lived in the Southern Hemisphere (Figure 8b). At .34 mb (Figure 8c) the zonal wind in the Southern Hemisphere exhibits a greater annual variation, although not as pronounced as in the lower stratosphere. These features are consistent with those observed in Fourier analyses displayed in Figure 10(a-g). (At lower thermospheric levels, month-latitude plots of the zonal wind show highly variable, unstructured patterns and thus are not shown here).

Globally Averaged Zonal Wind

Figure 9 shows a month-height cross section of the deviation from the annual mean of the globally averaged zonal wind for each pressure level and month. A dominant semiannual cycle is observed from 10 mb to the mesopause; westerlies generally occur during the equinoctial seasons and easterlies during the solstices, with some downward progression of the zero wind line observed with time (although not as sharp as seen in figure 7d). This feature can be explained by the fact that the annual cycle is nearly equal in amplitude and six months out of phase in each hemisphere, thus giving a relatively small contribution in the global average, whereas the semiannual cycle is generally of the same phase in the two hemispheres and is thus reinforced in the global average. (See the harmonic analysis plots in Figures 10[b-e]). An annual cycle of smaller amplitude is also evident in the upper stratosphere and lower mesosphere, with stronger easterlies exhibited during

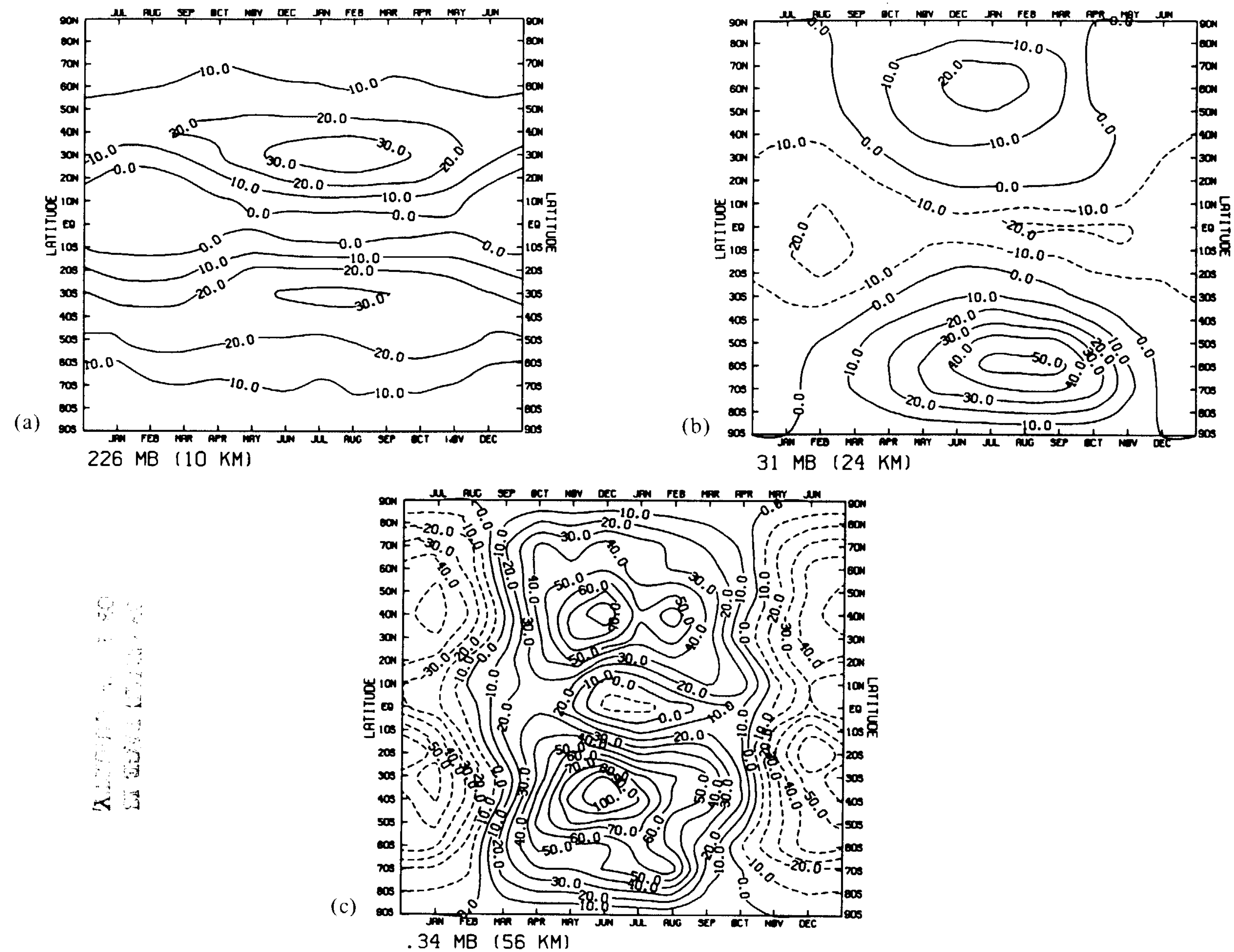


Figure 8. Month-latitude cross sections of zonal mean zonal wind for (a) 226 mb (10 km), (b) 31 mb (24 km), and (c) 0.34 mb (56 km). Contour interval of 10 m/s. Months run January-December for latitudes 0°-90°S (labels at bottom of plots), and July-June for 10°N-90°N (labels at top of plots). Negative (casterly) values are dashed.

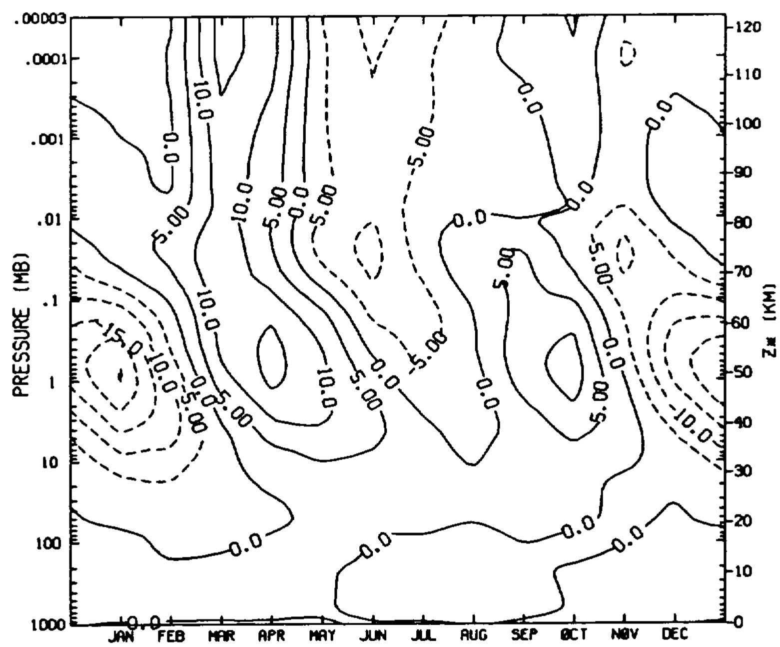


Figure 9. Month-height cross section of the zonal mean globally averaged zonal wind with the annual average at each pressure level subtracted out. The global average was computed by weighting the zonal average at each latitude by the cosine of the latitude. Contour interval of 5 m/s. Negative (easterly) values are dashed.

January than during July.

There is some evidence of an SAO in the lower thermosphere, with the phase remaining generally constant with height above the mesopause.

Harmonic Analysis

Figure 10(a-g) shows latitude-height sections of the annual mean, and the amplitudes and phases of the annual, semiannual, and terannual harmonics. The annual mean and harmonic amplitudes are in m/s, and the phases are represented by a number indicating the time of first maximum of westerly wind (-1 = November 15, 0 = December 15, 1 = January 15).

The annual mean exhibits westerlies at all levels at middle and high latitudes except for the upper mesosphere at 50°N-70°N. Easterlies are observed in the tropics at all levels below the mesopause, except for a shallow layer in the middle mesosphere. The annual mean westerlies at low and middle latitudes between .001 and .0001 mb are relatively strong, and the high latitude westerlies in the upper stratosphere and lower mesosphere are stronger in the Southern than in the Northern Hemisphere.

The patterns observed in the analysis of the annual cycle amplitude (Figure 10b) are directly related to the structure of the zonal circulation during the solstices. The largest amplitudes coincide with the high latitude jet streams in the stratosphere and the midlatitude jet streams in the upper troposphere, low to middle mesosphere, and lower thermosphere, which undergo maximum variation from summer to winter. The midlatitude mesospheric maximum in the Southern Hemisphere is larger and is located at a lower level than in the Northern Hemisphere, and the tropical minumum in the upper stratosphere and lower mesosphere is displaced slightly north of the equator. The phase of the annual cycle is relatively uniform below the mesopause outside of the equatorial region, with maxima during the winter season in each hemisphere. There is some tendency for the westerly wind maximum to occur progressively earlier with increasing height in the Southern Hemisphere stratosphere. The phase changes rapidly just above the mesopause, with the maximum westerly wind during the summer in the regions of the midlatitude lower thermospheric jet stream in each hemisphere. The phase becomes indistinct in regions of small amplitude, e.g., the lower troposphere.

The tropical semiannual oscillation centered near the stratopause (mesopause) exhibits westerly wind maxima during the equinoxes (solstices), similar to Figure 7d. Maximum semiannual amplitudes with equinoctial season maxima are also observed in the middle mesosphere centered at 50° latitude in both hemispheres. The significance of the large semiannual amplitudes at the top level of the climatology is questionable, given the large deviation of the wind from geostrophy observed at these levels.

The terannual wave is observed to have largest amplitudes in the lower mesosphere at high Southern latitudes, and in the tropical lower thermosphere. Strongest westerly winds are observed during December, April, and August in these regions.

The features observed in Figure 10(a-g) are for the most part similar to those observed in other studies of periodic cycles of the zonal wind, such as Angell and Korshover (1970), Belmont et al. (1974), McGregor and Chapman (1978), and Belmont (1985).

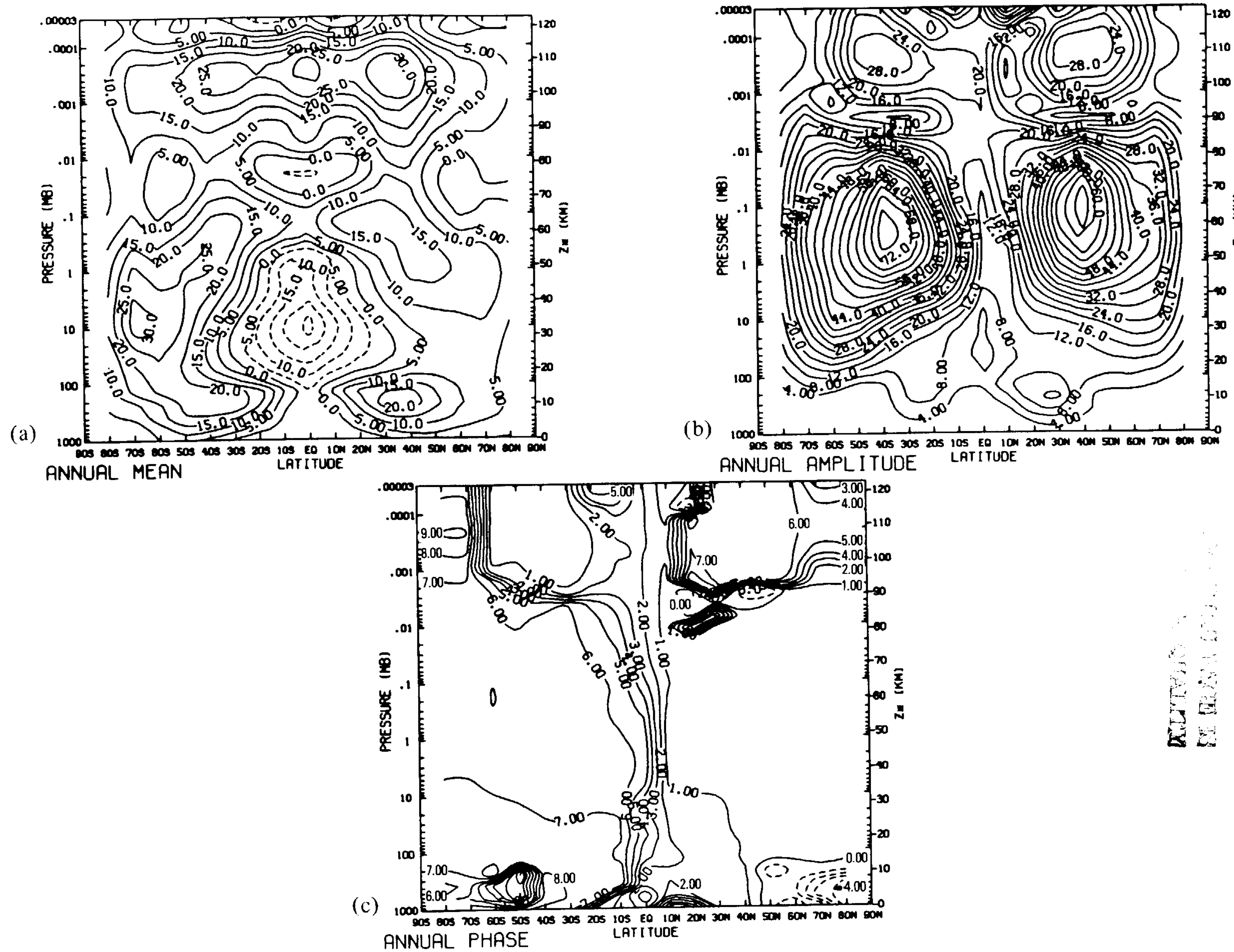


Figure 10. Latitude-height cross sections of Fourier analysis of the zonal mean zonal wind climatology. (a) annual mean, contour interval of 5 m/s, (b) annual cycle amplitude, (c) annual cycle phase, (d) semiannual cycle amplitude, (e) semiannual cycle phase, (f) terannual cycle amplitude (g) terannual cycle phase. Contour interval is 4 m/s for the amplitude plots. Values in the phase plots correspond to the month of first maximum of the westerly wind and have a contour interval of 1. Negative values are dashed. See text for details.

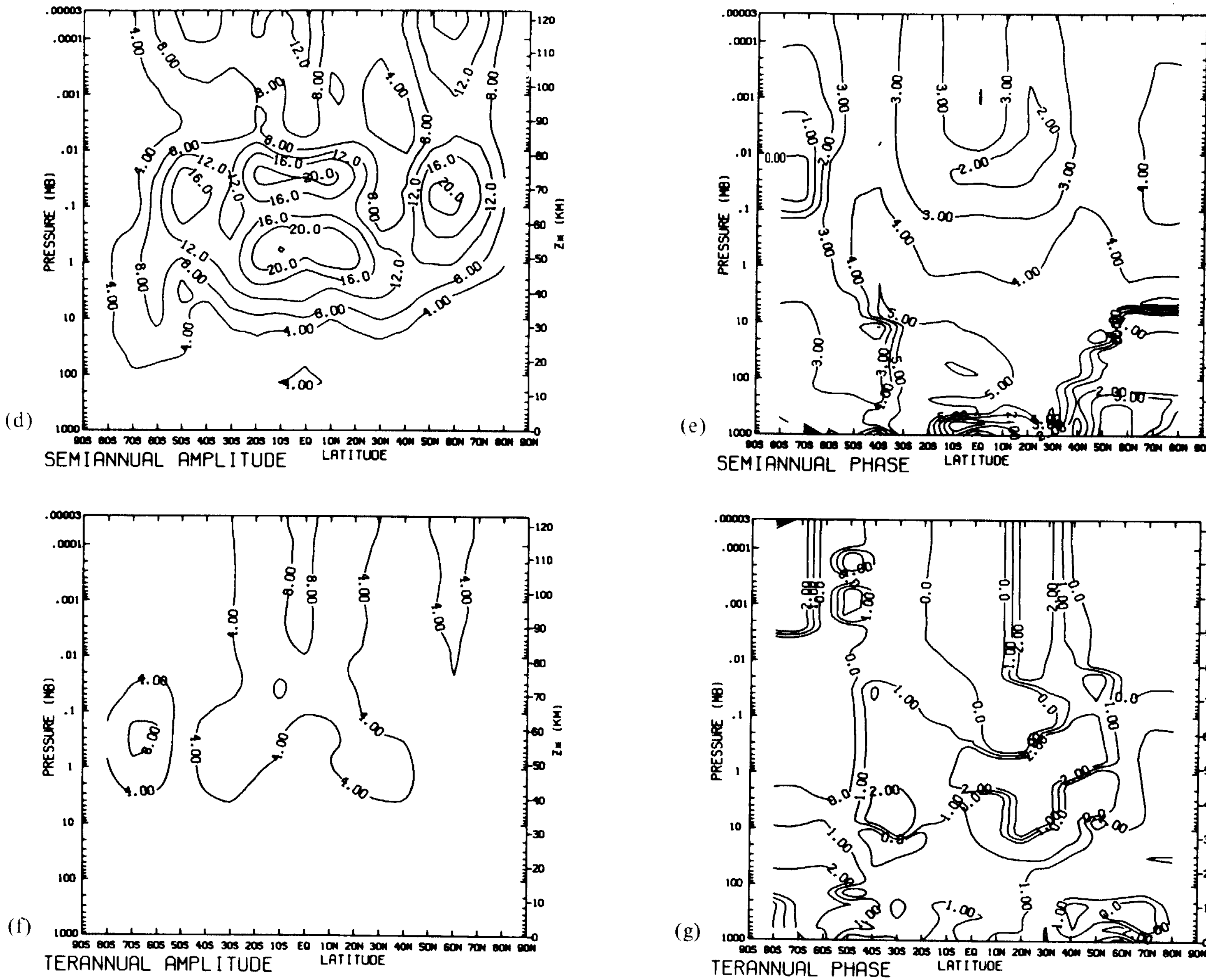


Figure 10. (cont.)

C). ZONAL MEAN GEOPOTENTIAL HEIGHT

Month - Latitude

Figure 11(a-d) shows month-latitude sections of geopotential height at 2.5, .01, .00019, and .000025 mb (months run from January to December for all latitudes). A dominant annual cycle is observed at 2.5 and .01 mb with highest heights in the summer hemisphere and maximum amplitudes at the poles. The tropical regions exhibit relatively little seasonal variation. This seasonal cycle extends from the lower troposphere up to approximately the mesopause, above which the highest geopotential heights are observed during the winter (Figure 11c). This reversal occurs at ~.0014 mb (94 km) in the Northern Hemisphere and at ~.00031 mb (105 km) poleward of 35°S in the Southern Hemisphere (no reversal occurs at southern low latitudes). A second reversal back to a summer maximum/winter minimum occurs above .000042 mb (119 km) at middle and high southern latitudes with no second reversal observed in the Northern Hemisphere below the top level of the climatology (.000025 mb, 122 km -- Figure 11d).

These plots allow for quick approximate conversion between pressure and altitude coordinates. Geopotential height is approximately equal to geometric height at the levels of this climatology, with a maximum error of 2% occurring at 120 km.

Plotting geopotential height in latitude-altitude or month-altitude reveals cross sections with only near-horizontal lines representing the geopotential height contours, and thus they are not included here.

D). ZONAL MEAN PRESSURE

Month - Latitude

Figure 12(a-d) shows month-latitude cross sections of pressure at 40, 80, 100, and 120 km (geometric altitude), respectively (months run from January to December for all latitudes -- also note the figure captions for the scaling factors used). The 40 and 80 km levels are characterized by summer maxima and winter minima, with largest annual variation at the poles, and a relatively small annual cycle in the tropics. At 100 km, a Southern Hemisphere summer maximum and Northern Hemisphere winter maximum are observed with some evidence of a semiannual cycle exhibited at middle and high southern latitudes. The tropics at this level exhibit a relatively strong annual variation. Thus at 100 km at each latitude, the maximum pressure occurs during November and the minimum during July. At 120 km, the area south of ~15°N is observed to have a strong annual variation with a November-December maximum. Only a weak semiannual cycle is observed northward of 20°N. This hemispheric asymmetry was previously discussed in the temperature analysis section (4-A).

Again these plots facilitate the conversion between pressure and altitude coordinates. Since pressure decreases logarithmically with altitude, latitude-altitude or month-altitude cross sections are useful only if the logarithm of the pressure values is plotted. However the information presented in this form is rather difficult to interpret and is not presented here.

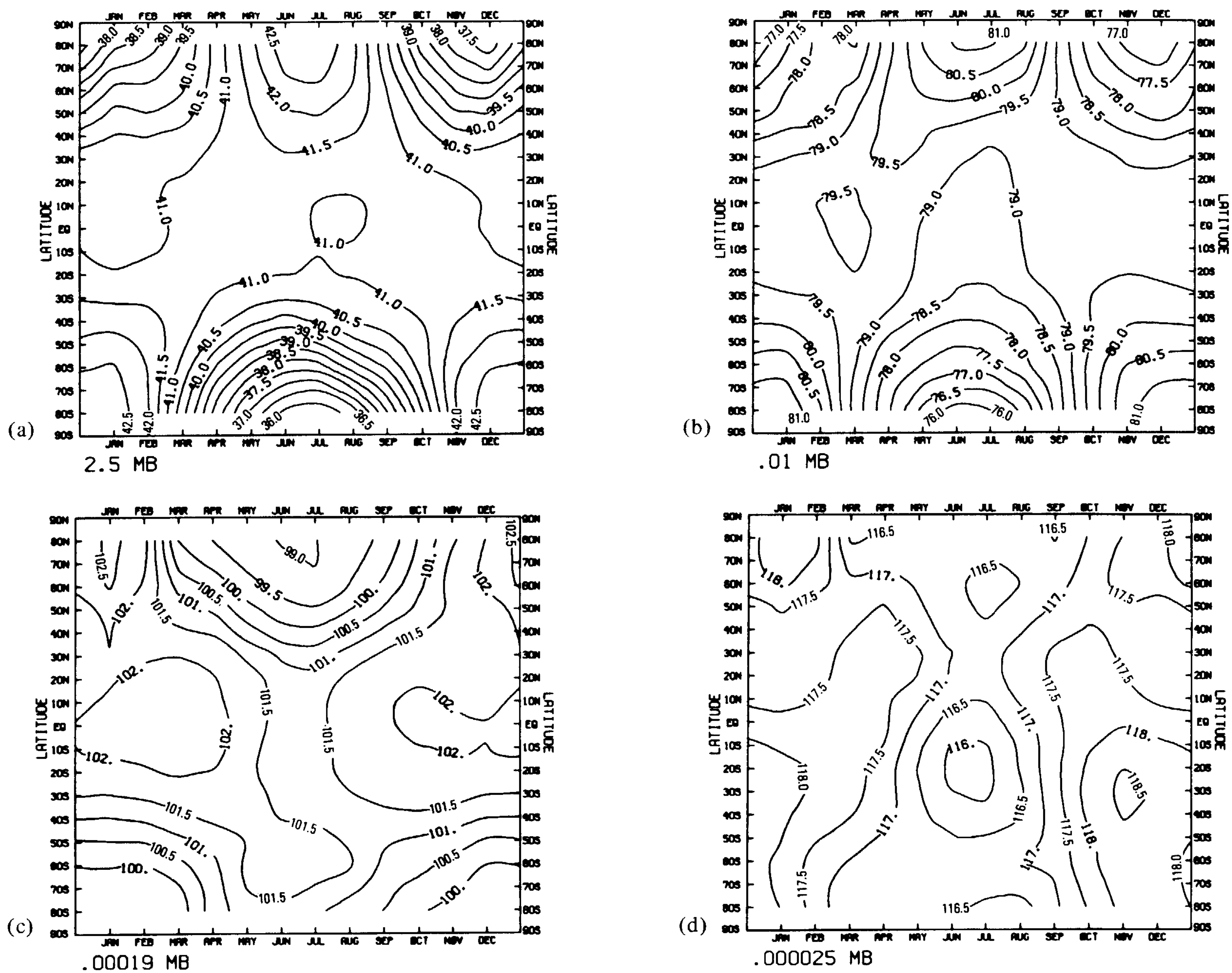


Figure 11. Month-latitude cross sections of zonal mean geopotential height at (a) 2.5 mb, (b) 0.01 mb, (c) 0.00019 mb, and (d) 0.000025 mb. Contour interval of 0.5 km. Months run January-December for all latitudes.

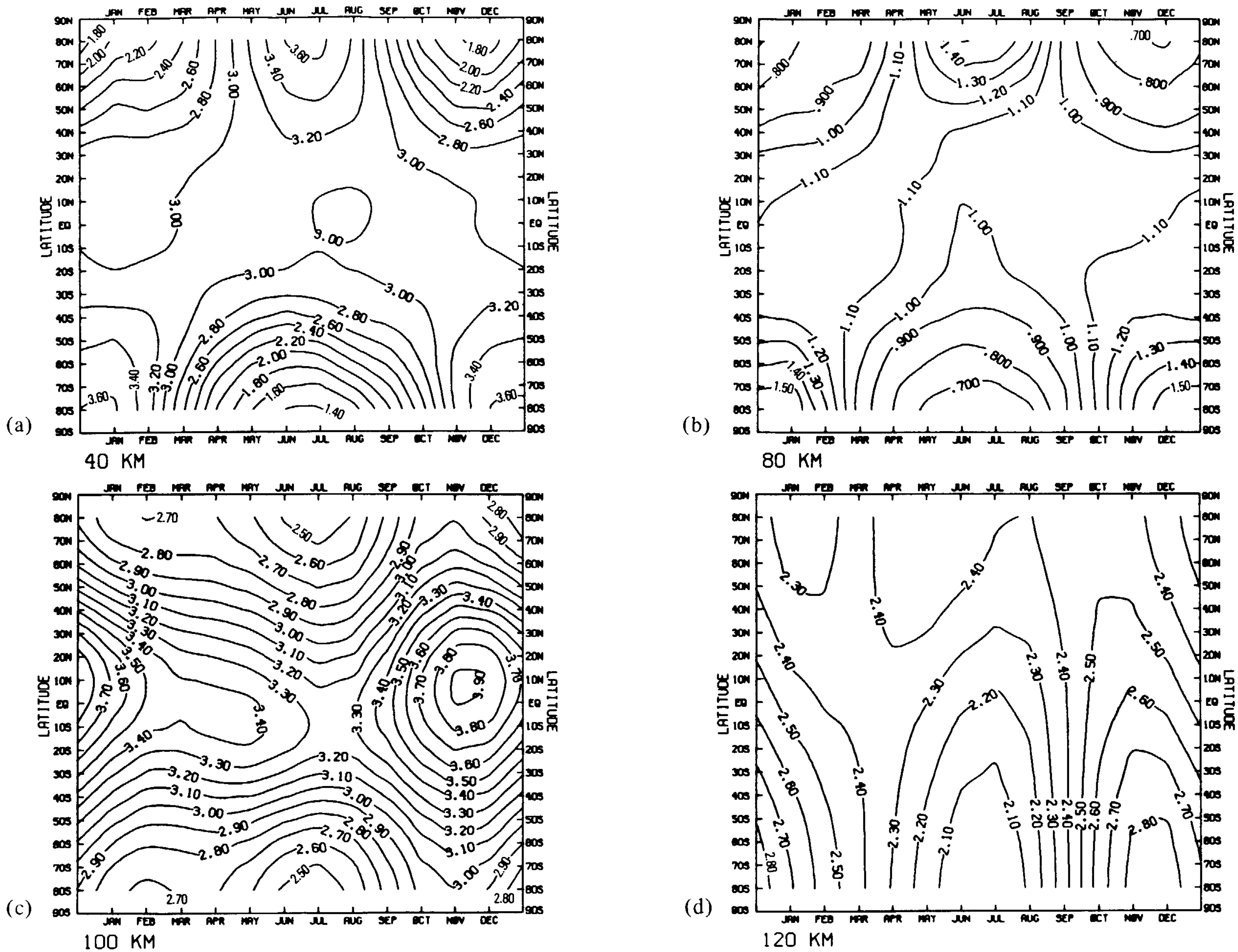


Figure 12. Month-latitude cross sections of zonal mean pressure at (a) 40 km, contour interval of 0.2 mb; (b) 80 km, labels scaled by 100 mb (e.g., a value of 1.0 = 0.01 mb), contour interval of 0.1; (c) 100 km, labels scaled by 10,000 mb (e.g., 1.0 = 0.0001 mb), contour interval of 0.1; and (d) 120 km, labels scaled by 100,000 mb (e.g., 1.0 = 0.00001 mb), contour interval of 0.1. Months run January-December for all latitudes.

5. ANALYSIS OF ZONAL WIND AT 65 - 120 KM

The climatological zonal wind as we have presented here (based on the zonal mean zonal momentum equation) is a good approximation of the actual wind below 70-80 km. Above this level, the zonal wind becomes increasingly modified by gravity wave and tidal forcing. In order to get some idea of the magnitude of these influences, we compared this zonal wind climatology with monthly mean zonal wind measurements from ground-based radar stations at selected latitudes from 65°N to 45°S, and with the monthly mean climatological zonal wind model from CIRA, 1972 (based on rocket, gun-probe, and radio-meteor techniques), for the 65-120 km levels. Although the radar data and, to some extent, the CIRA model at a given latitude are from one longitude zone and do not necessarily represent zonal mean conditions, they provide a means for a general comparison with our climatology.

Figures 13-17 show the zonal wind in constant altitude coordinates as derived from three separate sources:

a) The zonal mean zonal momentum equation (equation 9) using monthly mean zonally averaged pressure and density values from our climatology;

b) Monthly mean climatological radar station measurements at Poker Flat, Alaska (65°N, 147°W); Saskatoon, Canada (52°N, 107°W); Atlanta, Georgia (34°N, 84°W); Townsville, Australia (20°S, 147°E); and Christchurch, New Zealand (44°S, 173°E);

c) The CIRA, 1972 monthly mean climatological zonal wind model.

For direct comparison with the radar data, our climatology and the CIRA values were linearly interpolated in latitude and height where necessary. In some cases only the radar or the CIRA data were available at a particular latitude and/or altitude for comparison with our climatology.

As discussed in CIRA 1972, diurnal effects in the wind model were removed where possible. However this procedure was limited due to the absence of data during certain times of the day. Due to the lack of Southern Hemisphere data, the CIRA winds above 60 km are combinations of data from both hemispheres with Southern Hemisphere data shifted by six months.

The following is a brief explanation of the radar data sources and analysis as taken from the MAP handbook. "The radars include medium frequency (MF) radars or partial reflection systems giving data from 60/70 - 100/110 km (and MST radars operating as meteor radars). The methods of data analyses are discussed in detail elsewhere (Manson et al., 1981; Massebeuf et al., 1979; Vincent and Stubbs, 1979; Salby and Roper, 1980; Smith, 1981; Carter and Balsley, 1982; Clark, 1983; Aso and Vincent, 1982). Generally however, tidal oscillations have been removed from days or groups of days. Time resolution varies from 10-15 days to seasonal."

The radar wind values used here are taken directly from the MAP handbook (#16) which are in the form of tabulated values except for the Poker Flat data which were extracted from a month-height cross sectional plot in the handbook.

The following observations are noted from Figures 13-17:

- At 45°-65° latitude, all three data sets show good agreement at and below 80 km; at 35°N at 70 km, the CIRA data and our climatology also exhibit a strong similarity.
- At 20°S the radar data and our climatology exhibit some agreement at and below 90 km.
- Except for 45°S, the radar data and our climatology both exhibit small seasonal variations and primarily westerly wind throughout the year near 100 km (and 111 km at 52°N).

The strong similarities between the derived wind data and the direct wind measurements below 80 km are somewhat surprising since we are comparing a zonal mean wind climatology with direct wind measurements at individual longitudes [4]. Although this discrepancy could become more significant in the lower thermosphere, gravity wave and tidal forcing most likely play the largest role in creating the differences observed between our climatology and the direct wind measurements above 80 km.

$$\frac{[U]^2 \tan\theta}{a} + 2\Omega[U]\sin\theta = -\frac{1}{[\rho]}\frac{\partial[p]}{\partial y} \qquad (9)$$

(ρ = density)

[4] Labitzke et al., 1987 present a detailed comparison of the wind observed from the medium frequency (MF) radar at Saskatoon, Canada (52°N, 107°W) and the geostrophic wind derived for 50°N, 110°W.

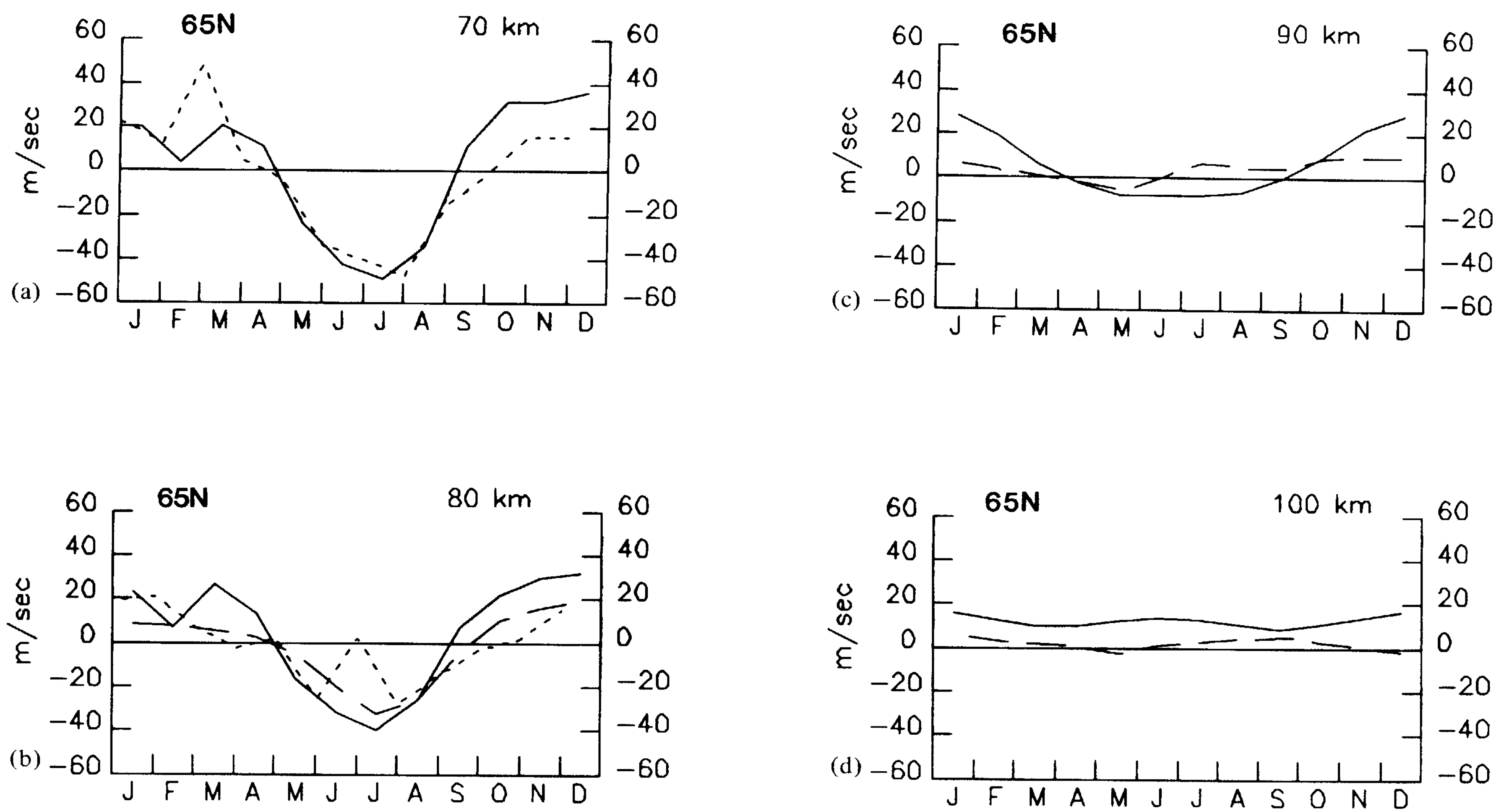


Figure 13. Zonal wind (m/s) profiles by month from equation (9) for 65°N (solid line); ground based radar measurements at Poker Flat, Alaska (65°N, 147°W) (dashed line); and the CIRA, 1972 wind model at 65°N (dotted line) for (a) 70 km, (b) 80 km, (c) 90 km, and (d) 100 km. Radar wind measurements were unavailable for 70 km and CIRA wind values were unavailable for 90 to 100 km. Negative values are easterly.

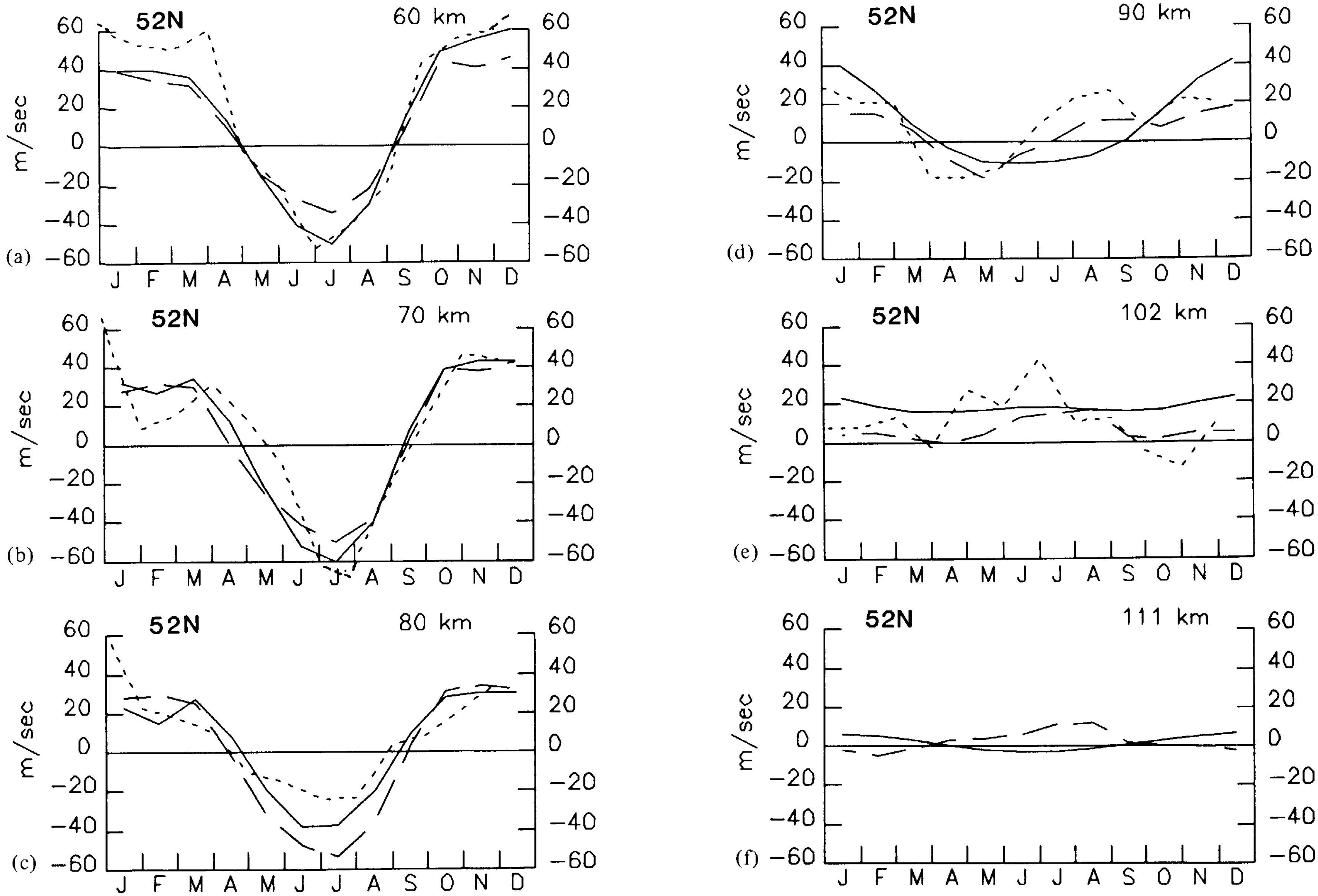


Figure 14. Zonal wind (m/s) profiles by month from equation (9) for 52°N (solid line); ground based radar measurements at Saskatoon, Canada (52°N, 107°W) (dashed line); and the CIRA, 1972 wind model at 50°N (dotted line) for (a) 60 km, (b) 70 km, (c) 80 km,, (d) 90 km, (e) 102 km, and (f) 111 km. CIRA wind values were unavailable at 111 km and CIRA values in (e) are for 100 km. Negative values are easterly.

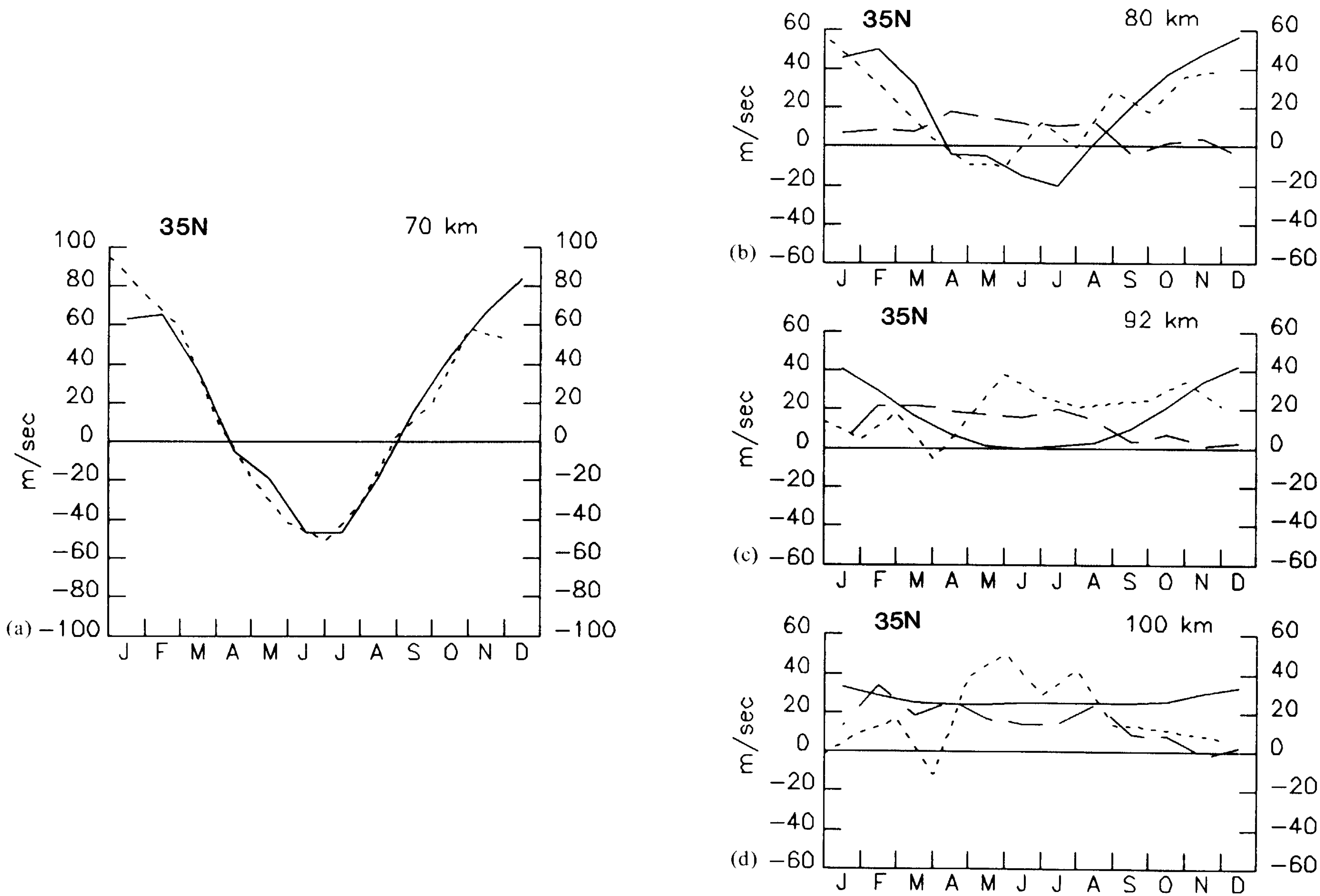


Figure 15. Zonal wind (m/s) profiles by month from equation (9) for 35°N (solid line); ground based radar measurements at Atlanta, Georgia (34°N, 84°W) (dashed line); and the CIRA, 1972 wind model at 35°N (dotted line) for (a) 70 km, (b) 80 km, (c) 92 km, and (d) 100 km. Radar wind values were unavailable for 70 km. Negative values are easterly.

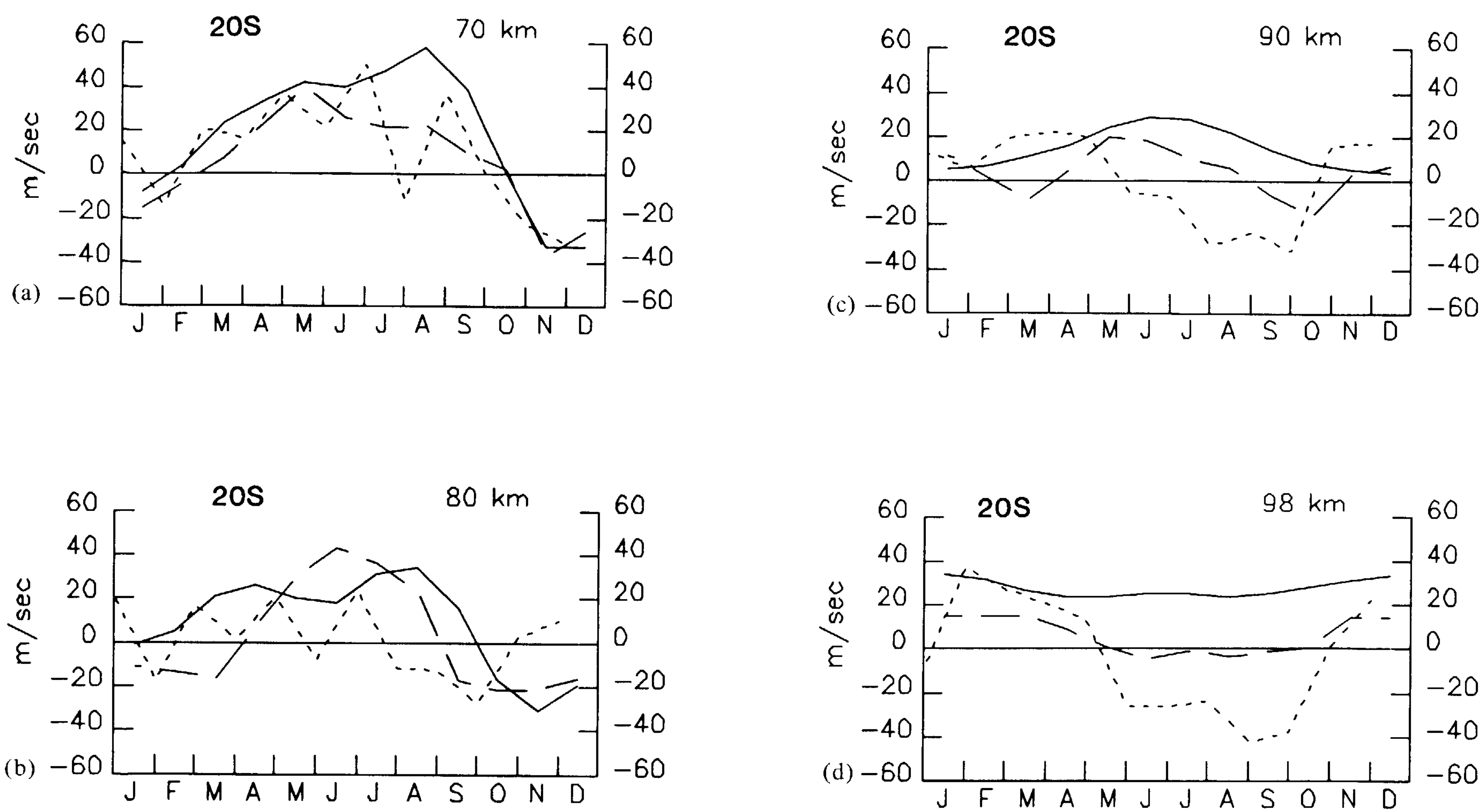


Figure 16. Zonal wind profiles (m/s) by month from equation (9) for 20°S (solid line); ground based radar measurements at Townsville, Australia (20°S, 147°E) (dashed line); and the CIRA, 1972 wind model at 20°N shifted by six months (dotted line) for (a) 70 km, (b) 80 km, (c) 90 km, and (d) 98 km. Negative values are easterly.

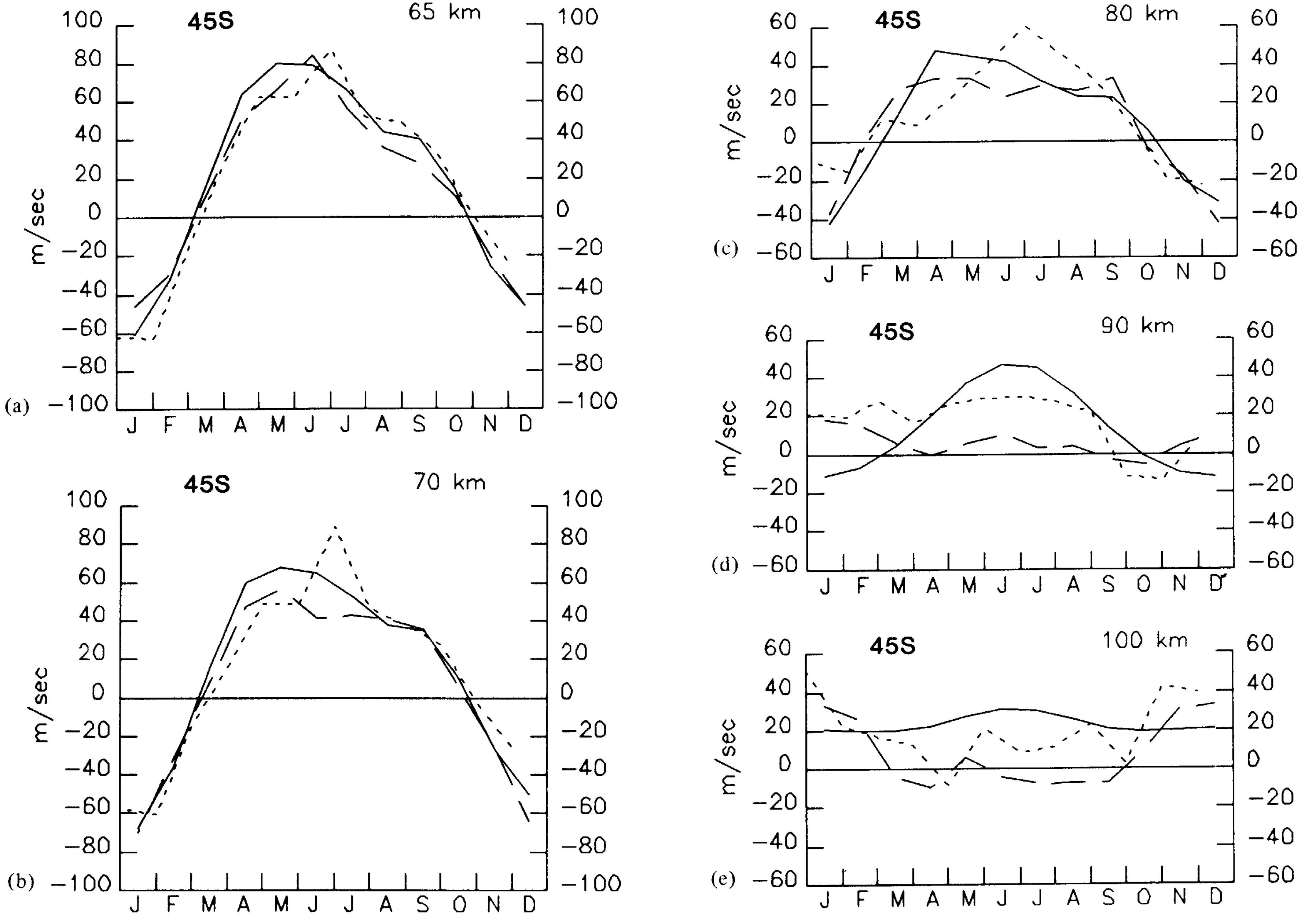


Figure 17. Zonal wind (m/s) profiles by month from equation (9) for 45°S (solid line); ground based radar measurements at Christchurch, New Zealand (44°S, 173°E) (dashed line); and the CIRA, 1972 wind model at 45°N shifted by six months (dotted line) for (a) 65 km, (b) 70 km, (c) 80 km, (d) 90 km, and (e) 100 km. Negative values are easterly.

6. LONGITUDINAL VARIATIONS IN THE STRATOSPHERE AND MESOSPHERE

The MAP handbook contains longitudinal variations of monthly mean climatological geopotential height and temperature data for the stratosphere and mesosphere. These are analyzed in the form of amplitudes and phases of zonal wave numbers 1 and 2 on constant pressure surfaces. The data extend in the vertical from 83 to .0062 mb (2.5 to 12.0 sh) and cover the latitudinal range 80°S to 80°N at 10° resolution.

The user can construct longitudinal arrays of temperature (or geopotential height) at a given latitude, pressure level, and month by,

$$T(\lambda) = T_0 + T_1\cos(\lambda - \phi_1) + T_2\cos(2\lambda - \phi_2) \tag{10}$$

where T_0 is the zonal mean, T_1 and T_2 are wave number one and two amplitudes, ϕ_1 and ϕ_2 are wave number one and two phases, and λ is the longitude in degrees east. A detailed analysis of this data can be found in the MAP handbook. This data can also be used to generate latitude-longitude grids of horizontal geostrophic wind as discussed below.

Zonal geostrophic wind [5] for 15°N-85°N (15°S-85°S) at every 5° of longitude was generated from the geopotential height grid described above by,

$$Ug = -\frac{g_0}{2\Omega\sin\theta}\frac{\partial Z}{\partial y} \tag{11}$$

(geopotential height was interpolated to the pole in order to calculate the wind at 85°N and 85°S). Zonal wind at the equator at 5° longitudinal intervals was derived by,

$$Ueq = -\frac{g_0}{\beta}\frac{\partial^2 Z}{\partial y^2} \tag{12}$$

Figures 18(a-d) and 19(a-d) show the longitudinal variations of the zonal geostrophic wind on cylindrical equidistant projections at 11 mb and .21 mb, respectively for January, April, July, and October. In addition to the latitudinal variations observed in the zonally averaged climatology discussed in section 4, well known longitudinal features are readily apparent. The solstice seasons are characterized by zonally symmetric easterly flow in the summer hemisphere with a much more disturbed westerly flow in the winter hemisphere. Due to the superposition of planetary waves on the zonal flow, the jet maxima are more pronounced in the winter hemisphere. April and October are somewhat similar to the wintertime circulation in the extratropics, although the flow is generally weaker.

Meridional geostrophic wind for 10°N-80°N (10°S-80°S) at every 5° of

[5] For simplicity we present geostrophic wind here (for both zonal and meridional components). However a more accurate representation of the wind is obtained by using the methodology described in section 3-E.

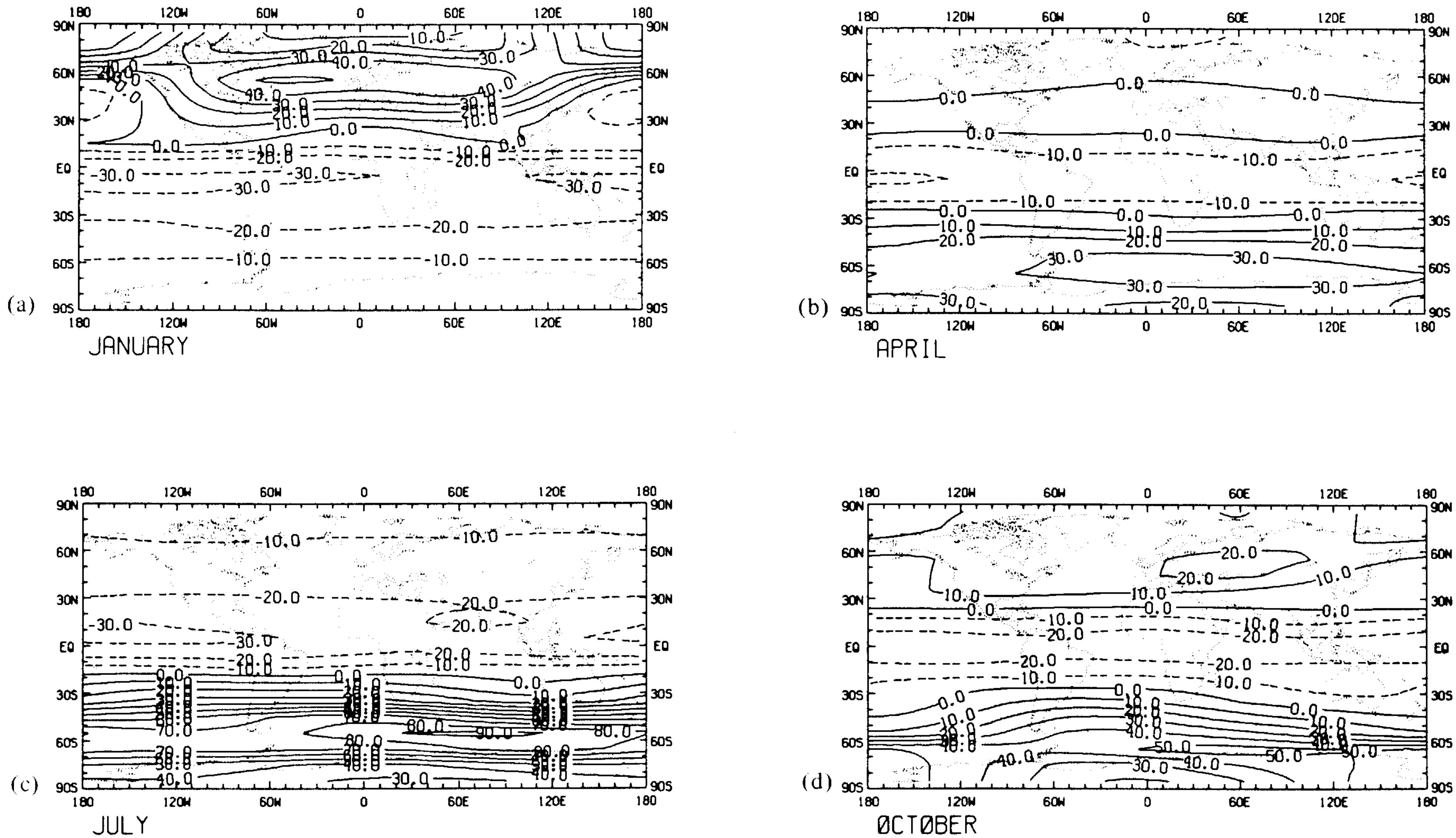


Figure 18. Latitude-longitude plot of zonal geostrophic wind at 11 mb (31 km) for (a) January, (b) April, (c) July, and (d) October. Contour interval of 10 m/s. Negative (easterly) values are dashed.

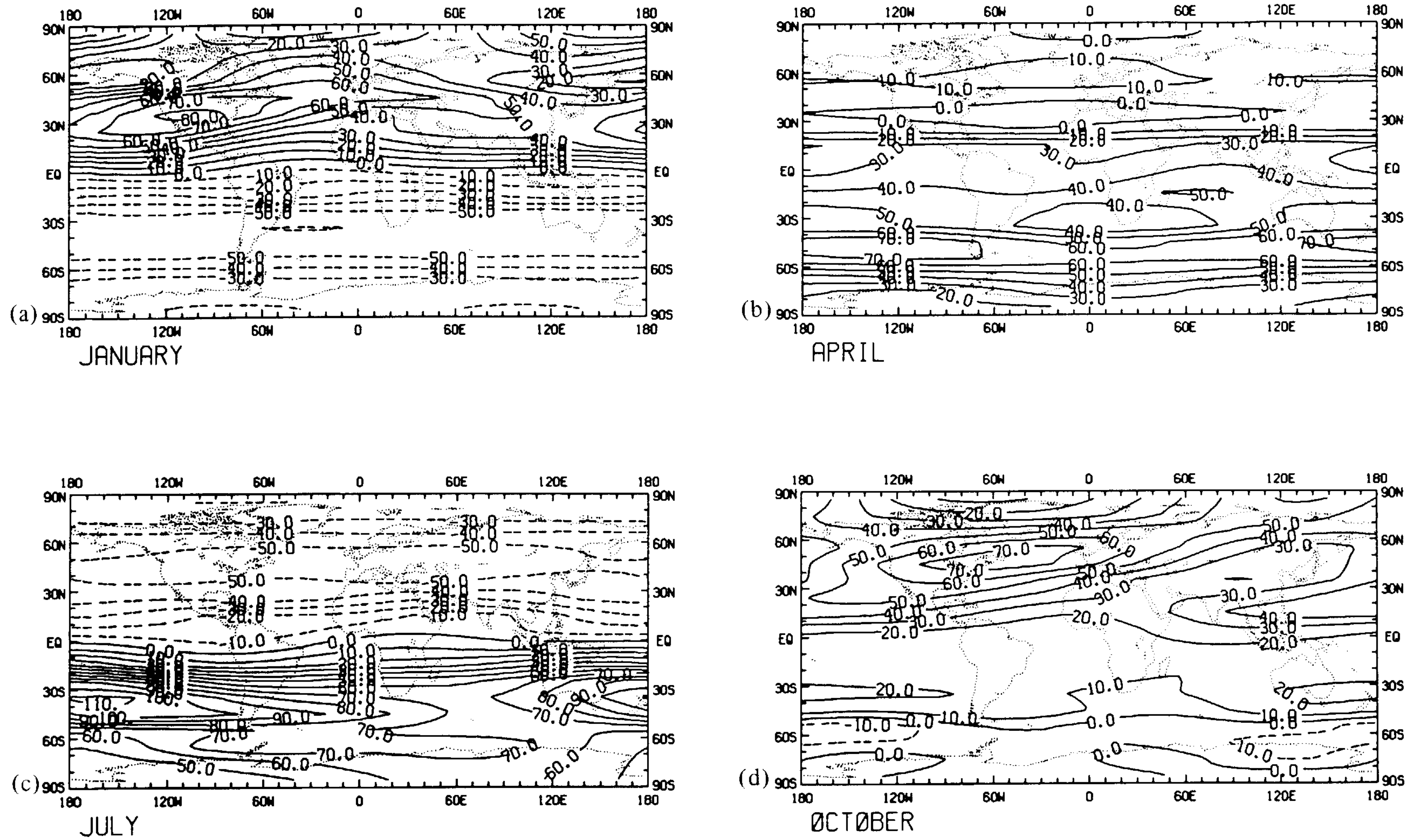


Figure 19. Latitude-longitude plot of zonal geostropic wind at 0.21 mb (60 km) for (a) January, (b) April, (c) July and (d) October. Contour interval of 10 m/s. Negative (easterly) values are dashed.

longitude was also computed from the latitude-longitude grid of geopotential height by,

$$V_g = \frac{g_0}{2\Omega\sin\theta}\frac{\partial Z}{\partial x} \qquad (13)$$

Meridional wind at the equator at 5° longitudinal intervals was computed by,

$$V_{eq} = \frac{g_0}{\beta}\frac{\partial}{\partial y}\left(\frac{\partial Z}{\partial x}\right) \qquad (14)$$

Equation (14) was derived by a procedure analogous to that done for the zonal wind at the equator (originally derived for the zonal mean zonal wind at the equator -- section 3-E). Figures 20(a-d) and 21(a-d) show the meridional geostrophic wind for January, April, July, and October at 11 mb and .21 mb, respectively. Positive values indicate flow from south to north in both hemispheres. The amplitude of the planetary waves can be directly related to the strength of the meridional flow. In January (Figures 20a and 21a), the high northern latitudes are observed to have strong southward flow centered over western Canada and Alaska with northward flow centered over eastern Siberia, indicating a strong planetary wave 1 feature. At high latitudes the meridional wind is as strong as or stronger than the zonal wind at 11 mb in January. The Southern Hemisphere in January exhibits very weak meridional flow, consistent with the near-absence of planetary waves in the summer hemisphere. In general, meridional flow patterns of zonal waves one and/or two are observed in all seasons except summer in both hemispheres, with largest velocities observed during the Northern Hemisphere winter.

We have included the plots in Figures 18-21 to illustrate the potential uses of such longitudinal variations of various atmospheric parameters. However, the user should keep in mind that these zonal and meridional wind values are derived from data averaged over just two or three years. Longitudinal variations of temperature and wind exhibit large interannual variability in the middle atmosphere, so that observations from other years may have much different patterns.

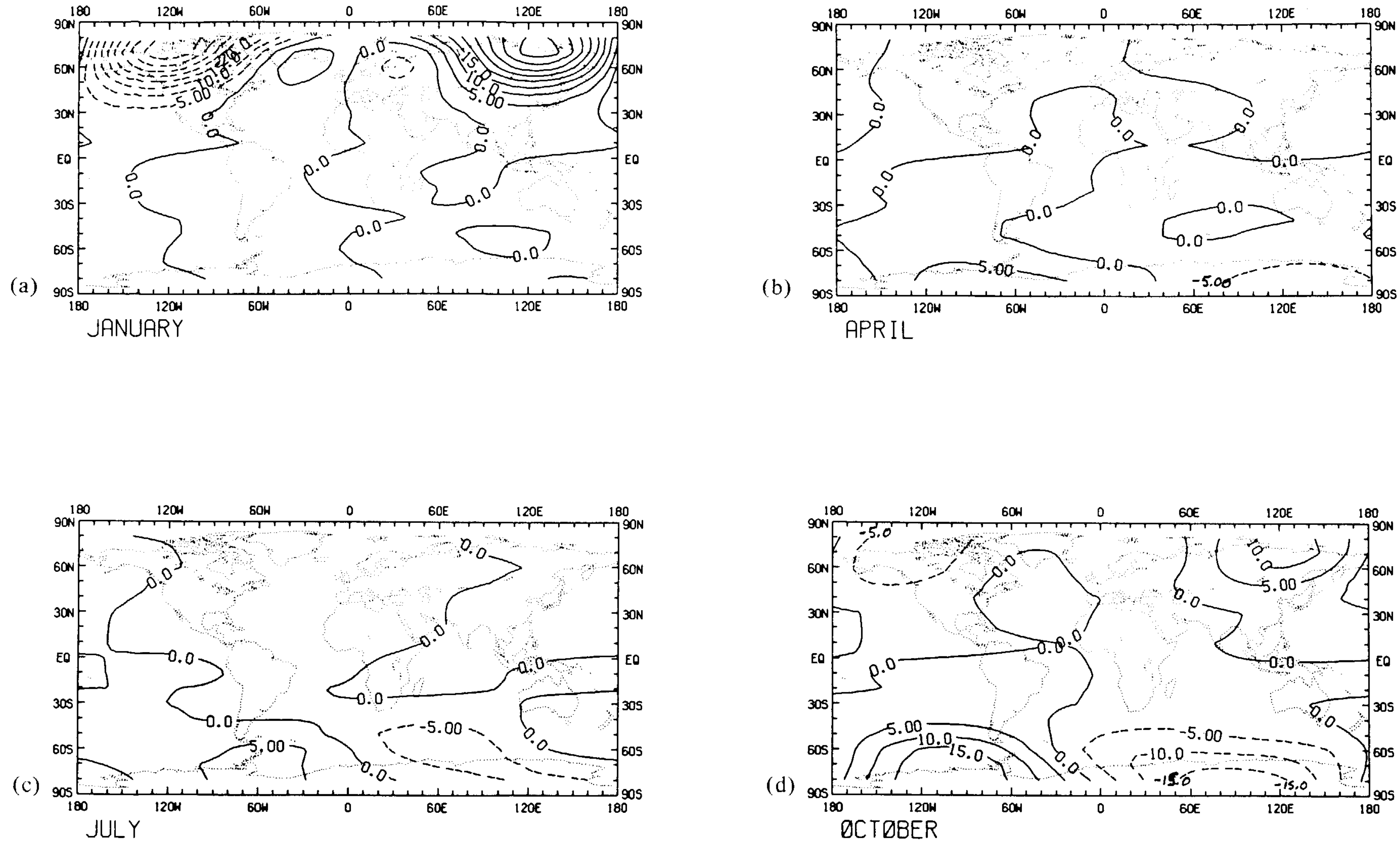


Figure 20. Latitude-longitude plot of meridional geostrophic wind at 11 mb (31 km) for (a) January, (b) April, (c) July, and (d) October. Contour interval of 5 m/s. Negative (northerly–north to south) values are dashed.

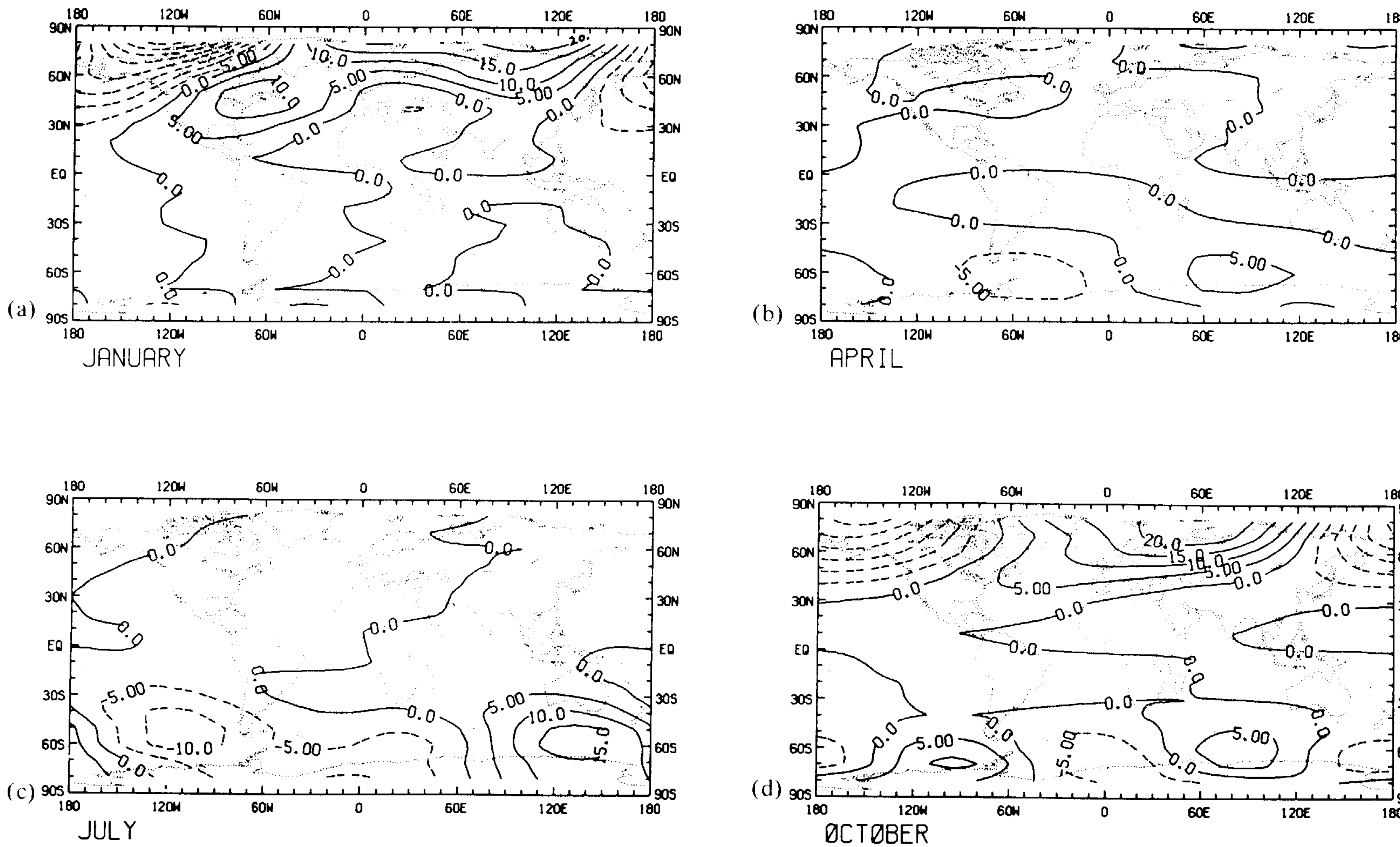


Figure 21. Latitude-longitude plot of meridional geostrophic wind at 0.21 mb (60 km) for (a) January, (b) April, (c) July, and (d) October. Contour interval of 5 m/s. Negative (northerly—north to south) values are dashed.

7. COMPARISON WITH NMC DATA

Data from the National Meteorological Center (NMC -- Washington, D.C.) is widely used by atmospheric scientists as a climatological base state for observational and numerical modeling research and analysis. For this reason, we compare the NMC data with our zonal mean climatology.

NMC provides pole to pole temperature and geopotential height data on a latitude-longitude grid of five degree resolution at eight pressure levels from 70 to 0.4 mb. This data is available in the form of monthly averages from October 1978 through November 1986 and is based on satellite data (from the Vertical Temperature Profiler Radiometer -- VTPR, and the TIROS Operational Vertical Sounding system -- TOVS) above 10 mb, and radiosonde and satellite data at and below 10 mb. The temperatures and geopotential heights above 10 mb were adjusted with rocketsonde data by a regression method described by Gelman et al. (1986).

We derived zonally averaged zonal wind values from the NMC geopotential height data in a manner similar to that done for our climatology (section 3-E). Zonal wind for 12.5°N-77.5°N (12.5°S-77.5°S) at five degree intervals was generated by equation (1). Zonal wind at the equator was generated from equation (6), with wind at 7.5°N (7.5°S) and 2.5°N (2.5°S) linearly interpolated from the zonal wind at the equator and 12.5°N (12.5°S) wind. Zonal wind at 82.5°N (82.5°S) and 87.5°N (87.5°S) was derived by assuming the relative angular velocity (equation 7) to be constant poleward of 77.5°N (77.5°S).

Figures 22(a-h) and 23(a-h) show our zonal mean climatology compared with the eight year (nine year for October) average of the zonal mean NMC data for January, April, July, and October for temperature and zonal wind, respectively. For these plots, the NMC data were linearly interpolated in log-pressure to the vertical grid of our climatology for easier visual comparison. The general features are similar in both temperature data sets such as the warm summer polar stratopause, the latitudinal maximum at the winter polar stratopause (which is most pronounced in the Southern Hemisphere), and the cold winter lower stratosphere. The zonal wind plots also show general agreement of the large scale features such as the summer hemispheric easterlies, winter hemispheric westerlies, and high latitude winter westerly (polar night) jet. The largest differences occur in the tropics where the NMC data exhibits stronger westerlies and weaker easterlies during all months. Also, the winter hemispheric zero wind line is observed to be closer to the equator in the NMC data.

Although some of the differences observed in the two data sets may reflect differences in the various instruments used, natural phenomena such as interannual variability or the 11 year solar cycle may also be a source of discrepancy since our climatology at these levels contains data from 1963 to 1978 whereas the NMC data has a period of coverage of 1978 to 1986.

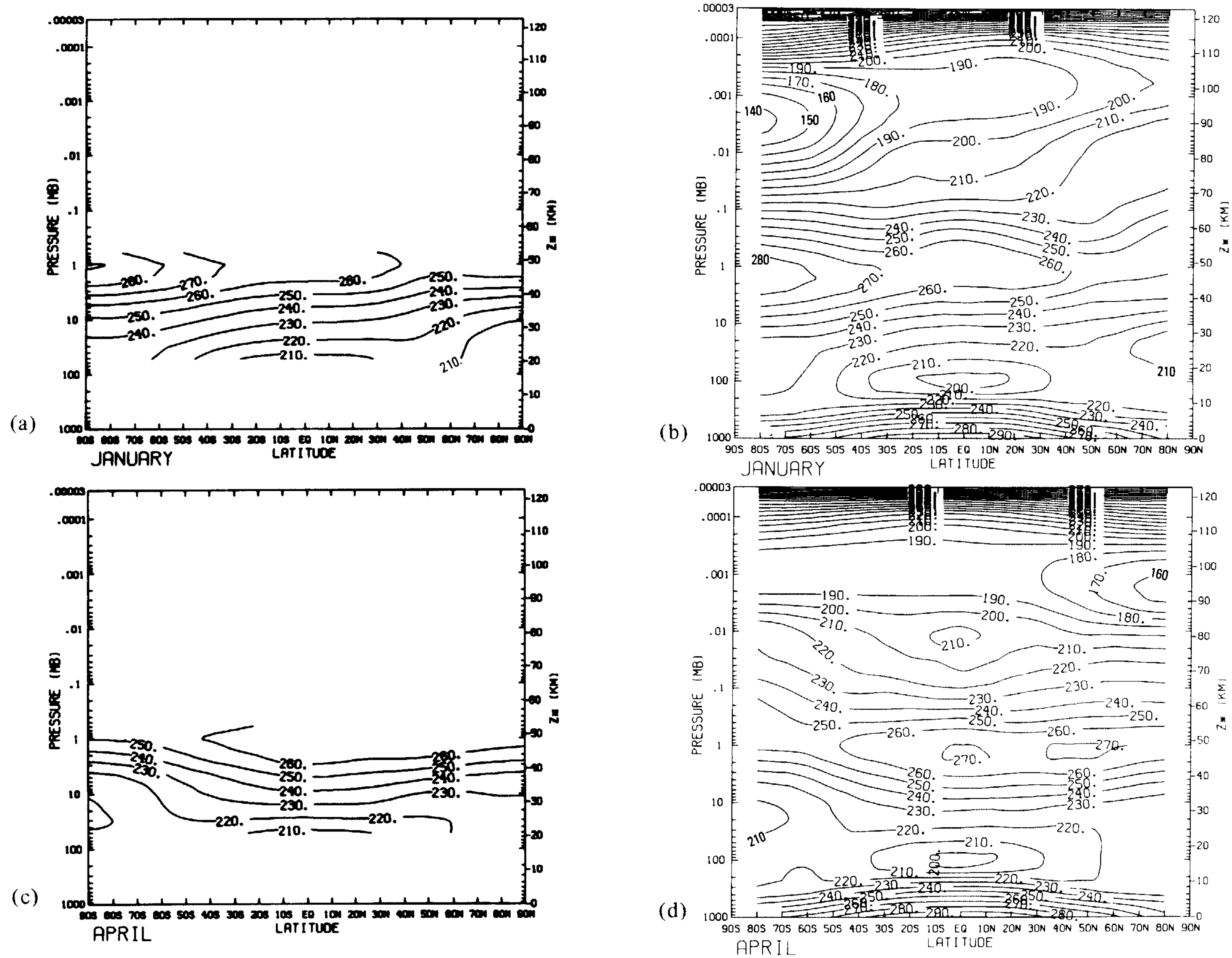
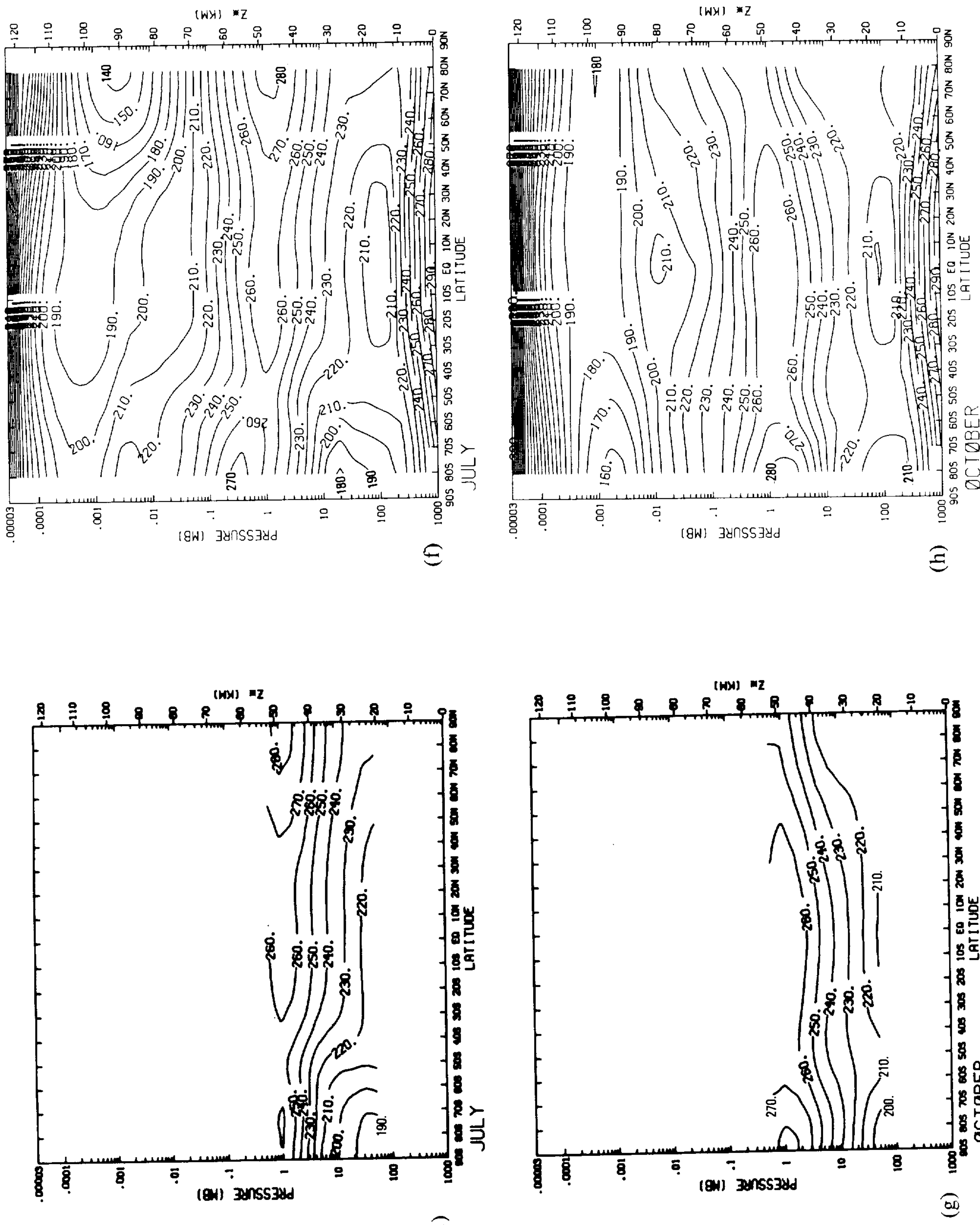


Figure 22. Latitude-height cross section of zonal mean temperature for (a) January NMC data, (b) January climatology, (c) April NMC data, (d) April climatology, (e) July NMC data, (f) July climatology, (g) October NMC data, and (h) October climatology. Contour interval of 10K. Note that (b), (d), (f) and (h) are repeats of figure 1.

ORIGINAL PAGE IS
OF POOR QUALITY



(f) (h) (e) (g)

Figure 22. (cont.)

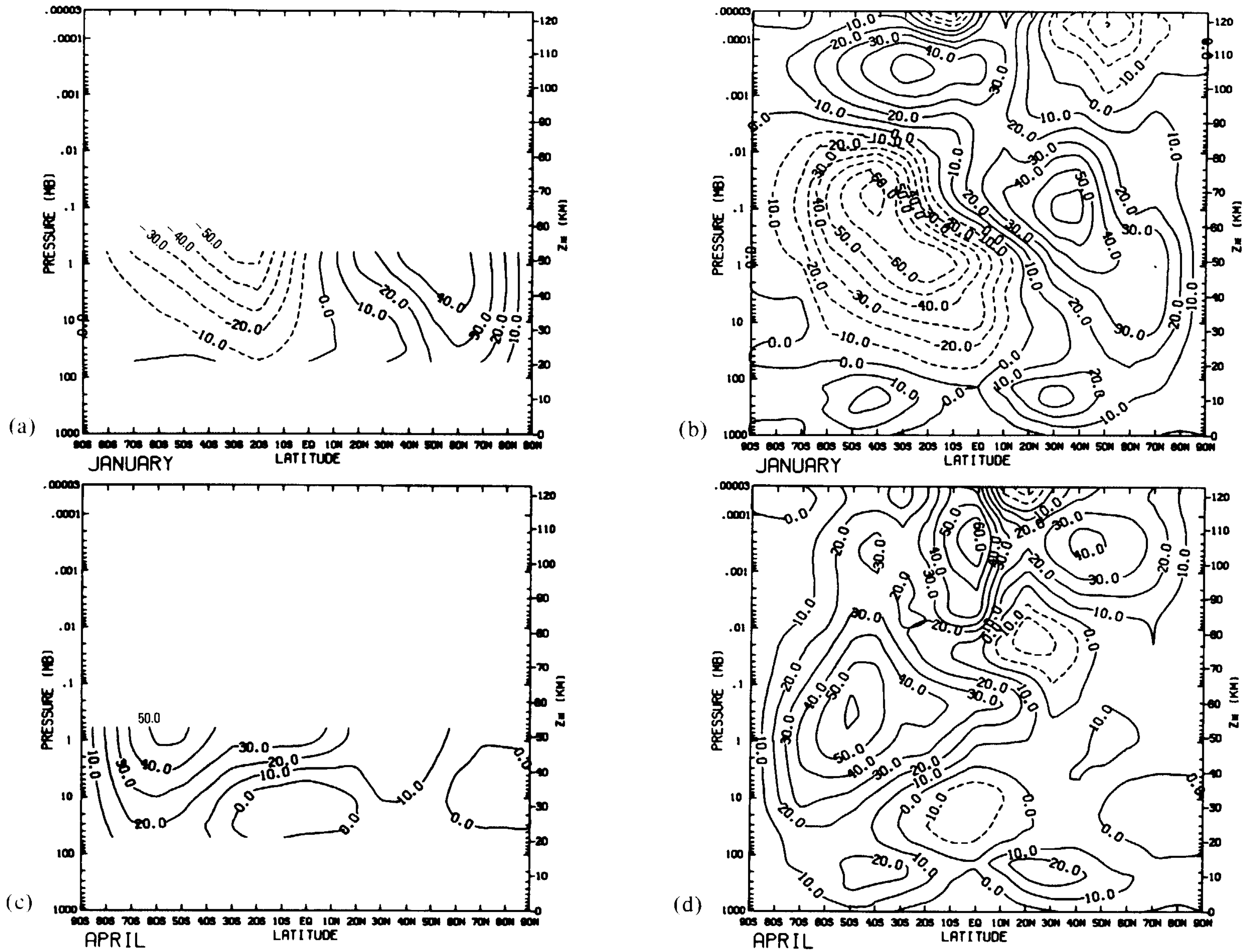


Figure 23. Latitude-height cross section of zonal mean zonal wind for (a) January NMC data (b) January climatology, (c) April NMC data, (d) April climatology, (e) July NMC data, (f) July climatology, (g) October NMC data, and (h) October climatology. Contour interval of 10 m/s. Negative (easterly) values are dashed. Note that (b), (d), (f) and (h) are repeats of figure 6.

ORIGINAL PAGE IS
OF POOR QUALITY

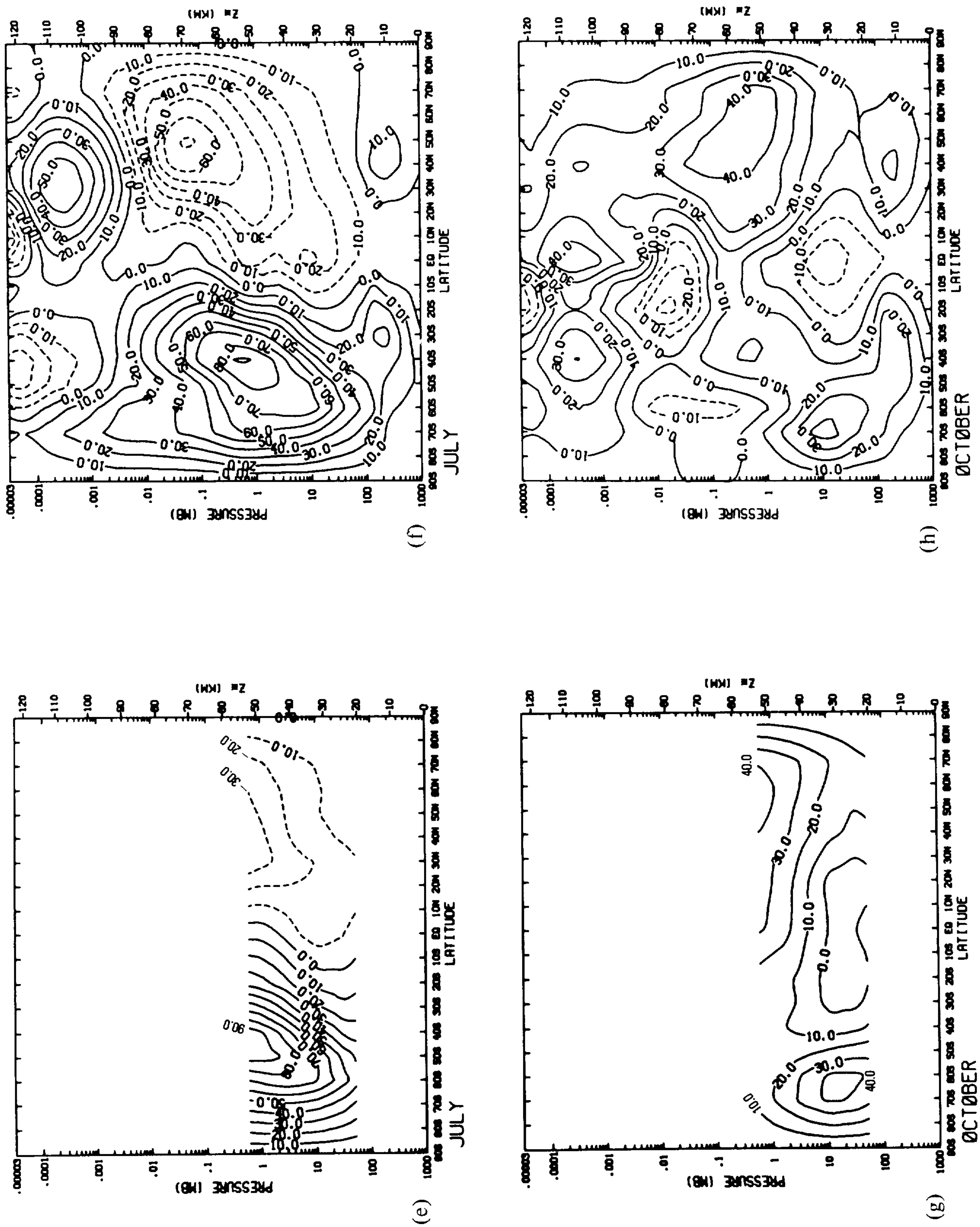


Figure 23. (cont.)

8. CONCLUSIONS AND OUTLOOK

In this report we have presented a climatology of several atmospheric parameters using current data sources which provide global coverage from the ground to 120 km. Based on current knowledge, this climatology provides a reasonably accurate representation of the zonally averaged atmospheric state. It is hoped that this climatology will provide a useful data base for observational and theoretical studies, and a guidance for instrument design and development.

Numerous satellite and ground-based measurements provide relatively complete spatial and temporal data coverage below 80 km (on a global monthly mean basis). However many atmospheric phenomena remain in question, such as the polar latitudinal temperature maximum of the winter polar stratopause and the relationship of the temperature and wind fields to the annual springtime depletion of ozone over the Antarctic.

Knowledge of the upper mesosphere and lower thermosphere is limited due to the relative sparsity of data, and the complex forcing mechanisms observed at these levels, e.g., gravity waves and tides, cause basic approximations such as geostrophy to be inaccurate. However, the development of a global distribution of radar systems (Manson et al., 1985, 1986) is providing a substantial array of direct wind measurements for the 60-110 km region. Using MSIS-86 data, we are also investigating the diurnal variations of the horizontal wind in the lower thermosphere.

Through the on-going development of a global network of satellite and ground-based measurements, knowledge of the atmosphere as a whole will continue to increase.

Acknowledgments. We would like to thank A.E. Hedin of NASA/Goddard Space Flight Center, Greenbelt, Maryland and M.E. Gelman of NMC, Washington, D.C. for supplying their data and for helpful discussions. Thanks also to K. Labitzke of the Meteorological Institute, Free University Berlin, Federal Republic of Germany for helpful comments.

APPENDIX A : STABILITY ANALYSIS OF THE CLIMATOLOGY

In order to estimate the magnitude of bias that both long wave components and smaller scale eddies have on the mean zonal flow, a stability analysis was done on the zonal mean temperature and zonal wind climatology in constant pressure coordinates. An explanation of the effects of stability, as taken from Schoeberl and Zalesak (1976) is as follows: "If the mean zonal wind field is stable to wave perturbations, then any finite amplitude eddy disturbances can be assumed to arise from boundary (tropospheric) forcing. If the flow field is unstable, then finite amplitude disturbances may arise spontaneously from infinitesimal, local disturbances. The stability of the zonal flow is computed using the Charney-Stern stability criteria (Charney and Stern, 1962) for an atmosphere bounded by rigid walls. A necessary criterion for stability is that Q (the latitudinal gradient of potential vorticity), defined as

$$Q = \underset{(1)}{2(\Omega + [\omega])} - \underset{(2)}{\frac{\partial^2[\omega]}{\partial\theta^2}} + \underset{(3)}{3\tan\theta\,\frac{\partial[\omega]}{\partial\theta}} - \underset{(4)}{\sin^2\theta\, e^z \frac{\partial}{\partial z}\left(\frac{e^{-z}}{S}\frac{\partial[\omega]}{\partial z}\right)} \qquad \text{(A-1)}$$

does not change sign within the bounded region". Note that here, $z=\ln(p_0/p)$, and S is the static stability defined as

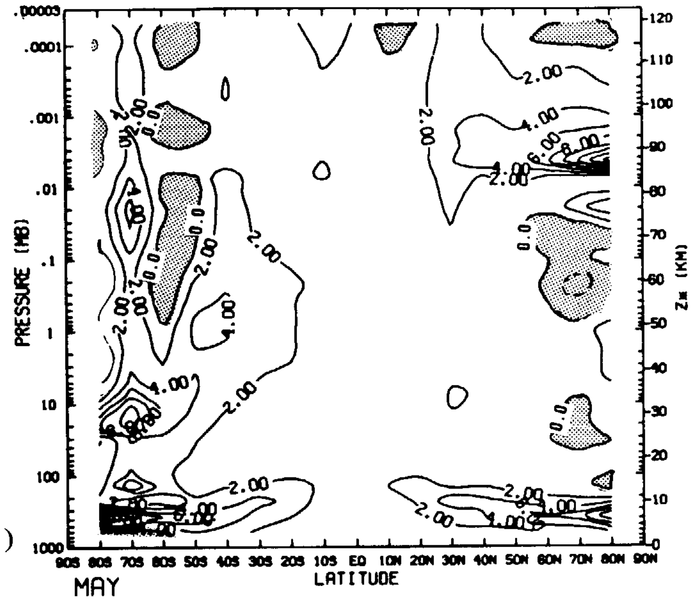
$$S = \frac{R}{(2\Omega a)^2}\left(\kappa[T] + \frac{\partial[T]}{\partial z}\right) \qquad \text{(A-2)}$$

where R is the gas constant for dry air, $\kappa=R/C_p$ (C_p is the specific heat of dry air at constant pressure), T is temperature, and all other symbols are as previously defined. Figures A1-A12 show latitude-height sections of Q for each month. Standard center differencing was used in the calculations. It is evident that there are regions of instability in the climatology. Largest areas of instability occur in the summer hemisphere mesosphere at 50°-80° latitude, and in the winter hemisphere mesosphere and lower thermosphere at 50°-60° latitude (although instability sometimes occurs further poleward as well, e.g., January and February in the Northern Hemisphere). A term by term analysis of equation (A-1) reveals that sign changes in Q in these regions at 50°-70° latitude result mainly from sign changes in terms 2 and 4 (terms 1-3 are barotropic terms and term 4 is a baroclinic term). Recall that in the zonal mean zonal wind derivation (section 3-E), $[\omega]$ was defined to be constant poleward of 70°N (70°S), thus maintaining barotropic stability of the zonal mean flow at high latitudes. Therefore the instability observed poleward of 70°N (70°S) in Figures A1-A12 is baroclinic. Figures A1-A12 also reveal a certain amount of hemispheric symmetry, i.e. instability patterns in summer and winter are similar in both hemispheres. Note also that March and September exhibit relatively small areas of instability.

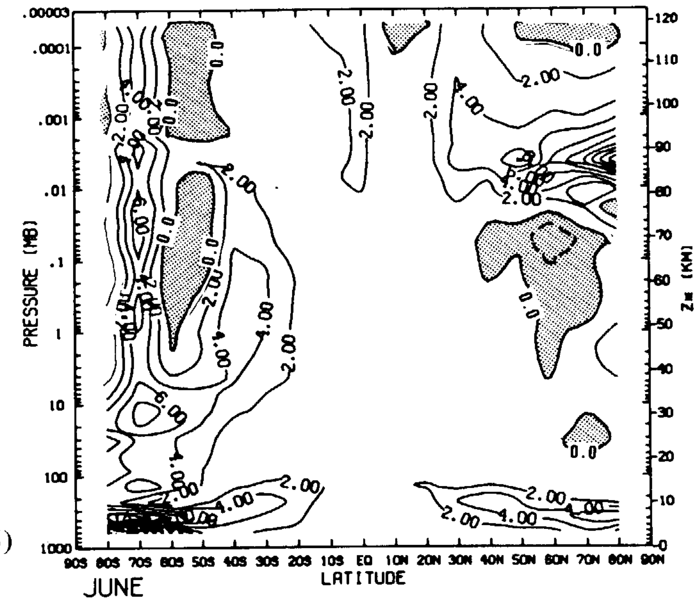
The Charney-Stern stability criterion is based on the assumption that the given data sets represent zonal mean conditions. This assumption would seem to be valid for this climatology, given the extensive longitudinal coverage of data for the troposphere (from a large radio/rocketsonde network) and the stratosphere, mesosphere, and lower thermosphere (based primarily on satellite measurements). Therefore it appears that the regions of instability observed in Figures A1-A12 indicate that small scale eddies may develop from local disturbances in the zonal mean flow, even on a monthly averaged climatological basis. (Further discussion of stability of the zonal mean flow can be found in Matsuno, 1970.)

ORIGINAL PAGE IS
OF POOR QUALITY

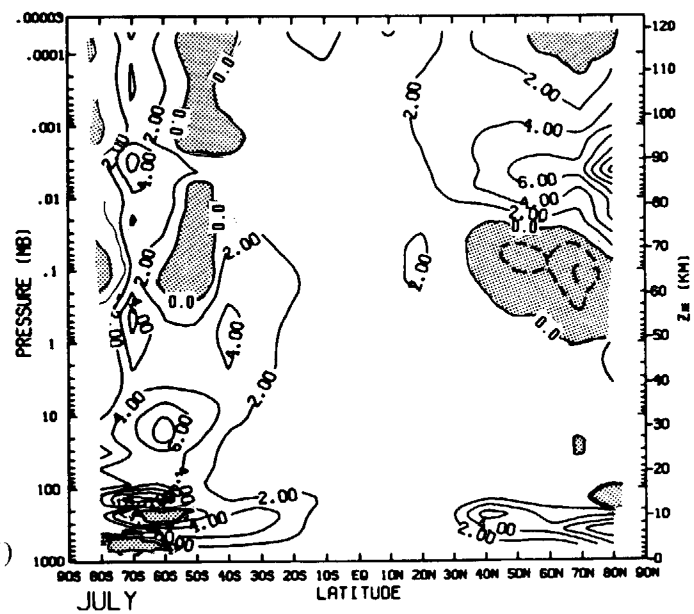
(A5)



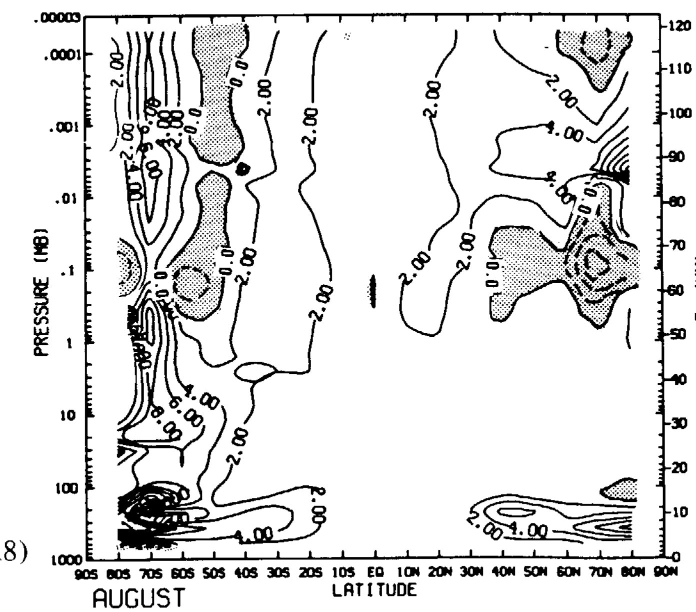
(A6)



(A7)

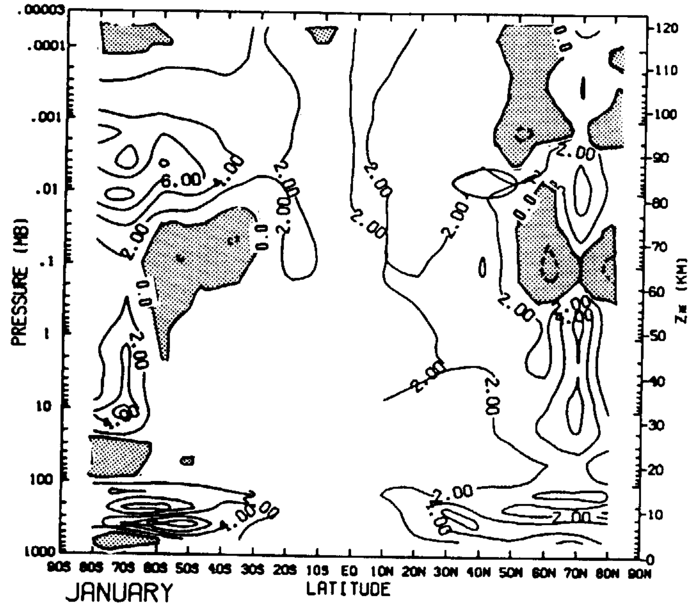


(A8)

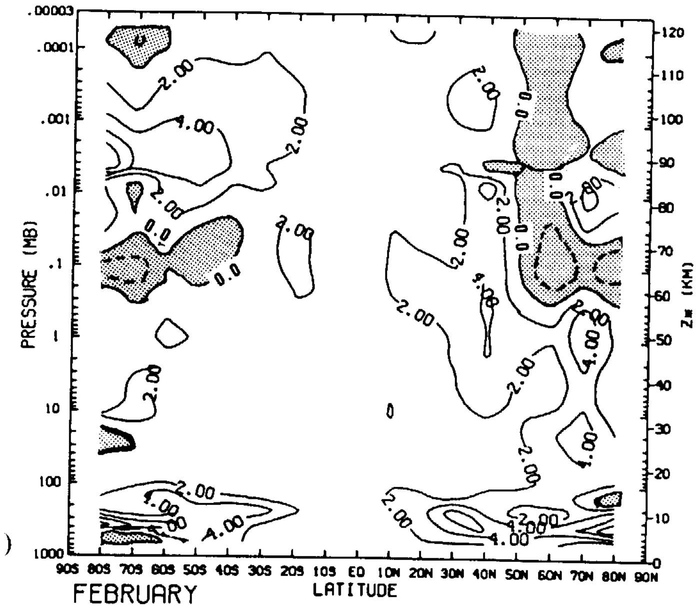


Figures A (1 - 12) (cont.)

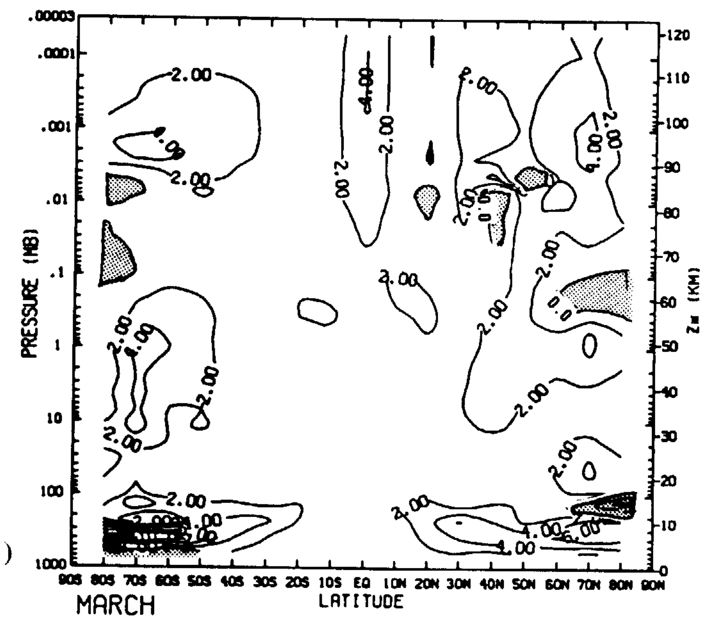
(A1)



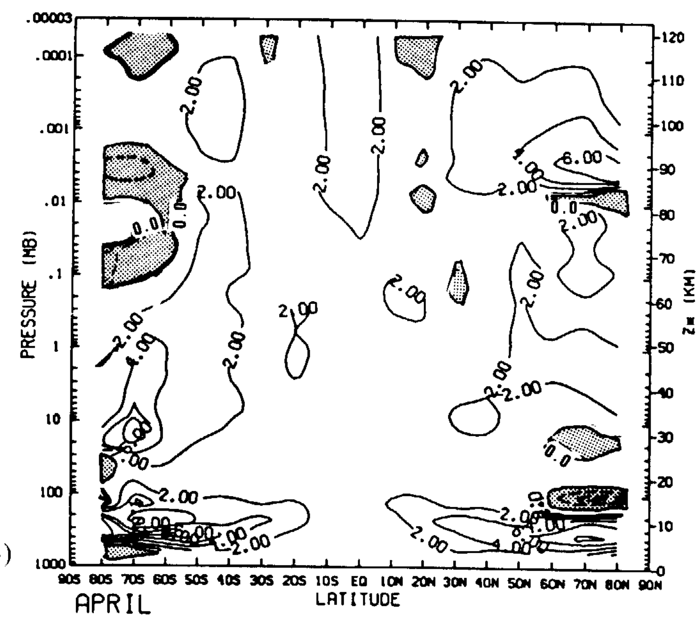
(A2)



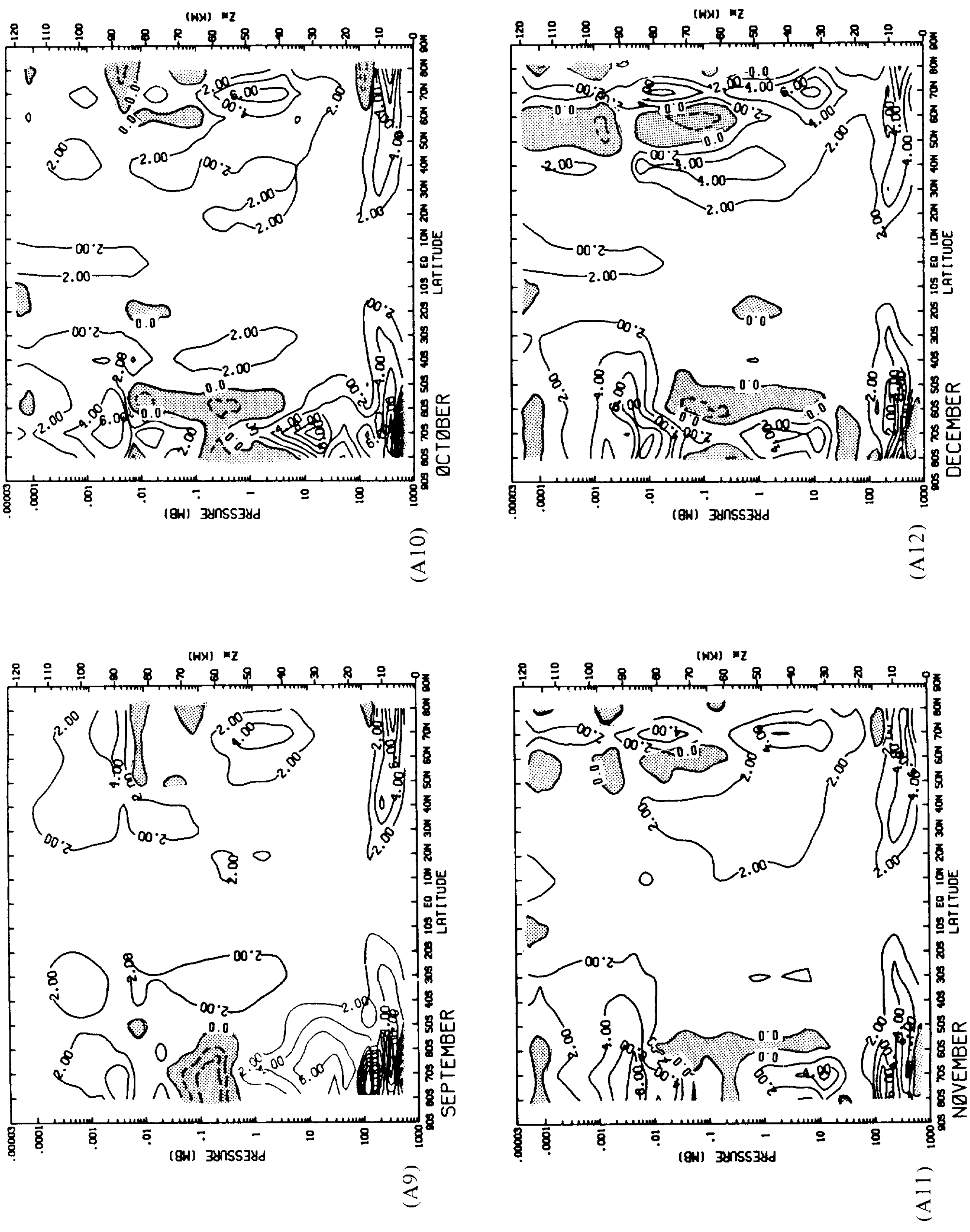
(A3)



(A4)



Figures A (1 - 12). Latitude-height cross sections of stability parameter Q, defined in equation (A-1), for each month. Labels have been scaled by 10,000 s^{-1}; e.g., a value of 1.0 = 0.0001 s^{-1}. Contour interval of 2. Negative values are indicated by the shading.



Figures A (1 - 12) (cont.)

APPENDIX B : TABLES OF THE CLIMATOLOGICAL VALUES

The values of the five zonally averaged climatological data sets described in section 3 are listed by month in Tables B1-B5 as follows.

Table B1

JANUARY ZONAL MEAN TEMPERATURE (K)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
120	391.2	390.6	389.7	388.5	386.9	385.2	383.2	381.1	379.0	376.8	374.7	372.7	371.0	369.4	368.2	367.3	366.7
115	318.1	318.8	319.1	318.1	315.4	311.0	305.7	300.6	296.6	294.3	293.7	294.1	294.5	293.9	291.9	289.2	286.9
110	293.9	287.9	279.1	268.7	257.7	247.0	237.3	229.0	222.8	219.3	218.8	221.6	226.8	233.0	238.6	242.5	244.6
105	246.1	240.0	231.9	223.3	215.3	208.5	202.8	198.2	194.7	192.5	192.2	194.3	198.5	204.4	210.8	216.3	220.0
100	189.1	188.3	187.4	186.8	186.8	187.3	187.9	188.1	187.7	187.0	186.7	187.4	189.6	193.2	197.6	201.9	204.9
95	152.2	155.3	160.0	166.0	172.5	178.7	183.5	186.4	187.3	187.0	186.6	187.2	189.1	192.2	196.0	199.5	202.1
90	142.9	147.6	154.8	163.9	173.3	181.5	187.1	189.7	190.5	190.6	191.3	193.5	196.9	201.3	205.6	209.1	211.6
85	147.9	152.7	160.1	170.1	180.6	189.4	194.6	196.5	197.5	198.6	200.5	204.1	208.6	213.7	217.8	220.3	222.2
80	171.7	173.6	176.9	184.1	192.9	200.7	204.7	204.8	205.5	206.3	207.7	211.5	215.8	221.4	224.4	224.6	225.8
75	200.1	199.8	199.8	201.6	204.6	208.4	210.8	210.6	211.1	211.4	212.3	215.6	219.3	223.8	226.3	225.6	226.8
70	226.4	224.8	222.7	219.0	215.2	214.1	215.9	217.8	218.3	217.7	217.5	219.5	221.2	225.0	227.7	227.3	229.3
65	248.3	245.3	241.5	235.5	229.8	227.5	230.4	233.8	235.1	233.1	230.7	227.8	226.3	226.2	229.6	232.6	236.4
60	266.7	262.9	258.7	252.8	247.4	245.0	247.7	252.6	252.9	250.2	244.5	238.7	232.5	230.7	235.0	241.9	247.2
55	281.1	276.8	272.1	266.3	261.1	258.7	259.4	263.3	264.6	262.9	258.3	251.9	245.2	241.7	244.2	250.7	255.5
50	288.5	284.4	279.7	275.4	271.4	268.7	267.4	267.8	267.8	267.9	267.0	263.4	259.2	253.5	253.5	255.0	255.4
45	286.1	283.4	280.0	275.8	272.8	269.5	267.1	264.0	263.8	264.5	265.8	264.4	260.6	254.4	252.3	252.0	251.0
40	276.2	274.1	271.2	267.6	264.1	260.2	256.5	254.9	255.2	255.2	255.8	254.0	250.0	246.4	246.5	246.7	246.9
35	261.8	260.5	258.1	254.6	250.6	246.8	244.1	242.3	242.5	242.1	241.7	239.2	237.4	235.4	235.7	236.3	236.6
30	244.5	244.1	243.7	240.7	236.1	232.0	228.9	227.8	227.2	228.0	228.1	228.5	227.5	226.2	224.7	221.7	219.1
25	235.6	233.8	232.6	229.0	225.4	222.1	219.2	218.1	217.5	218.0	218.3	219.3	219.6	218.2	213.8	207.8	202.0
20	234.6	233.2	229.6	222.8	215.5	210.2	207.4	205.3	204.3	204.6	206.7	210.0	214.5	216.8	215.5	211.4	205.9
15	232.5	231.3	227.3	220.3	212.3	206.0	202.0	199.8	199.3	199.7	202.2	208.1	214.7	217.9	217.0	214.1	211.2
10	226.9	225.5	224.8	225.9	229.8	235.0	238.3	239.0	239.2	238.6	235.4	228.6	221.6	218.8	217.1	215.2	214.0
5	240.8	243.7	248.3	255.8	263.8	269.4	271.9	272.3	272.4	272.4	269.6	261.8	252.5	244.5	239.1	234.8	231.9
0		272.0	275.2	281.4	289.5	295.9	298.9	300.5	300.6	300.0	297.1	291.7	284.7	277.7	266.4	254.1	248.6

FEBRUARY ZONAL MEAN TEMPERATURE (K)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
120	391.7	391.3	390.7	389.9	388.9	387.7	386.4	385.0	383.5	382.1	380.7	379.4	378.2	377.2	376.4	375.8	375.4
115	316.8	317.9	318.7	318.3	316.1	312.4	307.8	303.5	300.5	299.3	299.7	301.0	302.0	301.9	300.3	297.9	295.8
110	283.8	279.5	272.7	264.0	254.2	244.5	235.8	228.8	224.1	222.0	223.0	226.8	232.6	239.1	244.6	248.3	250.2
105	236.6	232.2	225.9	218.9	212.0	206.0	201.2	197.5	194.9	193.6	193.9	196.1	200.2	205.6	211.2	215.9	219.0
100	187.6	186.9	186.3	185.9	186.0	186.6	187.4	187.8	187.7	187.1	186.6	186.6	187.7	189.9	192.8	195.7	197.8
95	157.2	159.7	163.7	168.7	174.4	179.7	184.0	186.5	187.3	186.9	186.1	185.6	185.7	186.5	187.9	189.4	190.6
90	151.9	155.7	161.7	169.2	177.0	183.5	187.8	189.9	190.5	190.5	190.8	191.5	193.0	194.9	196.8	198.2	199.2
85	158.7	162.5	168.5	177.0	185.4	191.9	195.1	196.6	197.4	198.3	199.8	201.6	204.2	207.4	210.0	211.1	211.8
80	179.1	180.3	182.8	189.8	197.3	202.6	204.1	204.3	205.1	206.2	208.4	210.1	213.4	217.9	221.3	221.3	221.4
75	201.4	200.8	200.8	203.7	207.3	209.9	210.6	210.2	210.6	211.6	213.7	215.7	219.0	223.4	227.1	226.6	227.2
70	223.1	221.2	219.8	217.3	216.0	216.2	217.6	217.9	217.6	217.1	218.2	220.0	222.5	226.2	230.7	231.3	233.7
65	244.1	240.2	235.9	230.7	227.3	228.4	231.1	231.5	231.3	230.0	228.0	226.7	227.1	229.4	234.2	239.6	245.7
60	259.7	255.5	251.2	245.9	242.7	243.0	246.3	248.2	248.0	246.4	241.3	237.7	233.3	234.0	240.2	249.3	258.1
55	271.4	268.1	264.8	260.6	256.8	255.8	257.3	262.2	263.9	262.9	258.2	253.3	246.7	244.3	248.6	257.1	265.4
50	278.8	276.1	273.3	271.5	268.6	267.1	267.4	270.0	271.4	271.4	269.5	265.1	260.3	254.9	253.3	254.7	257.9
45	276.9	275.1	273.5	271.5	270.0	267.9	268.3	268.4	269.7	270.2	270.0	266.8	262.3	255.6	250.2	246.8	245.5
40	267.1	265.6	264.0	262.5	261.6	259.0	258.2	259.0	259.9	260.1	259.6	256.7	252.2	245.5	242.0	239.2	236.7
35	253.9	253.0	251.8	250.0	247.4	245.8	245.5	244.6	244.9	244.9	245.0	242.3	238.0	232.4	231.9	232.5	231.3
30	239.4	239.1	238.6	236.7	233.8	231.9	229.9	228.9	228.2	228.8	229.0	228.8	225.1	221.9	222.2	224.0	222.9
25	232.8	231.2	229.2	226.7	224.3	221.9	219.5	218.5	217.9	217.9	217.8	218.3	218.4	218.1	216.2	213.6	210.4
20	232.2	230.7	227.7	221.5	215.1	210.3	207.3	205.3	204.1	204.6	207.0	210.3	214.8	217.6	217.1	213.8	209.1
15	230.7	229.7	226.1	219.2	212.1	206.2	202.0	199.9	199.8	200.1	202.5	208.3	215.2	218.8	217.9	214.6	210.4
10	226.1	226.1	225.3	226.5	230.7	235.5	238.7	239.1	239.1	238.9	236.0	228.9	221.6	219.0	217.5	215.6	213.7
5	239.2	241.6	247.4	256.5	264.8	269.8	272.0	272.3	272.3	272.5	269.4	261.7	252.2	244.3	239.3	235.6	233.0
0		272.0	276.2	282.2	290.0	296.3	299.5	300.7	300.6	299.8	296.7	291.2	284.3	277.6	266.5	254.0	247.4

MARCH ZONAL MEAN TEMPERATURE (K)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
120	387.3	387.2	387.0	386.8	386.6	386.3	386.0	385.6	385.3	385.0	384.6	384.3	384.0	383.8	383.6	383.5	383.4
115	310.0	311.6	313.1	313.6	312.4	309.7	306.3	303.5	302.0	302.5	304.4	307.0	309.1	309.8	308.9	307.0	305.1
110	268.1	265.5	260.9	254.1	246.1	238.1	231.4	226.7	224.6	225.1	228.3	233.9	240.9	248.1	254.1	258.1	260.2
105	225.5	222.4	217.8	212.2	206.6	201.8	198.3	196.1	195.0	195.1	196.5	199.4	203.7	208.9	214.2	218.6	221.4
100	188.0	187.2	186.4	185.7	185.5	186.0	186.8	187.5	187.7	187.3	186.6	186.0	185.9	186.6	187.9	189.3	190.4
95	167.3	168.7	171.0	174.3	178.0	181.7	184.7	186.6	187.3	186.7	185.3	183.1	180.8	178.6	176.9	175.8	175.2
90	168.5	170.8	174.3	178.6	183.0	186.5	188.9	190.2	190.7	190.4	189.8	188.7	186.9	185.0	183.0	181.2	179.9
85	179.9	182.0	185.1	189.0	192.8	195.2	196.5	197.5	198.2	198.2	198.4	198.5	197.6	197.0	196.0	194.1	192.4
80	199.4	199.8	200.0	201.8	204.0	204.8	204.7	205.8	206.9	206.9	208.0	209.6	209.1	210.7	212.0	210.3	208.4
75	212.9	212.1	211.2	210.6	211.0	211.5	211.2	211.3	211.6	211.6	214.0	217.1	217.8	220.7	222.0	219.4	216.9
70	223.3	221.8	220.9	217.4	216.6	218.5	219.1	217.7	217.2	216.8	219.8	222.8	224.1	226.9	227.2	224.6	222.1
65	236.8	233.3	230.3	226.5	226.6	230.3	231.7	230.6	229.8	229.1	229.0	229.9	229.9	232.0	231.0	229.9	228.6
60	247.1	243.8	241.5	239.3	238.9	241.1	244.4	244.9	245.4	243.6	240.5	239.2	237.9	238.4	238.2	239.9	240.8
55	256.3	254.2	252.9	253.5	254.2	254.9	256.0	260.6	261.9	260.8	257.2	254.2	252.1	250.5	250.1	253.6	256.5
50	263.6	263.8	264.5	266.3	267.3	267.3	267.8	270.2	271.5	270.7	268.8	265.9	264.7	262.4	261.1	261.2	261.9
45	259.7	261.0	263.4	265.7	266.3	266.1	268.3	270.5	271.6	271.3	270.0	267.5	266.0	263.5	260.2	256.6	254.4
40	247.9	248.8	251.4	255.1	256.5	256.4	258.7	260.9	261.9	261.6	260.1	257.2	255.7	252.4	247.9	243.1	240.2
35	235.0	236.7	239.4	241.5	242.1	243.4	244.4	245.5	246.2	246.4	245.4	243.1	240.6	236.4	233.0	231.8	232.0
30	225.7	227.1	228.3	229.1	229.8	230.2	230.5	230.0	229.7	229.8	230.1	229.3	225.5	221.9	221.0	222.4	224.4
25	221.6	221.7	223.3	223.2	222.6	221.6	220.7	220.3	219.3	218.9	218.9	218.9	218.4	218.1	218.2	218.8	219.7
20	224.2	223.8	222.3	219.7	215.3	210.9	207.4	205.6	205.3	205.4	207.3	210.8	215.2	218.2	218.8	217.2	214.6
15	225.4	225.5	223.4	218.5	212.5	206.4	202.0	199.6	199.3	199.9	202.8	208.6	215.2	218.9	219.4	217.6	214.6
10	224.2	223.9	223.3	224.8	229.0	234.3	238.1	239.2	239.3	238.9	235.7	228.7	222.1	219.6	218.9	217.6	215.8
5	235.9	239.8	246.8	255.7	263.5	268.8	271.8	272.3	272.4	272.4	269.8	262.6	254.2	246.8	241.4	237.2	234.0
0		271.8	275.0	281.3	289.7	296.0	299.4	301.0	300.9	300.1	297.0	291.4	284.8	279.0	268.5	256.4	248.2

Table B1 (cont.)

APRIL ZONAL MEAN TEMPERATURE (K)

HEIGHT (km)	LATITUDE 80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
120	377.8	378.0	378.4	378.8	379.4	380.1	380.9	381.7	382.5	383.4	384.2	385.0	385.7	386.3	386.8	387.1	387.3
115	298.9	300.9	303.1	304.4	304.1	302.5	300.6	299.4	299.7	301.9	305.4	309.3	312.4	314.0	313.9	312.6	311.3
110	253.8	252.0	248.3	242.8	236.3	229.9	225.3	223.2	223.8	227.1	232.7	240.2	248.8	257.3	264.7	270.0	273.1
105	219.1	216.3	211.9	206.7	201.6	197.6	195.1	194.3	194.9	196.6	199.4	203.4	208.5	214.4	220.4	225.5	228.9
100	193.1	191.6	189.6	187.7	186.5	186.1	186.5	187.2	187.7	187.6	187.0	186.1	185.5	185.3	185.7	186.4	186.9
95	181.8	181.7	181.6	182.1	183.0	184.3	185.6	186.8	187.3	186.6	184.4	180.8	176.2	171.5	167.4	164.2	162.2
90	189.3	189.2	189.2	189.3	189.5	189.7	190.0	190.6	190.8	190.2	188.5	185.3	180.3	174.5	168.9	164.2	161.1
85	204.3	203.5	202.2	201.2	200.1	198.9	198.2	198.7	198.6	197.7	196.6	194.3	190.1	184.9	180.0	175.1	171.9
80	222.7	220.2	215.9	212.6	209.9	207.4	206.1	207.9	208.0	206.6	206.5	205.9	203.1	200.6	199.5	197.0	195.3
75	230.1	227.4	223.6	218.5	215.2	212.8	210.6	210.8	210.3	209.9	212.4	214.5	214.4	215.1	215.9	214.6	213.7
70	232.9	230.8	228.5	222.5	219.7	218.5	215.9	213.3	212.6	213.9	219.3	222.2	223.9	226.0	227.1	226.9	226.4
65	241.4	237.9	234.0	228.5	228.3	230.4	228.6	226.1	225.9	226.9	229.6	231.9	233.7	234.9	235.1	234.0	232.8
60	249.9	245.5	241.0	238.5	239.2	240.3	242.0	242.6	243.1	242.1	240.1	241.2	243.1	244.4	244.7	244.9	244.4
55	254.7	250.9	247.3	248.7	252.2	254.5	257.0	259.2	259.7	258.2	255.2	255.4	257.5	258.4	257.8	258.8	259.2
50	258.9	257.2	255.5	257.7	263.4	265.9	267.1	269.2	269.7	269.2	268.2	268.2	269.6	269.5	269.3	269.1	268.7
45	252.8	252.3	252.2	256.1	260.9	263.8	267.0	269.5	270.2	269.7	269.0	269.2	270.4	270.9	268.7	265.5	263.2
40	237.0	236.2	237.9	243.8	248.6	252.3	257.0	260.4	261.6	261.1	259.5	259.0	260.9	260.0	256.2	252.0	249.2
35	220.0	219.5	223.6	229.6	235.3	239.4	243.0	246.5	247.8	247.5	246.0	245.1	245.2	243.5	239.9	235.5	233.3
30	210.3	211.9	215.0	220.6	225.1	228.4	230.6	231.5	231.0	230.4	231.6	230.7	228.4	226.6	225.8	225.2	225.1
25	203.6	209.0	216.3	219.7	221.2	221.6	221.5	221.1	220.3	220.1	220.6	220.4	219.4	219.8	221.5	224.3	227.0
20	212.1	214.6	216.9	217.4	214.9	211.3	208.0	206.4	206.0	206.4	208.5	211.6	215.1	218.6	221.1	222.9	224.1
15	217.1	219.1	219.8	217.6	213.1	207.4	202.5	199.5	199.1	199.8	203.0	208.6	214.6	218.8	221.4	222.9	223.5
10	218.3	219.7	220.6	222.0	226.0	231.6	237.0	239.3	239.7	238.9	235.5	229.4	223.5	221.2	221.1	221.5	221.4
5	233.7	237.8	244.1	252.5	260.7	266.9	271.2	272.4	272.5	272.4	270.2	264.9	257.6	250.8	245.2	240.9	237.9
0		270.5	274.5	280.8	288.9	295.0	298.8	301.0	301.1	300.5	297.8	292.6	286.0	280.3	273.1	262.2	253.2

MAY ZONAL MEAN TEMPERATURE (K)

HEIGHT (km)	LATITUDE 80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
120	367.7	368.2	369.0	370.0	371.3	372.8	374.4	376.1	378.0	379.8	381.5	383.2	384.6	385.9	387.0	387.7	388.2
115	288.3	290.6	293.1	295.0	295.4	294.8	294.0	294.0	295.8	299.3	303.9	308.8	312.8	315.1	315.7	315.1	314.2
110	245.4	243.5	239.9	234.6	228.5	223.2	220.0	219.8	222.6	227.9	235.3	244.3	254.2	264.2	273.3	280.7	285.5
105	218.6	215.3	210.3	204.4	198.9	194.9	192.8	192.9	194.6	197.6	201.6	206.7	212.8	219.9	227.4	234.3	239.2
100	201.1	198.6	195.0	191.4	188.6	187.0	186.6	187.1	187.7	187.9	187.5	186.8	186.1	185.9	186.2	186.8	187.4
95	196.4	194.5	192.0	189.4	187.4	186.4	186.4	186.9	187.3	186.4	183.7	179.1	173.3	167.2	161.6	157.1	154.3
90	206.1	204.0	201.1	198.0	194.8	192.2	190.7	190.4	190.5	189.8	187.2	182.3	174.9	166.5	158.4	151.8	147.4
85	219.6	217.1	213.7	210.2	205.9	201.6	198.8	198.0	197.5	196.4	194.2	189.8	182.4	173.9	165.8	158.9	154.3
80	231.0	227.2	223.2	219.4	213.9	208.0	204.6	205.0	205.2	204.3	202.6	199.8	193.6	188.2	184.6	180.9	178.6
75	234.1	231.6	230.0	225.1	218.6	211.9	207.1	205.7	206.1	207.2	208.4	208.1	205.6	204.9	205.6	204.8	204.2
70	235.0	235.2	236.6	230.8	223.7	216.9	210.6	206.9	207.4	211.0	215.5	217.5	217.7	220.0	223.1	224.9	225.7
65	240.6	241.9	243.7	237.3	231.0	228.9	225.4	222.3	223.4	225.9	228.7	229.9	231.0	233.9	236.7	238.6	239.9
60	249.8	250.5	249.3	243.5	238.5	240.1	241.6	243.0	243.5	243.2	242.1	242.8	243.6	247.8	250.9	254.7	257.8
55	257.6	257.0	253.2	249.2	248.1	252.0	256.1	258.5	258.7	256.8	255.2	256.6	259.7	262.8	265.5	268.9	272.4
50	260.4	259.5	254.8	252.3	255.7	261.3	264.8	266.7	266.7	266.5	267.9	269.2	271.2	273.4	275.3	277.9	280.6
45	253.6	251.5	246.8	247.1	255.2	261.0	265.3	265.8	266.0	266.4	267.3	269.7	272.9	274.6	275.6	276.1	276.9
40	236.7	234.8	231.8	233.7	241.5	249.8	255.5	258.0	258.7	258.6	258.0	259.4	262.9	263.9	263.9	264.9	264.7
35	220.6	217.6	215.0	218.5	228.5	236.2	242.4	246.1	247.3	246.7	245.4	245.7	247.0	247.6	248.0	248.0	247.2
30	204.2	202.9	204.7	212.6	220.9	226.9	229.8	231.7	231.4	230.8	231.9	231.9	230.8	230.8	232.0	233.8	234.8
25	187.5	196.5	206.6	214.6	219.2	221.1	221.5	221.3	220.6	220.8	222.0	221.8	221.3	222.5	224.2	226.6	229.0
20	198.5	204.3	210.4	215.0	215.1	212.3	209.2	207.4	206.8	207.3	209.4	212.5	216.2	220.2	224.1	227.5	230.0
15	206.5	210.2	214.3	216.2	214.0	208.6	203.0	199.9	199.7	200.2	203.0	208.2	214.2	219.4	223.4	226.4	228.7
10	211.7	214.3	216.8	219.5	223.3	229.4	235.6	238.8	239.5	239.4	237.0	232.1	226.3	223.7	223.7	224.8	226.2
5	231.8	236.6	243.4	250.7	258.1	264.6	270.0	272.3	272.5	272.5	271.3	267.5	261.9	255.5	250.3	246.0	242.8
0		273.4	276.7	280.7	287.5	293.4	297.8	300.5	301.0	300.9	298.7	294.2	287.9	281.6	277.3	269.2	263.6

JUNE ZONAL MEAN TEMPERATURE (K)

HEIGHT (km)	LATITUDE 80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
120	363.0	363.5	364.5	365.9	367.5	369.4	371.5	373.7	376.0	378.3	380.5	382.6	384.5	386.1	387.5	388.5	389.0
115	283.5	285.9	288.6	290.6	291.4	291.1	290.9	291.6	294.0	298.2	303.4	308.8	313.2	316.0	317.0	316.8	316.1
110	242.9	240.8	236.9	231.3	225.1	220.1	217.6	218.2	222.0	228.4	236.7	246.4	257.1	268.1	278.6	287.6	293.9
105	220.2	216.4	210.7	204.2	198.2	193.9	191.9	192.2	194.5	198.2	202.9	208.6	215.4	223.4	232.2	240.6	246.9
100	206.5	203.3	198.7	194.0	190.1	187.6	186.8	187.0	187.7	188.1	187.9	187.3	186.8	186.8	187.3	188.3	189.1
95	204.4	201.6	197.6	193.4	189.8	187.5	186.7	187.0	187.3	186.4	183.4	178.5	172.1	165.5	159.3	154.4	151.2
90	213.9	211.0	206.8	202.1	197.3	193.3	190.9	190.3	190.2	189.4	186.5	180.8	172.1	162.6	153.4	146.0	141.2
85	224.4	221.5	217.7	213.4	208.1	202.6	198.7	197.1	196.4	195.2	192.8	187.4	177.8	167.8	158.0	150.5	145.8
80	228.1	224.9	221.6	218.6	213.1	206.5	202.4	202.2	202.4	201.3	200.0	196.1	186.7	180.2	174.3	171.3	169.7
75	230.1	228.0	227.2	224.0	217.8	209.4	204.4	203.3	203.8	204.2	205.0	203.5	198.8	197.4	197.3	197.8	198.4
70	234.6	234.9	236.5	232.5	224.4	215.5	208.2	205.8	206.2	208.0	210.3	211.3	212.6	215.4	220.0	222.7	224.5
65	243.0	244.3	246.3	241.2	233.9	228.8	224.4	222.0	222.7	223.9	224.4	225.0	229.0	233.4	239.0	242.3	244.7
60	254.3	255.4	254.3	248.4	241.5	241.1	241.2	242.6	243.1	243.3	242.1	242.3	245.0	250.6	255.8	260.7	264.4
55	265.0	264.0	258.9	253.2	248.7	251.6	255.1	257.5	257.5	256.6	255.6	257.2	259.7	265.5	269.5	274.7	278.8
50	267.3	265.1	259.5	254.5	254.7	260.5	264.3	264.8	264.4	264.6	266.2	267.7	269.8	273.9	277.7	282.2	285.9
45	257.1	254.9	250.6	247.3	252.8	259.3	263.7	262.5	262.5	263.1	265.2	268.0	271.6	274.3	277.8	281.1	283.4
40	240.1	239.4	235.0	231.4	236.9	247.1	253.4	254.7	255.0	254.7	255.3	257.8	260.8	264.6	267.7	270.7	271.9
35	223.4	222.3	215.7	212.6	221.8	232.5	240.5	244.1	244.7	243.7	243.1	244.9	246.9	249.7	252.5	255.1	255.7
30	199.8	199.9	200.5	206.6	217.1	225.7	228.7	230.7	230.4	230.4	231.5	232.1	233.6	235.1	237.6	239.7	241.1
25	180.2	188.8	200.4	211.2	218.1	220.7	221.3	220.5	220.3	221.0	221.9	222.5	223.4	225.1	227.8	230.3	232.9
20	191.3	198.9	206.6	213.3	215.2	212.9	210.2	208.8	208.1	208.6	210.2	212.7	216.7	221.6	225.9	229.6	232:2
15	198.0	204.0	210.8	215.9	215.6	209.7	203.8	200.8	200.8	201.2	203.3	207.5	213.7	220.1	224.5	227.9	230.7
10	207.1	210.4	213.9	218.0	222.4	228.8	235.5	238.3	238.9	239.1	238.6	236.0	230.6	226.8	226.1	227.2	228.8
5	231.1	235.0	241.7	248.9	255.5	262.7	269.3	272.0	272.2	272.3	272.1	270.2	265.6	260.2	255.9	252.5	249.5
0		268.4	274.2	279.9	286.3	292.0	296.9	300.0	300.7	300.8	299.5	296.2	290.1	283.1	281.3	276.2	271.2

ORIGINAL PAGE IS
OF POOR QUALITY

Table B1 (cont.)

JULY ZONAL MEAN TEMPERATURE (K)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
120	366.1	366.7	367.6	368.9	370.5	372.3	374.3	376.4	378.6	380.8	382.9	384.9	386.7	388.3	389.5	390.5	391.0
115	286.5	288.8	291.4	293.4	294.0	293.7	293.3	293.9	296.2	300.2	305.4	310.7	315.1	317.8	318.8	318.5	317.8
110	244.4	242.2	238.3	232.7	226.5	221.3	218.6	219.1	222.7	228.9	237.2	247.0	257.7	268.7	279.2	288.0	294.1
105	220.1	216.4	210.8	204.4	198.5	194.2	192.1	192.5	194.7	198.2	202.9	208.6	215.4	223.4	232.1	240.3	246.4
100	205.3	202.2	197.9	193.4	189.7	187.5	186.7	187.0	187.7	188.1	187.9	187.3	186.9	186.9	187.4	188.4	189.2
95	202.7	200.0	196.4	192.5	189.3	187.3	186.6	187.0	187.3	186.4	183.5	178.6	172.4	165.9	159.9	155.1	152.0
90	211.8	209.2	205.5	201.1	196.7	193.1	190.9	190.2	190.1	189.4	186.8	181.1	172.9	163.2	154.1	146.9	142.3
85	221.4	219.1	216.2	212.2	207.1	202.3	198.8	197.0	196.1	195.4	193.4	188.2	179.3	168.3	158.2	150.9	146.6
80	222.6	220.6	219.3	216.7	211.2	206.3	202.9	201.8	201.7	201.8	201.3	197.5	189.5	179.6	172.3	169.6	169.1
75	224.9	223.4	223.4	220.8	214.8	209.4	206.0	205.1	205.3	205.9	206.3	204.5	200.4	196.1	194.2	195.4	197.2
70	231.7	230.8	231.4	227.4	219.7	214.2	210.7	210.1	210.6	211.2	210.8	210.3	210.9	213.9	217.7	221.3	224.0
65	243.6	242.4	241.1	235.3	228.3	224.1	224.2	224.7	225.8	225.5	224.3	223.1	224.9	230.6	237.3	242.9	246.3
60	258.7	256.1	251.3	243.5	236.6	236.8	239.3	242.7	244.2	244.5	242.0	240.8	242.5	248.3	254.8	260.7	264.6
55	270.8	267.1	259.9	252.2	247.5	251.1	255.2	257.9	258.5	257.2	255.0	254.8	256.9	262.2	268.2	273.6	278.2
50	271.9	269.0	264.0	258.1	258.5	262.1	265.1	265.1	264.4	264.1	263.9	264.7	267.2	271.1	275.4	280.4	284.5
45	261.1	261.0	258.1	254.5	257.0	260.8	262.9	262.0	261.0	260.8	263.1	264.5	267.7	270.9	275.3	278.8	281.1
40	248.2	249.1	246.1	240.9	241.8	248.0	251.5	252.4	252.5	251.5	251.5	254.2	257.6	261.5	265.6	268.7	269.9
35	234.0	233.2	227.5	222.3	226.7	233.6	238.7	240.8	241.5	240.5	240.8	242.0	244.5	248.4	251.7	254.2	254.9
30	209.2	208.3	206.5	210.4	220.3	227.0	228.5	229.1	228.5	228.8	229.1	230.6	232.6	235.7	237.7	240.0	241.2
25	179.2	186.9	197.4	211.2	219.2	221.0	221.2	220.0	219.4	220.0	220.8	222.1	223.7	225.8	228.3	230.8	233.3
20	186.5	194.0	202.8	211.3	215.1	213.6	210.9	209.3	208.6	209.0	210.5	212.6	216.3	221.6	226.3	229.8	232.3
15	192.2	197.8	206.4	214.2	215.5	210.1	204.3	202.1	202.1	202.5	204.2	207.5	212.9	219.8	224.6	228.1	230.9
10	202.5	205.5	210.8	216.6	222.3	229.1	235.4	237.8	238.1	238.6	239.0	238.6	234.8	230.0	227.9	227.9	228.8
5	229.9	233.0	240.4	247.7	254.7	262.3	269.2	271.9	271.8	271.9	272.1	271.8	268.6	263.6	259.7	256.5	253.6
0		267.4	273.9	279.4	286.2	291.3	295.9	299.3	300.1	300.8	299.9	298.0	293.1	285.4	283.6	279.6	274.2

AUGUST ZONAL MEAN TEMPERATURE (K)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
120	374.6	375.0	375.6	376.5	377.6	378.8	380.2	381.7	383.2	384.7	386.2	387.6	388.8	389.9	390.8	391.4	391.8
115	294.9	297.0	299.5	301.1	301.3	300.3	299.1	298.8	300.1	303.2	307.6	312.3	316.1	318.3	318.8	318.0	317.0
110	249.5	247.6	243.9	238.4	232.0	226.2	222.6	221.8	223.9	228.8	235.9	244.8	254.6	264.5	273.4	280.4	284.8
105	219.0	215.9	211.1	205.4	200.0	195.9	193.7	193.5	194.9	197.6	201.4	206.3	212.4	219.3	226.6	233.0	237.5
100	198.5	196.3	193.3	190.2	187.9	186.7	186.6	187.1	187.7	187.9	187.4	186.7	186.1	186.0	186.4	187.0	187.6
95	191.8	190.4	188.7	187.1	186.1	185.8	186.2	186.9	187.3	186.5	183.9	179.6	174.1	168.4	163.2	159.2	156.6
90	200.2	199.0	197.4	195.3	193.2	191.5	190.6	190.3	190.3	189.8	187.7	183.3	176.5	168.5	160.8	154.7	150.9
85	211.6	210.7	209.5	206.9	203.8	201.0	198.8	197.2	196.7	196.4	195.1	191.6	184.7	175.9	167.2	160.9	157.7
80	218.1	217.8	217.9	215.1	211.2	208.0	205.4	202.9	203.0	203.8	204.1	202.3	196.1	188.1	181.1	178.2	178.8
75	222.1	221.6	222.6	220.3	216.4	212.9	210.2	207.6	208.0	209.4	210.6	209.9	206.3	202.0	199.3	199.4	202.0
70	227.4	225.9	226.6	224.4	220.6	217.3	215.0	213.4	214.8	216.5	217.1	216.4	215.6	216.0	218.8	221.1	224.3
65	239.5	235.3	231.7	229.2	225.6	223.7	224.9	226.4	228.2	229.2	229.5	228.0	226.7	229.0	235.0	240.6	244.8
60	255.4	249.2	241.1	235.3	231.8	234.5	238.2	242.5	244.2	244.7	243.8	241.4	240.7	243.2	248.9	254.8	258.8
55	270.7	264.1	254.3	245.9	244.2	250.1	255.1	259.0	259.6	258.1	254.1	252.6	253.1	256.5	260.9	265.1	268.7
50	275.2	270.5	263.4	255.9	256.3	261.3	266.1	267.4	267.1	266.0	263.8	263.1	263.8	267.1	269.2	272.4	275.5
45	269.1	267.5	263.1	256.8	257.0	261.1	265.2	265.6	265.0	263.7	263.6	262.9	264.9	266.9	269.5	271.6	273.0
40	258.9	259.7	255.8	247.8	245.7	249.0	253.3	255.0	254.9	253.5	251.9	252.5	255.5	257.2	259.5	261.6	262.2
35	244.9	245.7	240.8	233.5	233.0	236.3	240.0	241.3	241.4	240.6	240.4	240.2	241.9	245.1	247.3	248.6	248.7
30	219.5	221.0	218.9	220.0	224.8	228.1	228.3	228.6	227.9	228.3	228.5	229.6	230.8	233.5	234.7	235.8	236.4
25	183.2	192.8	204.3	215.4	221.0	221.7	220.7	219.2	218.2	218.7	219.5	221.1	222.7	224.5	226.3	227.9	229.4
20	187.6	194.5	204.3	213.4	217.0	214.6	211.3	209.9	209.4	209.3	210.4	212.6	216.1	221.0	225.0	227.7	229.8
15	191.4	196.7	205.8	214.4	215.9	210.5	204.4	202.0	202.0	202.4	204.1	207.2	212.4	219.2	223.9	226.9	229.3
10	201.0	204.9	210.6	217.2	223.0	229.3	235.3	237.7	237.9	238.5	239.1	238.6	234.8	229.6	227.0	226.4	227.1
5	229.3	234.4	241.0	247.9	254.5	262.1	269.4	271.8	271.6	271.9	272.4	271.9	268.8	263.2	258.5	254.8	251.5
0		270.0	273.0	278.2	285.3	291.0	295.8	299.0	299.9	300.9	300.2	298.9	294.8	287.0	283.8	279.3	273.4

SEPTEMBER ZONAL MEAN TEMPERATURE (K)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
120	382.8	383.0	383.1	383.4	383.7	384.1	384.5	384.9	385.3	385.8	386.2	386.6	387.0	387.3	387.5	387.7	387.8
115	304.2	306.1	308.1	309.0	308.5	306.5	304.0	302.2	302.0	303.6	306.6	310.1	312.9	314.2	313.8	312.4	310.8
110	259.1	257.0	253.1	247.2	240.2	233.3	227.9	224.8	224.5	226.9	231.8	238.8	246.9	255.1	262.0	266.8	269.5
105	221.0	218.2	213.8	206.5	203.3	199.1	196.3	195.0	195.0	196.2	198.6	202.2	207.1	212.7	218.4	223.2	226.3
100	190.9	189.7	188.2	186.8	186.0	186.0	186.6	187.3	187.7	187.5	186.8	186.0	185.5	185.6	186.2	187.1	187.8
95	176.5	176.9	177.8	179.2	181.2	183.4	185.3	186.8	187.3	186.6	184.7	181.5	177.6	173.7	170.3	167.8	166.2
90	181.6	182.6	184.2	185.8	187.4	188.7	189.7	190.2	190.5	190.1	188.4	186.3	182.4	177.7	173.0	169.3	166.8
85	194.2	195.4	197.0	197.6	198.0	197.9	197.7	197.4	197.4	197.3	196.5	195.2	192.2	187.8	183.3	180.1	177.4
80	209.8	210.8	212.2	210.4	208.9	207.3	205.8	204.5	204.7	205.1	205.0	205.3	203.5	200.2	197.7	197.6	196.0
75	219.1	219.9	222.1	220.4	217.5	214.1	211.2	208.6	208.9	210.1	211.2	212.1	210.9	209.3	209.1	210.2	209.9
70	226.4	226.2	228.1	227.0	224.1	220.1	217.1	213.9	214.4	216.1	218.3	218.6	217.0	216.8	219.4	220.6	221.5
65	236.4	233.4	232.6	231.9	229.6	227.6	226.6	226.5	226.9	228.5	230.1	229.8	226.9	226.2	229.6	232.8	236.3
60	252.6	245.8	239.8	237.1	236.2	237.3	238.5	241.4	242.4	242.3	242.8	240.2	238.6	238.8	241.1	243.6	247.2
55	270.8	261.2	250.9	246.9	248.2	252.4	255.5	258.4	258.9	257.9	254.5	253.3	252.1	251.6	252.0	253.7	256.0
50	278.0	269.4	260.7	256.7	259.0	263.2	266.7	268.1	268.4	267.4	266.0	265.3	264.4	263.5	262.5	262.2	261.7
45	277.2	270.9	263.5	258.3	259.1	263.2	267.1	268.2	268.2	267.1	265.6	263.5	263.2	262.8	260.9	258.3	256.4
40	273.5	268.3	258.6	249.4	248.0	251.6	256.6	258.4	258.4	257.2	255.2	252.9	253.2	252.3	249.6	246.0	244.3
35	262.7	257.3	246.1	236.6	235.3	238.8	242.9	244.5	244.0	243.1	241.7	240.4	239.6	239.7	238.5	234.8	232.9
30	237.4	235.0	229.0	225.1	225.7	228.3	229.5	229.7	229.6	229.7	229.7	228.7	228.7	228.4	228.0	226.7	225.5
25	202.4	208.1	214.1	220.8	222.9	221.8	220.2	219.2	218.2	218.3	219.1	220.1	221.0	221.6	222.0	221.8	221.4
20	196.6	200.5	208.3	216.7	218.3	214.6	210.8	209.0	208.7	208.8	210.2	212.8	216.0	219.6	222.0	223.0	223.3
15	193.8	198.7	207.2	215.8	216.7	210.6	204.4	201.7	201.6	201.8	203.2	206.3	212.0	218.2	222.2	224.1	225.2
10	201.6	205.2	211.3	218.2	223.7	229.8	235.5	238.1	238.5	238.8	238.6	236.6	231.4	226.4	224.1	223.6	223.8
5	229.5	234.2	241.2	248.3	255.6	263.4	269.6	271.9	272.0	272.3	272.2	270.8	266.1	259.3	253.8	249.5	246.5
0		271.3	274.1	278.8	285.3	291.0	295.9	299.1	299.8	300.8	300.3	296.5	293.5	286.1	281.3	275.5	268.6

Table B1 (cont.)

OCTOBER ZONAL MEAN TEMPERATURE (K)

LATITUDE

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
120	387.1	387.0	386.6	386.2	385.7	385.1	384.4	383.7	382.9	382.2	381.4	380.8	380.1	379.6	379.2	378.9	378.7
115	310.7	312.1	313.5	313.7	312.2	309.1	305.3	302.0	300.0	299.8	301.2	303.3	304.9	305.3	304.1	302.0	300.0
110	271.8	268.9	263.7	256.5	248.2	239.7	232.4	227.0	223.9	223.5	225.8	230.6	237.1	243.8	249.3	253.0	254.9
105	228.0	224.7	219.8	213.9	208.1	203.0	199.2	196.5	194.9	194.4	195.4	197.9	202.0	207.1	212.3	216.6	219.4
100	187.0	186.4	185.8	185.4	185.4	186.1	186.9	187.6	187.7	187.2	186.5	186.1	186.4	187.5	189.2	191.1	192.5
95	163.1	165.0	168.0	172.0	176.5	180.9	184.4	186.6	187.3	186.8	185.6	184.0	182.5	181.4	180.7	180.5	180.5
90	162.4	165.5	170.1	175.4	180.9	185.4	188.5	190.1	190.8	190.6	190.0	189.5	189.0	188.4	187.8	187.6	187.4
85	173.5	176.8	181.5	185.9	190.7	194.2	196.1	197.4	198.6	198.8	198.4	198.8	199.4	200.1	200.3	201.3	201.7
80	196.4	198.6	201.3	201.7	203.8	204.8	204.9	205.8	207.9	208.0	206.9	207.6	209.2	211.3	213.0	216.9	219.0
75	214.9	216.3	217.8	216.3	215.1	213.2	210.5	208.9	210.0	210.8	211.4	213.0	214.6	217.0	220.5	224.0	226.5
70	228.2	228.8	229.1	227.6	224.7	221.4	217.9	212.9	211.8	212.9	216.0	218.2	219.0	221.0	225.6	228.0	230.5
65	236.5	236.4	236.6	235.9	233.9	231.7	228.8	226.0	224.7	225.3	228.1	229.7	227.7	227.4	231.8	236.1	240.4
60	251.3	248.3	245.2	243.3	242.0	241.1	240.0	241.6	241.9	241.5	241.2	239.7	239.0	238.3	240.0	244.0	249.2
55	267.2	261.7	256.5	254.7	254.6	255.1	255.4	257.5	258.6	258.1	256.3	254.4	252.4	249.7	247.8	249.7	253.3
50	279.3	273.1	267.7	264.9	266.3	267.5	268.1	268.1	268.6	268.0	266.5	266.0	263.7	259.0	256.5	255.8	256.3
45	284.0	277.1	269.8	266.2	266.1	267.5	268.3	268.5	268.8	268.1	266.4	263.9	261.3	257.1	252.5	249.2	247.8
40	283.6	274.1	261.6	255.0	254.6	255.7	258.3	260.0	260.3	259.3	256.4	252.3	249.1	245.4	239.2	232.6	228.9
35	269.0	260.0	247.5	240.0	239.2	241.7	245.0	247.1	247.2	245.9	242.9	239.3	235.8	231.8	227.0	219.2	212.9
30	242.8	238.5	232.0	226.7	225.8	228.9	231.1	230.8	231.4	231.5	230.7	228.0	225.1	222.1	218.5	215.6	211.4
25	216.6	220.2	225.8	224.6	222.9	221.5	220.3	219.6	218.9	219.2	219.9	220.2	219.5	218.2	216.4	213.7	210.6
20	209.0	212.0	216.4	219.6	218.4	213.9	210.1	208.3	208.1	208.1	209.4	211.7	214.5	217.2	218.4	217.1	215.1
15	203.1	207.6	214.0	218.5	216.8	210.2	203.9	200.5	200.1	200.4	202.1	206.3	212.0	216.9	220.0	220.6	220.2
10	205.6	209.1	214.4	220.2	224.8	230.2	235.8	238.4	238.7	238.7	237.5	233.4	227.3	223.2	221.4	220.6	220.5
5	233.1	236.9	242.9	249.8	257.4	264.4	269.4	271.9	272.1	272.4	271.8	268.2	262.0	254.8	248.4	243.3	239.0
0		273.3	276.4	280.5	286.4	292.1	296.5	299.3	300.1	300.9	300.1	297.0	291.1	283.5	277.0	268.3	261.6

NOVEMBER ZONAL MEAN TEMPERATURE (K)

LATITUDE

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
120	388.2	387.7	387.0	386.0	384.7	383.3	381.7	380.0	378.3	376.5	374.9	373.3	371.9	370.6	369.6	368.9	368.4
115	314.0	314.9	315.6	315.0	312.7	308.8	304.0	299.5	296.1	294.4	294.5	295.3	296.0	295.7	293.9	291.4	289.1
110	284.5	279.9	272.7	263.7	253.8	244.0	235.2	227.9	222.7	220.1	220.4	223.6	229.0	235.1	240.4	244.1	245.9
105	238.3	233.5	226.9	219.5	212.5	206.5	201.5	197.6	194.6	193.0	193.0	195.0	199.1	204.5	210.3	215.2	218.5
100	187.3	186.7	186.1	185.8	186.0	186.7	187.5	187.9	187.7	187.1	186.6	186.9	188.4	191.1	194.6	198.0	200.5
95	154.8	157.6	161.9	167.4	173.5	179.2	183.8	186.4	187.3	186.9	186.3	186.3	187.1	188.9	191.2	193.6	195.3
90	148.3	152.6	159.2	167.1	175.4	182.5	187.4	189.9	190.7	190.8	190.9	192.2	194.5	197.4	200.3	202.8	204.6
85	155.5	160.3	167.1	175.1	183.5	190.3	194.6	197.1	198.5	199.2	200.0	202.3	205.8	209.5	212.7	215.4	217.2
80	180.0	182.9	186.6	190.6	196.0	200.7	203.7	206.0	208.0	208.4	208.1	210.3	214.4	218.7	221.8	224.5	226.4
75	205.4	206.5	207.4	207.4	208.3	209.1	209.6	209.4	209.7	210.1	211.2	214.3	218.8	223.3	227.1	227.8	228.6
70	226.3	225.6	223.9	221.9	220.3	218.5	216.6	213.4	210.9	211.0	213.9	218.3	222.9	227.1	231.6	230.4	230.0
65	240.6	239.1	236.9	235.3	233.3	231.0	229.7	228.2	226.1	225.4	227.2	229.1	229.7	232.5	237.1	236.8	236.5
60	259.3	255.9	251.4	248.7	245.6	244.4	243.2	245.0	244.8	244.2	242.2	240.2	238.3	239.8	243.1	246.0	247.1
55	273.7	270.2	266.2	263.5	261.5	258.8	256.8	257.6	258.6	258.3	256.0	253.1	250.3	249.8	250.5	254.3	256.2
50	283.7	280.3	276.7	274.2	273.0	271.9	269.8	267.0	266.5	266.4	265.3	263.3	259.5	256.9	256.6	260.2	261.7
45	284.4	281.4	278.4	276.4	275.1	272.6	269.8	267.6	266.7	266.6	266.9	263.6	259.2	252.5	249.8	251.4	253.2
40	277.7	274.2	269.5	267.0	265.3	262.2	261.0	260.3	260.0	259.6	257.8	252.7	245.6	239.0	234.9	232.4	231.4
35	263.3	259.9	255.1	250.7	247.9	246.6	246.9	247.8	247.9	246.8	243.9	238.1	231.5	223.9	219.4	215.0	211.2
30	246.6	243.6	238.6	232.5	229.4	229.9	230.5	229.9	230.6	230.8	228.9	225.8	220.4	215.1	209.9	205.4	201.0
25	235.5	234.6	230.4	226.9	222.9	221.0	219.9	219.3	219.0	219.3	219.5	218.6	216.9	214.5	210.6	206.1	201.9
20	233.8	231.8	227.9	222.0	216.6	211.8	208.6	207.2	206.7	206.8	208.5	210.7	213.8	215.6	215.3	212.2	208.7
15	226.1	225.4	223.4	220.4	215.2	208.6	202.8	199.3	198.9	199.3	201.6	206.6	212.4	216.5	217.9	216.6	214.5
10	214.8	216.5	219.0	222.5	226.2	231.1	236.3	238.5	238.9	238.6	236.0	230.4	223.9	220.5	219.3	218.1	216.9
5	235.6	238.7	244.5	252.1	259.8	266.1	270.5	271.9	272.1	272.5	270.9	265.2	257.5	249.8	243.3	238.7	236.0
0		269.9	274.4	280.2	287.3	292.9	297.2	299.7	300.2	300.6	299.3	295.0	288.3	281.0	271.8	261.2	255.7

DECEMBER ZONAL MEAN TEMPERATURE (K)

LATITUDE

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
120	388.9	388.3	387.4	386.0	384.4	382.5	380.5	378.3	376.0	373.7	371.5	369.4	367.5	365.9	364.6	363.6	363.0
115	316.1	316.8	317.0	316.0	313.2	308.8	303.4	298.2	294.1	291.7	290.9	291.2	291.4	290.7	288.6	285.9	283.5
110	293.5	287.4	278.4	268.0	257.0	246.3	236.6	228.4	222.0	218.3	217.6	220.2	225.2	231.4	236.9	240.8	242.9
105	246.6	240.3	232.0	223.3	215.3	208.5	202.8	198.1	194.5	192.3	191.9	193.9	198.2	204.2	210.7	216.3	220.1
100	189.1	188.2	187.3	186.7	186.8	187.3	187.9	188.1	187.7	187.0	186.8	187.6	190.0	193.9	198.6	203.1	206.3
95	151.3	154.5	159.4	165.5	172.2	178.5	183.4	186.4	187.3	187.0	186.7	187.4	189.7	193.2	197.4	201.3	204.1
90	141.5	146.4	153.8	163.0	172.6	181.0	186.8	189.6	190.5	190.6	191.3	193.6	197.5	202.1	206.8	210.9	213.8
85	146.3	151.4	159.1	169.0	179.3	188.1	193.6	196.3	197.7	198.5	200.1	203.8	209.0	214.1	218.4	222.0	224.7
80	170.7	173.2	177.0	183.1	190.8	198.0	202.4	204.4	206.1	206.2	206.3	209.9	215.7	220.7	223.8	226.7	229.3
75	199.4	199.7	200.1	200.9	203.1	206.0	208.4	209.0	209.5	209.2	209.4	212.9	219.0	224.0	227.7	229.0	230.6
70	225.0	223.9	221.8	218.6	216.0	214.4	214.3	214.6	214.0	213.3	213.5	217.3	221.7	227.7	232.9	233.3	233.6
65	245.7	243.4	240.2	236.5	232.3	229.1	229.4	231.8	231.8	230.2	229.5	228.5	227.3	231.3	238.5	239.6	239.5
60	266.3	262.5	257.7	253.5	248.8	246.7	246.8	250.3	250.6	249.2	244.9	239.7	233.9	237.0	244.2	248.6	249.4
55	281.2	276.8	271.8	267.8	263.7	260.8	259.1	260.8	261.5	260.6	257.0	251.7	246.2	245.6	250.2	256.4	258.5
50	288.8	284.9	280.6	276.6	273.8	271.0	268.9	266.4	265.7	265.8	265.7	262.9	258.2	253.5	254.2	258.6	260.1
45	287.2	284.5	281.6	278.3	276.3	272.5	268.7	264.9	263.8	264.1	266.8	264.7	259.6	249.4	246.6	249.1	250.5
40	277.8	275.7	272.8	269.9	266.7	263.6	260.0	257.3	256.9	257.2	258.6	255.3	247.1	236.9	233.0	233.6	235.6
35	263.4	261.8	258.4	254.7	251.6	248.9	246.1	244.8	245.3	245.3	244.4	240.1	233.7	223.8	219.3	217.6	219.5
30	245.0	244.9	242.7	238.0	234.7	231.7	230.2	228.6	228.6	229.2	228.3	227.5	223.1	217.1	211.3	203.6	201.0
25	236.2	235.4	232.8	228.4	224.7	222.2	220.4	219.5	218.7	218.8	219.2	218.7	217.4	214.5	209.0	201.1	193.8
20	236.1	234.0	229.3	222.3	215.7	211.0	208.0	206.5	205.6	206.0	207.8	210.5	214.2	215.9	214.1	209.2	204.3
15	231.9	230.1	226.8	220.9	213.5	206.9	202.2	199.4	198.9	199.2	201.6	207.2	213.5	217.0	216.7	213.6	210.4
10	223.1	222.6	222.7	224.0	227.6	232.9	237.3	238.8	238.9	238.3	235.3	228.9	222.2	219.3	217.9	216.1	214.8
5	240.9	243.0	247.0	253.9	261.7	267.7	271.2	272.1	272.3	272.4	270.1	263.1	254.1	246.3	240.9	236.7	233.4
0		271.5	275.0	281.3	288.6	294.6	298.2	300.2	300.5	300.3	298.1	293.0	286.0	279.1	268.1	257.0	251.6

Table B2

JANUARY ZONAL MEAN PRESSURE (mb)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N	EXPONENT
									LATITUDE									
120	2.714	2.702	2.682	2.657	2.623	2.583	2.540	2.497	2.456	2.418	2.384	2.353	2.325	2.299	2.277	2.260	2.250	E-5
115	4.264	4.238	4.201	4.155	4.104	4.052	3.998	3.945	3.889	3.835	3.781	3.731	3.689	3.656	3.634	3.622	3.616	E-5
110	7.174	7.158	7.142	7.136	7.144	7.167	7.195	7.213	7.201	7.146	7.039	6.904	6.760	6.639	6.562	6.526	6.518	E-5
105	1.294	1.311	1.338	1.374	1.415	1.460	1.505	1.542	1.567	1.570	1.547	1.500	1.439	1.379	1.333	1.303	1.288	E-4
100	2.727	2.796	2.901	3.030	3.171	3.315	3.452	3.572	3.658	3.686	3.632	3.495	3.301	3.097	2.925	2.804	2.735	E-4
95	7.250	7.368	7.534	7.730	7.928	8.133	8.338	8.552	8.733	8.814	8.694	8.341	7.803	7.212	6.694	6.313	6.089	E-4
90	2.307	2.264	2.205	2.142	2.087	2.051	2.043	2.064	2.101	2.122	2.093	1.995	1.843	1.675	1.526	1.418	1.353	E-3
85	7.222	6.796	6.263	5.727	5.286	5.004	4.886	4.891	4.953	4.976	4.868	4.597	4.198	3.777	3.435	3.169	3.008	E-3
80	1.590	1.504	1.408	1.290	1.186	1.129	1.119	1.123	1.130	1.118	1.083	1.033	0.960	0.890	0.861	0.815	0.781	E-2
75	3.903	3.680	3.421	3.069	2.737	2.537	2.486	2.503	2.514	2.480	2.391	2.253	2.060	1.880	1.806	1.714	1.639	E-2
70	8.541	8.080	7.545	6.786	6.067	5.592	5.440	5.473	5.484	5.408	5.206	4.854	4.392	3.956	3.769	3.591	3.417	E-2
65	1.730	1.647	1.552	1.417	1.288	1.195	1.152	1.148	1.146	1.136	1.099	1.025	0.928	0.831	0.784	0.745	0.703	E-1
60	3.321	3.189	3.032	2.814	2.597	2.426	2.319	2.282	2.273	2.267	2.219	2.101	1.926	1.733	1.616	1.513	1.410	E-1
55	6.130	5.940	5.710	5.372	5.019	4.713	4.483	4.359	4.333	4.346	4.320	4.163	3.893	3.532	3.262	2.993	2.749	E-1
50	1.107	1.081	1.049	0.998	0.942	0.890	0.847	0.818	0.812	0.816	0.817	0.797	0.757	0.695	0.640	0.582	0.531	E 0
45	1.989	1.956	1.913	1.835	1.747	1.658	1.584	1.537	1.525	1.531	1.531	1.503	1.443	1.345	1.244	1.130	1.033	E 0
40	3.624	3.579	3.524	3.410	3.266	3.127	3.006	2.935	2.912	2.922	2.914	2.872	2.786	2.636	2.447	2.224	2.037	E 0
35	6.791	6.737	6.677	6.509	6.288	6.081	5.892	5.776	5.724	5.747	5.735	5.690	5.572	5.313	4.932	4.473	4.099	E 0
30	1.326	1.318	1.311	1.288	1.260	1.231	1.203	1.184	1.174	1.178	1.177	1.173	1.154	1.106	1.030	0.937	0.861	E 1
25	2.700	2.690	2.675	2.654	2.628	2.595	2.560	2.528	2.512	2.516	2.512	2.497	2.462	2.372	2.235	2.071	1.935	E 1
20	5.563	5.571	5.591	5.633	5.669	5.678	5.652	5.613	5.593	5.596	5.568	5.499	5.382	5.187	4.944	4.686	4.487	E 1

FEBRUARY ZONAL MEAN PRESSURE (mb)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N	EXPONENT
									LATITUDE									
120	2.559	2.552	2.539	2.523	2.501	2.475	2.447	2.419	2.392	2.368	2.347	2.328	2.312	2.296	2.281	2.270	2.263	E-5
115	4.005	3.986	3.960	3.928	3.895	3.861	3.828	3.793	3.759	3.723	3.689	3.657	3.631	3.611	3.598	3.593	3.592	E-5
110	6.777	6.761	6.750	6.753	6.779	6.822	6.869	6.903	6.906	6.865	6.775	6.659	6.540	6.445	6.388	6.367	6.366	E-5
105	1.249	1.261	1.283	1.314	1.354	1.399	1.441	1.476	1.496	1.495	1.471	1.427	1.373	1.323	1.285	1.261	1.250	E-4
100	2.676	2.727	2.811	2.923	3.053	3.189	3.317	3.421	3.487	3.498	3.440	3.317	3.153	2.985	2.846	2.749	2.696	E-4
95	7.007	7.090	7.224	7.400	7.598	7.802	8.001	8.184	8.321	8.359	8.248	7.963	7.551	7.105	6.710	6.420	6.250	E-4
90	2.100	2.072	2.033	1.995	1.965	1.949	1.953	1.973	2.000	2.012	1.989	1.919	1.814	1.696	1.591	1.512	1.466	E-3
85	6.057	5.793	5.472	5.161	4.908	4.752	4.697	4.712	4.760	4.781	4.702	4.501	4.209	3.904	3.673	3.496	3.391	E-3
80	1.320	1.262	1.213	1.173	1.138	1.124	1.130	1.134	1.141	1.144	1.117	1.057	0.974	0.904	0.895	0.881	0.875	E-2
75	3.177	3.037	2.906	2.740	2.585	2.513	2.521	2.534	2.544	2.538	2.452	2.306	2.100	1.917	1.877	1.856	1.844	E-2
70	7.000	6.715	6.429	6.055	5.691	5.503	5.506	5.536	5.556	5.534	5.306	4.955	4.468	4.028	3.899	3.861	3.822	E-2
65	1.432	1.387	1.341	1.279	1.212	1.169	1.160	1.164	1.170	1.169	1.123	1.048	0.940	0.840	0.801	0.787	0.770	E-1
60	2.791	2.729	2.670	2.584	2.473	2.377	2.336	2.338	2.351	2.358	2.294	2.157	1.947	1.733	1.626	1.564	1.500	E-1
55	5.255	5.185	5.121	5.014	4.837	4.652	4.537	4.503	4.517	4.546	4.483	4.268	3.921	3.500	3.236	3.035	2.844	E-1
50	0.968	0.961	0.956	0.942	0.916	0.883	0.860	0.844	0.843	0.850	0.844	0.814	0.760	0.686	0.632	0.585	0.540	E 0
45	1.773	1.769	1.766	1.748	1.707	1.651	1.606	1.572	1.565	1.577	1.571	1.529	1.443	1.322	1.232	1.145	1.056	E 0
40	3.299	3.302	3.306	3.284	3.214	3.126	3.036	2.969	2.951	2.967	2.961	2.903	2.772	2.589	2.444	2.296	2.131	E 0
35	6.313	6.342	6.370	6.345	6.238	6.096	5.928	5.793	5.744	5.782	5.770	5.704	5.516	5.247	4.986	4.703	4.392	E 0
30	1.255	1.261	1.270	1.271	1.259	1.236	1.206	1.182	1.173	1.179	1.177	1.170	1.147	1.107	1.051	0.987	0.926	E 1
25	2.583	2.603	2.628	2.645	2.641	2.607	2.560	2.518	2.502	2.515	2.510	2.494	2.462	2.393	2.282	2.147	2.028	E 1
20	5.366	5.434	5.535	5.644	5.715	5.704	5.652	5.585	5.574	5.596	5.563	5.499	5.388	5.218	5.008	4.774	4.577	E 1

MARCH ZONAL MEAN PRESSURE (mb)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N	EXPONENT
									LATITUDE									
120	2.425	2.423	2.421	2.417	2.411	2.403	2.392	2.383	2.376	2.371	2.369	2.367	2.366	2.363	2.359	2.356	2.354	E-5
115	3.800	3.790	3.776	3.764	3.752	3.742	3.734	3.727	3.719	3.711	3.701	3.694	3.689	3.688	3.691	3.697	3.702	E-5
110	6.535	6.521	6.518	6.538	6.588	6.659	6.733	6.788	6.806	6.779	6.710	6.620	6.532	6.465	6.433	6.428	6.436	E-5
105	1.244	1.252	1.270	1.299	1.340	1.385	1.428	1.459	1.471	1.463	1.435	1.393	1.345	1.302	1.270	1.252	1.243	E-4
100	2.709	2.748	2.821	2.925	3.054	3.189	3.306	3.390	3.425	3.407	3.335	3.219	3.079	2.941	2.829	2.754	2.713	E-4
95	6.848	6.931	7.074	7.279	7.519	7.758	7.959	8.102	8.167	8.143	8.020	7.794	7.510	7.211	6.949	6.764	6.657	E-4
90	1.868	1.865	1.867	1.875	1.891	1.911	1.932	1.951	1.962	1.960	1.941	1.903	1.854	1.803	1.759	1.728	1.710	E-3
85	4.742	4.694	4.648	4.607	4.591	4.604	4.638	4.675	4.697	4.685	4.639	4.557	4.437	4.330	4.227	4.146	4.094	E-3
80	0.953	0.968	1.006	1.040	1.074	1.107	1.135	1.152	1.159	1.145	1.131	1.107	1.051	1.007	0.943	0.880	0.832	E-2
75	2.132	2.167	2.259	2.326	2.391	2.463	2.532	2.562	2.569	2.535	2.484	2.408	2.288	2.170	2.019	1.900	1.813	E-2
70	4.604	4.692	4.903	5.078	5.227	5.359	5.506	5.586	5.606	5.539	5.365	5.141	4.864	4.565	4.241	4.034	3.888	E-2
65	0.954	0.980	1.031	1.080	1.112	1.129	1.155	1.177	1.184	1.171	1.129	1.075	1.015	0.947	0.881	0.844	0.819	E-1
60	1.908	1.979	2.099	2.219	2.287	2.297	2.331	2.378	2.393	2.377	2.305	2.198	2.080	1.932	1.804	1.727	1.677	E-1
55	3.722	3.889	4.146	4.390	4.514	4.517	4.555	4.610	4.629	4.612	4.519	4.339	4.130	3.843	3.594	3.414	3.301	E-1
50	0.711	0.744	0.793	0.836	0.858	0.857	0.863	0.866	0.867	0.865	0.854	0.826	0.790	0.739	0.693	0.655	0.630	E 0
45	1.351	1.412	1.497	1.572	1.609	1.607	1.611	1.607	1.605	1.604	1.588	1.548	1.485	1.400	1.319	1.254	1.210	E 0
40	2.629	2.736	2.883	2.999	3.061	3.056	3.046	3.023	3.008	3.011	2.991	2.935	2.831	2.688	2.559	2.462	2.396	E 0
35	5.300	5.500	5.741	5.922	6.024	6.002	5.952	5.878	5.834	5.840	5.828	5.756	5.583	5.361	5.174	5.024	4.912	E 0
30	1.107	1.142	1.185	1.217	1.234	1.226	1.212	1.196	1.187	1.188	1.185	1.178	1.155	1.124	1.092	1.060	1.032	E 1
25	2.373	2.441	2.517	2.577	2.609	2.594	2.565	2.535	2.520	2.522	2.520	2.506	2.480	2.432	2.368	2.290	2.219	E 1
20	5.084	5.236	5.393	5.546	5.658	5.669	5.647	5.599	5.579	5.593	5.568	5.513	5.420	5.294	5.150	4.993	4.851	E 1

ORIGINAL PAGE IS
OF POOR QUALITY

Table B2 (cont.)

APRIL ZONAL MEAN PRESSURE (mb)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N	EXPONENT
120	2.291	2.296	2.303	2.312	2.320	2.329	2.338	2.349	2.361	2.376	2.393	2.410	2.427	2.439	2.448	2.454	2.458	E-5
115	3.625	3.623	3.623	3.626	3.636	3.651	3.669	3.689	3.709	3.728	3.747	3.766	3.785	3.805	3.826	3.845	3.858	E-5
110	6.379	6.373	6.383	6.424	6.501	6.601	6.702	6.777	6.811	6.800	6.754	6.693	6.635	6.598	6.586	6.595	6.610	E-5
105	1.246	1.255	1.275	1.308	1.353	1.402	1.445	1.470	1.475	1.459	1.427	1.385	1.341	1.302	1.273	1.254	1.246	E-4
100	2.715	2.758	2.840	2.959	3.105	3.251	3.368	3.431	3.436	3.387	3.297	3.178	3.047	2.922	2.819	2.746	2.705	E-4
95	6.501	6.629	6.852	7.162	7.516	7.846	8.084	8.199	8.193	8.101	7.944	7.756	7.545	7.340	7.167	7.043	6.971	E-4
90	1.601	1.631	1.683	1.754	1.832	1.904	1.954	1.973	1.969	1.952	1.933	1.923	1.922	1.932	1.949	1.969	1.986	E-3
85	3.724	3.790	3.916	4.097	4.321	4.508	4.633	4.691	4.686	4.649	4.642	4.679	4.762	4.887	5.035	5.172	5.281	E-3
80	0.798	0.814	0.853	0.915	1.007	1.067	1.097	1.119	1.120	1.109	1.122	1.141	1.148	1.139	1.113	1.072	1.048	E-2
75	1.655	1.704	1.816	1.976	2.201	2.357	2.440	2.473	2.474	2.462	2.484	2.516	2.544	2.532	2.467	2.393	2.349	E-2
70	3.417	3.539	3.807	4.216	4.749	5.118	5.349	5.451	5.470	5.435	5.397	5.411	5.446	5.384	5.227	5.093	5.012	E-2
65	0.694	0.724	0.785	0.886	1.002	1.078	1.135	1.167	1.173	1.160	1.136	1.128	1.130	1.113	1.079	1.054	1.040	E-1
60	1.373	1.450	1.592	1.818	2.053	2.194	2.310	2.382	2.392	2.367	2.315	2.290	2.282	2.241	2.173	2.127	2.107	E-1
55	2.673	2.854	3.165	3.621	4.064	4.324	4.519	4.640	4.654	4.619	4.555	4.501	4.465	4.372	4.247	4.149	4.109	E-1
50	0.515	0.553	0.619	0.703	0.778	0.823	0.855	0.874	0.875	0.871	0.864	0.854	0.843	0.825	0.802	0.784	0.776	E 0
45	0.993	1.069	1.198	1.349	1.475	1.548	1.601	1.627	1.628	1.621	1.611	1.591	1.568	1.535	1.497	1.469	1.460	E 0
40	1.979	2.133	2.381	2.646	2.857	2.967	3.039	3.064	3.058	3.050	3.039	3.006	2.953	2.894	2.845	2.820	2.823	E 0
35	4.157	4.489	4.961	5.404	5.741	5.895	5.964	5.955	5.922	5.910	5.922	5.866	5.747	5.653	5.622	5.642	5.695	E 0
30	0.916	0.987	1.076	1.149	1.197	1.215	1.217	1.207	1.198	1.198	1.201	1.194	1.176	1.163	1.165	1.180	1.197	E 1
25	2.094	2.222	2.368	2.483	2.560	2.577	2.570	2.547	2.533	2.537	2.537	2.530	2.507	2.491	2.492	2.515	2.540	E 1
20	4.740	4.956	5.176	5.393	5.563	5.633	5.647	5.610	5.596	5.605	5.579	5.546	5.480	5.404	5.371	5.374	5.388	E 1

MAY ZONAL MEAN PRESSURE (mb)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N	EXPONENT
120	2.145	2.153	2.167	2.185	2.204	2.226	2.249	2.274	2.303	2.334	2.368	2.400	2.430	2.457	2.477	2.492	2.500	E-5
115	3.438	3.442	3.450	3.466	3.491	3.524	3.561	3.603	3.645	3.687	3.728	3.768	3.809	3.848	3.884	3.914	3.936	E-5
110	6.173	6.176	6.201	6.263	6.365	6.488	6.608	6.698	6.745	6.749	6.725	6.690	6.660	6.645	6.648	6.663	6.680	E-5
105	1.221	1.233	1.257	1.297	1.348	1.402	1.445	1.468	1.466	1.446	1.412	1.370	1.329	1.292	1.261	1.238	1.226	E-4
100	2.616	2.673	2.775	2.922	3.096	3.265	3.387	3.439	3.421	3.351	3.247	3.124	2.995	2.870	2.760	2.673	2.618	E-4
95	5.941	6.126	6.443	6.876	7.368	7.811	8.111	8.220	8.167	8.020	7.838	7.661	7.479	7.306	7.146	7.017	6.932	E-4
90	1.354	1.408	1.498	1.619	1.754	1.876	1.954	1.979	1.963	1.935	1.917	1.923	1.952	1.999	2.053	2.106	2.144	E-3
85	2.988	3.144	3.382	3.678	4.034	4.358	4.563	4.637	4.623	4.592	4.611	4.715	4.917	5.242	5.646	6.056	6.368	E-3
80	0.674	0.734	0.797	0.846	0.925	0.993	1.023	1.034	1.046	1.066	1.095	1.117	1.126	1.167	1.222	1.274	1.316	E-2
75	1.377	1.518	1.665	1.792	2.001	2.200	2.300	2.319	2.343	2.390	2.462	2.530	2.596	2.722	2.863	3.014	3.136	E-2
70	2.815	3.114	3.407	3.733	4.258	4.796	5.129	5.230	5.280	5.333	5.429	5.556	5.714	5.959	6.220	6.539	6.799	E-2
65	0.570	0.629	0.685	0.763	0.889	1.016	1.105	1.141	1.149	1.147	1.152	1.172	1.204	1.246	1.290	1.348	1.397	E-1
60	1.132	1.244	1.352	1.532	1.814	2.073	2.262	2.343	2.350	2.339	2.343	2.380	2.438	2.500	2.566	2.664	2.746	E-1
55	2.195	2.410	2.636	3.026	3.616	4.097	4.429	4.560	4.571	4.562	4.596	4.656	4.751	4.825	4.920	5.062	5.177	E-1
50	0.420	0.462	0.511	0.591	0.703	0.787	0.842	0.862	0.863	0.865	0.871	0.881	0.893	0.902	0.916	0.936	0.950	E 0
45	0.808	0.892	0.999	1.158	1.355	1.494	1.584	1.616	1.620	1.620	1.629	1.640	1.655	1.665	1.685	1.717	1.738	E 0
40	1.609	1.786	2.019	2.332	2.666	2.885	3.015	3.070	3.070	3.072	3.085	3.095	3.098	3.110	3.145	3.202	3.237	E 0
35	3.376	3.774	4.309	4.932	5.478	5.776	5.934	5.984	5.970	5.979	6.024	6.036	6.005	6.021	6.090	6.195	6.276	E 0
30	0.750	0.845	0.969	1.084	1.164	1.200	1.213	1.212	1.208	1.212	1.223	1.225	1.220	1.223	1.234	1.252	1.270	E 1
25	1.793	1.993	2.217	2.399	2.512	2.553	2.565	2.558	2.551	2.563	2.576	2.582	2.581	2.586	2.601	2.626	2.651	E 1
20	4.332	4.649	4.993	5.281	5.480	5.574	5.624	5.624	5.627	5.641	5.641	5.633	5.607	5.574	5.557	5.557	5.563	E 1

JUNE ZONAL MEAN PRESSURE (mb)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N	EXPONENT
120	2.025	2.035	2.051	2.071	2.096	2.123	2.151	2.184	2.219	2.258	2.299	2.340	2.377	2.409	2.435	2.454	2.465	E-5
115	3.269	3.274	3.287	3.308	3.339	3.379	3.427	3.477	3.529	3.581	3.632	3.684	3.734	3.782	3.826	3.862	3.886	E-5
110	5.920	5.930	5.963	6.037	6.149	6.284	6.411	6.506	6.558	6.570	6.559	6.539	6.522	6.518	6.526	6.542	6.557	E-5
105	1.172	1.186	1.214	1.258	1.313	1.369	1.412	1.433	1.429	1.407	1.372	1.333	1.294	1.256	1.223	1.198	1.182	E-4
100	2.478	2.542	2.656	2.818	3.009	3.190	3.317	3.366	3.338	3.259	3.150	3.027	2.898	2.771	2.653	2.555	2.489	E-4
95	5.467	5.681	6.040	6.533	7.092	7.601	7.937	8.047	7.972	7.802	7.611	7.430	7.255	7.081	6.909	6.751	6.637	E-4
90	1.203	1.264	1.368	1.509	1.670	1.815	1.909	1.937	1.917	1.884	1.866	1.877	1.916	1.972	2.037	2.096	2.138	E-3
85	2.605	2.788	3.059	3.397	3.803	4.185	4.431	4.517	4.493	4.447	4.472	4.605	4.866	5.292	5.828	6.375	6.805	E-3
80	0.612	0.690	0.764	0.809	0.879	0.948	0.977	0.984	0.991	1.001	1.028	1.056	1.083	1.172	1.288	1.407	1.501	E-2
75	1.272	1.451	1.619	1.727	1.911	2.120	2.221	2.236	2.245	2.274	2.339	2.429	2.583	2.843	3.170	3.474	3.713	E-2
70	2.622	2.998	3.333	3.594	4.071	4.664	4.997	5.080	5.090	5.129	5.232	5.440	5.817	6.384	7.049	7.682	8.173	E-2
65	0.529	0.603	0.666	0.728	0.845	0.990	1.084	1.112	1.112	1.114	1.130	1.171	1.243	1.346	1.461	1.580	1.671	E-1
60	1.041	1.181	1.302	1.444	1.708	2.016	2.222	2.282	2.278	2.278	2.315	2.398	2.517	2.691	2.878	3.078	3.229	E-1
55	1.988	2.255	2.505	2.817	3.308	3.900	4.359	4.452	4.440	4.445	4.532	4.689	4.890	5.154	5.454	5.762	5.997	E-1
50	0.373	0.425	0.479	0.546	0.659	0.766	0.830	0.844	0.843	0.844	0.861	0.888	0.922	0.960	1.008	1.054	1.087	E 0
45	0.709	0.812	0.925	1.065	1.276	1.459	1.565	1.594	1.591	1.592	1.617	1.660	1.712	1.772	1.845	1.916	1.963	E 0
40	1.399	1.608	1.855	2.152	2.534	2.833	2.997	3.050	3.046	3.046	3.082	3.145	3.218	3.307	3.420	3.530	3.606	E 0
35	2.903	3.344	3.922	4.612	5.305	5.727	5.928	5.990	5.970	5.987	6.060	6.151	6.257	6.377	6.551	6.710	6.846	E 0
30	0.645	0.746	0.888	1.039	1.148	1.199	1.218	1.219	1.214	1.220	1.235	1.249	1.265	1.283	1.307	1.333	1.357	E 1
25	1.600	1.810	2.084	2.342	2.499	2.556	2.581	2.579	2.570	2.578	2.601	2.630	2.654	2.682	2.716	2.750	2.782	E 1
20	3.991	4.334	4.783	5.197	5.458	5.579	5.652	5.667	5.658	5.664	5.692	5.726	5.744	5.744	5.749	5.764	5.784	E 1

JULY ZONAL MEAN PRESSURE (mb)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N	EXPONENT
120	2.000	2.009	2.023	2.043	2.066	2.090	2.116	2.146	2.179	2.216	2.254	2.291	2.327	2.356	2.381	2.398	2.409	E-5
115	3.214	3.218	3.229	3.249	3.278	3.315	3.359	3.406	3.454	3.503	3.551	3.599	3.645	3.690	3.730	3.766	3.787	E-5
110	5.793	5.800	5.833	5.902	6.010	6.138	6.260	6.351	6.399	6.410	6.395	6.371	6.351	6.343	6.349	6.364	6.378	E-5
105	1.144	1.158	1.185	1.227	1.279	1.334	1.376	1.397	1.393	1.371	1.337	1.298	1.258	1.221	1.190	1.166	1.150	E-4
100	2.426	2.488	2.597	2.751	2.934	3.106	3.231	3.278	3.252	3.176	3.069	2.947	2.819	2.694	2.579	2.485	2.423	E-4
95	5.386	5.589	5.933	6.398	6.931	7.414	7.729	7.839	7.766	7.603	7.415	7.232	7.052	6.874	6.702	6.550	6.447	E-4
90	1.194	1.252	1.350	1.484	1.635	1.772	1.861	1.887	1.867	1.835	1.817	1.824	1.857	1.906	1.965	2.018	2.057	E-3
85	2.604	2.770	3.041	3.370	3.744	4.097	4.341	4.430	4.404	4.351	4.353	4.461	4.704	5.090	5.582	6.106	6.521	E-3
80	0.620	0.683	0.773	0.828	0.881	0.938	0.962	1.000	1.003	1.003	1.006	1.016	1.050	1.126	1.238	1.379	1.496	E-2
75	1.318	1.460	1.653	1.781	1.931	2.098	2.221	2.269	2.276	2.271	2.272	2.321	2.467	2.747	3.104	3.457	3.728	E-2
70	2.748	3.057	3.452	3.758	4.161	4.613	4.952	5.080	5.090	5.073	5.062	5.191	5.556	6.202	6.979	7.709	8.239	E-2
65	0.557	0.621	0.702	0.774	0.878	0.990	1.070	1.097	1.096	1.092	1.093	1.124	1.198	1.317	1.457	1.587	1.681	E-1
60	1.087	1.218	1.387	1.559	1.804	2.046	2.200	2.245	2.233	2.222	2.242	2.316	2.453	2.653	2.878	3.087	3.242	E-1
55	2.051	2.315	2.673	3.067	3.612	4.070	4.333	4.377	4.339	4.326	4.394	4.551	4.798	5.121	5.470	5.791	6.021	E-1
50	0.380	0.433	0.508	0.592	0.700	0.781	0.823	0.829	0.822	0.821	0.838	0.867	0.910	0.960	1.014	1.062	1.094	E 0
45	0.716	0.817	0.967	1.140	1.341	1.482	1.552	1.564	1.555	1.554	1.580	1.633	1.702	1.785	1.868	1.938	1.983	E 0
40	1.389	1.584	1.888	2.247	2.632	2.868	2.962	3.005	2.991	2.994	3.036	3.121	3.231	3.359	3.482	3.588	3.661	E 0
35	2.800	3.187	3.845	4.661	5.418	5.784	5.934	5.949	5.910	5.937	6.018	6.164	6.326	6.515	6.690	6.849	6.970	E 0
30	0.601	0.686	0.840	1.022	1.156	1.206	1.223	1.220	1.212	1.218	1.235	1.260	1.285	1.311	1.337	1.361	1.383	E 1
25	1.449	1.636	1.962	2.290	2.497	2.565	2.594	2.590	2.578	2.587	2.617	2.659	2.700	2.736	2.773	2.806	2.835	E 1
20	3.699	3.995	4.577	5.099	5.447	5.591	5.669	5.689	5.678	5.689	5.732	5.796	5.836	5.848	5.860	5.874	5.889	E 1

AUGUST ZONAL MEAN PRESSURE (mb)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N	EXPONENT
120	2.114	2.121	2.131	2.145	2.160	2.177	2.195	2.214	2.236	2.261	2.288	2.315	2.339	2.361	2.377	2.389	2.396	E-5
115	3.359	3.360	3.366	3.377	3.396	3.422	3.452	3.485	3.519	3.552	3.584	3.616	3.649	3.680	3.711	3.737	3.754	E-5
110	5.964	5.965	5.985	6.040	6.131	6.243	6.352	6.434	6.473	6.471	6.439	6.396	6.357	6.335	6.331	6.342	6.358	E-5
105	1.172	1.183	1.206	1.242	1.290	1.340	1.382	1.404	1.404	1.385	1.351	1.311	1.270	1.232	1.202	1.182	1.170	E-4
100	2.526	2.576	2.669	2.802	2.961	3.117	3.233	3.286	3.275	3.211	3.111	2.991	2.864	2.741	2.635	2.556	2.506	E-4
95	5.830	5.992	6.272	6.655	7.084	7.479	7.751	7.857	7.817	7.682	7.512	7.321	7.132	6.948	6.784	6.658	6.576	E-4
90	1.359	1.405	1.481	1.584	1.698	1.801	1.869	1.891	1.879	1.853	1.834	1.832	1.849	1.880	1.918	1.957	1.985	E-3
85	3.042	3.197	3.416	3.660	3.939	4.213	4.412	4.479	4.465	4.429	4.417	4.472	4.616	4.862	5.189	5.534	5.823	E-3
80	0.681	0.764	0.843	0.875	0.916	0.980	1.041	1.054	1.061	1.069	1.067	1.060	1.057	1.085	1.147	1.230	1.324	E-2
75	1.456	1.634	1.797	1.881	1.995	2.158	2.316	2.373	2.389	2.396	2.379	2.371	2.418	2.556	2.770	2.989	3.183	E-2
70	3.074	3.455	3.780	3.980	4.275	4.685	5.073	5.251	5.269	5.258	5.201	5.191	5.333	5.682	6.165	6.628	6.986	E-2
65	0.631	0.716	0.786	0.833	0.905	1.000	1.085	1.123	1.121	1.113	1.100	1.102	1.137	1.205	1.290	1.369	1.427	E-1
60	1.246	1.432	1.600	1.714	1.882	2.079	2.237	2.293	2.276	2.254	2.228	2.247	2.329	2.452	2.579	2.692	2.777	E-1
55	2.359	2.756	3.153	3.448	3.812	4.155	4.407	4.465	4.421	4.383	4.363	4.429	4.587	4.801	4.984	5.141	5.250	E-1
50	0.436	0.516	0.603	0.673	0.745	0.799	0.837	0.842	0.834	0.830	0.833	0.849	0.878	0.912	0.940	0.961	0.974	E 0
45	0.810	0.965	1.142	1.295	1.431	1.518	1.573	1.579	1.564	1.560	1.573	1.603	1.656	1.709	1.752	1.784	1.798	E 0
40	1.535	1.831	2.187	2.521	2.795	2.932	3.003	3.006	2.982	2.985	3.015	3.078	3.160	3.250	3.312	3.356	3.379	E 0
35	3.000	3.567	4.313	5.087	5.656	5.881	5.946	5.931	5.878	5.901	5.982	6.102	6.226	6.367	6.454	6.512	6.551	E 0
30	0.621	0.736	0.900	1.074	1.185	1.218	1.224	1.217	1.206	1.212	1.229	1.254	1.274	1.292	1.304	1.312	1.319	E 1
25	1.446	1.683	2.020	2.341	2.535	2.582	2.599	2.589	2.573	2.585	2.615	2.657	2.691	2.712	2.724	2.734	2.740	E 1
20	3.666	4.060	4.632	5.169	5.496	5.613	5.681	5.689	5.672	5.692	5.738	5.798	5.825	5.813	5.790	5.770	5.749	E 1

SEPTEMBER ZONAL MEAN PRESSURE (mb)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N	EXPONENT
120	2.358	2.360	2.365	2.369	2.372	2.374	2.377	2.379	2.385	2.392	2.402	2.412	2.420	2.427	2.431	2.434	2.436	E-5
115	3.711	3.706	3.701	3.699	3.701	3.708	3.717	3.726	3.736	3.745	3.753	3.762	3.771	3.783	3.798	3.811	3.822	E-5
110	6.469	6.461	6.466	6.500	6.568	6.659	6.750	6.818	6.846	6.826	6.771	6.696	6.627	6.578	6.557	6.561	6.574	E-5
105	1.254	1.262	1.281	1.313	1.358	1.404	1.447	1.475	1.482	1.468	1.436	1.393	1.348	1.307	1.277	1.259	1.250	E-4
100	2.736	2.777	2.854	2.968	3.108	3.250	3.367	3.438	3.453	3.414	3.328	3.208	3.072	2.943	2.837	2.765	2.724	E-4
95	6.683	6.794	6.989	7.260	7.573	7.870	8.096	8.223	8.238	8.168	8.018	7.816	7.579	7.342	7.143	6.999	6.919	E-4
90	1.703	1.723	1.759	1.809	1.866	1.920	1.960	1.979	1.980	1.967	1.948	1.928	1.911	1.901	1.897	1.899	1.904	E-3
85	4.090	4.126	4.197	4.294	4.419	4.546	4.642	4.683	4.683	4.666	4.643	4.623	4.620	4.649	4.722	4.800	4.863	E-3
80	0.881	0.898	0.931	0.962	1.007	1.052	1.064	1.069	1.067	1.092	1.093	1.077	1.041	1.005	0.989	0.971	0.960	E-2
75	1.910	1.939	1.995	2.077	2.194	2.316	2.411	2.437	2.434	2.436	2.435	2.388	2.316	2.262	2.243	2.192	2.175	E-2
70	4.055	4.106	4.182	4.368	4.664	4.990	5.258	5.381	5.367	5.343	5.306	5.191	5.062	4.957	4.898	4.775	4.739	E-2
65	0.838	0.852	0.866	0.906	0.975	1.053	1.117	1.149	1.145	1.133	1.118	1.094	1.076	1.056	1.034	1.000	0.986	E-1
60	1.667	1.720	1.763	1.852	2.002	2.165	2.298	2.350	2.334	2.305	2.267	2.228	2.208	2.172	2.107	2.022	1.972	E-1
55	3.169	3.338	3.498	3.711	4.008	4.294	4.519	4.589	4.548	4.501	4.447	4.398	4.377	4.309	4.171	3.978	3.851	E-1
50	0.585	0.629	0.675	0.723	0.776	0.822	0.858	0.866	0.857	0.851	0.846	0.839	0.837	0.826	0.801	0.763	0.737	E 0
45	1.072	1.173	1.282	1.387	1.481	1.554	1.606	1.617	1.600	1.591	1.588	1.580	1.580	1.563	1.521	1.456	1.410	E 0
40	1.981	2.193	2.444	2.690	2.877	2.982	3.049	3.058	3.024	3.017	3.027	3.027	3.030	3.003	2.944	2.844	2.770	E 0
35	3.712	4.167	4.767	5.391	5.782	5.937	5.982	5.973	5.913	5.916	5.964	5.996	6.017	5.970	5.887	5.747	5.633	E 0
30	0.730	0.827	0.972	1.124	1.207	1.225	1.223	1.217	1.206	1.208	1.220	1.233	1.239	1.230	1.217	1.198	1.181	E 1
25	1.586	1.786	2.096	2.404	2.568	2.596	2.596	2.586	2.564	2.570	2.594	2.621	2.633	2.617	2.591	2.559	2.530	E 1
20	3.740	4.121	4.693	5.218	5.535	5.641	5.686	5.692	5.667	5.672	5.709	5.732	5.721	5.652	5.574	5.499	5.436	E 1

ORIGINAL PAGE IS
OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

Table B2 (cont.)

OCTOBER ZONAL MEAN PRESSURE (mb)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N	EXPONENT
120	2.645	2.643	2.637	2.628	2.616	2.599	2.582	2.564	2.547	2.533	2.523	2.513	2.503	2.494	2.484	2.477	2.471	E-5
115	4.154	4.140	4.121	4.100	4.079	4.059	4.041	4.022	4.002	3.981	3.960	3.940	3.924	3.914	3.910	3.910	3.912	E-5
110	7.133	7.116	7.106	7.120	7.162	7.225	7.291	7.342	7.352	7.319	7.236	7.123	7.018	6.935	6.891	6.880	6.886	E-5
105	1.349	1.358	1.377	1.410	1.451	1.499	1.544	1.578	1.594	1.588	1.559	1.513	1.461	1.413	1.377	1.356	1.346	E-4
100	2.935	2.979	3.057	3.168	3.303	3.445	3.572	3.668	3.717	3.709	3.638	3.513	3.356	3.200	3.072	2.985	2.938	E-4
95	7.544	7.621	7.759	7.948	8.177	8.403	8.616	8.778	8.872	8.870	8.743	8.489	8.141	7.772	7.447	7.213	7.080	E-4
90	2.132	2.116	2.098	2.085	2.079	2.082	2.096	2.115	2.133	2.137	2.114	2.064	1.991	1.911	1.840	1.788	1.758	E-3
85	5.623	5.506	5.343	5.164	5.052	4.985	4.953	4.960	4.991	4.997	4.947	4.822	4.633	4.426	4.258	4.129	4.051	E-3
80	1.121	1.132	1.133	1.109	1.121	1.126	1.109	1.093	1.096	1.098	1.091	1.061	1.000	0.928	0.878	0.831	0.799	E-2
75	2.504	2.511	2.491	2.453	2.479	2.498	2.479	2.437	2.424	2.424	2.418	2.338	2.190	2.014	1.889	1.761	1.680	E-2
70	5.317	5.314	5.248	5.193	5.290	5.386	5.419	5.402	5.370	5.346	5.285	5.080	4.739	4.323	3.998	3.700	3.504	E-2
65	1.094	1.092	1.078	1.069	1.097	1.126	1.144	1.156	1.156	1.147	1.122	1.072	1.003	0.912	0.832	0.762	0.715	E-1
60	2.182	2.185	2.162	2.152	2.217	2.286	2.336	2.365	2.367	2.351	2.289	2.185	2.055	1.877	1.694	1.533	1.418	E-1
55	4.171	4.222	4.230	4.226	4.359	4.494	4.596	4.624	4.617	4.592	4.487	4.311	4.072	3.733	3.375	3.028	2.768	E-1
50	0.772	0.792	0.803	0.806	0.830	0.853	0.871	0.874	0.871	0.867	0.851	0.820	0.779	0.722	0.657	0.589	0.536	E 0
45	1.403	1.459	1.500	1.516	1.557	1.595	1.625	1.630	1.624	1.618	1.596	1.542	1.475	1.382	1.270	1.145	1.043	E 0
40	2.544	2.689	2.825	2.890	2.970	3.030	3.073	3.076	3.061	3.058	3.030	2.958	2.854	2.702	2.519	2.308	2.118	E 0
35	4.682	5.057	5.489	5.718	5.881	5.973	6.005	5.973	5.943	5.952	5.958	5.875	5.724	5.486	5.210	4.892	4.571	E 0
30	0.908	0.997	1.113	1.183	1.219	1.226	1.229	1.211	1.203	1.206	1.215	1.211	1.193	1.158	1.115	1.069	1.020	E 1
25	1.908	2.098	2.340	2.510	2.594	2.599	2.583	2.564	2.549	2.556	2.573	2.577	2.558	2.503	2.438	2.360	2.284	E 1
20	4.242	4.600	5.023	5.379	5.591	5.655	5.669	5.652	5.627	5.641	5.658	5.644	5.585	5.461	5.323	5.194	5.084	E 1

NOVEMBER ZONAL MEAN PRESSURE (mb)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N	EXPONENT
120	2.842	2.832	2.816	2.794	2.765	2.732	2.695	2.657	2.622	2.588	2.559	2.531	2.506	2.484	2.463	2.448	2.438	E-5
115	4.471	4.449	4.415	4.376	4.332	4.287	4.242	4.195	4.147	4.099	4.053	4.009	3.971	3.942	3.922	3.913	3.908	E-5
110	7.600	7.581	7.564	7.561	7.580	7.618	7.657	7.684	7.678	7.622	7.519	7.384	7.241	7.126	7.055	7.026	7.023	E-5
105	1.399	1.413	1.438	1.473	1.516	1.562	1.609	1.648	1.670	1.671	1.645	1.596	1.535	1.476	1.432	1.405	1.390	E-4
100	2.995	3.056	3.153	3.278	3.420	3.567	3.706	3.822	3.901	3.919	3.859	3.720	3.530	3.334	3.169	3.054	2.990	E-4
95	7.922	8.015	8.161	8.343	8.541	8.745	8.950	9.154	9.318	9.374	9.251	8.915	8.415	7.869	7.385	7.031	6.819	E-4
90	2.438	2.395	2.337	2.277	2.226	2.194	2.189	2.209	2.240	2.257	2.230	2.143	2.008	1.858	1.723	1.623	1.564	E-3
85	7.114	6.792	6.339	5.893	5.535	5.294	5.177	5.156	5.194	5.215	5.131	4.897	4.539	4.156	3.834	3.578	3.411	E-3
80	1.396	1.376	1.312	1.247	1.198	1.160	1.131	1.101	1.086	1.082	1.066	1.023	0.947	0.873	0.827	0.768	0.715	E-2
75	3.303	3.221	3.043	2.874	2.731	2.617	2.532	2.449	2.400	2.388	2.356	2.240	2.044	1.855	1.738	1.605	1.486	E-2
70	7.141	6.961	6.579	6.242	5.953	5.725	5.556	5.419	5.330	5.295	5.175	4.849	4.353	3.898	3.603	3.338	3.092	E-2
65	1.466	1.432	1.361	1.299	1.245	1.204	1.175	1.155	1.147	1.141	1.105	1.025	0.912	0.808	0.737	0.685	0.635	E-1
60	2.870	2.826	2.708	2.595	2.505	2.433	2.383	2.341	2.332	2.325	2.255	2.090	1.867	1.643	1.482	1.373	1.273	E-1
55	5.394	5.348	5.182	4.999	4.856	4.739	4.656	4.553	4.526	4.521	4.416	4.128	3.707	3.263	2.928	2.687	2.480	E-1
50	0.986	0.984	0.962	0.933	0.909	0.891	0.879	0.862	0.856	0.855	0.839	0.789	0.716	0.633	0.568	0.516	0.475	E 0
45	1.782	1.792	1.762	1.716	1.676	1.647	1.635	1.612	1.603	1.603	1.574	1.490	1.366	1.223	1.101	0.996	0.911	E 0
40	3.247	3.286	3.260	3.187	3.123	3.087	3.076	3.042	3.032	3.033	2.982	2.855	2.661	2.423	2.209	1.999	1.829	E 0
35	6.066	6.185	6.207	6.118	6.024	5.987	5.970	5.901	5.881	5.895	5.840	5.676	5.401	5.034	4.654	4.272	3.942	E 0
30	1.178	1.212	1.233	1.233	1.225	1.218	1.211	1.196	1.190	1.194	1.193	1.177	1.142	1.090	1.026	0.958	0.900	E 1
25	2.394	2.473	2.545	2.583	2.596	2.583	2.570	2.541	2.526	2.533	2.537	2.522	2.482	2.405	2.305	2.197	2.102	E 1
20	4.934	5.122	5.345	5.502	5.613	5.644	5.658	5.607	5.585	5.599	5.591	5.549	5.453	5.289	5.115	4.941	4.802	E 1

DECEMBER ZONAL MEAN PRESSURE (mb)

HEIGHT (km)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N	EXPONENT
120	2.860	2.847	2.825	2.796	2.758	2.716	2.668	2.620	2.574	2.532	2.493	2.458	2.426	2.397	2.371	2.352	2.340	E-5
115	4.508	4.479	4.438	4.387	4.332	4.274	4.213	4.153	4.091	4.030	3.970	3.914	3.867	3.829	3.804	3.789	3.781	E-5
110	7.608	7.590	7.572	7.562	7.567	7.586	7.611	7.624	7.609	7.547	7.432	7.284	7.128	6.997	6.911	6.872	6.862	E-5
105	1.373	1.392	1.421	1.459	1.502	1.549	1.594	1.633	1.659	1.663	1.638	1.588	1.524	1.460	1.408	1.376	1.360	E-4
100	2.894	2.970	3.083	3.219	3.368	3.517	3.660	3.785	3.877	3.908	3.852	3.705	3.496	3.275	3.088	2.956	2.881	E-4
95	7.720	7.849	8.028	8.230	8.434	8.635	8.846	9.065	9.264	9.348	9.222	8.833	8.247	7.600	7.030	6.615	6.370	E-4
90	2.483	2.434	2.366	2.291	2.226	2.181	2.169	2.190	2.228	2.251	2.219	2.111	1.943	1.757	1.594	1.475	1.405	E-3
85	7.750	7.281	6.675	6.087	5.612	5.294	5.142	5.127	5.184	5.204	5.097	4.801	4.353	3.875	3.502	3.207	3.025	E-3
80	1.563	1.492	1.391	1.285	1.207	1.150	1.121	1.108	1.102	1.086	1.064	1.014	0.924	0.830	0.796	0.736	0.688	E-2
75	3.845	3.650	3.366	3.066	2.815	2.623	2.516	2.478	2.451	2.418	2.372	2.234	1.987	1.758	1.672	1.535	1.425	E-2
70	8.439	8.019	7.417	6.793	6.245	5.812	5.550	5.468	5.416	5.349	5.232	4.864	4.237	3.685	3.455	3.172	2.935	E-2
65	1.722	1.643	1.533	1.417	1.318	1.237	1.181	1.157	1.147	1.137	1.114	1.030	0.892	0.764	0.703	0.645	0.597	E-1
60	3.318	3.189	3.005	2.809	2.644	2.497	2.380	2.315	2.292	2.285	2.253	2.104	1.846	1.565	1.410	1.284	1.188	E-1
55	6.124	5.946	5.665	5.340	5.085	4.832	4.610	4.447	4.396	4.396	4.390	4.163	3.715	3.137	2.779	2.496	2.301	E-1
50	1.105	1.081	1.040	0.989	0.949	0.908	0.869	0.839	0.829	0.830	0.832	0.798	0.722	0.615	0.541	0.480	0.440	E 0
45	1.983	1.954	1.892	1.813	1.747	1.681	1.620	1.576	1.561	1.562	1.563	1.506	1.381	1.197	1.058	0.929	0.850	E 0
40	3.603	3.563	3.475	3.349	3.244	3.145	3.058	2.997	2.975	2.975	2.958	2.872	2.680	2.393	2.138	1.871	1.703	E 0
35	6.731	6.684	6.558	6.370	6.213	6.069	5.952	5.857	5.811	5.811	5.782	5.673	5.412	4.989	4.521	3.964	3.585	E 0
30	1.309	1.304	1.291	1.266	1.246	1.226	1.209	1.195	1.184	1.183	1.181	1.169	1.136	1.076	0.994	0.887	0.802	E 1
25	2.662	2.653	2.638	2.624	2.607	2.587	2.565	2.542	2.525	2.520	2.517	2.498	2.452	2.365	2.235	2.065	1.916	E 1
20	5.463	5.472	5.507	5.577	5.630	5.650	5.641	5.616	5.591	5.577	5.557	5.496	5.377	5.205	4.988	4.728	4.500	E 1

JANUARY ZONAL MEAN TEMPERATURE (K)

LATITUDE

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	404.5	402.6	390.0	396.4	392.4	387.0	382.0	377.7	372.0	367.0	363.2	360.3	356.7	352.0	348.5	346.4	343.2
119.0	.000042	319.4	319.7	319.3	317.0	312.5	305.0	298.1	290.1	283.2	278.0	275.0	274.3	274.7	275.0	274.5	273.1	271.7
115.5	.000069	295.5	280.8	281.4	271.3	260.6	250.3	240.8	232.7	220.3	222.1	220.4	221.5	226.0	230.0	236.0	238.8	242.1
112.0	.00011	257.7	251.6	243.5	234.0	226.4	218.0	212.3	200.7	202.2	190.4	190.0	200.3	204.0	200.3	214.9	219.9	223.4
108.5	.00019	214.3	212.4	200.7	206.5	203.2	200.1	197.1	194.3	191.7	190.0	190.0	191.0	194.2	190.6	203.5	207.9	211.0
105.0	.00031	182.9	183.8	184.0	186.2	187.5	180.6	180.2	180.0	180.3	187.4	187.1	187.0	190.0	193.2	197.3	201.1	203.9
101.5	.00051	162.1	164.0	160.6	173.1	177.7	181.0	180.0	180.0	187.3	187.0	180.6	187.0	188.7	191.7	198.4	190.0	201.5
98.0	.00084	140.6	152.4	158.0	164.8	172.0	170.5	183.5	186.4	187.3	187.0	186.0	187.2	189.3	192.7	197.1	201.4	204.3
94.5	.0014	140.3	144.9	151.9	160.5	169.6	177.7	183.7	186.8	187.5	187.2	187.1	188.5	192.0	197.2	202.9	208.0	211.5
91.0	.0023	136.6	142.1	150.5	160.8	171.5	180.6	186.0	190.4	190.1	190.4	191.7	195.1	200.3	200.5	213.0	218.0	221.3
87.5	.0038	138.4	143.8	152.2	163.9	176.4	186.8	192.9	195.0	195.7	196.4	198.3	203.0	208.9	215.1	220.3	223.1	225.2
84.0	.0062	148.1	152.1	158.4	170.4	184.1	195.5	201.2	202.1	202.3	202.0	204.0	200.7	214.1	220.3	223.8	224.3	225.4
80.5	.0100	160.8	163.8	168.4	179.1	191.0	201.8	200.3	205.0	200.0	206.6	207.6	211.7	216.0	222.5	225.3	224.7	225.6
77.0	.0170	174.1	176.7	180.4	180.9	198.5	205.7	208.6	207.3	207.7	208.7	210.4	214.2	219.0	223.9	226.1	225.3	226.4
73.5	.0280	180.9	191.9	194.5	190.8	205.1	208.8	210.8	210.1	210.4	211.3	212.7	216.5	220.4	224.6	227.1	226.4	228.1
70.0	.0460	200.2	207.5	208.9	210.7	211.2	212.2	214.0	215.1	215.3	215.5	215.9	219.1	221.3	225.2	228.1	228.6	231.4
66.5	.0760	222.5	222.9	222.8	221.4	218.9	210.4	221.2	223.0	228.0	223.0	223.3	224.0	224.7	228.0	229.5	232.8	237.4
63.0	0.12	230.5	237.5	236.0	232.5	229.1	228.8	232.4	236.1	237.9	235.5	233.3	230.5	228.5	228.0	232.0	230.1	245.3
59.5	0.21	253.4	251.5	248.8	246.1	241.7	241.0	244.0	250.0	250.7	240.0	243.0	230.3	233.4	232.0	237.9	246.3	252.7
56.0	0.34	267.3	264.6	261.4	257.0	263.3	252.4	258.0	260.0	261.7	250.0	253.5	247.0	242.0	240.9	244.0	251.8	256.0
52.5	0.56	279.1	275.6	271.8	267.1	263.1	261.0	262.7	265.7	267.4	260.0	262.8	250.0	253.6	250.7	252.4	254.9	256.1
49.0	0.92	287.2	283.2	278.7	274.0	271.2	260.1	260.2	267.0	267.3	260.0	267.7	264.0	261.3	256.4	253.8	253.4	251.7
45.5	1.52	288.3	284.9	280.9	276.8	273.3	260.0	267.4	264.1	263.6	264.5	265.9	264.3	260.0	253.4	250.0	249.9	248.7
42.0	2.51	283.0	280.4	277.0	272.7	268.8	264.3	260.1	257.0	257.6	257.0	260.0	256.9	252.0	247.1	248.2	245.4	244.9
38.5	4.14	273.3	271.1	268.1	263.9	258.4	254.7	250.6	248.0	248.5	248.7	248.5	245.0	242.5	239.2	238.5	237.6	236.4
35.0	6.83	261.7	260.3	257.6	253.6	248.8	244.3	241.1	238.9	239.1	238.7	238.2	236.1	234.3	232.0	230.0	228.1	225.2
31.5	11.3	249.1	248.4	246.9	243.5	238.2	233.6	230.2	228.7	227.8	228.0	228.9	229.0	227.0	226.1	223.3	218.0	212.3
28.0	18.5	238.1	237.2	237.3	233.9	230.0	226.4	223.0	221.6	220.0	221.7	221.9	222.0	222.2	220.4	215.6	208.8	202.3
24.5	30.6	235.4	233.5	231.5	227.5	223.3	219.0	216.0	219.5	214.0	215.2	215.8	217.0	217.9	217.0	213.2	207.2	201.6
21.0	50.4	234.8	233.3	229.9	223.5	216.7	212.0	200.3	207.2	205.9	206.4	208.2	210.9	214.7	218.0	215.0	212.5	207.8
17.5	83.2	233.0	232.5	228.3	220.9	212.1	204.0	200.4	197.0	196.7	197.3	200.7	206.9	214.0	217.4	216.7	214.1	210.7
14.0	137.	231.0	230.5	226.8	220.4	213.0	207.0	203.0	200.9	200.4	200.0	203.6	200.4	215.1	217.9	217.0	214.4	212.3
10.5	226.	228.0	226.6	225.1	223.5	222.9	224.7	226.2	220.0	220.2	220.7	224.7	222.1	219.0	218.2	216.9	215.2	214.1
7.0	373.	227.2	228.8	232.0	237.8	244.0	240.3	252.6	263.3	263.6	263.0	240.9	242.4	234.0	228.6	225.2	222.7	220.9
3.5	614.	248.0	251.5	255.6	262.1	260.2	274.3	276.6	276.7	276.9	277.0	274.5	267.2	250.7	252.0	247.5	243.8	241.1
0.0	1013.		272.0	275.8	281.6	280.5	290.0	290.2	300.7	300.8	300.3	297.4	291.7	284.4	270.1	267.0	254.2	248.5

FEBRUARY ZONAL MEAN TEMPERATURE (K)

LATITUDE

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	392.9	391.9	390.3	388.4	385.9	382.8	379.3	375.7	372.0	368.9	366.2	363.9	361.6	359.2	356.6	354.2	352.5
119.0	.000042	312.5	312.8	312.3	310.0	305.6	290.3	292.2	286.5	280.4	277.6	277.0	278.0	279.6	281.1	281.4	280.5	279.4
115.5	.000069	282.4	277.9	270.9	262.2	262.7	243.5	236.3	220.7	224.0	221.7	221.0	224.7	229.3	234.8	239.9	243.7	245.9
112.0	.00011	243.8	239.6	233.6	226.6	218.9	213.0	208.7	204.4	201.3	190.6	190.7	201.6	205.2	210.0	215.2	219.6	222.5
108.5	.00019	207.2	205.9	203.9	201.7	190.4	197.1	198.0	193.1	191.4	190.3	190.2	191.4	193.7	190.9	200.5	203.7	205.9
105.0	.00031	181.6	182.2	183.2	184.5	185.8	187.1	188.1	188.4	188.1	187.5	187.0	187.0	187.9	180.6	191.9	194.2	195.8
101.5	.00051	184.4	186.6	180.8	173.7	177.9	181.0	184.9	188.8	187.3	186.9	186.1	185.6	185.8	180.7	188.2	189.7	190.9
98.0	.00084	153.0	156.7	161.5	167.4	173.7	179.5	183.9	188.5	187.3	186.0	186.1	185.7	185.9	180.8	188.4	190.1	191.3
94.5	.0014	147.0	151.7	157.7	166.1	172.0	179.7	184.5	187.0	187.0	187.2	188.8	187.2	188.5	190.6	193.0	195.1	190.4
91.0	.0023	146.0	151.5	160.7	167.6	176.2	183.4	187.9	190.0	190.6	190.8	191.4	193.1	190.8	190.0	202.3	204.8	200.4
87.5	.0038	151.6	156.1	163.1	172.0	182.5	188.8	193.9	195.7	198.4	196.0	198.1	200.6	204.1	200.2	211.7	213.5	214.3
84.0	.0062	163.3	166.1	170.0	180.4	190.0	197.8	200.7	201.0	202.7	203.2	204.4	200.6	210.7	215.7	219.2	219.6	219.6
80.5	.0100	175.0	176.6	179.2	188.0	197.3	203.4	204.8	206.0	206.0	206.7	208.6	210.6	214.7	220.1	223.7	223.3	223.1
77.0	.0170	185.5	186.7	188.5	196.6	202.8	207.0	207.2	208.4	206.9	208.0	211.7	214.1	218.2	223.2	226.7	225.8	225.9
73.5	.0280	196.0	198.8	200.0	204.2	208.2	210.3	210.0	209.0	209.9	211.6	214.3	217.0	220.9	225.3	229.0	228.6	229.8
70.0	.0460	211.2	211.3	212.0	212.0	213.4	214.3	215.3	215.2	214.7	216.1	217.0	219.5	222.6	226.6	231.4	233.1	236.4
66.5	.0760	225.5	224.5	223.6	221.1	219.7	220.7	222.0	223.0	222.4	221.7	222.3	223.3	225.6	228.0	233.9	239.1	245.4
63.0	0.12	240.5	237.6	234.4	230.2	227.9	229.7	232.7	233.0	232.0	231.4	229.0	228.7	229.1	231.5	237.5	246.1	254.9
59.5	0.21	253.0	249.4	248.4	240.9	238.0	240.1	243.8	246.1	244.6	243.0	238.0	236.0	234.1	238.0	243.0	253.3	262.8
56.0	0.34	263.6	260.0	258.4	252.1	248.4	249.7	252.7	256.5	257.7	250.0	251.2	247.7	243.3	243.7	249.2	257.6	265.2
52.5	0.56	272.4	269.4	268.4	263.0	259.0	258.5	261.0	265.8	260.1	260.9	263.2	250.2	254.8	252.4	253.0	255.0	257.3
49.0	0.92	278.6	275.9	273.1	271.3	268.7	267.7	268.2	270.5	271.0	271.0	270.4	260.5	262.4	256.8	252.5	249.5	247.8
45.5	1.52	278.2	276.2	274.4	272.3	270.4	268.3	266.7	268.6	260.9	270.5	270.2	260.9	261.8	254.1	248.0	243.4	240.2
42.0	2.51	272.1	270.5	269.9	267.2	266.0	262.0	261.9	262.2	263.3	263.6	263.1	250.8	254.2	246.1	241.6	238.4	235.6
38.5	4.14	262.6	261.4	259.9	258.3	256.3	253.0	252.5	252.2	252.0	252.7	252.4	240.1	243.9	238.7	234.5	233.7	231.8
35.0	6.83	252.3	251.6	250.5	248.6	245.5	243.5	242.5	240.9	240.0	240.9	241.1	230.6	233.7	228.1	227.6	228.6	227.0
31.5	11.3	241.9	241.6	240.9	239.0	236.7	233.0	231.3	229.0	228.0	229.7	229.9	229.4	225.3	221.8	221.5	222.2	219.9
28.0	18.5	234.0	233.4	232.7	230.0	228.2	226.2	223.4	222.3	221.0	222.2	222.1	222.2	220.6	219.0	217.1	215.0	211.4
24.5	30.6	232.8	230.9	228.4	225.8	222.6	219.0	217.2	218.9	215.2	216.0	215.3	216.1	217.2	217.6	215.9	212.2	208.3
21.0	50.4	232.3	230.8	227.8	222.2	216.4	212.0	200.3	207.1	206.0	206.4	208.4	211.1	214.9	217.6	217.1	214.1	209.6
17.5	83.2	231.4	230.2	226.7	219.7	211.8	206.1	200.3	197.0	196.0	197.6	200.6	207.1	214.5	218.3	217.8	214.6	210.2
14.0	137.	230.2	229.4	225.9	219.4	212.7	207.1	203.1	201.2	201.1	201.3	203.9	200.6	215.7	218.6	217.8	214.8	211.2
10.5	226.	226.9	227.0	225.5	223.4	223.3	226.1	220.4	228.3	228.4	228.2	225.5	222.7	219.3	218.5	217.4	215.5	213.6
7.0	373.	226.1	228.1	232.1	238.6	244.9	240.7	252.9	263.6	263.8	253.3	260.3	242.3	233.7	220.3	225.2	222.9	220.8
3.5	614.	248.0	249.9	254.9	262.7	270.0	274.6	276.7	276.9	277.0	277.2	274.5	267.2	250.5	251.7	247.5	244.1	241.5
0.0	1013.		272.0	277.0	282.3	289.9	296.4	290.8	301.2	301.1	300.2	297.1	291.2	284.0	277.9	266.9	254.1	247.4

MARCH ZONAL MEAN TEMPERATURE (K)

LATITUDE

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	377.7	377.8	377.0	377.7	377.1	376.1	374.0	373.5	372.5	371.0	371.7	371.0	371.3	370.7	369.8	368.8	368.1
119.0	.000042	290.3	300.0	300.2	290.8	296.5	290.9	286.0	282.1	280.1	280.3	282.5	286.9	289.5	292.0	293.0	292.5	291.6
115.5	.000069	264.3	261.4	256.5	250.0	242.7	236.7	229.0	225.7	223.7	224.0	226.6	231.1	237.1	243.5	249.2	253.3	256.7
112.0	.00011	230.8	227.9	223.4	218.1	212.7	208.2	204.6	202.2	200.9	201.0	202.5	206.3	209.3	214.2	219.1	223.2	225.8
108.5	.00019	203.0	201.7	199.9	197.8	196.8	194.1	192.8	191.9	191.3	191.2	191.6	192.8	194.5	196.7	199.1	201.2	202.7
105.0	.00031	184.0	184.0	184.2	184.6	185.4	186.4	187.3	188.0	188.1	187.7	187.1	186.4	185.9	185.9	186.3	186.8	187.3
101.5	.00051	171.7	172.0	174.0	177.1	179.9	182.8	186.2	188.0	187.3	186.0	185.5	183.7	181.9	180.2	179.0	178.2	177.9
98.0	.00084	164.8	166.0	169.6	173.5	177.7	181.0	184.8	186.6	187.3	186.7	185.3	183.2	180.7	178.2	176.1	174.6	173.7
94.5	.0014	163.0	165.4	169.2	173.8	178.6	182.7	185.6	187.1	187.4	187.2	186.1	184.5	182.4	180.1	177.8	175.9	174.6
91.0	.0023	166.4	169.4	173.8	178.9	183.6	187.2	189.4	190.5	190.8	190.7	190.3	189.5	188.3	186.6	184.6	182.6	181.2
87.5	.0038	176.8	179.4	182.8	187.3	191.4	194.0	195.6	197.1	199.0	197.6	197.3	197.1	196.2	195.6	194.9	193.7	192.4
84.0	.0062	193.0	193.9	194.4	197.2	200.0	201.1	202.1	204.8	206.3	206.4	205.0	205.2	204.1	205.2	206.9	206.6	205.5
80.5	.0100	203.9	203.6	202.3	203.7	206.4	206.0	206.4	207.4	209.2	209.7	209.1	210.6	210.1	212.0	215.6	214.8	213.1
77.0	.0170	209.6	209.0	207.6	207.9	208.7	208.5	207.2	207.8	208.8	209.1	211.2	214.4	215.4	219.1	221.4	218.9	216.3
73.5	.0280	215.8	214.9	213.5	212.1	211.7	211.0	211.1	210.8	210.5	211.0	214.1	218.2	220.1	224.1	225.0	222.3	219.6
70.0	.0460	223.3	221.6	220.1	216.5	215.3	216.5	216.7	215.3	214.6	214.6	218.3	221.9	223.7	227.0	227.6	225.5	223.3
66.5	.0760	232.3	229.3	226.2	221.7	221.1	223.7	224.1	222.5	221.2	221.4	223.0	226.3	227.5	230.3	230.1	229.0	227.8
63.0	0.12	241.2	237.1	233.2	228.0	228.3	231.0	233.2	231.0	230.5	230.3	230.3	231.5	231.7	234.2	233.8	234.6	234.8
59.5	0.21	248.1	244.4	241.2	237.9	237.0	239.4	242.3	241.8	242.0	240.4	238.3	238.1	237.8	239.3	240.2	243.3	245.5
56.0	0.34	255.0	251.7	248.9	247.7	247.3	248.4	250.6	253.3	254.5	252.9	249.9	248.2	247.4	247.8	249.0	253.5	257.1
52.5	0.56	261.8	260.5	259.1	250.2	250.6	259.9	260.3	264.5	266.1	264.9	262.1	259.7	256.9	258.2	256.4	260.3	261.9
49.0	0.92	263.6	264.5	265.7	267.4	268.1	268.0	268.0	270.0	272.4	271.4	269.7	267.2	266.4	264.2	262.6	260.4	258.8
45.5	1.52	258.0	259.9	263.2	266.0	266.8	266.6	268.7	270.0	272.4	271.6	270.3	267.8	265.7	262.5	258.2	253.3	249.8
42.0	2.51	248.8	250.6	254.2	258.6	260.2	260.0	262.5	264.0	265.0	265.3	263.8	260.5	258.3	253.9	248.3	242.7	239.2
38.5	4.14	239.2	241.1	244.8	248.7	250.1	250.7	252.3	253.0	254.7	254.5	253.0	250.0	247.4	242.4	237.6	234.7	233.7
35.0	6.83	231.4	233.6	236.6	238.8	239.7	240.8	241.8	242.0	242.2	242.6	241.0	239.6	236.0	231.0	227.9	227.0	228.6
31.5	11.3	225.5	227.3	229.1	230.2	231.2	231.5	231.8	231.1	230.6	230.7	231.1	230.0	225.8	221.9	220.8	222.0	223.8
28.0	18.5	221.3	222.1	224.3	225.0	225.2	225.1	224.6	224.0	223.9	223.3	223.2	222.8	220.5	218.7	218.1	219.3	220.6
24.5	30.6	222.8	222.3	222.9	222.5	221.3	219.7	218.3	217.6	217.1	216.0	216.3	216.8	217.4	218.1	218.5	218.4	218.1
21.0	50.4	224.2	223.7	222.3	220.0	216.3	212.5	208.4	207.7	207.0	207.3	208.8	211.5	215.3	218.2	218.8	217.1	214.3
17.5	83.2	225.1	225.0	222.8	218.7	212.5	206.0	200.4	197.7	196.9	197.9	201.2	207.0	214.8	218.6	219.2	217.2	213.9
14.0	137.	225.7	225.7	223.4	218.7	213.1	207.4	203.0	200.8	200.4	201.2	204.2	200.7	215.5	218.7	219.3	217.7	215.0
10.5	226.	224.5	224.4	223.2	221.8	222.0	224.0	225.6	226.2	226.5	226.2	225.3	222.2	219.0	218.9	218.8	217.7	215.9
7.0	373.	224.4	228.6	231.1	237.6	243.6	248.9	252.0	253.7	254.0	253.3	250.1	242.0	236.2	229.8	226.5	223.6	221.3
3.5	614.	245.3	248.4	254.6	262.2	268.9	273.7	276.3	276.9	277.2	277.3	275.0	268.3	260.6	254.0	249.2	245.0	241.4
0.0	1013.		271.8	275.7	281.5	280.7	296.1	290.7	301.4	301.4	300.5	297.4	291.6	284.7	279.1	268.6	256.4	246.4

ORIGINAL PAGE IS
OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

Table B3 (cont.)

APRIL ZONAL MEAN TEMPERATURE (K)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	357.3	358.6	360.2	362.0	363.4	364.6	366.7	367.0	368.6	370.0	373.2	375.5	377.4	378.8	379.7	380.3	380.5
119.0	.000042	283.5	284.6	285.2	284.6	282.7	280.0	277.6	276.7	277.9	281.3	286.3	292.1	297.4	301.2	303.1	303.3	302.8
115.5	.000069	249.2	247.1	243.3	238.1	232.4	227.2	223.6	222.1	223.0	226.2	231.3	238.1	245.9	253.9	261.1	266.6	270.0
112.0	.00011	222.9	220.3	216.3	211.5	206.8	203.1	200.8	200.0	200.8	202.8	205.9	210.1	215.1	220.9	226.6	231.5	234.9
108.5	.00019	203.4	201.6	199.1	196.3	193.8	191.9	190.8	190.7	191.3	192.3	193.6	195.1	196.9	198.9	200.9	202.7	203.9
105.0	.00031	190.6	189.6	188.4	187.3	186.5	186.5	186.9	187.0	188.1	188.1	187.6	186.5	185.2	184.1	183.2	182.6	182.3
101.5	.00051	183.3	183.1	182.9	183.0	183.5	184.5	185.7	186.8	187.3	186.8	185.0	182.2	178.8	175.3	172.0	169.5	168.0
98.0	.00084	181.3	181.3	181.4	182.0	183.0	184.3	185.7	186.8	187.3	186.6	184.4	180.6	175.7	170.5	165.6	161.7	159.3
94.5	.0014	184.1	184.2	184.5	184.8	185.2	185.8	186.5	187.2	187.6	187.1	186.1	181.3	175.9	169.6	163.6	158.7	155.6
91.0	.0023	193.0	192.8	192.5	192.1	191.6	191.1	190.7	190.7	190.7	190.3	188.7	185.4	180.1	173.4	166.5	160.6	156.8
87.5	.0038	206.9	205.6	203.2	201.6	200.0	198.3	197.8	198.0	198.9	197.4	195.9	192.6	187.0	180.5	174.6	169.6	166.4
84.0	.0062	221.8	218.9	213.8	210.4	207.6	204.7	204.0	206.0	206.1	206.1	204.5	201.4	196.5	190.4	187.9	185.9	184.7
80.5	.0100	228.6	225.4	219.7	215.2	211.5	208.1	207.4	211.0	211.9	209.3	206.4	207.0	202.8	200.0	200.2	199.5	199.2
77.0	.0170	229.7	227.2	223.2	217.6	213.7	210.5	208.1	209.6	209.4	208.3	209.0	210.5	209.3	209.0	210.3	209.2	208.6
73.5	.0280	231.4	229.3	226.5	220.1	216.1	213.3	210.5	209.7	208.4	208.5	211.8	215.1	215.8	217.7	219.0	218.2	217.5
70.0	.0460	236.0	233.0	229.7	223.0	219.4	217.2	214.2	211.7	210.1	211.9	217.1	220.3	221.8	224.1	225.7	225.7	225.4
66.5	.0760	242.0	238.4	233.7	226.9	224.6	224.4	221.1	217.9	218.6	219.0	224.0	226.6	228.2	230.2	231.1	230.9	230.1
63.0	0.12	249.1	244.0	238.4	232.8	231.3	232.5	230.4	227.5	226.9	228.4	230.9	233.2	235.0	236.4	236.9	235.9	234.8
59.5	0.21	253.0	248.5	243.6	240.4	239.2	239.4	239.7	239.0	239.5	239.0	238.2	239.6	241.6	243.1	243.9	244.3	243.9
56.0	0.34	256.2	252.3	247.9	247.7	248.4	248.6	250.3	251.4	252.5	250.7	247.9	248.8	251.1	252.8	252.9	254.4	255.0
52.5	0.56	258.9	257.2	254.4	255.3	258.8	260.2	261.3	263.0	263.9	262.3	260.1	260.5	262.7	263.5	263.8	264.8	265.1
49.0	0.92	254.4	255.0	255.5	258.8	264.3	266.8	267.8	269.7	270.2	269.8	269.1	269.3	270.7	270.8	270.6	269.7	268.8
45.5	1.52	243.1	244.6	248.0	254.4	260.4	264.0	267.4	269.0	270.0	270.1	269.4	269.6	270.6	271.0	268.5	264.9	262.5
42.0	2.51	231.3	231.9	236.6	244.9	251.3	255.7	260.7	264.1	265.2	264.5	263.0	262.6	264.1	263.3	259.3	254.7	251.8
38.5	4.14	220.1	220.9	226.6	234.6	241.2	245.9	250.5	254.4	255.9	256.3	253.3	252.5	253.3	251.4	247.1	242.6	240.2
35.0	6.83	212.7	214.2	219.2	225.9	232.4	236.9	240.4	243.5	244.5	244.1	243.0	241.9	240.7	238.7	236.6	232.0	230.2
31.5	11.3	207.5	210.5	214.8	220.7	225.7	229.3	231.8	232.9	232.4	231.6	232.8	231.7	229.1	227.2	226.3	225.5	225.2
28.0	18.5	202.8	208.1	215.1	219.5	222.5	224.5	225.5	225.2	225.0	224.3	224.8	224.3	222.4	221.6	222.2	223.9	225.5
24.5	30.6	200.0	211.7	217.4	219.6	220.2	219.7	219.1	218.3	217.9	217.3	218.0	218.2	218.0	219.2	221.5	224.5	227.3
21.0	50.4	212.6	214.7	216.9	217.5	215.5	212.6	210.0	208.7	207.9	208.4	210.1	212.4	215.3	218.6	221.1	223.0	224.3
17.5	83.2	215.9	217.6	218.4	217.3	212.9	206.9	201.2	198.0	197.1	198.3	202.1	208.2	214.4	218.7	221.2	222.7	223.5
14.0	137.	218.2	219.9	220.1	217.7	213.5	208.3	203.6	200.6	200.2	201.0	204.4	208.6	214.8	218.7	221.3	222.8	223.3
10.5	226.	218.4	220.0	220.4	219.8	220.1	222.5	225.1	226.3	226.9	226.3	224.8	221.5	219.0	219.6	221.0	221.9	222.1
7.0	373.	221.9	224.5	228.9	234.8	240.7	246.4	251.3	253.6	254.2	253.3	250.3	244.8	238.1	233.0	229.0	226.1	224.2
3.5	614.	243.0	246.4	252.2	259.6	266.6	271.9	275.7	276.9	277.1	277.2	275.6	270.7	264.0	257.7	252.4	247.7	244.2
0.0	1013.		270.5	275.4	281.1	288.9	295.0	299.0	301.3	301.6	301.0	298.3	293.0	286.1	280.4	273.0	261.9	253.2

MAY ZONAL MEAN TEMPERATURE (K)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	335.1	337.3	340.4	343.7	346.9	349.7	352.6	356.0	359.7	364.1	368.8	373.0	376.8	379.8	382.1	383.8	384.8
119.0	.000042	269.4	270.3	270.9	270.5	269.2	267.8	267.4	268.9	272.6	278.3	285.5	293.0	299.8	304.9	307.7	308.7	308.8
115.5	.000069	240.3	238.0	234.2	229.2	224.0	219.8	217.7	218.2	221.3	226.6	233.6	242.1	251.5	261.2	270.4	278.1	283.2
112.0	.00011	220.7	217.7	213.1	207.7	202.7	199.2	197.6	197.9	200.1	203.7	208.2	213.5	219.7	226.8	234.1	240.5	245.1
108.5	.00019	207.1	204.5	200.8	196.8	193.2	190.6	189.5	189.8	191.1	193.0	195.1	197.1	199.3	201.6	203.7	205.6	206.8
105.0	.00031	199.3	197.1	194.2	191.1	188.6	187.2	186.9	187.3	188.0	188.4	188.1	186.9	185.5	183.9	182.3	181.0	180.0
101.5	.00051	198.1	194.2	191.7	189.2	187.2	186.3	186.3	186.9	187.3	186.7	184.8	181.4	177.1	172.5	168.0	164.3	161.8
98.0	.00084	198.1	196.1	193.1	190.1	187.7	186.5	186.4	186.9	187.3	186.4	183.6	178.8	172.4	165.5	158.9	153.6	150.1
94.5	.0014	204.6	202.1	198.5	194.4	190.7	188.1	187.1	187.2	187.0	187.0	184.2	178.8	171.1	162.5	154.3	147.7	143.4
91.0	.0023	215.6	212.6	208.2	203.1	198.3	194.4	191.9	190.9	190.6	189.9	187.5	182.1	173.9	164.1	154.4	146.4	141.3
87.5	.0038	225.1	221.2	216.2	211.5	206.4	201.8	198.8	198.0	197.8	198.2	193.6	188.1	179.0	168.4	156.7	151.1	146.1
84.0	.0062	231.8	227.1	221.6	217.5	212.0	208.4	204.0	205.2	205.8	203.6	200.7	195.4	185.8	176.0	168.6	163.4	160.0
80.5	.0100	233.9	230.0	225.7	221.2	214.8	208.3	206.4	207.1	208.1	208.4	204.1	200.3	192.6	185.5	180.8	177.1	174.5
77.0	.0170	233.5	231.4	230.2	224.4	217.1	209.9	205.5	205.3	205.7	205.8	205.1	203.5	199.3	196.9	193.5	189.9	187.4
73.5	.0280	234.9	234.3	234.8	228.2	220.4	212.7	208.8	204.1	203.5	206.0	208.2	208.2	206.6	206.4	206.0	203.9	201.8
70.0	.0460	238.5	238.6	239.5	232.7	224.4	216.4	209.4	206.6	206.0	209.1	213.2	214.6	214.2	215.5	217.5	217.1	216.4
66.5	.0760	243.9	244.2	244.7	237.2	229.3	223.7	216.9	212.7	212.6	216.8	220.9	222.5	222.7	224.4	226.8	227.8	227.9
63.0	0.12	251.2	250.5	248.8	241.6	234.5	232.4	228.3	224.7	225.2	227.9	230.3	231.1	231.7	234.0	236.1	237.0	237.3
59.5	0.21	257.0	255.8	251.9	246.2	240.1	240.0	239.6	238.3	238.9	240.3	238.8	240.1	240.4	243.8	246.1	248.4	250.1
56.0	0.34	260.1	258.8	254.2	249.8	247.2	248.4	250.6	252.3	253.0	251.0	248.9	249.6	251.2	254.6	257.3	260.4	263.0
52.5	0.56	259.4	258.8	254.3	252.1	253.8	257.3	260.2	262.1	262.8	260.6	259.7	260.8	263.5	265.9	268.1	270.9	273.9
49.0	0.92	250.4	250.8	248.4	249.8	257.0	262.4	265.6	267.1	267.1	267.1	266.7	269.9	271.6	273.7	275.4	277.9	280.6
45.5	1.52	238.0	238.6	238.1	242.6	253.6	260.8	265.6	266.2	266.3	266.0	267.9	270.2	273.2	275.0	276.2	277.1	278.4
42.0	2.51	227.0	226.8	226.8	232.1	242.9	252.7	259.0	261.0	261.3	261.6	261.5	263.5	267.2	268.5	269.0	270.5	270.9
38.5	4.14	216.4	215.7	215.8	221.4	232.8	242.3	249.4	253.0	254.2	253.8	252.7	253.5	256.2	257.1	257.3	258.3	258.0
35.0	6.83	208.2	206.3	207.7	214.6	225.6	233.6	238.7	243.5	244.7	243.9	242.9	243.1	243.7	244.3	245.2	245.7	245.2
31.5	11.3	194.8	198.6	204.1	212.7	221.1	227.5	230.9	233.2	233.1	232.2	233.2	233.3	232.3	232.3	233.7	235.6	236.4
28.0	18.5	187.4	195.9	205.4	213.6	219.7	223.5	225.2	225.6	225.3	225.0	226.2	226.2	225.2	225.6	226.7	228.3	230.0
24.5	30.6	194.3	201.1	209.1	215.2	218.7	219.5	219.2	218.6	218.1	218.2	219.6	219.7	219.8	221.5	223.8	226.5	229.1
21.0	50.4	200.1	204.9	210.4	214.9	215.4	213.3	211.1	208.6	208.8	208.6	211.4	213.0	216.7	220.4	224.1	227.5	230.0
17.5	83.2	204.9	208.5	212.8	215.7	214.0	208.5	202.4	198.9	198.0	199.0	202.4	208.2	214.6	219.7	223.8	227.0	229.4
14.0	137.	208.9	211.8	214.8	216.1	214.2	209.5	204.2	201.0	200.7	201.3	204.1	209.1	214.4	219.3	223.3	226.2	228.5
10.5	226.	211.7	214.2	216.1	217.3	218.5	221.4	224.4	225.8	226.7	226.4	225.3	222.6	219.9	220.8	223.3	225.3	227.1
7.0	373.	219.4	222.2	227.0	232.7	238.2	244.3	250.1	253.3	254.1	253.7	251.8	247.4	241.7	236.7	232.8	230.2	228.6
3.5	614.	241.2	245.2	251.0	257.7	264.2	269.9	274.7	276.7	277.1	277.3	276.0	273.2	267.9	262.0	257.2	253.4	250.4
0.0	1013.		273.4	276.9	280.9	287.6	293.5	298.0	300.8	301.4	301.3	298.2	294.6	288.0	281.7	277.5	269.3	263.6

JUNE ZONAL MEAN TEMPERATURE (K)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	320.5	323.2	327.1	331.1	336.0	338.5	342.1	346.3	351.2	356.8	362.7	368.1	372.9	376.7	379.0	381.7	382.9
119.0	.000042	261.8	262.4	262.4	261.5	260.1	258.1	258.0	262.2	267.1	274.1	282.4	290.9	298.6	304.4	308.1	309.9	310.4
115.5	.000069	236.9	234.2	229.9	224.6	219.3	215.4	213.9	215.3	219.3	225.6	233.5	242.7	252.9	263.7	274.4	283.8	290.4
112.0	.00011	220.9	217.4	212.2	206.3	200.8	198.9	195.5	196.3	199.1	203.3	208.4	214.3	221.4	229.1	237.2	244.7	250.2
108.5	.00019	210.3	207.0	202.4	197.6	193.2	190.1	188.8	189.2	190.0	193.1	195.4	197.7	200.0	202.3	204.5	206.5	207.9
105.0	.00031	204.9	202.0	197.9	193.6	190.0	187.7	186.9	187.2	187.9	188.4	188.1	187.0	185.4	183.5	181.5	179.6	178.2
101.5	.00051	204.1	201.1	196.9	192.8	189.4	187.3	186.7	187.0	187.3	186.7	184.6	181.0	176.2	170.9	165.8	161.3	158.2
98.0	.00084	206.0	204.6	199.8	194.6	190.2	187.6	186.7	187.0	187.3	186.4	183.3	177.9	170.8	163.0	155.6	149.5	145.5
94.5	.0014	216.6	212.5	206.4	199.7	193.7	189.5	187.5	187.3	187.6	187.0	183.8	177.6	169.0	159.3	150.2	142.7	137.9
91.0	.0023	225.2	222.0	216.3	209.4	202.2	196.6	193.0	191.2	190.0	189.9	187.0	180.7	171.2	159.9	149.0	140.2	134.5
87.5	.0038	227.8	224.3	219.7	214.0	208.7	203.1	199.1	197.0	196.3	195.1	192.2	185.9	174.7	162.4	150.7	142.1	136.7
84.0	.0062	227.7	223.6	219.5	216.2	210.9	206.0	201.7	201.6	202.1	200.5	198.0	192.2	179.1	167.7	156.9	150.8	147.0
80.5	.0100	228.8	225.1	222.0	218.7	212.7	206.5	202.1	202.8	204.2	202.6	201.1	198.7	184.9	176.1	167.3	163.0	160.2
77.0	.0170	230.6	228.4	227.3	223.3	216.4	207.3	202.9	202.3	203.4	202.5	202.8	200.1	191.9	186.5	180.2	176.4	174.0
73.5	.0280	235.3	233.9	234.0	229.3	220.8	210.5	204.5	202.1	202.3	203.6	205.4	204.1	199.8	197.5	194.6	191.9	189.9
70.0	.0460	241.1	240.4	241.0	236.7	225.7	215.3	207.2	204.7	204.8	206.6	208.8	209.1	206.1	206.2	206.6	207.4	206.4
66.5	.0760	248.4	247.9	248.0	241.7	232.4	223.0	215.7	212.6	212.8	214.6	215.9	216.4	217.9	219.4	221.9	222.3	222.2
63.0	0.12	257.7	256.3	253.9	247.0	238.5	233.2	228.0	225.2	226.0	226.9	226.8	228.4	229.1	231.5	235.0	235.9	236.3
59.5	0.21	265.4	263.1	257.9	251.4	243.3	241.4	238.5	239.7	240.3	240.7	238.3	238.6	240.5	244.0	247.7	249.7	251.0
56.0	0.34	267.9	266.0	259.8	253.0	248.7	248.9	248.9	252.0	252.4	251.5	250.0	250.2	251.8	256.2	259.7	263.3	265.8
52.5	0.56	262.3	262.2	258.4	254.4	253.7	256.9	258.6	261.2	261.3	260.4	259.8	260.7	262.4	267.0	270.1	274.1	277.4
49.0	0.92	250.3	252.0	250.6	249.8	255.3	261.5	265.2	265.1	264.5	265.2	266.9	266.1	269.8	273.6	277.0	281.3	285.0
45.5	1.52	238.2	240.6	239.4	239.9	249.9	258.8	264.0	262.9	262.6	263.4	265.7	268.6	272.2	275.1	278.9	282.6	285.7
42.0	2.51	227.1	229.7	227.6	227.2	237.1	249.8	256.8	257.3	257.5	257.5	256.9	262.0	266.0	270.0	274.0	277.6	279.8
38.5	4.14	213.7	216.5	214.4	214.7	225.6	238.5	247.3	250.2	251.0	250.0	250.0	252.5	255.5	259.7	263.4	267.6	268.6
35.0	6.83	198.0	202.4	204.0	207.6	219.1	230.2	237.9	241.7	242.5	241.3	241.0	242.9	245.1	248.1	251.5	254.7	255.8
31.5	11.3	182.7	189.9	198.5	206.8	217.2	226.1	229.7	232.1	231.8	231.0	232.8	233.7	236.8	237.5	240.5	243.0	244.4
28.0	18.5	181.4	189.0	199.2	209.5	217.7	223.0	224.6	224.7	224.3	225.0	226.2	227.1	228.1	229.3	231.7	233.9	236.0
24.5	30.6	189.4	196.5	204.8	212.9	218.0	219.3	219.3	218.3	217.7	218.6	219.7	220.5	221.9	224.1	227.1	229.9	232.6
21.0	50.4	192.8	199.0	206.8	213.2	215.4	213.9	212.0	211.1	210.1	210.8	212.3	214.4	217.7	222.0	226.1	229.9	232.4
17.5	83.2	196.7	202.7	209.5	214.9	215.0	209.6	203.5	200.6	200.0	200.5	202.8	207.3	214.0	220.6	225.2	228.8	231.4
14.0	137.	201.5	206.1	211.5	215.7	215.7	210.6	204.9	201.8	201.8	202.2	204.3	208.4	214.2	220.0	224.3	227.8	230.7
10.5	226.	207.3	210.1	213.2	216.2	218.7	221.7	224.4	225.2	225.9	226.1	226.4	225.2	222.9	222.7	224.6	227.3	229.0
7.0	373.	218.5	221.2	225.7	231.0	236.1	243.1	249.8	252.8	253.4	253.5	253.2	250.8	246.4	240.6	237.3	234.9	233.1
3.5	614.	241.1	244.1	250.0	256.4	262.0	268.2	274.0	278.3	278.7	277.1	277.5	275.7	271.4	266.2	262.4	259.5	256.7
0.0	1013.		268.4	274.9	280.2	286.3	292.0	296.9	300.1	301.0	301.2	300.0	298.7	290.2	283.2	281.5	276.4	271.3

Table B3 (cont.)

JULY ZONAL MEAN TEMPERATURE (K)

LOG-P	PRESSURE								LATITUDE								
ALT(km)	(mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	321.1	323.8	327.0	331.0	335.3	330.6	341.9	346.0	300.3	366.7	361.4	366.7	371.3	374.0	377.5	379.3	380.4
119.0	.000042	282.6	263.1	262.9	261.6	250.8	250.4	250.8	261.0	265.8	272.7	281.0	289.6	297.6	303.0	307.7	309.5	310.0
115.5	.000069	236.9	234.2	229.9	224.5	219.2	218.2	213.6	214.8	218.6	224.7	232.4	241.4	251.5	262.2	272.8	282.1	268.7
112.0	.00011	220.2	216.8	211.8	206.1	200.7	196.7	195.2	195.9	190.6	202.5	207.4	213.4	220.1	227.5	236.1	242.2	247.3
108.5	.00019	209.1	205.9	201.5	197.0	192.9	190.0	188.8	189.1	190.7	192.8	194.9	197.0	190.0	200.9	202.9	204.7	205.9
105.0	.00031	203.3	200.6	196.9	192.9	180.6	187.6	186.8	187.1	187.9	190.2	187.0	186.6	184.0	182.0	180.6	170.6	177.1
101.5	.00051	202.4	199.7	195.8	192.0	188.9	187.1	186.6	187.0	187.3	186.7	184.6	180.8	176.0	170.0	165.4	160.9	157.8
98.0	.00084	206.2	203.1	198.7	193.9	180.8	187.4	186.7	187.0	187.3	186.4	183.3	177.9	170.0	163.1	155.9	140.9	145.9
94.5	.0014	215.0	211.2	205.4	199.1	193.5	189.5	187.6	187.4	187.7	187.1	184.0	176.0	160.5	159.9	150.9	143.5	130.7
91.0	.0023	222.9	220.3	215.2	208.7	201.8	196.5	193.1	191.5	191.0	190.2	187.4	181.3	172.0	160.9	150.2	141.4	135.8
87.5	.0038	223.3	221.2	218.1	213.7	207.8	202.5	198.5	190.7	196.0	195.2	192.8	186.9	176.5	163.0	151.8	143.2	137.9
84.0	.0062	221.4	219.0	217.3	214.6	209.3	204.3	200.5	190.9	190.0	200.3	196.9	193.5	182.6	166.7	156.9	150.5	147.2
80.5	.0100	222.6	220.3	219.0	216.5	210.8	205.4	202.0	201.6	201.9	202.7	202.6	196.6	189.1	176.4	166.0	161.4	150.5
77.0	.0170	226.3	224.0	223.0	220.1	214.1	208.0	204.5	203.3	203.0	203.6	204.7	202.4	195.8	185.9	177.7	174.0	172.7
73.5	.0280	231.9	229.6	228.7	224.6	217.2	210.8	208.6	206.3	204.9	205.8	209.7	205.7	202.2	196.0	191.5	180.2	180.3
70.0	.0460	239.6	237.0	235.2	229.6	220.5	214.2	209.0	209.0	209.9	209.9	209.7	209.0	206.2	207.4	205.9	204.9	204.7
66.5	.0760	250.4	246.3	242.2	235.1	226.3	220.1	217.2	216.5	217.4	217.8	216.6	218.4	215.8	218.2	220.0	220.7	221.2
63.0	0.12	261.8	256.7	249.8	240.9	232.5	227.9	227.4	227.0	229.5	220.9	227.5	225.4	225.0	229.4	233.3	236.0	237.3
59.5	0.21	270.6	265.5	256.8	247.1	238.4	236.9	237.9	240.5	242.2	242.6	239.9	237.8	230.3	242.9	246.4	250.2	252.2
56.0	0.34	273.1	269.7	262.1	253.3	244.3	247.0	248.3	252.5	254.0	253.1	250.2	240.9	240.8	253.8	250.7	263.1	265.8
52.5	0.56	266.0	266.6	263.7	257.8	256.6	257.6	260.4	262.1	262.4	261.0	259.9	250.6	259.9	263.7	268.7	273.1	276.8
49.0	0.92	256.0	256.9	258.8	256.9	259.9	263.2	265.7	265.4	264.1	264.4	264.7	266.2	267.4	270.8	274.8	279.7	283.7
45.5	1.52	246.6	249.9	250.3	249.7	254.9	268.4	263.1	262.3	261.1	261.1	263.5	265.0	260.4	271.8	276.3	280.5	283.8
42.0	2.51	236.9	230.9	230.8	236.0	243.0	251.0	254.9	256.4	256.3	254.3	256.2	250.3	262.4	266.7	271.6	275.4	277.5
38.5	4.14	222.3	225.2	225.3	225.0	231.4	230.7	246.2	247.0	240.1	246.4	246.5	240.0	252.8	257.5	262.1	265.6	267.2
35.0	6.83	204.4	208.5	211.5	215.0	223.7	231.5	236.5	230.5	230.3	238.2	238.7	240.2	243.1	247.5	251.3	254.3	256.4
31.5	11.3	186.1	192.3	200.7	210.0	220.4	227.3	229.5	230.3	229.4	230.0	230.4	232.0	234.6	230.4	241.0	243.5	244.6
28.0	18.5	178.0	186.7	197.1	210.2	219.7	223.8	224.4	223.0	223.1	223.8	224.6	226.4	228.0	230.2	232.5	234.9	236.8
24.5	30.6	186.0	192.5	201.3	212.3	218.6	219.5	219.3	218.0	217.3	217.9	219.6	220.5	222.4	224.9	227.0	230.5	233.0
21.0	50.4	187.9	195.0	203.1	211.3	215.3	214.8	212.7	211.4	210.3	211.1	212.6	214.6	217.8	222.3	226.6	230.0	232.5
17.5	83.2	191.5	197.2	205.3	212.8	214.7	210.0	204.2	201.9	201.3	201.8	203.7	209.9	212.0	220.2	225.5	229.1	231.6
14.0	137.	198.3	200.3	207.3	214.2	215.8	211.0	205.3	203.0	203.0	203.4	205.1	208.2	213.6	219.9	224.4	227.9	230.7
10.5	226.	203.4	205.8	210.0	215.1	219.3	222.4	224.5	224.9	225.3	225.7	226.6	227.1	225.9	224.5	225.3	227.4	229.6
7.0	373.	218.5	220.4	224.3	229.3	236.1	242.8	240.7	252.5	252.0	253.1	253.5	252.9	240.0	244.0	240.4	237.6	235.9
3.5	614.	240.5	243.0	240.0	256.3	261.3	267.8	273.7	276.1	276.3	276.0	277.3	277.1	274.1	260.3	265.6	263.0	260.4
0.0	1013.		287.4	274.8	279.6	286.1	291.2	296.0	290.4	300.3	301.1	300.4	298.5	293.3	285.5	283.6	279.8	274.3

AUGUST ZONAL MEAN TEMPERATURE (K)

LOG-P	PRESSURE								LATITUDE								
ALT(km)	(mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	336.7	340.8	343.7	346.6	349.3	351.6	353.0	356.1	350.2	363.0	367.1	371.0	374.2	376.7	378.3	379.4	380.0
119.0	.000042	273.2	273.7	273.0	272.6	270.5	260.3	267.1	267.9	270.9	276.2	283.0	290.6	297.4	302.8	300.0	307.2	307.3
115.5	.000069	241.9	239.5	235.5	230.4	224.0	220.6	210.0	217.9	220.4	226.0	231.6	239.4	248.4	257.0	268.6	274.0	270.8
112.0	.00011	220.0	217.2	212.9	207.9	203.0	190.1	197.4	197.6	190.2	202.2	206.2	211.2	217.2	223.6	230.0	236.7	230.6
108.5	.00019	204.7	202.3	199.1	195.8	192.7	190.5	189.6	189.8	190.9	192.4	194.0	195.7	197.4	190.1	200.8	202.5	203.6
105.0	.00031	195.7	194.0	191.8	189.5	187.7	186.7	186.7	187.3	187.9	188.1	187.6	186.3	184.7	182.9	181.2	179.8	178.6
101.5	.00051	191.8	190.3	186.6	187.1	186.0	186.7	186.1	186.9	187.3	186.7	184.7	181.4	177.1	172.4	160.1	164.5	162.1
98.0	.00084	193.1	191.8	188.8	187.8	186.4	185.9	186.2	186.9	187.3	186.6	183.0	179.2	173.1	166.4	160.2	156.2	152.0
94.5	.0014	190.1	197.4	194.9	192.1	180.6	187.8	187.2	187.4	187.7	187.2	184.7	179.0	172.7	164.6	150.9	150.6	146.6
91.0	.0023	200.1	207.3	204.4	200.7	197.0	194.1	192.2	191.4	191.1	186.5	186.3	183.6	176.3	167.2	150.1	150.6	146.7
87.5	.0038	214.8	213.6	211.7	206.2	204.2	200.7	190.1	196.7	196.4	196.0	194.4	190.1	182.4	172.4	162.4	156.0	150.8
84.0	.0062	217.5	216.8	216.2	213.1	206.9	206.0	202.2	200.7	201.0	201.0	201.2	197.0	190.0	179.7	169.9	164.4	162.9
80.5	.0100	219.9	219.1	219.4	216.6	212.1	209.3	205.2	202.0	203.1	204.0	206.2	203.5	196.6	187.2	178.4	174.6	174.9
77.0	.0170	222.5	221.4	222.3	220.0	215.7	211.7	209.4	205.1	204.6	206.0	207.6	207.3	202.3	194.0	187.6	184.9	186.6
73.5	.0280	226.4	224.2	224.9	222.8	218.0	214.7	211.1	208.1	207.7	209.4	211.0	210.0	206.0	203.7	190.3	197.5	198.4
70.0	.0460	233.2	229.0	227.7	225.2	220.9	217.1	214.1	211.9	212.7	214.7	216.6	216.1	213.0	212.2	211.8	210.9	212.1
66.5	.0760	243.4	236.3	231.4	228.5	224.2	220.0	219.0	218.0	220.6	222.1	222.7	221.6	220.3	220.9	223.5	224.9	226.7
63.0	0.12	256.5	246.1	237.1	232.3	228.1	228.3	227.2	228.6	230.5	231.6	232.1	230.3	228.4	229.7	234.3	230.4	241.6
59.5	0.21	267.8	257.8	245.8	237.6	233.0	234.3	236.6	239.0	241.9	242.7	242.3	239.0	238.3	239.6	244.5	249.7	253.2
56.0	0.34	275.5	267.6	255.7	245.6	241.7	246.1	240.5	252.6	254.1	253.0	250.2	246.0	247.6	240.6	254.1	260.7	262.2
52.5	0.56	273.6	270.5	262.7	253.8	262.1	256.3	260.8	263.1	264.0	262.2	260.2	256.0	256.6	259.5	262.8	266.3	269.7
49.0	0.92	267.1	268.0	264.2	257.9	258.1	262.5	266.0	267.9	267.4	266.5	264.6	263.9	264.5	267.3	269.1	272.2	275.3
45.5	1.52	250.0	262.2	260.4	256.4	256.3	261.0	265.5	266.0	265.3	264.0	263.9	263.3	265.3	267.7	270.3	272.8	274.7
42.0	2.51	240.8	254.7	253.7	240.0	247.0	252.2	267.1	250.7	260.3	256.7	255.6	256.3	260.7	261.6	264.6	266.9	267.9
38.5	4.14	234.9	241.3	241.0	237.0	238.3	242.2	246.9	240.6	246.6	247.3	246.4	247.0	250.1	252.8	256.4	257.5	258.1
35.0	6.83	215.7	223.9	227.5	227.6	230.3	234.2	237.5	238.0	238.6	237.9	238.2	238.3	240.2	243.9	246.3	247.7	247.9
31.5	11.3	192.7	203.7	212.6	219.6	225.1	228.7	229.4	229.7	228.9	229.4	229.0	230.9	232.5	235.6	237.2	238.3	238.8
28.0	18.5	179.0	191.5	204.5	210.2	222.8	224.9	224.3	223.3	222.4	222.7	223.4	226.2	226.3	226.3	229.8	230.9	232.0
24.5	30.6	186.2	194.2	204.9	214.7	220.1	220.3	219.0	217.4	216.4	216.0	217.6	219.6	221.5	223.7	225.8	227.6	229.3
21.0	50.4	188.3	194.7	204.3	213.4	217.3	216.7	213.1	211.9	211.2	211.3	212.4	214.8	217.5	221.6	225.1	227.8	229.8
17.5	83.2	190.9	196.0	205.1	213.8	215.9	210.7	204.6	202.3	202.0	202.1	203.7	206.0	212.4	219.0	224.5	227.4	229.6
14.0	137.	195.0	196.9	206.4	214.3	216.2	211.4	206.4	203.0	203.0	203.3	205.0	207.9	213.0	219.4	223.7	226.7	229.2
10.5	226.	202.0	204.7	200.4	215.5	220.1	222.9	224.4	224.7	225.1	225.6	226.0	227.0	225.0	224.4	224.5	225.9	227.9
7.0	373.	217.5	220.8	224.8	220.0	235.4	242.8	240.6	252.3	252.6	253.2	253.6	252.8	240.1	243.6	230.4	236.4	234.0
3.5	614.	230.8	243.8	240.1	256.2	261.0	267.6	273.0	276.0	276.1	276.0	277.4	277.1	274.3	260.9	264.7	261.5	258.7
0.0	1013.		270.0	273.1	278.1	285.1	290.9	296.7	290.0	300.1	301.3	300.7	290.3	286.1	287.2	284.0	279.5	273.5

SEPTEMBER ZONAL MEAN TEMPERATURE (K)

LOG-P	PRESSURE								LATITUDE								
ALT(km)	(mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	367.9	368.6	369.7	370.7	371.4	371.8	372.1	372.4	373.2	374.3	376.0	377.2	378.2	378.9	378.2	379.3	379.3
119.0	.000042	290.0	291.8	292.4	291.6	290.2	286.9	282.6	288.0	289.7	283.0	287.1	292.1	296.8	300.2	301.6	301.5	300.8
115.5	.000069	254.9	252.6	248.6	243.0	230.0	230.9	228.4	224.1	224.0	226.2	230.6	236.7	243.9	251.4	258.0	263.0	268.0
112.0	.00011	225.7	223.0	218.9	214.0	200.1	206.2	202.4	201.1	201.2	202.0	205.2	208.9	213.6	219.1	224.5	229.0	232.0
108.5	.00019	203.2	201.6	190.3	196.9	194.6	192.7	191.6	191.2	191.4	192.0	193.1	194.5	196.3	190.3	200.4	202.2	203.5
105.0	.00031	186.1	187.5	186.0	186.2	186.1	188.5	187.1	187.7	188.1	188.0	187.4	186.5	185.4	184.7	184.2	183.9	183.8
101.5	.00051	179.0	179.3	179.8	180.6	182.2	183.9	185.5	186.8	187.3	186.0	185.1	182.7	179.8	178.8	174.2	172.2	171.0
98.0	.00084	175.2	175.9	177.1	178.9	181.1	183.4	185.4	186.8	187.3	186.6	184.7	181.4	177.3	172.9	168.8	165.6	163.6
94.5	.0014	176.4	177.4	179.0	180.9	182.9	184.7	186.2	187.2	187.0	187.1	185.5	182.4	178.0	172.9	166.0	164.0	161.4
91.0	.0023	183.3	184.4	186.0	187.6	188.9	189.8	190.3	190.6	190.0	190.4	190.2	186.0	182.9	177.7	172.2	167.5	164.4
87.5	.0038	194.2	195.1	196.1	196.4	196.6	196.6	196.6	196.8	197.1	196.9	195.7	193.0	190.6	185.9	180.8	177.1	174.1
84.0	.0062	206.3	206.9	207.2	206.4	204.2	203.3	202.9	203.1	203.9	203.9	202.0	201.7	190.6	196.6	192.1	191.4	180.4
80.5	.0100	213.0	214.0	216.5	212.6	210.0	207.9	206.4	205.0	206.2	206.0	206.1	206.0	205.2	202.1	190.9	201.1	199.9
77.0	.0170	217.7	219.0	221.6	219.1	215.3	211.7	206.4	206.1	206.9	207.1	207.8	209.4	208.7	206.6	205.3	206.7	205.9
73.5	.0280	222.2	222.9	225.5	224.3	220.2	216.7	211.4	208.2	207.0	210.0	211.4	212.0	212.0	211.2	211.7	212.9	212.8
70.0	.0460	227.8	227.1	228.0	227.3	224.0	219.4	216.7	212.0	211.9	214.3	216.4	217.1	216.0	216.0	218.5	220.0	220.9
66.5	.0760	234.8	232.0	231.6	230.0	227.7	224.1	221.4	219.1	218.9	221.2	223.5	224.0	221.9	221.6	225.3	228.2	230.9
63.0	0.12	244.9	239.2	235.0	234.1	231.6	229.6	228.1	229.1	228.2	230.3	232.1	231.9	229.2	229.0	232.6	236.5	240.5
59.5	0.21	256.7	249.9	242.0	238.2	236.6	236.4	236.3	230.3	230.0	230.9	241.1	239.1	237.3	237.8	240.7	243.9	247.7
56.0	0.34	272.0	261.7	250.4	245.4	244.8	240.7	248.2	250.9	252.2	251.1	240.4	247.7	246.7	246.9	248.2	251.1	254.5
52.5	0.56	277.0	266.3	256.1	253.6	254.5	257.8	260.3	262.5	263.3	262.2	250.1	250.0	257.7	257.3	257.6	250.0	260.2
49.0	0.92	277.9	271.1	263.4	258.6	260.4	264.3	267.5	260.7	260.2	260.1	267.0	266.3	266.4	264.6	263.5	262.4	261.3
45.5	1.52	275.3	270.2	262.8	257.5	258.8	263.4	267.5	260.6	260.9	267.5	266.0	264.0	263.6	263.0	260.9	257.6	255.3
42.0	2.51	271.5	267.2	256.3	250.6	250.6	256.2	260.5	262.2	262.3	260.0	256.7	256.3	256.7	256.7	252.6	248.4	246.1
38.5	4.14	259.5	257.4	240.1	241.4	241.2	245.2	250.5	252.3	251.9	250.0	246.0	247.2	240.9	246.3	243.8	239.6	237.4
35.0	6.83	240.6	242.2	237.7	232.3	232.5	236.5	240.3	241.6	240.9	240.1	239.2	238.1	237.3	237.3	236.3	232.7	230.6
31.5	11.3	215.9	222.7	225.5	225.1	226.1	229.2	230.9	231.1	230.0	230.9	230.9	230.0	230.0	229.7	229.1	227.4	226.0
28.0	18.5	196.5	207.1	215.7	222.1	224.2	224.7	224.1	223.9	223.4	223.0	223.5	223.7	224.0	224.1	223.6	222.9	222.1
24.5	30.6	197.7	202.3	210.5	219.7	222.1	220.4	218.4	217.0	216.2	216.1	217.2	218.7	220.0	220.9	221.7	221.8	221.6
21.0	50.4	194.4	190.7	200.1	216.9	218.7	215.7	212.6	211.1	210.4	210.7	212.1	214.6	217.0	219.9	222.0	222.8	223.1
17.5	83.2	193.8	190.6	207.2	215.9	218.9	210.7	204.4	201.8	201.0	201.3	203.0	206.7	212.5	218.6	222.3	223.8	224.5
14.0	137.	196.1	190.9	207.4	215.6	217.0	211.4	205.4	202.6	202.8	202.8	204.2	207.2	212.7	218.4	222.1	224.0	225.3
10.5	226.	202.0	205.1	210.3	216.8	220.0	223.0	224.4	225.1	226.0	226.0	226.2	226.6	223.5	222.2	222.0	223.4	224.4
7.0	373.	218.4	220.7	225.0	230.5	236.4	243.5	240.9	252.6	253.2	253.4	253.2	251.3	246.0	240.3	235.8	232.5	230.2
3.5	614.	240.2	243.0	240.3	256.0	262.1	268.7	274.2	276.1	276.4	277.0	277.2	276.0	271.6	265.4	260.5	256.8	254.0
0.0	1013.		271.3	274.5	279.0	285.4	290.9	296.8	290.1	300.2	301.2	300.8	290.0	293.8	286.3	281.7	275.8	268.8

ORIGINAL PAGE IS
OF POOR QUALITY

Table B3 (cont.)

OCTOBER ZONAL MEAN TEMPERATURE (K)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	395.2	394.6	393.5	392.2	390.8	390.0	387.2	385.2	383.1	381.4	380.0	378.0	377.3	376.1	374.9	373.8	373.0
119.0	.000042	300.7	310.7	311.4	310.6	308.0	303.0	298.9	294.4	291.3	290.1	290.0	292.5	294.4	295.3	294.9	293.5	292.0
115.5	.000069	273.8	270.9	265.9	258.1	251.4	243.9	237.4	232.4	229.4	228.6	230.0	233.4	238.4	244.0	249.1	252.7	254.7
112.0	.00011	239.2	235.8	230.7	224.8	218.8	213.3	208.7	205.4	203.3	202.7	203.7	206.4	210.5	215.4	220.3	224.4	227.0
108.5	.00019	208.1	206.5	204.2	201.6	199.0	196.6	194.6	193.1	192.0	191.5	191.8	193.2	196.4	198.3	201.4	204.1	206.0
105.0	.00031	185.2	185.3	185.4	186.0	186.8	187.6	188.2	188.5	188.4	187.9	187.4	187.1	187.4	188.0	189.1	190.4	191.4
101.5	.00051	170.5	171.8	173.9	176.6	179.7	182.7	185.2	186.8	187.3	186.9	185.7	184.5	183.4	182.9	182.8	182.9	183.2
98.0	.00084	161.4	163.7	167.2	171.6	176.4	180.9	184.4	186.6	187.3	186.8	186.0	184.0	182.6	181.3	180.4	179.9	179.7
94.5	.0014	157.0	159.9	164.5	170.2	176.1	181.3	185.0	187.0	187.5	187.1	186.2	186.1	184.0	183.1	182.4	181.9	181.5
91.0	.0023	158.0	161.6	167.1	173.6	180.0	185.0	188.2	189.7	190.1	190.0	189.9	189.8	189.9	189.9	189.7	189.5	189.3
87.5	.0038	167.1	170.4	175.2	180.8	186.9	191.7	194.8	196.5	198.1	197.9	197.1	197.2	198.3	199.4	200.1	201.6	202.4
84.0	.0062	184.4	186.4	188.9	191.4	195.9	200.0	202.7	205.1	208.8	207.8	205.1	204.7	206.6	208.8	210.4	214.9	217.3
80.5	.0100	198.5	199.9	201.6	201.5	203.7	205.4	206.4	208.2	211.9	211.2	208.6	208.8	210.9	213.8	216.3	221.5	224.5
77.0	.0170	208.2	209.8	211.9	210.7	210.3	209.0	207.0	207.2	209.2	208.8	209.1	210.9	213.1	216.1	219.0	223.4	225.9
73.5	.0280	217.6	219.1	220.8	219.5	216.9	213.8	209.8	207.5	208.0	208.7	211.3	213.4	215.5	218.5	223.1	225.9	228.5
70.0	.0460	226.2	227.0	227.6	226.1	223.0	219.4	215.6	210.9	209.5	211.5	214.5	217.0	218.7	221.4	226.6	230.2	233.9
66.5	.0760	232.2	232.6	232.9	232.0	229.2	226.1	222.7	218.1	215.7	217.5	221.2	224.0	223.9	225.4	231.0	236.0	241.3
63.0	0.12	238.4	238.1	238.2	237.4	235.5	233.0	230.1	227.6	225.9	227.0	230.1	231.9	230.9	231.5	236.3	242.0	248.0
59.5	0.21	249.8	247.1	244.5	242.8	241.0	239.6	237.8	238.4	238.4	238.3	239.1	238.8	239.0	239.8	242.4	246.6	251.9
56.0	0.34	263.5	256.1	252.7	250.7	249.1	248.6	248.0	250.2	251.5	250.7	248.8	248.6	248.5	248.1	247.9	250.6	254.3
52.5	0.56	273.3	267.2	261.8	259.7	260.1	260.2	260.1	261.5	262.8	262.2	260.8	260.4	258.9	256.3	256.0	256.4	256.3
49.0	0.92	281.6	275.1	269.2	266.2	267.4	268.5	268.9	268.7	269.1	268.6	267.2	266.9	264.6	259.9	256.4	253.1	250.6
45.5	1.52	284.2	277.2	269.7	266.1	266.3	267.9	268.8	268.8	269.2	268.5	266.7	264.1	260.8	256.8	249.5	242.8	237.9
42.0	2.51	283.8	275.2	263.9	258.1	258.2	259.7	262.0	263.4	263.8	262.7	260.0	256.6	251.7	246.9	239.3	230.5	224.2
38.5	4.14	272.8	265.4	253.7	247.1	247.2	249.2	252.4	254.7	254.9	253.3	250.1	246.8	241.8	237.0	230.3	221.3	214.3
35.0	6.83	256.0	251.0	242.6	236.2	235.8	239.0	242.4	244.0	244.3	243.0	240.3	236.7	232.8	228.2	223.4	216.7	210.6
31.5	11.3	233.6	234.4	231.8	227.2	226.7	230.0	232.6	232.2	232.8	232.9	231.8	228.9	225.7	222.4	218.4	215.3	211.1
28.0	18.5	217.0	221.8	226.9	225.1	224.0	224.5	224.7	224.3	224.0	224.1	224.4	223.3	221.4	219.2	216.3	213.6	210.2
24.5	30.6	212.7	217.1	224.1	223.9	222.2	220.1	218.2	217.1	216.4	216.7	217.7	218.6	218.5	217.8	216.9	214.6	212.1
21.0	50.4	207.2	210.8	216.3	219.9	218.9	215.1	211.9	210.5	210.0	210.2	211.4	213.2	215.2	217.3	218.3	217.0	215.1
17.5	83.2	203.7	208.0	214.0	218.7	216.9	210.2	203.5	200.2	198.6	198.9	202.0	206.4	212.1	216.9	219.5	219.4	218.5
14.0	137.	202.7	207.1	213.3	218.2	217.0	211.0	204.9	201.6	201.2	201.4	203.2	207.3	212.6	217.1	220.0	221.0	220.9
10.5	226.	205.7	208.5	213.3	218.6	221.2	222.9	224.6	225.4	225.9	225.7	225.4	223.6	220.8	220.2	220.7	220.7	220.9
7.0	373.	220.2	222.0	226.3	232.1	238.0	244.3	250.1	252.7	253.4	253.3	252.1	248.2	242.0	236.6	232.0	228.0	224.9
3.5	614.	242.6	244.9	250.1	256.6	263.5	268.8	274.3	276.2	276.5	276.9	276.5	273.4	267.7	261.3	256.6	251.0	246.6
0.0	1013.		273.3	276.0	280.5	286.4	292.1	296.5	298.4	300.5	301.3	300.5	297.3	291.1	283.7	277.5	268.5	261.6

NOVEMBER ZONAL MEAN TEMPERATURE (K)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	410.9	408.9	406.3	403.1	399.8	396.3	392.5	388.3	384.1	379.8	375.9	372.4	369.3	366.5	363.9	361.8	360.3
119.0	.000042	319.5	320.5	321.0	320.1	317.1	312.1	305.9	299.5	294.1	290.3	288.3	287.6	287.4	286.8	285.2	283.1	281.1
115.5	.000069	289.3	285.4	279.2	271.1	262.0	252.8	244.3	237.1	231.6	228.3	227.5	229.2	232.9	237.5	241.9	245.1	246.8
112.0	.00011	254.9	249.8	242.6	234.7	226.8	219.6	213.3	208.1	204.1	201.9	201.6	203.6	207.4	212.5	217.8	222.3	225.2
108.5	.00019	215.9	213.8	210.7	207.1	203.6	200.3	197.3	194.8	192.6	191.1	190.8	192.0	194.9	199.0	203.3	207.2	209.9
105.0	.00031	185.8	186.2	186.8	187.7	188.6	189.2	189.5	189.2	188.5	187.7	187.3	187.8	189.4	191.9	194.9	197.9	200.1
101.5	.00051	166.3	168.3	171.3	175.0	178.9	182.4	185.3	187.0	187.4	186.9	186.4	186.2	187.1	188.9	191.4	193.9	195.7
98.0	.00084	153.5	156.6	161.4	167.3	173.6	179.4	183.8	186.4	187.3	186.9	186.3	186.2	187.1	189.1	191.5	194.0	195.9
94.5	.0014	145.7	149.7	155.8	163.4	171.5	178.7	184.0	186.8	187.5	187.1	186.8	187.4	189.1	192.2	195.8	199.0	201.2
91.0	.0023	142.7	147.4	154.9	164.0	173.4	181.4	186.6	189.1	189.6	189.7	190.3	192.4	196.0	200.5	204.8	208.5	211.1
87.5	.0038	146.8	151.5	158.8	168.3	178.7	187.4	192.9	195.6	197.4	197.6	199.1	200.5	205.0	208.8	213.9	217.7	220.4
84.0	.0062	160.3	163.9	169.2	176.9	186.9	195.6	201.3	204.7	208.4	208.0	206.7	208.1	212.3	216.9	220.4	224.1	226.6
80.5	.0100	174.6	177.6	181.8	187.0	194.4	201.1	205.3	208.4	212.3	211.6	210.0	211.4	215.8	220.5	223.9	226.5	228.3
77.0	.0170	187.3	190.2	194.3	197.4	201.2	204.3	206.2	207.8	209.7	208.8	209.9	212.7	217.6	222.6	227.1	227.4	227.9
73.5	.0280	201.6	204.0	207.1	207.8	208.6	208.8	209.1	209.1	207.3	209.5	210.8	214.8	220.1	225.1	230.1	229.4	229.4
70.0	.0460	216.0	216.9	217.6	216.8	216.1	215.2	214.0	211.3	209.5	209.7	212.8	217.7	223.3	228.2	233.3	232.9	233.1
66.5	.0760	227.4	227.1	226.3	225.3	224.5	223.0	221.6	219.0	215.6	216.4	219.5	224.2	227.8	231.9	237.4	238.1	238.9
63.0	0.12	236.8	236.1	235.3	234.6	233.4	231.7	230.9	230.0	227.8	227.4	229.8	232.2	233.1	236.5	241.5	244.7	246.8
59.5	0.21	250.0	247.9	245.2	244.1	241.7	241.1	240.5	242.1	241.6	241.1	240.3	240.0	239.9	243.1	246.5	251.2	254.1
56.0	0.34	263.9	260.6	256.8	254.8	252.6	251.0	250.0	252.4	253.5	252.7	250.7	249.1	248.7	250.4	252.1	256.7	259.1
52.5	0.56	274.5	271.2	267.8	265.9	264.7	262.9	261.1	261.2	262.4	261.8	260.1	258.7	256.8	256.2	256.6	260.0	261.6
49.0	0.92	283.2	279.8	276.3	274.1	273.2	272.5	270.5	267.6	267.0	267.0	266.2	264.6	260.9	255.8	252.9	253.3	252.8
45.5	1.52	284.9	281.9	278.9	276.8	275.4	273.1	270.3	267.9	269.9	269.9	267.1	263.3	257.5	248.9	243.2	240.0	237.3
42.0	2.51	282.1	278.8	274.5	271.9	270.0	266.6	264.6	263.2	262.7	262.5	261.2	256.4	246.9	238.2	231.8	225.9	221.3
38.5	4.14	272.5	269.3	264.4	260.9	258.2	255.6	256.0	256.0	256.1	254.0	251.2	244.7	236.3	227.5	221.6	215.6	210.4
35.0	6.83	260.5	257.6	252.8	247.6	244.3	243.4	243.7	244.3	244.0	243.6	240.4	234.6	227.5	219.3	213.7	208.4	203.4
31.5	11.3	248.1	245.6	240.4	234.3	231.0	231.4	232.0	231.3	232.1	232.2	229.9	226.4	220.5	215.0	209.4	204.4	199.6
28.0	18.5	236.6	235.9	232.8	228.5	224.8	224.2	223.7	223.2	223.2	223.5	223.0	221.0	217.4	213.9	209.4	204.8	200.5
24.5	30.6	235.8	234.4	229.7	226.2	221.8	219.3	217.8	216.8	216.2	216.6	217.2	217.1	216.5	215.2	212.8	209.4	206.2
21.0	50.4	233.7	232.0	228.2	222.4	217.2	213.0	210.5	209.4	208.6	208.8	210.2	211.8	214.1	215.5	215.2	212.3	209.9
17.5	83.2	228.9	228.0	225.5	220.9	215.0	208.0	202.0	198.6	197.9	198.3	201.2	206.3	212.4	216.1	217.0	215.2	212.5
14.0	137.	221.8	222.4	221.8	220.0	215.5	209.4	203.8	200.4	200.0	200.5	202.8	207.7	213.0	216.7	218.2	217.3	215.7
10.5	226.	214.8	216.5	218.7	220.5	221.0	222.5	224.6	225.5	226.0	225.7	224.3	222.0	219.2	218.7	218.9	218.1	217.0
7.0	373.	223.4	225.1	228.8	234.4	240.0	245.7	250.5	252.8	253.6	253.2	250.9	245.2	238.1	232.6	228.2	225.0	222.9
3.5	614.	246.4	247.7	252.2	256.9	265.6	271.4	275.2	276.3	276.7	277.0	275.7	270.6	263.5	256.8	251.1	246.6	243.8
0.0	1013.		269.9	275.0	280.4	287.2	292.9	297.2	299.9	300.5	301.0	299.7	296.2	288.3	281.4	272.3	261.3	255.7

DECEMBER ZONAL MEAN TEMPERATURE (K)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	412.9	410.5	407.1	403.2	398.9	394.3	389.3	383.8	378.2	372.9	368.0	363.5	359.5	355.8	352.2	349.3	347.2
119.0	.000042	321.5	322.3	322.5	321.0	317.4	311.5	304.1	296.6	289.8	284.6	281.3	279.5	278.6	277.7	276.2	274.0	272.1
115.5	.000069	297.3	292.1	284.4	275.0	264.8	254.5	245.0	236.7	230.0	225.5	223.6	224.4	227.6	232.2	236.9	240.5	242.6
112.0	.00011	263.4	256.8	248.0	238.7	229.7	221.6	214.6	208.5	203.6	200.5	199.6	201.2	205.2	210.6	216.4	221.4	224.8
108.5	.00019	219.4	217.0	213.5	209.5	205.5	201.7	198.2	195.1	192.4	190.5	190.0	191.3	194.8	199.5	204.8	209.5	212.8
105.0	.00031	185.6	186.3	187.1	188.2	189.2	189.8	189.9	189.5	188.5	187.5	187.2	188.2	190.6	194.3	198.5	202.8	205.7
101.5	.00051	163.6	166.2	169.9	174.1	178.4	182.3	185.3	187.0	187.4	187.0	186.7	187.3	189.3	192.6	196.8	200.7	203.5
98.0	.00084	149.2	152.9	158.5	165.2	172.2	178.6	183.5	186.4	187.3	187.0	186.7	187.4	189.7	193.6	198.2	202.8	206.0
94.5	.0014	140.1	144.7	151.7	160.2	169.3	177.5	183.5	186.7	187.5	187.1	187.1	188.6	192.0	197.6	203.7	209.2	212.9
91.0	.0023	135.7	141.1	149.4	159.6	170.4	179.7	186.0	188.9	189.6	189.8	191.0	194.5	200.2	206.8	213.4	219.1	222.7
87.5	.0038	137.2	142.4	150.8	162.1	174.6	185.1	191.7	194.7	196.9	196.3	197.8	202.3	209.1	215.1	220.0	224.5	227.7
84.0	.0062	147.1	151.2	157.7	168.6	181.5	192.7	199.4	202.4	204.4	204.2	204.1	207.9	214.2	219.4	222.6	226.0	229.1
80.5	.0100	160.3	163.6	168.8	177.8	188.6	198.1	203.8	206.1	208.4	207.6	206.7	210.0	216.3	221.5	224.6	227.1	229.6
77.0	.0170	174.0	177.0	181.6	188.3	195.4	201.7	205.6	206.6	208.3	207.6	207.6	211.3	218.5	223.7	227.7	228.7	230.2
73.5	.0280	189.9	192.4	195.9	199.4	202.8	205.9	208.3	208.2	208.1	208.1	209.2	213.3	220.4	226.2	231.4	232.2	233.2
70.0	.0460	206.2	207.8	209.6	210.1	210.5	211.2	212.0	212.1	211.4	211.3	212.0	216.7	222.1	228.6	235.0	236.3	237.0
66.5	.0760	221.8	222.3	222.3	221.2	219.9	218.9	219.5	220.0	220.6	219.0	220.3	223.4	225.9	231.3	239.2	241.5	242.4
63.0	0.12	236.1	235.9	235.0	233.4	231.1	229.3	230.8	233.9	234.5	232.0	232.3	231.6	230.0	234.8	243.2	248.2	250.2
59.5	0.21	251.3	250.0	247.9	245.9	242.8	241.9	243.4	247.5	248.2	246.5	243.1	239.4	236.5	240.1	247.6	254.5	257.2
56.0	0.34	267.1	264.3	260.8	258.2	254.9	253.7	254.0	257.2	258.5	257.0	252.6	247.8	244.3	246.7	251.9	258.3	260.3
52.5	0.56	279.3	275.6	271.5	268.7	265.5	263.6	262.6	263.4	264.1	263.3	260.8	257.5	254.2	252.8	254.1	257.5	258.0
49.0	0.92	287.5	283.6	279.5	276.0	273.5	271.3	269.5	266.8	265.6	266.1	266.6	264.6	260.3	252.5	249.0	249.2	248.7
45.5	1.52	288.9	285.7	282.4	278.8	276.7	272.9	269.1	265.2	263.8	264.3	264.9	264.6	258.2	245.6	239.6	238.1	237.9
42.0	2.51	284.4	281.9	278.7	275.1	271.9	267.9	263.5	260.1	259.3	259.7	261.6	258.0	248.5	235.8	229.7	226.9	227.2
38.5	4.14	274.8	272.7	269.1	265.3	261.3	257.9	254.0	251.7	252.0	251.8	251.8	247.0	238.4	226.7	220.7	216.7	216.4
35.0	6.83	263.1	261.3	257.4	252.9	249.3	246.0	242.9	241.4	242.0	241.8	240.5	236.5	230.0	220.1	214.1	207.6	204.9
31.5	11.3	249.9	248.9	246.6	240.6	236.9	233.5	231.6	229.9	229.6	230.2	229.2	228.1	223.1	216.8	210.4	201.0	194.7
28.0	18.5	237.7	238.0	236.3	231.9	228.5	225.7	223.8	222.7	222.2	222.3	222.1	221.5	218.5	214.6	208.6	200.3	193.5
24.5	30.6	236.4	235.1	231.8	227.1	222.9	220.2	218.2	217.2	216.5	216.3	217.0	217.0	216.7	214.9	210.9	205.0	199.7
21.0	50.4	236.3	234.3	229.6	222.7	216.7	212.5	210.0	208.6	207.4	208.0	209.4	211.3	214.4	215.9	214.2	209.8	205.7
17.5	83.2	234.2	232.1	228.0	221.2	213.3	206.2	201.0	198.2	197.0	197.9	200.9	206.7	213.2	216.6	216.0	212.7	209.3
14.0	137.	230.1	228.5	225.8	220.7	213.9	207.8	203.3	200.5	200.0	200.4	203.0	208.4	214.0	217.1	216.9	214.5	212.1
10.5	226.	223.9	223.3	222.7	221.7	221.3	223.2	225.2	225.7	226.0	225.5	224.2	221.4	218.8	218.3	217.6	215.9	214.8
7.0	373.	226.5	228.0	231.0	236.0	242.0	247.5	251.8	253.1	253.5	253.0	250.2	243.5	236.5	230.0	226.5	223.8	221.9
3.5	614.	240.2	251.1	254.8	260.4	267.2	272.8	275.9	276.5	276.8	277.1	275.0	268.6	260.4	253.6	249.1	245.4	242.5
0.0	1013.		271.5	275.7	281.5	288.5	294.6	298.4	300.4	300.6	300.7	298.5	293.1	285.9	279.6	268.7	257.2	251.7

Table B4

JANUARY ZONAL MEAN GEOPOTENTIAL HEIGHT (km)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.00002	117.90	117.93	117.93	118.01	118.10	118.17	118.15	117.93	117.05	117.34	117.11	117.15	117.20	117.80	118.00	118.27	118.36
119.0	.00004	112.26	112.20	112.22	112.33	112.47	112.62	112.70	112.57	112.30	112.15	111.90	112.06	112.24	112.50	113.16	113.30	113.52
115.5	.00007	107.45	107.44	107.51	107.73	107.90	108.27	108.40	108.50	108.42	108.26	108.13	108.20	108.34	108.64	109.17	109.30	109.51
112.0	.00011	103.17	103.25	103.47	103.83	104.24	104.86	105.00	105.12	105.12	105.02	104.90	104.96	105.04	105.26	105.71	105.85	105.93
108.5	.00019	99.00	99.74	100.04	100.40	100.90	101.48	101.80	102.07	102.13	102.06	101.90	101.90	102.02	102.17	102.54	102.61	102.66
105.0	.00031	96.64	96.78	97.00	97.56	98.05	98.56	98.90	99.19	99.27	99.22	99.13	99.14	99.14	99.23	99.54	99.56	99.56
101.5	.00051	94.00	94.20	94.47	94.88	95.34	95.81	96.21	96.30	96.47	96.43	96.34	96.35	96.32	96.37	96.63	96.50	96.54
98.0	.00084	91.01	91.07	92.06	92.30	92.76	93.15	93.40	93.62	93.60	93.64	93.58	93.50	93.53	93.53	93.73	93.64	93.56
94.5	.0014	89.00	89.00	89.79	90.00	90.25	90.52	90.78	90.87	90.93	90.91	90.83	90.82	90.73	90.67	90.60	90.64	90.51
91.0	.0023	87.67	87.00	87.58	87.06	87.75	87.90	88.06	88.11	88.16	88.14	88.06	88.02	87.86	87.72	87.75	87.52	87.33
87.5	.0038	85.00	85.53	85.38	85.29	85.22	85.23	85.30	85.31	85.36	85.32	85.20	85.10	84.86	84.61	84.55	84.27	84.05
84.0	.0062	83.65	83.41	83.13	82.80	82.50	82.44	82.42	82.41	82.43	82.30	82.25	82.00	81.75	81.42	81.30	80.90	80.75
80.5	.0100	81.30	81.10	80.75	80.30	79.84	79.51	79.42	79.40	79.43	79.30	79.22	78.90	78.50	78.17	78.01	77.70	77.46
77.0	.0170	78.94	78.62	78.20	77.61	76.90	76.53	76.36	76.30	76.30	76.33	76.16	75.86	75.40	74.90	74.70	74.41	74.14
73.5	.0280	76.20	75.92	75.45	74.77	74.82	73.49	73.31	73.32	73.33	73.26	73.06	72.72	72.18	71.61	71.30	71.10	70.82
70.0	.0460	73.30	73.00	72.50	71.76	70.98	70.41	70.20	70.21	70.22	70.14	69.93	69.53	68.96	68.32	68.05	67.77	67.46
66.5	.0760	70.24	69.84	69.34	68.80	67.83	67.26	67.01	67.00	66.90	66.92	66.71	66.20	65.60	65.02	64.70	64.30	64.02
63.0	0.12	66.80	66.47	65.86	65.28	64.56	63.99	63.70	63.64	63.62	63.56	63.37	62.97	62.37	61.70	61.32	60.94	60.49
59.5	0.21	63.26	62.86	62.43	61.78	61.10	60.56	60.20	60.07	60.04	60.02	59.88	59.53	58.90	58.32	57.87	57.38	56.84
56.0	0.34	59.45	59.11	58.60	58.10	57.46	56.94	56.54	56.34	56.29	56.31	56.25	55.96	55.51	54.80	54.34	53.74	53.11
52.5	0.56	55.44	55.15	54.78	54.26	53.60	53.17	52.74	52.40	52.41	52.40	52.47	52.27	51.80	51.25	50.60	50.02	49.36
49.0	0.92	51.29	51.06	50.75	50.29	49.78	49.28	48.86	48.57	48.49	48.54	48.58	48.44	48.10	47.54	46.90	46.29	45.65
45.5	1.52	47.07	46.86	46.65	46.24	45.78	45.33	44.93	44.67	44.60	44.64	44.66	44.56	44.20	43.81	43.20	42.61	41.99
42.0	2.51	42.80	42.74	42.58	42.21	41.81	41.41	41.00	40.85	40.70	40.81	40.61	40.73	40.52	40.14	39.64	38.90	38.37
38.5	4.14	38.80	38.70	38.56	38.28	37.94	37.61	37.32	37.14	37.07	37.10	37.10	37.06	36.90	36.50	36.00	35.44	34.86
35.0	6.83	34.80	34.80	34.71	34.40	34.21	33.95	33.71	33.56	33.40	33.53	33.53	33.52	33.41	33.13	32.60	32.03	31.46
31.5	11.3	31.14	31.06	31.01	30.85	30.65	30.45	30.27	30.14	30.06	30.11	30.12	30.12	30.03	29.70	29.33	28.76	28.26
28.0	18.5	27.58	27.53	27.47	27.35	27.22	27.00	26.86	26.86	26.80	26.82	26.82	26.81	26.73	26.51	26.12	25.64	25.23
24.5	30.6	24.12	24.00	24.04	23.98	23.91	23.82	23.73	23.64	23.60	23.62	23.62	23.59	23.51	23.31	22.90	22.00	22.28
21.0	50.4	20.87	20.67	20.67	20.66	20.60	20.66	20.60	20.55	20.52	20.52	20.51	20.45	20.35	20.14	19.85	19.54	19.29
17.5	83.2	17.24	17.26	17.31	17.43	17.56	17.60	17.61	17.50	17.57	17.57	17.51	17.40	17.21	16.96	16.60	16.41	16.22
14.0	137.	13.83	13.87	13.98	14.20	14.44	14.61	14.60	14.60	14.60	14.60	14.50	14.36	14.07	13.77	13.51	13.27	13.13
10.5	226.	10.40	10.53	10.60	10.95	11.25	11.45	11.53	11.56	11.56	11.56	11.44	11.20	10.80	10.58	10.34	10.13	10.01
7.0	373.	7.16	7.20	7.34	7.58	7.83	7.97	8.02	8.05	8.04	8.05	7.96	7.80	7.57	7.31	7.11	6.94	6.84
3.5	614.	3.00	3.70	3.77	3.92	4.00	4.14	4.14	4.16	4.15	4.16	4.12	4.07	3.97	3.80	3.86	3.53	3.47
0.0	1013.		-0.11	-0.11	-0.05	-0.01	-0.04	-0.06	-0.06	-0.09	-0.06	-0.06	-0.03	-0.01	-0.06	-0.11	-0.11	-0.11

FEBRUARY ZONAL MEAN GEOPOTENTIAL HEIGHT (km)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.00002	117.31	117.25	117.30	117.56	117.70	117.83	117.83	117.70	117.63	117.50	117.30	117.20	117.10	117.20	117.70	117.96	118.11
119.0	.00004	111.73	111.67	111.72	112.00	112.26	112.47	112.56	112.47	112.30	112.31	112.21	112.11	112.06	112.15	112.64	112.94	113.13
115.5	.00007	107.66	107.04	107.16	107.52	107.90	108.23	108.43	108.47	108.46	108.42	108.33	108.20	108.00	108.13	108.57	108.84	109.03
112.0	.00011	103.02	103.05	103.27	103.76	104.27	104.71	105.02	105.14	105.18	105.18	105.00	104.93	104.75	104.71	105.07	105.28	105.44
108.5	.00019	99.61	99.00	99.96	100.51	101.00	101.50	101.95	102.11	102.20	102.22	102.13	101.94	101.73	101.83	101.93	102.00	102.19
105.0	.00031	96.70	96.78	97.07	97.62	98.20	98.71	99.06	99.25	99.35	99.30	99.29	99.10	98.86	98.73	98.99	99.11	99.19
101.5	.00051	94.15	94.21	94.45	94.90	95.50	95.97	96.30	96.45	96.55	96.50	96.52	96.33	96.00	95.84	96.17	96.26	96.33
98.0	.00084	91.81	91.83	92.01	92.46	92.90	93.30	93.57	93.69	93.77	93.82	93.76	93.50	93.34	93.10	93.39	93.47	93.51
94.5	.0014	89.60	89.56	89.67	90.01	90.35	90.65	90.86	90.94	91.01	91.00	91.01	90.84	90.50	90.41	90.60	90.64	90.67
91.0	.0023	87.45	87.36	87.36	87.56	87.80	87.90	88.13	88.17	88.24	88.29	88.24	88.06	87.78	87.56	87.71	87.72	87.73
87.5	.0038	85.30	85.13	85.03	85.10	85.19	85.27	85.34	85.36	85.41	85.46	85.40	85.18	84.85	84.56	84.67	84.66	84.64
84.0	.0062	83.05	82.81	82.60	82.53	82.47	82.44	82.46	82.46	82.40	82.53	82.44	82.19	81.81	81.47	81.52	81.40	81.46
80.5	.0100	80.56	80.30	80.04	79.83	79.62	79.40	79.47	79.45	79.40	79.52	79.41	79.13	78.80	78.27	78.26	78.23	78.21
77.0	.0170	77.93	77.64	77.36	77.03	76.60	76.40	76.46	76.44	76.46	76.40	76.33	76.02	75.52	75.03	74.96	74.94	74.93
73.5	.0280	75.12	74.82	74.51	74.10	73.60	73.43	73.40	73.30	73.41	73.40	73.21	72.86	72.31	71.74	71.63	71.61	71.50
70.0	.0460	72.13	71.82	71.50	71.06	70.50	70.32	70.28	70.29	70.30	70.20	70.06	69.67	68.96	68.43	68.25	68.23	68.18
66.5	.0760	68.93	68.63	68.30	67.87	67.42	67.14	67.07	67.07	67.00	67.00	66.84	66.43	65.78	65.10	64.85	64.77	64.66
63.0	0.12	65.52	65.25	64.95	64.57	64.15	63.86	63.74	63.74	63.70	63.77	63.53	63.12	62.45	61.73	61.40	61.22	60.99
59.5	0.21	61.90	61.67	61.44	61.12	60.73	60.40	60.25	60.24	60.27	60.29	60.10	59.71	59.06	58.31	57.80	57.56	57.19
56.0	0.34	58.11	57.94	57.76	57.51	57.16	56.82	56.62	56.56	56.60	56.64	56.52	56.17	55.57	54.80	54.28	53.82	53.32
52.5	0.56	54.19	54.06	53.93	53.73	53.42	53.00	52.86	52.73	52.74	52.80	52.74	52.45	51.92	51.16	50.60	50.06	49.49
49.0	0.92	50.15	50.07	49.96	49.82	49.56	49.22	48.96	48.80	48.79	48.85	48.83	48.60	48.13	47.43	46.80	46.37	45.79
45.5	1.52	46.06	46.02	45.96	45.83	45.60	45.29	45.04	44.85	44.81	44.80	44.87	44.86	44.28	43.86	43.22	42.76	42.22
42.0	2.51	42.03	42.01	41.97	41.87	41.66	41.39	41.14	40.96	40.90	40.96	40.95	40.82	40.49	40.01	39.63	39.23	38.74
38.5	4.14	38.11	38.11	38.10	38.02	37.84	37.61	37.38	37.19	37.13	37.18	37.18	37.00	36.85	36.48	36.15	35.77	35.32
35.0	6.83	34.34	34.35	34.36	34.31	34.16	33.97	33.75	33.58	33.51	33.56	33.50	33.52	33.35	33.07	32.76	32.30	31.96
31.5	11.3	30.72	30.74	30.77	30.74	30.64	30.48	30.26	30.13	30.06	30.12	30.12	30.10	29.90	29.78	29.48	29.06	28.66
28.0	18.5	27.24	27.27	27.30	27.30	27.24	27.11	26.96	26.82	26.78	26.81	26.81	26.79	26.73	26.56	26.27	25.86	25.53
24.5	30.6	23.83	23.86	23.93	23.97	23.94	2..86	23.73	23.62	23.58	23.61	23.61	23.58	23.52	23.36	23.10	22.76	22.46
21.0	50.4	20.42	20.50	20.59	20.69	20.73	20.66	20.60	20.51	20.49	20.52	20.51	20.46	20.36	20.17	19.93	19.65	19.41
17.5	83.2	17.03	17.12	17.28	17.45	17.50	17.63	17.61	17.56	17.56	17.57	17.51	17.40	17.22	16.96	16.75	16.56	16.33
14.0	137.	13.65	13.75	13.96	14.24	14.50	14.63	14.60	14.60	14.60	14.60	14.57	14.36	14.07	13.78	13.56	13.36	13.25
10.5	226.	10.31	10.42	10.65	11.00	11.30	11.47	11.53	11.52	11.52	11.54	11.43	11.19	10.80	10.50	10.30	10.22	10.15
7.0	373.	7.00	7.10	7.31	7.63	7.86	7.90	8.02	8.00	8.00	8.02	7.94	7.79	7.57	7.32	7.14	7.02	6.96
3.5	614.	3.54	3.61	3.75	3.90	4.11	4.15	4.14	4.11	4.11	4.13	4.00	4.05	3.96	3.81	3.80	3.61	3.80
0.0	1013.		-0.20	-0.14	-0.03	0.01	-0.04	-0.00	-0.13	-0.13	-0.10	-0.10	-0.04	-0.01	-0.07	-0.07	-0.03	0.04

MARCH ZONAL MEAN GEOPOTENTIAL HEIGHT (km)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.00002	116.53	116.00	116.90	117.20	117.53	117.67	117.74	117.80	117.81	117.70	117.67	117.67	117.47	117.30	117.13	116.76	116.42
119.0	.00004	111.19	111.33	111.60	111.80	112.16	112.33	112.44	112.53	112.57	112.46	112.41	112.40	112.19	112.10	111.87	111.53	111.21
115.5	.00007	106.78	106.93	107.24	107.60	107.95	108.22	108.42	108.56	108.64	108.53	108.46	108.37	108.00	107.92	107.63	107.26	106.93
112.0	.00011	102.97	103.17	103.56	104.00	104.45	104.81	105.06	105.29	105.30	105.27	105.15	105.01	104.65	104.40	104.04	103.60	103.23
108.5	.00019	99.69	99.92	100.35	100.85	101.36	101.76	102.06	102.29	102.40	102.29	102.16	101.99	101.50	101.29	100.87	100.30	99.99
105.0	.00031	96.80	97.04	97.47	97.96	98.50	98.90	99.21	99.44	99.56	99.44	99.31	99.15	98.74	98.42	97.99	97.40	97.06
101.5	.00051	94.17	94.40	94.82	95.30	95.78	96.15	96.43	96.65	96.75	96.65	96.54	96.30	96.00	95.71	95.28	94.79	94.37
98.0	.00084	91.69	91.90	92.28	92.71	93.14	93.46	93.60	93.80	93.97	93.86	93.80	93.60	93.33	93.06	92.66	92.19	91.79
94.5	.0014	89.29	89.46	89.79	90.16	90.52	90.78	90.97	91.12	91.21	91.12	91.06	90.97	90.66	90.43	90.07	89.62	89.23
91.0	.0023	86.89	87.03	87.29	87.59	87.87	88.07	88.22	88.36	88.44	88.36	88.30	88.24	87.95	87.76	87.43	87.01	86.64
87.5	.0038	84.43	84.51	84.71	84.93	85.14	85.29	85.41	85.53	85.61	85.53	85.47	85.42	85.14	84.97	84.67	84.28	83.94
84.0	.0062	81.76	81.82	81.97	82.13	82.28	82.40	82.50	82.60	82.65	82.56	82.53	82.47	82.21	82.04	81.74	81.37	81.04
80.5	.0100	78.82	78.87	79.04	79.17	79.30	79.41	79.50	79.56	79.50	79.53	79.48	79.42	79.17	78.97	78.63	78.25	77.94
77.0	.0170	75.79	75.85	76.05	76.16	76.26	76.38	76.48	76.53	76.54	76.47	76.41	76.31	76.06	75.82	75.42	75.07	74.80
73.5	.0280	72.67	72.75	72.96	73.06	73.19	73.30	73.42	73.46	73.46	73.30	73.29	73.14	72.86	72.57	72.15	71.84	71.61
70.0	.0460	69.46	69.55	69.79	69.94	70.06	70.17	70.29	70.34	70.35	70.28	70.13	69.92	69.61	69.26	68.84	68.56	68.36
66.5	.0760	66.12	66.25	66.52	66.73	66.87	66.94	67.06	67.14	67.16	67.00	66.80	66.63	66.31	65.92	65.49	65.23	65.06
63.0	0.12	62.65	62.84	63.16	63.44	63.56	63.61	63.72	63.82	63.85	63.78	63.57	63.28	62.95	62.51	62.09	61.84	61.68
59.5	0.21	59.07	59.31	59.68	60.02	60.17	60.16	60.23	60.35	60.30	60.34	60.14	59.85	59.51	59.06	58.62	58.34	58.16
56.0	0.34	55.38	55.60	56.10	56.47	56.63	56.59	56.63	56.73	56.76	56.73	56.57	56.29	55.97	55.40	55.04	54.71	54.48
52.5	0.56	51.60	51.92	52.37	52.75	52.91	52.87	52.86	52.93	52.94	52.93	52.82	52.56	52.25	51.78	51.32	50.94	50.67
49.0	0.92	47.74	48.07	48.52	48.80	49.04	48.90	49.01	49.00	49.00	49.00	48.92	48.70	48.40	47.95	47.50	47.12	46.85
45.5	1.52	43.92	44.23	44.64	44.98	45.12	45.07	45.06	45.03	45.01	45.02	44.96	44.78	44.50	44.00	43.06	43.35	43.12
42.0	2.51	40.20	40.48	40.85	41.13	41.25	41.21	41.17	41.10	41.06	41.00	41.04	40.90	40.65	40.29	39.97	39.72	39.54
38.5	4.14	36.63	36.89	37.20	37.42	37.52	37.47	37.40	37.31	37.26	37.27	37.25	37.17	36.95	36.66	36.41	36.22	36.06
35.0	6.83	33.19	33.41	33.67	33.85	33.93	33.87	33.78	33.67	33.82	33.83	33.83	33.58	33.41	33.19	33.00	32.84	32.69
31.5	11.3	29.84	30.04	30.26	30.42	30.49	30.42	30.32	30.22	30.16	30.17	30.17	30.14	30.03	29.88	29.72	29.56	29.39
28.0	18.5	26.56	26.75	26.95	27.06	27.14	27.07	26.90	26.80	26.83	26.84	26.84	26.83	26.77	26.66	26.51	26.32	26.13
24.5	30.6	23.33	23.50	23.67	23.81	23.86	23.82	23.74	23.66	23.61	23.63	23.63	23.61	23.57	23.46	23.32	23.12	22.92
21.0	50.4	20.06	20.24	20.42	20.57	20.67	20.65	20.60	20.53	20.51	20.52	20.51	20.47	20.40	20.27	20.11	19.93	19.75
17.5	83.2	16.76	16.95	17.16	17.36	17.53	17.50	17.60	17.57	17.56	17.56	17.51	17.41	17.25	17.07	16.91	16.75	16.62
14.0	137.	13.46	13.65	13.80	14.16	14.42	14.58	14.60	14.60	14.67	14.67	14.57	14.37	14.10	13.87	13.60	13.56	13.46
10.5	226.	10.18	10.36	10.62	10.93	11.24	11.42	11.53	11.55	11.53	11.53	11.42	11.20	10.92	10.67	10.40	10.30	10.33
7.0	373.	6.90	7.07	7.30	7.57	7.83	7.96	8.03	8.03	8.01	8.02	7.94	7.80	7.60	7.30	7.24	7.10	7.14
3.5	614.	3.47	3.60	3.76	3.92	4.06	4.13	4.15	4.14	4.11	4.13	4.00	4.05	3.97	3.85	3.76	3.74	3.76
0.0	1013.		-0.18	-0.12	-0.06	-0.01	-0.05	-0.07	-0.11	-0.13	-0.11	-0.11	-0.05	-0.03	-0.05	-0.02	0.00	0.19

ORIGINAL PAGE IS
OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

Table B4 (cont.)

APRIL ZONAL MEAN GEOPOTENTIAL HEIGHT (km)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.00002	116.81	116.77	116.79	116.92	117.19	117.25	117.28	117.40	117.00	117.00	117.70	117.80	117.76	117.52	117.22	116.84	116.59
119.0	.00004	111.76	111.68	111.67	111.77	112.03	112.08	112.12	112.32	112.40	112.36	112.47	112.53	112.37	112.11	111.80	111.43	111.19
115.5	.00007	107.08	107.54	107.54	107.80	108.01	108.13	108.21	108.43	108.50	108.41	108.44	108.30	108.13	107.77	107.30	106.97	106.71
112.0	.00011	103.97	103.95	104.01	104.24	104.64	104.83	104.95	105.19	105.24	105.11	105.07	104.95	104.58	104.12	103.64	103.13	102.82
108.5	.00019	100.75	100.75	100.87	101.15	101.50	101.83	101.98	102.22	102.26	102.11	102.04	101.87	101.46	100.94	100.40	99.85	99.50
105.0	.00031	97.68	97.83	97.97	98.27	98.74	98.99	99.14	99.38	99.41	99.25	99.18	99.01	98.59	98.07	97.53	96.97	96.62
101.5	.00051	95.03	95.07	95.22	95.52	95.99	96.23	96.36	96.50	96.61	96.45	96.40	96.27	95.88	95.40	94.89	94.36	94.03
98.0	.00084	92.35	92.38	92.53	92.83	93.29	93.50	93.62	93.82	93.84	93.69	93.67	93.58	93.27	92.85	92.41	91.92	91.62
94.5	.0014	89.68	89.71	89.85	90.14	90.58	90.78	90.87	91.06	91.07	90.94	90.96	90.92	90.60	90.35	89.90	89.57	89.31
91.0	.0023	86.93	86.96	87.10	87.39	87.83	88.02	88.11	88.29	88.30	88.17	88.21	88.24	88.00	87.85	87.56	87.25	87.03
87.5	.0036	84.03	84.07	84.21	84.51	84.97	85.17	85.28	85.46	85.47	85.35	85.41	85.48	85.40	85.27	85.12	84.88	84.73
84.0	.0062	80.91	80.97	81.17	81.50	81.90	82.22	82.33	82.50	82.50	82.40	82.40	82.61	82.61	82.57	82.50	82.33	82.23
80.5	.0100	77.57	77.69	77.98	78.37	78.90	79.19	79.30	79.30	79.39	79.33	79.44	79.60	79.68	79.71	79.64	79.47	79.38
77.0	.0170	74.21	74.37	74.74	75.20	75.79	76.13	76.26	76.32	76.30	76.27	76.30	76.54	76.67	76.72	76.63	76.48	76.39
73.5	.0280	70.84	71.03	71.44	71.99	72.64	73.02	73.19	73.25	73.24	73.22	73.30	73.43	73.56	73.59	73.48	73.36	73.27
70.0	.0460	67.42	67.65	68.10	68.75	69.46	69.87	70.08	70.16	70.17	70.15	70.17	70.24	70.36	70.36	70.23	70.10	70.03
66.5	.0760	63.91	64.19	64.71	65.45	66.21	66.64	66.90	67.02	67.04	67.00	66.93	66.97	67.05	67.02	66.88	66.75	66.69
63.0	0.12	60.31	60.66	61.25	62.00	62.87	63.29	63.60	63.76	63.79	63.73	63.60	63.69	63.66	63.61	63.46	63.34	63.29
59.5	0.21	56.63	57.05	57.72	58.62	59.42	59.84	60.15	60.35	60.37	60.30	60.17	60.14	60.17	60.10	59.94	59.82	59.78
56.0	0.34	52.90	53.39	54.12	55.05	55.85	56.27	56.57	56.76	56.78	56.72	56.62	56.57	56.57	56.47	56.30	56.17	56.13
52.5	0.56	49.13	49.65	50.44	51.36	52.14	52.54	52.82	52.98	53.00	52.96	52.89	52.84	52.81	52.69	52.51	52.37	52.32
49.0	0.92	45.36	45.89	46.70	47.59	48.30	48.67	48.94	49.06	49.08	49.06	49.01	48.96	48.90	48.77	48.60	48.44	48.40
45.5	1.52	41.72	42.23	43.01	43.83	44.45	44.78	45.01	45.12	45.12	45.09	45.06	45.00	44.92	44.80	44.64	44.52	44.50
42.0	2.51	38.24	38.73	39.46	40.17	40.70	40.97	41.14	41.21	41.19	41.17	41.15	41.10	41.00	40.88	40.76	40.71	40.73
38.5	4.14	34.94	35.42	36.07	36.60	37.00	37.30	37.40	37.41	37.38	37.37	37.38	37.33	37.21	37.11	37.06	37.07	37.13
35.0	6.83	31.77	32.24	32.81	33.29	33.63	33.76	33.80	33.76	33.71	33.71	33.74	33.70	33.59	33.52	33.52	33.60	33.69
31.5	11.3	28.60	29.13	29.63	30.02	30.28	30.35	30.35	30.28	30.23	30.23	30.26	30.24	30.16	30.11	30.15	30.25	30.36
28.0	18.5	25.70	26.06	26.49	26.81	27.00	27.03	27.00	26.92	26.86	26.80	26.91	26.90	26.85	26.83	26.87	26.97	27.06
24.5	30.6	22.70	23.00	23.32	23.59	23.75	23.78	23.74	23.68	23.65	23.66	23.67	23.66	23.63	23.61	23.62	23.68	23.74
21.0	50.4	19.82	19.88	20.14	20.39	20.56	20.61	20.60	20.55	20.53	20.54	20.53	20.51	20.46	20.40	20.38	20.40	20.43
17.5	83.2	16.48	16.71	16.95	17.20	17.42	17.54	17.59	17.57	17.56	17.56	17.51	17.43	17.32	17.20	17.15	17.14	17.15
14.0	137.	13.30	13.51	13.74	14.02	14.31	14.51	14.65	14.69	14.68	14.67	14.56	14.39	14.18	14.00	13.90	13.88	13.88
10.5	226.	10.11	10.30	10.52	10.82	11.13	11.36	11.51	11.56	11.55	11.54	11.41	11.23	11.00	10.79	10.67	10.63	10.63
7.0	373.	6.90	7.05	7.24	7.49	7.76	7.92	8.02	8.03	8.02	8.02	7.93	7.81	7.65	7.48	7.38	7.38	7.37
3.5	614.	3.51	3.61	3.72	3.88	4.05	4.13	4.15	4.14	4.12	4.13	4.08	4.03	3.98	3.89	3.87	3.90	3.95
0.0	1013.		-0.16	-0.13	-0.08	-0.02	-0.03	-0.06	-0.10	-0.13	-0.11	-0.13	-0.10	-0.06	-0.04	0.03	0.18	0.32

MAY ZONAL MEAN GEOPOTENTIAL HEIGHT (km)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.00002	116.79	116.98	116.96	116.73	116.64	116.54	116.47	116.61	116.89	117.20	117.40	117.56	117.28	117.06	116.92	116.83	116.79
119.0	.00004	112.02	112.18	112.11	111.84	111.72	111.60	111.50	111.50	111.81	112.06	112.25	112.22	111.88	111.62	111.46	111.35	111.32
115.5	.00007	108.04	108.21	108.17	107.94	107.88	107.80	107.72	107.80	107.96	108.12	108.20	108.04	107.57	107.19	106.92	106.75	106.66
112.0	.00011	104.50	104.71	104.74	104.59	104.60	104.58	104.53	104.60	104.72	104.81	104.80	104.54	103.95	103.43	103.04	102.75	102.60
108.5	.00019	101.26	101.52	101.60	101.52	101.59	101.62	101.59	101.65	101.75	101.79	101.73	101.42	100.77	100.18	99.72	99.36	99.18
105.0	.00031	98.23	98.51	98.65	98.61	98.73	98.76	98.76	98.82	98.90	98.93	98.86	98.54	97.88	97.30	96.84	96.49	96.29
101.5	.00051	95.30	95.61	95.78	95.79	95.93	96.00	95.98	96.03	96.10	96.13	96.08	95.80	95.19	94.65	94.24	93.94	93.76
98.0	.00084	92.40	92.74	92.95	92.99	93.16	93.25	93.22	93.26	93.33	93.37	93.36	93.14	92.61	92.16	91.83	91.60	91.47
94.5	.0014	89.44	89.82	90.06	90.17	90.38	90.49	90.47	90.50	90.56	90.61	90.65	90.50	90.08	89.75	89.54	89.39	89.31
91.0	.0023	86.37	86.78	87.10	87.26	87.54	87.69	87.70	87.73	87.79	87.86	87.92	87.88	87.56	87.37	87.28	87.24	87.24
87.5	.0036	83.14	83.60	83.96	84.21	84.57	84.79	84.84	84.90	84.96	85.04	85.14	85.16	84.98	84.95	85.02	85.10	85.18
84.0	.0062	79.80	80.32	80.77	81.06	81.50	81.79	81.89	81.96	82.02	82.12	82.20	82.36	82.32	82.44	82.60	82.86	83.01
80.5	.0100	76.37	76.96	77.50	77.86	78.37	78.75	78.80	78.90	78.96	79.00	79.20	79.45	79.54	79.79	80.10	80.35	80.56
77.0	.0170	72.96	73.59	74.16	74.58	75.21	75.60	75.87	75.88	75.93	76.07	76.29	76.49	76.68	77.01	77.30	77.67	77.90
73.5	.0280	69.52	70.18	70.76	71.27	72.00	72.60	72.86	72.80	72.93	73.06	73.20	73.48	73.70	74.06	74.43	74.79	75.05
70.0	.0460	66.06	66.72	67.29	67.90	68.75	69.46	69.81	69.89	69.93	70.02	70.18	70.38	70.63	70.97	71.32	71.71	71.99
66.5	.0760	62.52	63.18	63.74	64.45	65.42	66.24	66.60	66.83	66.87	66.90	67.00	67.18	67.42	67.75	68.07	68.44	68.73
63.0	0.12	58.90	59.56	60.13	60.95	62.03	62.90	63.44	63.63	63.66	63.65	63.70	63.87	64.10	64.30	64.80	65.04	65.33
59.5	0.21	55.17	55.85	56.46	57.37	58.56	59.44	60.01	60.23	60.25	60.22	60.26	60.41	60.64	60.89	61.15	61.49	61.76
56.0	0.34	51.38	52.00	52.75	53.74	54.99	55.86	56.42	56.63	56.64	56.62	56.66	56.83	57.05	57.25	57.47	57.76	58.06
52.5	0.56	47.58	48.28	49.02	50.06	51.31	52.16	52.67	52.86	52.87	52.87	52.96	53.00	53.27	53.43	53.62	53.87	54.06
49.0	0.92	43.83	44.54	45.33	46.38	47.57	48.35	48.82	48.98	48.99	49.00	49.06	49.20	49.35	49.48	49.63	49.86	50.00
45.5	1.52	40.26	40.96	41.77	42.77	43.82	44.51	44.92	45.07	45.07	45.09	45.14	45.24	45.35	45.45	45.58	45.78	45.98
42.0	2.51	36.85	37.55	38.36	39.29	40.18	40.74	41.07	41.20	41.20	41.21	41.26	41.32	41.39	41.46	41.58	41.76	41.87
38.5	4.14	33.61	34.31	35.13	35.97	36.71	37.12	37.36	37.44	37.43	37.44	37.50	37.54	37.58	37.62	37.73	37.89	38.00
35.0	6.83	30.51	31.22	32.03	32.78	33.36	33.64	33.77	33.80	33.77	33.79	33.87	33.90	33.89	33.94	34.06	34.19	34.31
31.5	11.3	27.57	28.28	29.02	29.66	30.08	30.26	30.33	30.31	30.28	30.31	30.38	30.42	30.41	30.46	30.56	30.68	30.79
28.0	18.5	24.79	25.38	26.02	26.54	26.86	26.96	26.99	26.95	26.93	26.96	27.02	27.05	27.06	27.11	27.18	27.28	27.37
24.5	30.6	22.00	22.48	22.98	23.40	23.65	23.72	23.73	23.70	23.69	23.72	23.75	23.79	23.81	23.84	23.89	23.96	24.02
21.0	50.4	19.11	19.50	19.91	20.25	20.46	20.55	20.58	20.56	20.56	20.56	20.60	20.61	20.61	20.60	20.61	20.64	20.66
17.5	83.2	16.14	16.48	16.82	17.10	17.32	17.46	17.55	17.57	17.56	17.59	17.57	17.52	17.46	17.38	17.33	17.31	17.29
14.0	137.	13.11	13.40	13.66	13.93	14.19	14.41	14.60	14.66	14.69	14.69	14.62	14.48	14.32	14.17	14.06	13.99	13.94
10.5	226.	10.04	10.29	10.53	10.76	11.02	11.25	11.46	11.56	11.56	11.56	11.47	11.32	11.14	10.95	10.79	10.69	10.62
7.0	373.	6.90	7.10	7.30	7.47	7.66	7.84	7.98	8.03	8.03	8.03	7.97	7.88	7.76	7.60	7.46	7.38	7.29
3.5	614.	3.54	3.69	3.80	3.89	4.00	4.07	4.13	4.14	4.13	4.14	4.10	4.07	4.03	3.96	3.88	3.83	3.79
0.0	1013.		-0.10	-0.05	-0.05	-0.04	-0.05	-0.07	-0.08	-0.11	-0.10	-0.12	-0.08	-0.04	-0.02	-0.03	0.02	0.04

JUNE ZONAL MEAN GEOPOTENTIAL HEIGHT (km)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.00002	116.59	116.92	116.90	116.49	116.20	116.01	115.87	115.96	116.28	116.60	116.93	117.01	116.73	116.65	116.61	116.70	116.79
119.0	.00004	111.99	112.29	112.23	111.78	111.45	111.23	111.05	111.00	111.30	111.54	111.77	111.75	111.38	111.25	111.17	111.24	111.33
115.5	.00007	108.10	108.42	108.39	107.99	107.71	107.53	107.36	107.38	107.51	107.64	107.74	107.58	107.06	106.79	106.60	106.58	106.62
112.0	.00011	104.58	104.95	104.99	104.67	104.48	104.36	104.21	104.20	104.29	104.35	104.34	104.06	103.41	103.00	102.86	102.58	102.44
108.5	.00019	101.32	101.73	101.85	101.61	101.49	101.42	101.29	101.27	101.33	101.33	101.27	100.93	100.21	99.73	99.31	99.00	98.97
105.0	.00031	98.21	98.67	98.86	98.68	98.62	98.58	98.47	98.44	98.48	98.46	98.30	98.04	97.32	96.84	96.43	96.21	96.00
101.5	.00051	95.18	95.69	95.92	95.81	95.80	95.79	95.69	95.66	95.68	95.67	95.61	95.30	94.64	94.21	93.85	93.68	93.61
98.0	.00084	92.15	92.70	93.00	92.95	92.99	93.02	92.92	92.88	92.91	92.91	92.89	92.65	92.06	91.75	91.40	91.30	91.37
94.5	.0014	89.04	89.64	90.02	90.06	90.17	90.24	90.17	90.12	90.14	90.15	90.19	90.04	89.58	89.38	89.24	89.25	89.29
91.0	.0023	85.79	86.45	86.91	87.06	87.27	87.42	87.39	87.35	87.37	87.39	87.47	87.41	87.00	87.05	87.06	87.19	87.31
87.5	.0036	82.46	83.16	83.60	83.92	84.24	84.48	84.51	84.51	84.54	84.58	84.70	84.73	84.56	84.70	84.88	85.15	85.36
84.0	.0062	79.14	79.89	80.47	80.75	81.14	81.47	81.56	81.58	81.62	81.68	81.84	81.97	81.97	82.29	82.65	83.05	83.34
80.5	.0100	75.80	76.62	77.20	77.57	78.06	78.47	78.60	78.61	78.64	78.71	78.91	79.11	79.31	79.78	80.29	80.76	81.09
77.0	.0170	72.44	73.38	73.96	74.34	74.92	75.45	75.64	75.64	75.66	75.74	75.95	76.21	76.56	77.13	77.75	78.28	78.66
73.5	.0280	69.03	69.92	70.60	71.03	71.71	72.39	72.66	72.68	72.69	72.77	72.96	73.25	73.80	74.32	75.00	75.58	75.99
70.0	.0460	65.54	66.44	67.12	67.62	68.45	69.28	69.64	69.71	69.71	69.77	69.93	70.22	70.70	71.35	72.06	72.66	73.09
66.5	.0760	61.96	62.87	63.54	64.13	65.09	66.06	66.55	66.65	66.65	66.69	66.82	67.11	67.58	68.22	68.90	69.51	69.94
63.0	0.12	58.25	59.18	59.86	60.56	61.64	62.72	63.31	63.46	63.44	63.46	63.50	63.87	64.31	64.92	65.56	66.16	66.59
59.5	0.21	54.42	55.37	56.11	56.90	58.11	59.24	59.88	60.05	60.03	60.03	60.17	60.46	60.87	61.43	62.02	62.60	63.02
56.0	0.34	50.50	51.49	52.32	53.19	54.51	55.65	56.30	56.44	56.42	56.43	56.59	56.89	57.27	57.77	58.31	58.84	59.24
52.5	0.56	46.62	47.61	48.52	49.47	50.83	51.94	52.56	52.68	52.66	52.67	52.85	53.14	53.50	53.94	54.42	54.90	55.25
49.0	0.92	42.85	43.84	44.78	45.77	47.10	48.14	48.71	48.82	48.80	48.82	48.99	49.26	49.60	49.97	50.41	50.83	51.13
45.5	1.52	39.28	40.24	41.19	42.18	43.39	44.33	44.83	44.95	44.93	44.94	45.08	45.33	45.62	45.95	46.33	46.69	46.94
42.0	2.51	35.87	36.79	37.77	38.76	39.82	40.60	41.01	41.14	41.12	41.13	41.24	41.43	41.67	41.95	42.28	42.59	42.79
38.5	4.14	32.65	33.53	34.54	35.53	36.44	37.02	37.33	37.42	37.40	37.41	37.51	37.67	37.85	38.07	38.34	38.60	38.78
35.0	6.83	29.62	30.46	31.48	32.44	33.18	33.59	33.77	33.81	33.78	33.81	33.92	34.04	34.19	34.35	34.57	34.77	34.94
31.5	11.3	26.85	27.59	28.53	29.41	29.99	30.26	30.35	30.35	30.31	30.35	30.45	30.55	30.67	30.80	30.97	31.14	31.28
28.0	18.5	24.20	24.83	25.63	26.37	26.81	26.97	27.02	27.00	26.97	27.00	27.09	27.18	27.27	27.38	27.51	27.64	27.76
24.5	30.6	21.48	22.01	22.67	23.27	23.62	23.73	23.77	23.76	23.74	23.76	23.82	23.90	23.98	24.07	24.16	24.25	24.33
21.0	50.4	18.88	19.11	19.66	20.15	20.44	20.55	20.61	20.61	20.60	20.61	20.66	20.72	20.77	20.80	20.84	20.89	20.93
17.5	83.2	15.83	16.16	16.61	17.01	17.29	17.45	17.57	17.60	17.59	17.60	17.62	17.63	17.61	17.59	17.54	17.53	17.54
14.0	137.	12.92	13.17	13.52	13.86	14.14	14.39	14.60	14.68	14.68	14.68	14.66	14.61	14.48	14.34	14.25	14.19	14.15
10.5	226.	9.93	10.13	10.42	10.70	10.96	11.22	11.46	11.56	11.54	11.54	11.51	11.43	11.28	11.10	10.97	10.87	10.79
7.0	373.	6.82	6.98	7.21	7.43	7.63	7.82	7.98	8.05	8.03	8.02	7.99	7.95	7.86	7.71	7.59	7.49	7.41
3.5	614.	3.47	3.58	3.74	3.87	3.98	4.07	4.14	4.17	4.14	4.13	4.10	4.08	4.07	4.01	3.94	3.88	3.84
0.0	1013.		-0.17	-0.10	-0.06	-0.03	-0.03	-0.06	-0.08	-0.10	-0.11	-0.13	-0.11	-0.04	-0.01	-0.03	-0.03	-0.01

Table B4 (cont.)

JULY ZONAL MEAN GEOPOTENTIAL HEIGHT (km)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.00002	116.43	116.65	116.84	116.54	116.13	115.91	115.85	115.90	116.24	116.55	116.77	116.77	116.50	116.30	116.33	116.48	116.67
119.0	.00004	111.82	112.01	112.16	111.82	111.30	111.13	111.06	111.13	111.31	111.52	111.63	111.53	111.28	111.01	110.91	111.06	111.24
115.5	.00007	107.92	108.13	108.31	108.02	107.66	107.44	107.37	107.42	107.53	107.64	107.62	107.38	106.90	106.57	106.35	106.41	106.53
112.0	.00011	104.41	104.66	104.92	104.72	104.43	104.27	104.22	104.26	104.32	104.35	104.23	103.88	103.33	102.80	102.44	102.36	102.39
108.5	.00019	101.16	101.46	101.78	101.60	101.44	101.34	101.30	101.33	101.36	101.34	101.10	100.76	100.15	99.50	99.12	98.98	98.97
105.0	.00031	98.07	98.42	98.80	98.74	98.57	98.50	98.48	98.50	98.51	98.48	98.30	97.80	97.27	96.60	96.25	96.12	96.11
101.5	.00051	95.07	95.45	95.89	95.80	95.76	95.71	95.70	95.72	95.72	95.60	95.53	95.15	94.60	94.06	93.60	93.61	93.64
98.0	.00084	92.06	92.49	92.98	93.03	92.98	92.94	92.94	92.95	92.94	92.92	92.81	92.50	92.03	91.60	91.32	91.32	91.40
94.5	.0014	88.98	89.45	90.02	90.15	90.14	90.17	90.18	90.19	90.18	90.17	90.10	89.88	89.53	89.23	89.07	89.17	89.31
91.0	.0023	85.75	86.28	86.93	87.16	87.25	87.35	87.40	87.41	87.40	87.41	87.38	87.25	87.04	86.86	86.86	87.00	87.31
87.5	.0038	82.47	83.02	83.72	84.03	84.21	84.40	84.52	84.57	84.57	84.58	84.60	84.56	84.40	84.52	84.68	85.03	85.34
84.0	.0062	79.23	79.81	80.53	80.88	81.14	81.40	81.57	81.65	81.66	81.68	81.73	81.78	81.86	82.00	82.43	82.92	83.31
80.5	.0100	75.99	76.61	77.38	77.73	78.07	78.41	78.63	78.71	78.71	78.72	78.78	78.80	79.14	79.57	80.08	80.64	81.06
77.0	.0170	72.71	73.36	74.12	74.54	74.97	75.30	75.65	75.74	75.74	75.75	75.79	75.96	76.33	76.92	77.58	78.19	78.64
73.5	.0280	69.35	70.04	70.81	71.28	71.81	72.32	72.64	72.75	72.75	72.75	72.78	72.97	73.41	74.12	74.87	75.53	75.99
70.0	.0460	65.90	66.63	67.42	67.96	68.60	69.21	69.60	69.72	69.72	69.71	69.73	69.93	70.41	71.16	71.96	72.65	73.12
66.5	.0700	62.31	63.09	63.92	64.56	65.33	66.03	66.47	66.61	66.60	66.58	66.61	66.83	67.30	68.04	68.84	69.53	70.00
63.0	0.12	58.56	59.41	60.32	61.07	61.97	62.75	63.22	63.36	63.34	63.32	63.37	63.60	64.07	64.77	65.52	66.19	66.64
59.5	0.21	54.86	55.58	56.61	57.40	58.53	59.35	59.81	59.93	59.88	59.86	59.94	60.21	60.67	61.31	62.01	62.62	63.05
56.0	0.34	50.67	51.66	52.81	53.83	54.98	55.81	56.25	56.32	56.26	56.23	56.35	56.65	57.10	57.60	58.31	58.87	59.26
52.5	0.56	46.71	47.72	48.95	50.06	51.30	52.10	52.51	52.54	52.47	52.46	52.62	52.92	53.36	53.80	54.44	54.94	55.28
49.0	0.92	42.80	43.86	45.11	46.30	47.52	48.29	48.66	48.67	48.61	48.61	48.78	49.06	49.50	49.97	50.46	50.80	51.17
45.5	1.52	39.21	40.14	41.30	42.50	43.74	44.44	44.77	44.81	44.75	44.76	44.91	45.19	45.57	45.99	46.42	46.78	47.01
42.0	2.51	35.67	36.55	37.79	39.01	40.06	40.69	40.97	41.01	40.97	40.98	41.10	41.36	41.67	42.04	42.40	42.70	42.80
38.5	4.14	32.31	33.15	34.30	35.63	36.62	37.10	37.31	37.33	37.29	37.31	37.43	37.64	37.90	38.21	38.40	38.74	38.91
35.0	6.83	29.17	29.96	31.10	32.41	33.29	33.60	33.78	33.78	33.72	33.76	33.80	34.06	34.27	34.51	34.73	34.93	35.08
31.5	11.3	26.33	27.04	28.18	29.30	30.04	30.30	30.37	30.35	30.30	30.34	30.44	30.61	30.77	30.95	31.13	31.29	31.42
28.0	18.5	23.60	24.28	25.27	26.23	26.82	27.00	27.05	27.02	26.98	27.02	27.11	27.25	27.30	27.52	27.68	27.78	27.80
24.5	30.0	21.03	21.50	22.36	23.13	23.61	23.75	23.80	23.79	23.78	23.78	23.88	23.98	24.00	24.19	24.30	24.36	24.46
21.0	50.4	18.30	18.67	19.40	20.03	20.43	20.57	20.63	20.64	20.62	20.64	20.70	20.79	20.87	20.92	20.97	21.02	21.06
17.5	83.2	15.52	15.79	16.41	16.93	17.28	17.46	17.58	17.61	17.60	17.62	17.65	17.71	17.72	17.80	17.86	17.85	17.86
14.0	137.	12.08	12.80	13.30	13.80	14.13	14.30	14.61	14.60	14.67	14.68	14.60	14.60	14.61	14.46	14.37	14.31	14.27
10.5	226.	9.77	9.92	10.34	10.86	10.94	11.22	11.45	11.54	11.53	11.53	11.52	11.50	11.30	11.21	11.00	10.98	10.91
7.0	373.	6.00	6.81	7.16	7.41	7.62	7.81	7.96	8.04	8.02	8.02	8.00	7.98	7.92	7.79	7.68	7.50	7.51
3.5	614.	3.34	3.42	3.70	3.86	3.98	4.07	4.14	4.10	4.14	4.13	4.11	4.10	4.00	4.03	3.98	3.93	3.90
0.0	1013.		-0.32	-0.12	-0.06	-0.02	-0.03	-0.04	-0.06	-0.09	-0.10	-0.12	-0.12	-0.07	-0.03	-0.04	-0.03	-0.01

AUGUST ZONAL MEAN GEOPOTENTIAL HEIGHT (km)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.00002	116.28	116.76	117.02	116.73	116.46	116.42	116.54	116.50	116.80	117.00	117.25	117.21	116.94	116.67	116.51	116.56	116.79
119.0	.00004	111.46	111.80	112.12	111.80	111.30	111.46	111.56	111.50	111.75	111.90	112.04	111.92	111.60	111.27	111.00	111.14	111.30
115.5	.00007	107.43	107.90	108.14	107.87	107.64	107.65	107.79	107.80	107.92	108.05	108.03	107.78	107.32	106.80	106.60	106.50	106.78
112.0	.00011	103.88	104.30	104.70	104.51	104.35	104.43	104.50	104.60	104.60	104.76	104.68	104.32	103.74	103.18	102.78	102.66	102.79
108.5	.00019	100.67	101.21	101.58	101.46	101.35	101.47	101.65	101.66	101.72	101.76	101.62	101.23	100.60	99.98	99.52	99.34	99.43
105.0	.00031	97.67	98.25	98.65	98.56	98.50	98.63	98.82	98.83	98.86	98.90	98.75	98.38	97.73	97.11	96.60	96.40	96.58
101.5	.00051	94.80	95.40	95.83	95.77	95.72	95.80	96.05	96.04	96.00	96.11	95.96	95.63	95.04	94.40	94.07	93.94	94.06
98.0	.00084	91.97	92.56	93.04	93.00	92.97	93.11	93.29	93.27	93.31	93.35	93.25	92.96	92.44	91.90	91.65	91.50	91.79
94.5	.0014	89.10	89.73	90.22	90.21	90.20	90.36	90.54	90.51	90.54	90.50	90.30	90.32	89.92	89.35	89.33	89.50	89.56
91.0	.0023	86.11	86.77	87.29	87.34	87.38	87.57	87.77	87.74	87.77	87.63	87.61	87.06	87.37	87.13	87.03	87.14	87.43
87.5	.0038	82.90	83.67	84.23	84.33	84.43	84.67	84.90	84.80	84.93	85.00	85.01	84.93	84.78	84.66	84.71	84.94	85.30
84.0	.0062	79.83	80.52	81.00	81.23	81.30	81.60	81.96	81.97	82.01	82.00	82.12	82.10	82.03	82.00	82.29	82.64	83.06
80.5	.0100	76.62	77.32	77.90	78.00	78.31	78.67	78.97	79.02	79.04	79.10	79.13	79.14	79.19	79.40	79.74	80.15	80.61
77.0	.0170	73.30	74.10	74.60	74.80	75.10	75.50	75.94	76.03	76.00	76.10	76.11	76.13	76.27	76.61	77.07	77.53	77.96
73.5	.0280	70.10	70.83	71.30	71.64	72.00	72.47	72.87	73.01	73.04	73.06	73.04	73.07	73.27	73.60	74.23	74.72	75.13
70.0	.0460	66.74	67.52	68.07	68.30	68.70	69.31	69.70	69.93	69.96	69.95	69.92	69.95	70.18	70.64	71.23	71.74	72.13
66.5	.0700	63.25	64.11	64.71	65.04	65.92	66.10	66.56	66.70	66.78	66.78	66.71	66.74	66.96	67.47	68.03	68.54	68.97
63.0	0.12	59.60	60.56	61.28	61.67	62.21	62.83	63.32	63.51	63.48	63.44	63.38	63.46	63.72	64.17	64.60	65.15	65.49
59.5	0.21	55.76	56.80	57.75	58.23	58.63	59.46	59.82	60.00	60.02	60.00	59.91	59.91	60.30	60.73	61.17	61.57	61.90
56.0	0.34	51.78	53.04	54.06	54.60	55.30	55.66	56.37	56.47	56.40	56.53	56.30	56.43	56.74	57.15	57.62	57.66	58.00
52.5	0.56	47.75	49.00	50.27	51.03	51.74	52.27	52.64	52.60	52.60	52.56	52.50	52.74	53.06	53.42	53.74	54.00	54.19
49.0	0.92	43.79	45.15	46.41	47.20	48.06	48.47	48.77	48.80	48.71	48.60	48.74	48.92	49.23	49.56	49.84	50.06	50.19
45.5	1.52	39.94	41.28	42.56	43.51	44.22	44.63	44.87	44.80	44.80	44.79	44.87	45.06	45.34	45.64	45.88	46.06	46.16
42.0	2.51	36.21	37.47	38.79	39.82	40.53	40.86	41.03	41.03	40.96	40.97	41.05	41.24	41.40	41.75	41.90	42.10	42.18
38.5	4.14	32.60	33.84	35.17	36.27	36.97	37.24	37.36	37.32	37.25	37.20	37.38	37.56	37.76	37.90	38.15	38.26	38.33
35.0	6.83	29.35	30.43	31.72	32.80	33.64	33.76	33.79	33.78	33.60	33.72	33.83	34.00	34.17	34.35	34.47	34.56	34.62
31.5	11.3	26.36	27.30	28.51	29.50	30.21	30.37	30.38	30.35	30.27	30.31	30.41	30.57	30.71	30.84	30.93	31.00	31.06
28.0	18.5	23.66	24.42	25.46	26.40	26.93	27.05	27.06	27.01	26.98	27.00	27.08	27.23	27.36	27.44	27.52	27.57	27.61
24.5	30.0	20.90	21.60	22.47	23.25	23.60	22.79	23.82	23.79	23.75	23.70	23.80	23.97	24.07	24.14	24.19	24.22	24.24
21.0	50.4	18.25	18.75	19.47	20.11	20.40	20.00	20.05	20.04	20.02	20.04	20.71	20.79	20.88	20.88	20.88	20.88	20.88
17.5	83.2	15.47	15.90	16.47	16.90	17.31	17.48	17.50	17.61	17.50	17.62	17.60	17.71	17.71	17.65	17.50	17.56	17.52
14.0	137.	12.05	13.01	13.40	13.85	14.15	14.40	14.61	14.67	14.65	14.70	14.70	14.70	14.61	14.44	14.31	14.23	14.18
10.5	226.	9.75	10.00	10.42	10.71	10.98	11.22	11.44	11.53	11.51	11.53	11.53	11.51	11.40	11.19	11.04	10.92	10.82
7.0	373.	6.00	6.95	7.25	7.46	7.63	7.80	7.90	8.03	8.01	8.02	8.01	7.90	7.92	7.77	7.66	7.56	7.45
3.5	614.	3.36	3.56	3.79	3.90	3.90	4.07	4.15	4.16	4.13	4.13	4.12	4.11	4.00	4.02	3.90	3.91	3.86
0.0	1013.		-0.18	-0.03	0.00	-0.01	-0.03	-0.03	-0.06	-0.10	-0.11	-0.12	-0.11	-0.08	-0.06	-0.06	-0.04	-0.03

SEPTEMBER ZONAL MEAN GEOPOTENTIAL HEIGHT (km)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.00002	116.80	116.96	117.13	117.15	117.23	117.31	117.36	117.33	117.38	117.40	117.58	117.56	117.38	117.05	116.82	116.63	116.47
119.0	.00004	111.70	111.76	111.86	111.87	111.95	112.04	112.10	112.00	112.12	112.21	112.25	112.20	111.96	111.64	111.42	111.26	111.00
115.5	.00007	107.43	107.51	107.65	107.70	107.85	108.01	108.14	108.16	108.19	108.24	108.22	108.00	107.74	107.33	107.04	106.83	106.66
112.0	.00011	103.74	103.86	104.06	104.19	104.42	104.66	104.84	104.80	104.92	104.95	104.87	104.65	104.22	103.71	103.33	103.04	102.82
108.5	.00019	100.40	100.64	100.80	101.08	101.36	101.64	101.86	101.91	101.94	101.95	101.86	101.50	101.11	100.56	100.12	99.78	99.53
105.0	.00031	97.57	97.73	98.00	98.21	98.51	98.80	99.00	99.06	99.09	99.00	98.99	98.73	98.28	97.68	97.24	96.89	96.64
101.5	.00051	94.86	95.01	95.20	95.48	95.77	96.04	96.23	96.27	96.29	96.30	96.22	95.90	95.54	95.00	94.50	94.26	94.01
98.0	.00084	92.25	92.40	92.65	92.83	93.00	93.33	93.48	93.50	93.51	93.53	93.48	93.29	92.90	92.42	92.06	91.77	91.56
94.5	.0014	89.67	89.81	90.04	90.18	90.41	90.62	90.75	90.74	90.75	90.78	90.75	90.62	90.29	89.88	89.50	89.35	89.17
91.0	.0023	87.05	87.17	87.30	87.50	87.60	87.88	87.90	87.98	87.98	88.01	88.01	87.91	87.65	87.32	87.10	86.94	86.79
87.5	.0038	84.31	84.42	84.60	84.60	84.87	85.05	85.16	85.15	85.15	85.19	85.20	85.14	84.93	84.68	84.56	84.46	84.36
84.0	.0062	81.40	81.49	81.66	81.76	81.94	82.12	82.24	82.22	82.22	82.28	82.29	82.25	82.06	81.90	81.84	81.79	81.75
80.5	.0100	78.29	78.38	78.56	78.60	78.80	79.10	79.23	79.21	79.19	79.23	79.28	79.24	79.10	78.97	78.96	78.80	78.86
77.0	.0170	75.14	75.20	75.34	75.53	75.79	76.03	76.19	76.20	76.18	76.21	76.25	76.20	76.07	75.90	75.96	75.90	75.80
73.5	.0280	71.91	71.96	72.07	72.28	72.60	72.90	73.12	73.16	73.14	73.15	73.10	73.11	72.90	72.92	72.93	72.83	72.82
70.0	.0460	68.62	68.67	68.74	68.97	69.34	69.72	69.90	70.00	70.07	70.05	70.05	69.96	69.80	69.79	69.78	69.67	69.65
66.5	.0700	65.23	65.31	65.37	65.62	66.04	66.47	66.79	66.93	66.90	66.86	66.83	66.73	66.65	66.58	66.53	66.38	66.34
63.0	0.12	61.73	61.86	61.95	62.22	62.67	63.15	63.50	63.66	63.63	63.56	63.50	63.40	63.35	63.29	63.10	62.96	62.80
59.5	0.21	58.04	58.20	58.45	58.76	59.26	59.74	60.10	60.25	60.20	60.12	60.03	59.95	59.93	59.87	59.71	59.46	59.31
56.0	0.34	54.15	54.54	54.86	55.22	55.73	56.21	56.56	56.67	56.60	56.53	56.44	56.38	56.39	56.32	56.13	55.84	55.63
52.5	0.56	50.11	50.65	51.12	51.56	52.07	52.50	52.83	52.90	52.83	52.76	52.71	52.67	52.60	52.63	52.43	52.10	51.86
49.0	0.92	46.04	46.70	47.30	47.81	48.29	48.60	48.90	49.01	48.93	48.87	48.86	48.82	48.80	48.80	48.61	48.28	48.04
45.5	1.52	41.90	42.73	43.44	44.02	44.48	44.80	45.04	45.07	44.98	44.94	44.96	44.93	44.98	44.93	44.76	44.46	44.25
42.0	2.51	37.90	38.79	39.62	40.29	40.74	41.00	41.16	41.18	41.00	41.07	41.10	41.12	41.16	41.13	40.90	40.75	40.57
38.5	4.14	34.00	34.96	35.90	36.60	37.15	37.34	37.42	37.41	37.33	37.32	37.38	37.43	37.47	37.46	37.36	37.18	37.04
35.0	6.83	30.41	31.28	32.33	33.22	33.60	33.81	33.83	33.79	33.72	33.73	33.81	33.88	33.93	33.91	33.86	33.72	33.61
31.5	11.3	27.00	27.80	28.96	29.80	30.33	30.41	30.38	30.34	30.27	30.28	30.37	30.46	30.51	30.40	30.44	30.36	30.27
28.0	18.5	24.05	24.74	25.72	26.61	27.03	27.00	27.06	27.00	26.94	26.98	27.04	27.13	27.19	27.17	27.13	27.06	26.99
24.5	30.0	21.10	21.75	22.00	23.37	23.70	23.83	23.81	23.70	23.73	23.75	23.82	23.80	23.94	23.92	23.87	23.81	23.75
21.0	50.4	18.20	18.81	19.54	20.17	20.53	20.63	20.66	20.64	20.61	20.62	20.67	20.72	20.74	20.60	20.62	20.56	20.40
17.5	83.2	15.45	15.80	16.50	17.01	17.34	17.51	17.60	17.62	17.50	17.60	17.63	17.64	17.50	17.40	17.37	17.28	17.21
14.0	137.	12.06	12.90	13.40	13.85	14.17	14.43	14.62	14.60	14.67	14.60	14.66	14.63	14.40	14.28	14.11	14.00	13.92
10.5	226.	9.80	10.02	10.41	10.60	10.97	11.28	11.47	11.56	11.53	11.53	11.52	11.46	11.30	11.06	10.86	10.74	10.64
7.0	373.	6.02	6.91	7.23	7.41	7.62	7.83	7.90	8.05	8.02	8.02	8.01	7.97	7.86	7.66	7.52	7.41	7.32
3.5	614.	3.27	3.52	3.76	3.86	3.97	4.06	4.15	4.17	4.13	4.13	4.12	4.10	4.07	3.98	3.89	3.84	3.78
0.0	1013.		-0.23	-0.06	-0.05	-0.04	-0.02	-0.03	-0.06	-0.10	-0.12	-0.12	-0.11	-0.07	-0.06	-0.07	-0.05	-0.03

ORIGINAL PAGE IS
OF POOR QUALITY

Table B4 (cont.)

OCTOBER ZONAL MEAN GEOPOTENTIAL HEIGHT (km)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.00002	117.56	117.74	117.90	117.91	118.12	118.22	118.10	117.93	117.91	117.83	117.72	117.65	117.53	117.38	117.25	117.15	117.04
119.0	.00004	111.96	112.14	112.29	112.31	112.53	112.67	112.80	112.40	112.40	112.43	112.34	112.27	112.10	111.99	111.92	111.86	111.78
115.5	.00007	107.41	107.60	107.78	107.85	108.17	108.30	108.41	108.38	108.44	108.40	108.28	108.17	108.01	107.79	107.66	107.60	107.51
112.0	.00011	103.46	103.69	103.96	104.13	104.56	104.80	104.90	105.01	105.11	105.06	104.96	104.79	104.56	104.26	104.07	103.93	103.81
108.5	.00019	100.07	100.35	100.67	100.90	101.38	101.77	101.92	101.98	102.11	102.00	101.96	101.76	101.48	101.13	100.88	100.69	100.53
105.0	.00031	97.13	97.42	97.75	98.00	98.40	98.80	98.85	99.12	99.25	99.23	99.10	98.91	98.61	98.23	97.96	97.74	97.56
101.5	.00051	94.50	94.77	95.00	95.31	95.77	96.13	96.27	96.32	96.45	96.44	96.32	96.14	95.88	95.40	95.20	94.97	94.79
98.0	.00084	92.06	92.31	92.58	92.74	93.14	93.46	93.53	93.56	93.67	93.60	93.57	93.42	93.15	92.79	92.52	92.30	92.12
94.5	.0014	89.73	89.93	90.14	90.23	90.56	90.70	90.81	90.80	90.91	90.92	90.83	90.70	90.46	90.11	89.86	89.65	89.47
91.0	.0023	87.43	87.59	87.72	87.72	87.96	88.10	88.07	88.04	88.14	88.16	88.06	87.96	87.72	87.39	87.15	86.94	86.77
87.5	.0038	85.11	85.21	85.25	85.15	85.27	85.36	85.29	85.23	85.33	85.34	85.26	85.13	84.90	84.56	84.31	84.11	83.94
84.0	.0062	82.61	82.65	82.62	82.44	82.40	82.40	82.38	82.30	82.37	82.38	82.32	82.19	81.93	81.57	81.32	81.08	80.80
80.5	.0100	79.77	79.79	79.75	79.56	79.56	79.51	79.37	79.24	79.26	79.28	79.27	79.15	78.86	78.46	78.17	77.85	77.61
77.0	.0170	76.79	76.80	76.72	76.54	76.52	76.48	76.34	76.20	76.18	76.19	76.21	76.06	75.76	75.31	74.96	74.59	74.31
73.5	.0280	73.67	73.66	73.54	73.39	73.39	73.38	73.29	73.17	73.12	73.13	73.13	72.97	72.62	72.13	71.74	71.30	70.99
70.0	.0460	70.42	70.39	70.28	70.12	70.17	70.21	70.18	70.11	70.06	70.04	70.02	69.82	69.44	68.91	68.45	67.96	67.61
66.5	.0760	67.06	67.02	66.90	66.76	66.86	66.95	66.97	66.97	66.94	66.91	66.83	66.60	66.20	65.64	65.10	64.55	64.13
63.0	0.12	63.62	63.58	63.44	63.33	63.45	63.59	63.66	63.71	63.70	63.66	63.53	63.28	62.87	62.30	61.69	61.05	60.54
59.5	0.21	60.04	60.02	59.90	59.81	59.96	60.12	60.23	60.29	60.29	60.25	60.09	59.81	59.43	58.85	58.17	57.47	56.86
56.0	0.34	56.29	56.33	56.27	56.20	56.38	56.56	56.68	56.72	56.71	56.67	56.52	56.25	55.87	55.28	54.58	53.83	53.17
52.5	0.56	52.36	52.48	52.50	52.44	52.65	52.83	52.95	52.97	52.94	52.91	52.77	52.51	52.15	51.58	50.90	50.12	49.43
49.0	0.92	48.29	48.50	48.60	48.61	48.78	48.95	49.08	49.08	49.05	49.02	48.90	48.65	48.30	47.79	47.14	46.38	45.71
45.5	1.52	44.14	44.45	44.65	44.70	44.88	45.01	45.13	45.14	45.10	45.06	44.98	44.75	44.45	44.01	43.44	42.75	42.13
42.0	2.51	39.98	40.40	40.74	40.85	41.01	41.14	41.24	41.23	41.19	41.18	41.12	40.94	40.69	40.32	39.86	39.28	38.74
38.5	4.14	35.90	36.44	36.96	37.15	37.32	37.42	37.47	37.44	37.40	37.40	37.38	37.27	37.08	36.78	36.42	35.98	35.54
35.0	6.83	32.02	32.65	33.31	33.61	33.78	33.84	33.85	33.78	33.74	33.76	33.79	33.74	33.60	33.38	33.00	32.78	32.43
31.5	11.3	28.45	29.10	29.84	30.23	30.40	30.41	30.37	30.30	30.25	30.28	30.34	30.33	30.25	30.06	29.86	29.61	29.35
28.0	18.5	25.16	25.77	26.49	26.92	27.10	27.00	27.02	26.96	26.91	26.93	27.00	27.02	26.96	26.85	26.68	26.47	26.26
24.5	30.6	22.02	22.56	23.18	23.63	23.83	23.83	23.78	23.73	23.69	23.71	23.76	23.78	23.76	23.65	23.51	23.34	23.17
21.0	50.4	18.94	19.42	19.95	20.38	20.60	20.64	20.63	20.60	20.57	20.58	20.62	20.62	20.58	20.46	20.32	20.18	20.05
17.5	83.2	15.94	16.36	16.81	17.17	17.41	17.53	17.59	17.59	17.56	17.58	17.59	17.56	17.45	17.28	17.12	16.98	16.87
14.0	137.	12.97	13.32	13.68	13.97	14.24	14.40	14.63	14.68	14.66	14.68	14.65	14.54	14.35	14.11	13.90	13.76	13.65
10.5	226.	9.98	10.28	10.56	10.77	11.03	11.28	11.48	11.56	11.53	11.54	11.51	11.30	11.18	10.91	10.68	10.53	10.43
7.0	373.	6.80	7.14	7.36	7.47	7.67	7.80	8.00	8.04	8.01	8.03	8.01	7.93	7.79	7.57	7.37	7.28	7.17
3.5	614.	3.50	3.73	3.87	3.90	4.00	4.00	4.15	4.16	4.12	4.14	4.13	4.11	4.06	3.93	3.81	3.76	3.73
0.0	1013.		-0.04	0.02	-0.03	-0.03	-0.03	-0.03	-0.06	-0.11	-0.10	-0.10	-0.08	-0.03	-0.06	-0.09	-0.04	0.02

NOVEMBER ZONAL MEAN GEOPOTENTIAL HEIGHT (km)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.00002	118.14	118.26	118.30	118.30	118.54	118.60	118.40	118.20	117.94	117.70	117.51	117.44	117.42	117.40	117.60	117.60	117.53
119.0	.00004	112.34	112.46	112.51	112.61	112.81	112.94	112.80	112.60	112.40	112.32	112.18	112.14	112.16	112.26	112.52	112.58	112.45
115.5	.00007	107.59	107.73	107.82	107.90	108.29	108.52	108.60	108.56	108.40	108.28	108.16	108.12	108.11	108.18	108.42	108.46	108.34
112.0	.00011	103.39	103.60	103.80	104.00	104.53	104.89	105.06	105.00	105.05	104.97	104.86	104.79	104.73	104.72	104.80	104.87	104.71
108.5	.00019	99.82	100.09	100.36	100.74	101.26	101.70	101.97	102.02	102.04	101.90	101.89	101.79	101.67	101.61	101.70	101.62	101.42
105.0	.00031	96.82	97.10	97.30	97.79	98.32	98.78	98.96	99.13	99.17	99.14	99.05	98.94	98.79	98.68	98.72	98.50	98.35
101.5	.00051	94.22	94.48	94.73	95.10	95.59	96.02	96.27	96.33	96.37	96.35	96.26	96.16	95.99	95.85	95.85	95.60	95.42
98.0	.00084	91.87	92.00	92.29	92.57	92.99	93.34	93.54	93.57	93.59	93.58	93.50	93.40	93.23	93.06	93.03	92.83	92.54
94.5	.0014	89.88	89.84	89.96	90.15	90.46	90.71	90.83	90.82	90.83	90.82	90.76	90.65	90.46	90.26	90.19	89.95	89.63
91.0	.0023	87.58	87.60	87.60	87.75	87.93	88.07	88.11	88.06	88.07	88.06	87.90	87.88	87.65	87.39	87.26	86.97	86.62
87.5	.0038	85.51	85.53	85.43	85.34	85.37	85.39	85.36	85.26	85.26	85.25	85.17	85.01	84.72	84.39	84.19	83.84	83.45
84.0	.0062	83.33	83.28	83.06	82.83	82.71	82.50	82.48	82.35	82.31	82.30	82.21	82.01	81.66	81.28	81.01	80.61	80.16
80.5	.0100	80.86	80.77	80.49	80.17	79.91	79.67	79.48	79.29	79.20	79.18	79.13	78.93	78.51	78.05	77.75	77.30	76.83
77.0	.0170	78.22	78.00	77.74	77.36	77.01	76.70	76.47	76.24	76.11	76.18	76.06	75.82	75.34	74.81	74.45	73.90	73.49
73.5	.0280	75.37	75.19	74.80	74.39	74.01	73.68	73.43	73.19	73.06	73.04	72.90	72.60	72.14	71.53	71.10	70.63	70.15
70.0	.0460	72.31	72.11	71.60	71.28	70.90	70.58	70.33	70.13	70.01	69.98	69.80	69.53	68.99	68.21	67.71	67.25	66.76
66.5	.0760	69.06	68.86	68.44	68.04	67.67	67.37	67.14	66.98	66.89	66.86	66.72	66.29	65.59	64.84	64.27	63.80	63.31
63.0	0.12	65.66	65.46	65.06	64.67	64.32	64.04	63.83	63.69	63.64	63.62	63.43	62.96	62.22	61.41	60.76	60.27	59.75
59.5	0.21	62.10	61.92	61.54	61.17	60.84	60.56	60.38	60.23	60.20	60.18	59.90	59.50	58.75	57.90	57.19	56.63	56.08
56.0	0.34	58.34	58.20	57.87	57.52	57.23	56.98	56.79	56.61	56.57	56.56	56.39	55.92	55.18	54.29	53.54	52.92	52.32
52.5	0.56	54.39	54.38	54.02	53.70	53.44	53.21	53.04	52.86	52.79	52.79	52.65	52.19	51.47	50.56	49.81	49.12	48.50
49.0	0.92	50.39	50.26	50.04	49.74	49.49	49.29	49.15	48.97	48.91	48.91	48.79	48.36	47.67	46.82	46.06	45.36	44.72
45.5	1.52	46.14	46.15	45.96	45.70	45.47	45.28	45.18	45.04	45.00	45.00	44.88	44.49	43.87	43.12	42.43	41.74	41.13
42.0	2.51	41.98	42.03	41.90	41.67	41.47	41.32	41.26	41.15	41.12	41.12	41.00	40.68	40.17	39.56	38.95	38.33	37.77
38.5	4.14	37.92	38.02	37.98	37.77	37.60	37.50	37.45	37.36	37.33	37.34	37.25	37.02	36.64	36.14	35.63	35.10	34.62
35.0	6.83	34.01	34.15	34.16	34.04	33.91	33.84	33.79	33.69	33.66	33.60	33.65	33.51	33.24	32.87	32.44	32.00	31.59
31.5	11.3	30.28	30.47	30.56	30.52	30.44	30.37	30.32	30.22	30.18	30.21	30.21	30.14	29.96	29.60	29.36	28.98	28.64
28.0	18.5	26.74	26.95	27.00	27.14	27.11	27.04	26.98	26.89	26.85	26.87	26.80	26.86	26.76	26.56	26.29	25.99	25.72
24.5	30.6	23.29	23.51	23.71	23.81	23.84	23.79	23.75	23.67	23.63	23.66	23.67	23.65	23.58	23.41	23.20	22.95	22.74
21.0	50.4	19.85	20.00	20.36	20.52	20.62	20.62	20.61	20.55	20.52	20.53	20.54	20.51	20.43	20.26	20.06	19.86	19.70
17.5	83.2	16.46	16.73	17.04	17.28	17.46	17.54	17.59	17.56	17.54	17.56	17.53	17.45	17.31	17.10	16.90	16.73	16.61
14.0	137.	13.15	13.42	13.76	14.05	14.31	14.50	14.65	14.67	14.66	14.67	14.60	14.44	14.19	13.93	13.71	13.56	13.47
10.5	226.	9.97	10.22	10.54	10.83	11.11	11.34	11.51	11.56	11.53	11.54	11.47	11.29	11.03	10.75	10.51	10.39	10.32
7.0	373.	6.77	6.99	7.27	7.50	7.74	7.90	8.02	8.04	8.01	8.03	7.98	7.88	7.68	7.46	7.25	7.15	7.11
3.5	614.	3.34	3.54	3.76	3.89	4.04	4.12	4.17	4.16	4.12	4.14	4.12	4.09	4.01	3.87	3.74	3.71	3.70
0.0	1013.		-0.23	-0.10	-0.05	-0.01	-0.02	-0.03	-0.07	-0.11	-0.10	-0.10	-0.06	-0.03	-0.07	-0.06	0.00	0.06

DECEMBER ZONAL MEAN GEOPOTENTIAL HEIGHT (km)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.00002	118.21	118.20	118.17	118.24	118.30	118.46	118.35	118.10	117.77	117.40	117.10	117.18	117.21	117.28	117.75	117.86	117.83
119.0	.00004	112.36	112.37	112.36	112.46	112.67	112.81	112.80	112.64	112.41	112.12	111.97	112.02	112.10	112.22	112.78	112.92	112.94
115.5	.00007	107.55	107.57	107.61	107.80	108.11	108.30	108.51	108.48	108.36	108.15	108.04	108.10	108.16	108.25	108.76	108.91	108.92
112.0	.00011	103.21	103.33	103.50	103.84	104.31	104.73	104.98	105.06	105.03	104.88	104.79	104.83	104.84	104.85	105.28	105.36	105.33
108.5	.00019	99.56	99.74	100.01	100.44	101.01	101.51	101.84	102.00	102.02	101.91	101.83	101.85	101.80	101.74	102.09	102.10	102.02
105.0	.00031	96.53	96.73	97.01	97.47	98.06	98.56	98.93	99.10	99.16	99.07	99.00	99.00	98.91	98.79	99.07	99.01	98.89
101.5	.00051	93.95	94.12	94.37	94.78	95.32	95.81	96.13	96.30	96.36	96.28	96.21	96.20	96.00	95.92	96.13	96.02	95.86
98.0	.00084	91.86	91.77	91.95	92.28	92.73	93.14	93.41	93.53	93.56	93.51	93.45	93.43	93.29	93.07	93.22	93.05	92.84
94.5	.0014	89.54	89.59	89.60	89.80	90.22	90.52	90.70	90.79	90.82	90.75	90.69	90.67	90.48	90.20	90.27	90.03	89.77
91.0	.0023	87.53	87.51	87.48	87.56	87.74	87.90	87.99	88.03	88.06	87.99	87.93	87.87	87.62	87.24	87.22	86.89	86.56
87.5	.0038	85.57	85.47	85.38	85.21	85.23	85.25	85.24	85.23	85.25	85.18	85.00	84.97	84.62	84.14	84.01	83.62	83.27
84.0	.0062	83.56	83.36	83.07	82.81	82.63	82.40	82.30	82.34	82.32	82.24	82.13	81.95	81.50	80.94	80.76	80.32	79.92
80.5	.0100	81.29	81.06	80.60	80.28	79.92	79.61	79.42	79.32	79.28	79.20	79.11	78.86	78.35	77.72	77.50	77.01	76.56
77.0	.0170	78.86	78.58	78.13	77.60	77.11	76.80	76.42	76.30	76.23	76.16	76.06	75.80	75.17	74.46	74.19	73.67	73.20
73.5	.0280	76.19	75.87	75.37	74.76	74.19	73.70	73.30	73.26	73.19	73.12	73.03	72.60	71.96	71.16	70.83	70.30	69.81
70.0	.0460	73.29	72.94	72.40	71.76	71.17	70.65	70.32	70.19	70.12	70.05	69.95	69.54	68.71	67.83	67.42	66.87	66.36
66.5	.0760	70.15	69.79	69.23	68.60	68.01	67.50	67.16	67.02	66.96	66.89	66.79	66.32	65.43	64.46	63.94	63.37	62.85
63.0	0.12	66.80	66.44	65.89	65.28	64.71	64.23	63.87	63.70	63.63	63.59	63.48	62.99	62.10	61.05	60.41	59.79	59.25
59.5	0.21	63.23	62.88	62.35	61.76	61.24	60.77	60.39	60.17	60.09	60.07	59.90	59.54	58.60	57.57	56.81	56.10	55.53
56.0	0.34	59.44	59.11	58.63	58.08	57.60	57.15	56.75	56.47	56.38	56.38	56.36	55.98	55.18	54.01	53.16	52.35	51.74
52.5	0.56	55.43	55.15	54.72	54.21	53.78	53.36	52.96	52.65	52.55	52.56	52.60	52.27	51.53	50.35	49.45	48.56	47.93
49.0	0.92	51.28	51.06	50.60	50.22	49.83	49.44	49.06	48.77	48.67	48.69	48.73	48.45	47.75	46.64	45.75	44.84	44.21
45.5	1.52	47.05	46.88	46.57	46.15	45.80	45.44	45.11	44.87	44.79	44.80	44.82	44.57	43.95	42.99	42.18	41.28	40.65
42.0	2.51	42.84	42.72	42.45	42.00	41.77	41.47	41.21	41.02	40.96	40.90	40.94	40.73	40.23	39.46	38.74	37.87	37.24
38.5	4.14	38.75	38.65	38.44	38.13	37.87	37.63	37.42	37.27	37.21	37.21	37.19	37.03	36.67	36.00	35.44	34.63	34.00
35.0	6.83	34.81	34.74	34.58	34.33	34.12	33.93	33.77	33.65	33.59	33.59	33.58	33.40	33.24	32.81	32.28	31.52	30.91
31.5	11.3	31.06	31.00	30.90	30.72	30.57	30.42	30.30	30.21	30.14	30.14	30.14	30.00	29.92	29.61	29.15	28.53	27.99
28.0	18.5	27.49	27.44	27.37	27.26	27.18	27.06	26.97	26.90	26.84	26.83	26.84	26.80	26.80	26.45	26.09	25.60	25.16
24.5	30.6	24.02	23.99	23.95	23.91	23.86	23.80	23.73	23.67	23.63	23.62	23.63	23.59	23.50	23.31	23.02	22.63	22.28
21.0	50.4	20.56	20.55	20.57	20.61	20.64	20.63	20.59	20.56	20.52	20.51	20.50	20.46	20.34	20.16	19.91	19.59	19.32
17.5	83.2	17.11	17.13	17.22	17.36	17.40	17.56	17.59	17.57	17.56	17.54	17.50	17.40	17.22	16.90	16.76	16.50	16.27
14.0	137.	13.71	13.76	13.80	14.13	14.37	14.56	14.65	14.69	14.68	14.66	14.56	14.37	14.09	13.81	13.59	13.37	13.19
10.5	226.	10.39	10.46	10.61	10.80	11.19	11.39	11.51	11.56	11.56	11.53	11.43	11.22	10.92	10.63	10.41	10.23	10.07
7.0	373.	7.11	7.16	7.39	7.54	7.79	7.94	8.01	8.05	8.03	8.02	7.95	7.82	7.60	7.35	7.16	7.02	6.89
3.5	614.	3.63	3.66	3.75	3.91	4.07	4.13	4.14	4.16	4.14	4.13	4.10	4.06	3.97	3.81	3.60	3.59	3.58
0.0	1013.		-0.14	-0.13	-0.05	0.00	-0.03	-0.06	-0.07	-0.09	-0.10	-0.10	-0.05	-0.03	-0.09	-0.09	-0.08	-0.11

Table B5

JANUARY ZONAL MEAN ZONAL WIND (m/s)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	-0.9	-1.7	3.5	7.4	7.9	3.0	-23.5	-34.2	10.0	37.0	17.1	-12.0	-22.4	-30.4	-20.4	-0.7	-4.9
119.0	.000042	-0.6	-1.1	4.9	10.7	14.1	14.2	-6.3	-15.1	15.4	30.7	0.9	-17.0	-26.7	-41.1	-31.1	-13.1	-6.7
115.5	.000069	1.1	2.2	10.5	19.0	20.0	30.4	10.0	9.6	20.3	29.1	0.9	-14.5	-22.1	-37.0	-20.6	-12.3	-6.2
112.0	.00011	4.9	9.6	20.0	30.2	30.5	44.9	30.0	28.8	30.1	29.5	6.8	-9.3	-15.1	-29.2	-22.4	-8.2	-4.2
108.5	.00019	7.1	14.0	25.6	36.5	45.4	52.9	48.8	39.9	42.0	30.1	7.9	-4.6	-0.0	-22.7	-16.6	-4.2	-2.1
105.0	.00031	7.3	14.4	26.2	37.4	46.5	54.4	51.5	43.2	43.2	29.5	8.4	-1.6	-4.4	-17.4	-11.9	-0.7	-0.4
101.5	.00051	6.1	12.0	23.3	34.0	42.6	50.4	47.9	40.2	40.4	27.5	8.3	0.4	-1.1	-13.3	-7.9	2.4	1.2
98.0	.00084	4.3	8.4	18.2	27.5	36.2	42.4	39.7	33.0	34.9	24.6	7.8	2.1	2.2	-0.0	-3.6	5.4	2.7
94.5	.0014	1.7	3.4	11.2	18.7	24.8	31.3	29.0	24.2	28.7	21.8	0.2	5.0	6.9	-3.6	1.1	9.0	4.6
91.0	.0023	-1.6	-3.1	1.9	7.5	12.1	10.5	17.9	16.1	24.2	21.0	11.1	10.6	13.8	3.9	6.8	12.7	6.5
87.5	.0036	-4.2	-6.3	-0.3	-6.1	-2.7	4.7	7.0	9.7	23.1	24.6	18.3	19.9	22.5	11.7	10.0	15.7	8.0
84.0	.0062	-5.7	-11.2	-21.6	-21.0	-21.6	-12.5	3.4	5.9	24.7	29.5	20.7	30.3	30.0	19.8	10.2	17.5	8.9
80.5	.0100	-7.2	-14.1	-32.2	-37.8	-41.9	-28.1	-3.2	6.1	25.4	31.1	26.6	38.5	38.8	23.7	10.4	17.8	9.0
77.0	.0170	-9.1	-17.9	-40.9	-52.5	-50.0	-30.8	-6.4	8.8	26.8	34.6	33.0	46.9	48.6	27.0	11.4	17.1	8.7
73.5	.0280	-10.5	-20.8	-47.3	-62.9	-70.4	-47.3	-8.2	11.7	28.5	38.4	39.0	53.0	55.6	29.7	12.3	16.7	8.5
70.0	.0400	-11.5	-22.7	-50.9	-68.1	-75.0	-61.4	-11.3	11.3	28.2	40.3	45.1	58.7	60.9	32.7	13.6	17.2	8.7
66.5	.0700	-12.0	-23.7	-51.5	-67.3	-73.6	-63.8	-18.3	4.9	22.3	38.5	48.0	61.8	63.1	35.6	16.2	19.3	9.8
63.0	0.12	-11.7	-23.1	-49.3	-63.1	-60.7	-58.8	-28.7	-6.7	8.9	31.3	46.1	60.7	61.7	38.0	20.8	23.7	12.0
59.5	0.21	-10.7	-21.0	-45.4	-57.9	-65.5	-60.6	-42.0	-22.6	-6.9	16.3	37.8	54.7	57.4	40.7	28.9	29.9	15.2
56.0	0.34	-9.2	-18.0	-41.1	-52.4	-61.2	-63.0	-57.1	-40.7	-22.3	1.4	25.1	46.4	51.9	43.4	33.0	38.0	18.3
52.5	0.56	-7.3	-14.3	-36.3	-46.3	-68.7	-64.0	-67.2	-67.0	-38.5	-13.8	12.8	38.2	46.6	44.5	38.4	39.4	20.0
49.0	0.92	-5.1	-10.0	-31.3	-40.7	-62.2	-62.9	-70.0	-62.4	-42.6	-19.1	5.9	29.1	40.9	42.7	37.0	40.1	20.4
45.5	1.52	-2.9	-5.7	-26.6	-35.7	-47.2	-58.0	-64.2	-66.2	-37.5	-15.6	4.6	23.7	33.7	38.2	36.1	39.7	20.1
42.0	2.51	-1.2	-2.3	-22.0	-30.6	-41.2	-50.2	-53.9	-45.6	-33.0	-11.5	5.3	18.0	28.3	34.1	35.7	39.0	19.8
38.5	4.14	0.3	0.5	-17.8	-25.3	-34.2	-40.8	-44.1	-41.1	-34.4	-11.3	3.9	11.9	20.5	31.2	36.1	38.1	19.4
35.0	6.83	1.4	2.7	-13.8	-20.0	-27.0	-32.4	-35.4	-36.4	-36.7	-12.5	0.5	7.0	16.9	28.9	35.8	36.3	18.4
31.5	11.3	2.0	3.9	-10.5	-14.6	-19.5	-24.5	-28.2	-30.5	-31.3	-11.5	-0.9	4.9	14.0	26.6	33.8	32.3	16.4
28.0	18.5	0.2	0.3	-7.3	-9.8	-12.9	-17.2	-21.5	-24.3	-23.0	-8.3	0.1	4.9	13.3	23.5	29.5	26.7	13.6
24.5	30.6	-1.2	-2.4	-3.8	-5.4	-7.6	-10.8	-15.8	-19.4	-17.2	-6.7	1.9	6.0	12.6	20.2	24.3	21.4	10.8
21.0	50.4	-0.6	-1.1	0.6	0.7	-1.0	-4.7	-10.3	-13.4	-11.7	-1.1	5.9	9.6	15.0	18.9	20.6	17.4	8.8
17.5	83.2	0.9	1.7	5.9	9.6	8.9	3.5	-2.9	-6.0	-6.2	6.8	14.8	18.4	21.5	19.9	18.7	14.4	7.3
14.0	137.	2.4	4.7	11.1	18.7	20.0	14.2	6.6	1.7	-0.1	16.0	27.8	31.1	28.8	21.1	16.7	11.7	5.9
10.5	226.	1.9	2.5	9.2	19.5	23.2	17.1	5.7	-2.4	-2.0	6.8	24.7	37.7	27.7	16.5	10.4	7.3	3.6
7.0	373.	0.5	2.3	11.4	20.9	18.9	10.8	2.4	-2.0	-3.0	1.9	16.8	25.9	21.6	13.8	8.3	5.5	2.9
3.5	614.	-0.2	-0.8	6.2	13.4	11.6	4.9	-0.6	-1.4	-3.3	-2.8	5.8	11.9	12.0	8.4	4.9	3.0	1.7
0.0	1013.		-0.2	2.6	5.4	2.6	-2.3	-4.0	-1.8	-2.0	-6.1	-4.1	1.1	3.5	2.5	0.5	0.2	-1.2

FEBRUARY ZONAL MEAN ZONAL WIND (m/s)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	-0.1	-0.1	11.1	19.1	17.6	8.8	-14.7	-20.4	-10.0	15.2	21.5	10.4	-0.6	-22.4	-20.7	-14.1	-7.2
119.0	.000042	-0.1	-0.2	11.6	21.2	22.1	17.1	-0.4	-13.2	-4.0	13.5	17.6	8.5	-2.8	-25.4	-30.2	-17.2	-6.8
115.5	.000069	1.4	2.7	16.6	28.7	32.9	31.7	20.0	7.9	8.5	17.3	20.2	13.9	2.6	-20.8	-27.4	-16.1	-8.2
112.0	.00011	4.2	8.3	24.1	37.7	43.4	43.9	35.4	23.3	17.8	20.3	23.1	19.6	9.5	-13.9	-21.7	-12.5	-6.3
108.5	.00019	5.8	11.4	28.2	42.5	48.8	50.1	43.3	31.6	22.7	21.6	24.8	23.4	14.2	-8.7	-17.0	-9.1	-4.6
105.0	.00031	5.9	11.6	28.5	42.8	49.1	50.6	44.6	33.1	22.6	20.6	24.6	25.1	16.9	-5.6	-13.9	-6.7	-3.4
101.5	.00051	5.0	9.9	26.0	39.7	45.5	46.4	40.4	29.2	18.6	17.6	23.0	25.0	17.8	-3.8	-12.1	-6.1	-2.6
98.0	.00084	3.5	6.9	21.6	34.1	38.8	38.9	32.7	22.1	12.9	13.6	20.8	24.4	18.3	-2.6	-10.5	-3.7	-1.9
94.5	.0014	1.3	2.6	15.7	26.6	29.9	29.5	23.6	14.4	7.1	10.1	19.5	24.6	19.6	-0.8	-8.7	-2.3	-1.2
91.0	.0023	-1.5	-3.0	7.9	17.4	19.6	19.2	14.8	8.0	3.2	8.7	20.3	26.9	22.5	2.6	-5.6	-0.5	-0.2
87.5	.0036	-4.6	-9.0	-0.7	6.5	8.0	9.0	6.8	3.1	2.0	10.7	24.3	31.6	27.1	6.9	-3.0	2.3	1.2
84.0	.0062	-7.2	-14.2	-8.9	-6.4	-6.2	1.2	0.6	-0.9	1.0	13.4	27.7	34.5	42.5	10.6	-1.4	5.5	2.8
80.5	.0100	-8.9	-17.6	-15.7	-17.7	-18.2	-6.9	-1.4	-2.7	0.3	16.3	31.5	40.2	48.1	16.3	-0.2	6.6	3.4
77.0	.0170	-10.1	-20.0	-21.5	-28.5	-29.0	-12.3	0.2	-1.0	2.7	22.0	36.9	46.8	53.2	21.7	1.0	6.0	3.0
73.5	.0280	-10.9	-21.4	-25.4	-36.1	-35.8	-15.4	2.3	2.5	7.9	30.6	43.5	51.6	58.0	26.3	2.1	5.3	2.7
70.0	.0400	-11.3	-22.3	-27.3	-39.5	-38.6	-17.6	2.4	4.4	11.0	36.4	48.8	56.8	62.2	31.0	4.3	5.7	2.9
66.5	.0700	-11.1	-21.9	-26.7	-38.6	-38.5	-20.4	-0.3	4.1	11.3	39.0	53.3	60.5	65.6	35.5	8.2	8.4	4.3
63.0	0.12	-9.8	-19.4	-23.7	-34.9	-37.7	-24.9	-4.7	2.1	7.6	38.8	52.4	61.6	67.8	39.7	14.0	13.4	6.8
59.5	0.21	-7.6	-15.0	-19.2	-30.3	-38.9	-30.5	-11.5	-1.1	2.7	29.0	46.3	58.2	67.9	44.0	21.8	20.3	10.3
56.0	0.34	-5.5	-10.8	-14.8	-25.8	-36.6	-35.1	-20.9	-0.7	-6.5	18.6	37.0	53.7	66.9	47.8	29.4	27.1	13.8
52.5	0.56	-3.6	-7.2	-11.0	-21.4	-33.3	-37.2	-31.6	-25.3	-18.6	2.8	26.3	47.0	62.1	48.7	33.5	30.7	15.6
49.0	0.92	-2.2	-4.3	-8.1	-17.7	-30.5	-37.6	-30.0	-38.0	-28.2	-6.3	17.7	40.1	56.9	45.8	32.7	30.6	15.6
45.5	1.52	-1.0	-2.0	-6.1	-15.2	-27.6	-38.3	-41.5	-41.7	-32.7	-0.7	12.3	33.4	40.6	39.5	28.6	28.2	14.3
42.0	2.51	-0.2	-0.3	-4.2	-13.0	-24.2	-33.5	-41.5	-42.7	-36.7	-11.3	8.5	26.3	40.4	32.4	24.5	25.5	12.9
38.5	4.14	0.6	1.2	-2.8	-11.0	-20.7	-29.3	-39.9	-43.8	-37.8	-13.1	4.8	19.0	31.0	26.4	22.6	24.0	12.2
35.0	6.83	1.1	2.2	-1.4	-8.3	-16.9	-25.9	-37.0	-41.4	-38.5	-13.3	2.1	12.2	22.1	22.2	22.7	23.7	12.0
31.5	11.3	1.4	2.8	-0.1	-5.1	-12.8	-22.4	-32.3	-36.0	-34.0	-11.2	1.4	7.2	15.1	19.5	23.7	23.6	12.0
28.0	18.5	1.8	2.8	1.4	-2.3	-9.3	-17.9	-26.6	-30.5	-27.2	-8.9	1.7	5.0	10.6	17.5	23.1	22.3	11.3
24.5	30.6	1.7	3.3	3.5	0.5	-5.9	-13.1	-21.4	-26.4	-23.4	-7.0	2.3	5.3	10.2	16.3	20.6	19.5	9.9
21.0	50.4	3.0	5.9	7.2	5.1	-0.5	-7.8	-15.5	-20.4	-17.2	-3.1	5.6	8.8	13.3	16.4	18.3	16.0	8.1
17.5	83.2	4.0	7.8	12.8	12.2	8.5	0.2	-7.2	-12.1	-0.3	5.6	14.4	17.9	20.0	17.9	16.6	12.6	6.4
14.0	137.	4.9	9.6	18.3	20.6	18.6	10.6	2.9	-6.5	-0.2	13.7	27.0	31.1	27.8	19.3	14.5	9.2	4.7
10.5	226.	5.0	8.1	16.1	23.9	22.9	15.9	4.9	-2.8	-3.2	0.1	20.6	30.7	28.0	15.1	9.2	7.2	4.9
7.0	373.	4.0	5.8	13.6	20.1	16.9	9.1	1.8	-2.2	-3.3	2.0	18.5	27.0	21.3	12.7	7.4	5.3	3.8
3.5	614.	1.6	1.6	8.8	14.6	10.5	3.0	-1.1	-1.6	-3.0	-2.9	6.6	12.6	11.5	7.7	4.3	2.6	1.8
0.0	1013.		1.2	4.0	5.5	1.7	-3.1	-4.2	-1.4	-2.3	-6.2	-4.1	1.2	3.2	2.3	0.1	0.2	-0.3

MARCH ZONAL MEAN ZONAL WIND (m/s)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	7.1	14.1	19.9	21.2	10.0	11.7	10.0	22.6	42.9	19.5	2.6	10.6	12.6	13.0	21.0	21.6	11.0
119.0	.000042	6.5	12.9	19.0	21.4	20.1	16.3	17.3	30.6	40.5	23.8	5.8	12.8	13.2	12.2	19.2	20.0	10.2
115.5	.000069	7.3	14.4	22.4	27.3	28.6	27.1	30.3	44.2	61.9	33.8	14.9	21.4	20.3	17.1	22.1	21.2	10.8
112.0	.00011	9.1	18.0	27.8	34.2	36.8	36.4	40.1	54.2	71.0	41.0	21.9	29.2	27.7	23.6	26.7	24.1	12.2
108.5	.00019	10.3	20.3	30.9	38.1	40.9	40.9	44.9	59.0	75.3	44.4	25.4	33.1	31.8	27.4	29.8	26.3	13.4
105.0	.00031	10.5	20.7	31.6	38.6	41.4	41.1	45.1	56.8	74.6	43.7	25.1	33.6	32.8	28.6	30.9	27.2	13.8
101.5	.00051	10.2	20.0	30.1	36.6	36.7	37.6	41.3	54.9	70.3	38.8	21.9	31.2	31.1	27.6	30.4	27.1	13.8
98.0	.00084	9.3	18.3	27.4	32.8	34.0	32.2	35.3	48.9	64.2	34.4	17.2	27.4	28.2	25.4	29.1	26.3	13.4
94.5	.0014	8.0	15.8	23.7	27.9	28.2	26.0	29.1	43.1	58.7	29.6	12.8	23.5	24.7	22.6	27.0	25.0	12.7
91.0	.0023	6.3	12.6	19.0	22.4	22.2	20.2	24.2	39.1	55.2	26.6	10.1	20.9	22.0	20.0	25.0	23.6	12.0
87.5	.0036	5.0	9.9	14.7	16.6	16.6	15.6	20.8	36.5	53.4	25.5	9.5	19.8	20.4	18.1	23.1	22.3	11.3
84.0	.0062	4.6	9.1	12.0	9.7	13.5	12.4	13.1	30.5	46.1	22.6	3.2	17.2	9.9	24.5	22.1	21.4	10.9
80.5	.0100	4.9	9.6	11.1	7.7	12.0	11.8	10.1	20.6	33.3	17.6	4.1	16.9	11.0	26.9	22.8	20.3	10.3
77.0	.0170	5.3	10.5	11.2	6.6	11.1	12.9	11.0	15.4	26.5	18.2	9.4	19.1	14.2	29.8	23.7	18.5	9.4
73.5	.0280	5.8	11.5	12.3	7.0	10.9	14.0	13.3	14.9	25.8	23.9	18.3	23.9	19.3	32.2	23.1	16.0	8.1
70.0	.0400	6.4	12.7	14.2	9.1	10.8	13.8	15.7	17.1	26.8	31.7	28.4	29.0	24.6	33.9	22.2	13.8	7.0
66.5	.0700	7.6	14.9	17.4	12.2	9.6	11.8	18.1	21.6	29.9	39.3	36.7	32.9	29.3	34.9	21.5	12.6	6.4
63.0	0.12	9.3	18.3	21.3	14.9	6.9	8.4	19.9	25.8	32.7	42.8	40.9	35.1	33.4	35.1	21.2	12.7	6.4
59.5	0.21	11.0	21.6	25.0	17.6	4.7	3.6	18.7	27.4	30.6	39.5	40.4	35.5	36.3	35.6	22.3	14.8	7.5
56.0	0.34	12.4	24.5	27.5	19.4	3.6	-0.1	13.7	22.1	20.3	30.7	36.4	34.4	37.4	35.8	25.0	18.3	9.3
52.5	0.56	13.4	26.4	28.5	19.6	2.9	-1.5	6.1	9.9	10.0	20.6	30.2	32.1	37.1	35.8	27.2	21.1	10.7
49.0	0.92	13.5	26.5	28.2	19.3	2.5	-1.8	0.6	-0.9	-0.3	12.4	24.0	29.4	35.7	34.0	27.1	20.9	10.6
45.5	1.52	12.6	24.9	25.8	17.8	2.6	-3.0	-4.4	-8.4	-9.3	6.1	18.6	26.2	33.1	31.7	24.1	17.9	9.1
42.0	2.51	11.4	22.5	22.1	15.2	2.7	-6.2	-10.8	-15.9	-16.5	0.5	13.0	22.0	29.5	27.0	19.0	13.6	6.9
38.5	4.14	10.3	20.2	17.9	12.1	2.1	-7.5	-16.1	-22.3	-22.0	-4.7	7.2	17.5	24.8	21.3	14.6	10.4	5.3
35.0	6.83	9.0	17.8	14.4	9.8	1.0	-9.4	-18.6	-25.3	-24.1	-8.3	2.6	12.8	19.1	16.1	12.1	9.4	4.8
31.5	11.3	8.0	15.7	12.4	8.5	-0.1	-10.5	-18.6	-24.4	-22.7	-9.0	1.2	8.1	12.7	12.2	11.5	10.3	5.2
28.0	18.5	6.4	12.7	11.3	7.6	-0.7	-10.2	-17.6	-21.8	-20.3	-8.9	1.1	4.7	7.7	9.9	11.8	11.8	6.0
24.5	30.6	5.5	10.8	10.8	7.9	0.1	-8.6	-15.7	-19.6	-17.9	-8.0	1.2	3.8	6.8	9.7	12.0	12.3	6.3
21.0	50.4	5.7	11.3	11.5	9.9	3.8	-4.1	-11.2	-15.8	-15.5	-3.2	4.1	6.9	9.9	11.1	12.0	11.1	5.6
17.5	83.2	6.3	12.4	13.8	14.7	11.1	4.6	-2.2	-0.4	-11.7	3.5	13.1	16.1	16.4	13.2	11.5	8.4	4.3
14.0	137.	6.7	13.2	17.2	20.9	20.3	15.7	9.0	-1.4	-6.2	13.1	26.4	20.9	23.9	15.6	10.9	6.0	3.0
10.5	226.	6.4	9.8	16.8	23.5	22.7	18.0	7.1	-2.5	-3.8	5.3	24.3	30.0	25.9	14.8	10.9	8.7	4.7
7.0	373.	5.2	9.0	17.0	22.0	18.1	11.7	3.5	-2.7	-4.3	0.9	15.7	23.8	19.5	12.6	9.5	7.1	3.3
3.5	614.	2.1	3.4	9.8	14.4	10.8	4.5	-0.6	-2.3	-4.1	-3.7	5.4	11.7	10.4	7.3	5.7	4.0	1.6
0.0	1013.		-1.3	4.9	6.8	2.7	-2.9	-4.3	-2.4	-1.9	-4.8	-4.1	0.4	2.7	2.0	0.9	0.2	-1.3

ORIGINAL PAGE IS
OF POOR QUALITY

Table B5 (cont.)

APRIL ZONAL MEAN ZONAL WIND (m/s)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	-0.3	-0.6	5.1	14.7	14.6	4.4	20.2	42.8	36.4	-15.1	-20.9	-0.5	16.5	20.8	23.4	19.8	10.0
119.0	.000042	-1.5	-3.0	2.6	12.9	13.9	4.8	20.0	44.3	43.0	-3.5	-10.1	0.0	10.8	21.9	23.1	19.0	9.6
115.5	.000069	-1.1	-2.1	5.1	17.3	20.0	11.7	26.6	51.0	56.1	13.8	0.8	10.6	29.0	28.4	20.9	20.9	10.6
112.0	.00011	0.6	1.1	9.9	23.4	26.8	18.7	31.5	56.0	63.9	26.4	13.5	29.2	30.1	35.9	32.8	24.6	12.6
108.5	.00019	1.9	3.8	13.3	27.3	30.8	22.5	33.9	58.2	68.2	32.8	19.8	34.3	42.5	39.9	36.0	27.1	13.8
105.0	.00031	2.6	5.2	15.1	29.2	32.3	23.3	33.6	57.3	67.6	33.2	20.2	34.5	42.7	40.3	36.4	27.4	13.9
101.5	.00051	2.9	5.8	15.5	29.2	31.7	21.9	31.1	53.9	63.5	29.0	15.9	30.4	39.4	37.7	34.4	26.3	13.4
98.0	.00084	2.9	5.7	15.2	28.4	30.2	19.3	27.5	49.2	57.4	22.1	8.6	23.8	33.6	33.0	31.0	24.1	12.2
94.5	.0014	2.7	5.4	14.6	27.5	28.9	17.3	24.6	45.2	51.9	15.2	0.7	15.8	26.2	26.8	26.3	20.9	10.6
91.0	.0023	2.7	5.4	14.7	27.4	28.6	16.8	23.6	43.0	48.3	9.8	-4.3	7.6	18.0	19.4	20.2	16.9	8.6
87.5	.0038	3.3	6.5	15.2	28.4	29.8	18.3	24.8	43.0	46.5	5.9	-12.2	0.2	9.7	11.1	13.7	13.0	6.6
84.0	.0062	4.9	9.6	17.2	32.6	33.9	18.2	20.1	36.7	36.1	-1.3	-22.8	-11.1	0.1	6.6	8.7	10.7	5.4
80.5	.0100	7.0	13.7	21.2	36.7	38.4	21.4	14.4	20.4	17.2	-11.4	-27.0	-18.9	-7.0	3.9	6.9	10.2	5.2
77.0	.0170	8.8	17.4	26.0	41.4	42.9	26.2	13.2	10.8	6.2	-15.5	-25.8	-21.6	-10.2	3.3	7.0	10.0	5.1
73.5	.0280	10.0	19.7	30.4	46.5	47.1	31.6	16.8	9.6	4.8	-11.1	-17.6	-19.3	-8.6	4.4	7.2	9.6	4.9
70.0	.0460	11.2	22.2	34.9	51.5	50.8	36.5	23.5	14.9	10.3	0.9	-6.8	-15.1	-6.9	6.3	7.7	9.5	4.8
66.5	.0760	13.1	25.7	40.0	56.0	53.0	40.5	32.1	24.8	21.0	16.5	5.9	-10.9	-4.0	8.1	8.5	9.5	4.8
63.0	0.12	15.3	30.2	45.5	59.6	53.0	42.5	40.8	34.6	30.2	28.3	14.7	-6.9	-1.5	9.3	8.6	8.8	4.4
59.5	0.21	17.7	34.8	50.0	61.9	53.2	42.5	44.7	39.2	32.7	30.8	17.5	-3.2	0.7	10.3	9.0	8.1	4.1
56.0	0.34	19.7	38.8	52.8	62.5	53.6	41.4	43.0	36.8	27.2	24.7	15.9	0.1	3.3	11.5	10.0	8.3	4.2
52.5	0.56	21.1	41.6	54.3	61.1	51.6	39.1	39.0	30.7	17.9	15.9	12.2	3.0	5.8	12.3	10.8	8.6	4.4
49.0	0.92	21.6	42.5	54.3	58.1	47.2	36.8	35.5	24.8	11.7	10.5	9.8	5.1	7.3	12.6	11.0	8.5	4.3
45.5	1.52	21.0	41.4	51.2	52.7	41.4	32.6	30.0	18.7	6.5	7.3	8.8	6.6	8.7	12.9	9.1	6.3	3.2
42.0	2.51	20.1	39.7	46.0	45.9	35.1	25.8	21.0	10.2	0.3	3.0	7.0	7.9	10.2	9.9	5.3	2.6	1.3
38.5	4.14	19.1	37.6	39.6	38.2	28.3	17.7	9.9	-0.6	-7.9	-3.7	3.3	8.7	10.5	6.5	0.8	-1.3	-0.7
35.0	6.83	17.9	35.2	33.5	30.8	21.3	10.3	-0.2	-11.3	-15.1	-10.0	-0.5	8.2	9.5	3.0	-3.4	-4.8	-2.4
31.5	11.3	16.4	32.4	28.5	24.3	14.8	4.1	-7.2	-17.5	-19.2	-11.1	-1.5	5.8	6.8	0.5	-5.5	-6.7	-3.4
28.0	18.5	13.3	26.1	24.1	19.3	10.3	0.0	-10.0	-17.7	-17.9	-8.5	-1.0	3.2	3.9	-0.5	-6.1	-6.3	-3.2
24.5	30.6	9.7	19.1	20.1	16.6	8.7	-0.7	-9.5	-15.5	-15.1	-4.3	-0.8	2.1	3.2	0.4	-2.8	-3.9	-2.0
21.0	50.4	7.8	15.3	17.5	16.2	10.5	2.2	-5.7	-11.6	-10.7	-2.3	2.3	4.0	5.7	3.2	-0.1	-1.6	-0.8
17.5	83.2	7.1	14.1	16.5	18.2	16.1	9.9	3.3	-4.6	-4.8	5.6	11.6	11.6	11.8	6.8	1.8	-0.3	-0.2
14.0	137.	6.6	13.0	16.9	21.9	23.7	20.8	16.4	5.7	1.7	16.9	25.8	23.1	19.1	18.7	3.8	0.6	0.3
10.5	226.	7.6	8.5	14.0	21.7	23.1	22.3	14.3	1.7	-2.1	6.4	21.6	27.9	23.0	15.7	10.9	7.5	3.2
7.0	373.	4.9	6.7	14.1	21.4	18.9	14.7	7.9	-1.1	-4.0	0.9	12.1	18.5	17.4	13.5	10.1	7.1	2.6
3.5	614.	2.3	2.8	9.1	14.2	11.4	6.5	1.3	-2.7	-3.9	-3.3	3.5	8.7	9.3	7.7	5.9	3.7	0.7
0.0	1013.		1.9	6.0	6.9	3.6	-1.3	-4.1	-3.7	-2.0	-4.1	-4.4	-1.5	1.6	2.4	0.6	-0.5	-1.1

MAY ZONAL MEAN ZONAL WIND (m/s)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	2.6	5.1	-0.7	-15.1	-10.7	-11.2	5.9	15.0	-13.5	-63.0	-33.5	12.6	23.1	14.6	8.7	4.7	2.4
119.0	.000042	1.2	2.4	-13.1	-18.2	-13.1	-13.9	0.5	12.2	-6.8	-34.5	-16.4	22.0	20.6	17.3	9.7	4.9	2.5
115.5	.000069	1.6	3.5	-10.3	-13.6	-6.0	-9.5	1.1	13.8	4.9	-11.2	5.7	37.0	30.6	25.6	15.2	8.2	4.2
112.0	.00011	3.5	6.9	-5.0	-7.1	-1.2	-3.8	2.6	15.5	13.9	5.8	22.4	40.5	50.3	35.0	23.2	14.1	7.1
108.5	.00019	5.1	10.1	-0.2	-1.7	3.9	0.2	3.8	16.1	18.6	14.8	31.0	55.7	56.6	39.8	27.5	17.3	8.8
105.0	.00031	6.4	12.6	3.3	2.1	7.2	2.4	3.9	15.2	18.9	16.6	32.4	56.1	55.7	39.9	27.6	17.3	8.8
101.5	.00051	7.5	14.7	6.0	4.8	9.2	3.2	2.9	12.5	15.2	12.5	27.8	51.5	51.6	36.3	24.7	15.3	7.8
98.0	.00084	8.4	16.6	8.7	7.5	11.1	3.8	1.5	9.0	9.3	4.7	19.2	43.5	44.3	30.1	19.9	11.9	6.0
94.5	.0014	9.7	19.1	12.1	11.1	14.2	5.6	1.2	8.0	3.4	-3.9	8.8	33.0	34.7	21.6	13.2	7.2	3.7
91.0	.0023	11.1	21.9	16.3	16.4	19.6	9.8	3.4	5.1	-0.6	-11.4	-1.0	21.5	23.1	11.3	4.5	1.3	0.7
87.5	.0038	12.8	25.3	20.0	22.5	26.1	16.4	9.4	8.0	-1.0	-17.6	-11.5	9.5	10.1	-1.2	-6.5	-6.3	-2.7
84.0	.0062	15.0	29.4	23.2	26.3	36.9	20.3	12.9	6.8	-6.6	-20.5	-25.1	-3.6	-8.4	-12.4	-15.0	-11.3	-6.7
80.5	.0100	17.0	33.4	26.7	31.4	46.8	27.9	11.3	-3.9	-22.3	-30.6	-35.3	-16.7	-21.6	-21.6	-21.3	-15.4	-7.6
77.0	.0170	18.5	36.3	30.2	37.5	56.6	37.2	13.4	-0.0	-29.9	-46.2	-41.0	-25.2	-29.9	-27.4	-25.4	-18.6	-9.4
73.5	.0280	18.8	37.0	32.9	44.7	64.5	47.9	21.6	-4.3	-26.8	-42.9	-40.5	-28.7	-32.7	-29.1	-27.6	-21.7	-11.0
70.0	.0460	18.7	36.8	36.1	52.4	73.8	50.7	33.0	6.9	-14.4	-30.8	-34.5	-29.2	-32.5	-28.0	-27.8	-23.4	-11.9
66.5	.0760	18.5	36.3	37.4	60.4	82.3	70.9	46.2	20.8	1.0	-15.1	-25.9	-28.0	-31.1	-25.5	-26.1	-23.3	-11.8
63.0	0.12	18.6	36.6	40.4	68.1	88.2	78.5	57.7	33.2	12.4	-3.4	-19.2	-26.7	-28.7	-22.8	-24.2	-22.6	-11.5
59.5	0.21	19.3	38.0	44.2	74.9	92.0	81.1	62.4	38.0	15.5	-0.5	-17.2	-26.1	-25.6	-19.5	-22.2	-21.2	-10.8
56.0	0.34	20.4	40.1	48.4	79.7	93.8	80.1	60.2	34.8	11.0	-5.5	-18.4	-25.3	-22.0	-15.8	-19.3	-18.5	-9.4
52.5	0.56	21.4	42.1	52.3	81.7	92.2	76.2	55.2	27.9	1.7	-12.8	-20.0	-22.1	-17.4	-13.0	-16.4	-15.1	-7.7
49.0	0.92	22.1	43.5	54.8	80.0	86.6	70.5	49.9	22.3	-3.4	-13.5	-18.2	-18.7	-13.9	-10.8	-13.9	-11.7	-6.0
45.5	1.52	22.3	44.0	54.9	73.9	76.8	62.4	44.6	20.7	-2.4	-9.0	-14.0	-14.6	-10.6	-9.1	-12.3	-9.6	-6.0
42.0	2.51	22.6	44.6	53.6	66.0	64.5	51.2	37.1	18.5	-2.7	-6.8	-10.6	-8.8	-6.8	-7.8	-11.3	-9.0	-4.5
38.5	4.14	23.1	45.4	51.8	57.6	51.0	37.6	25.9	11.0	-6.0	-11.2	-9.9	-4.2	-3.4	-7.0	-10.1	-8.6	-4.4
35.0	6.83	23.3	46.0	40.4	46.6	37.8	24.6	13.1	0.2	-13.4	-16.7	-10.9	-1.9	-1.5	-6.2	-9.4	-9.0	-4.5
31.5	11.3	22.4	44.2	44.9	39.5	26.6	14.4	3.5	-0.6	-18.2	-18.1	-10.3	-1.9	-1.6	-6.3	-7.9	-8.3	-4.2
28.0	18.5	18.9	37.3	38.1	31.2	18.4	7.8	-1.4	-11.6	-18.2	-15.1	-8.2	-2.7	-2.5	-4.6	-6.3	-6.5	-3.3
24.5	30.6	14.8	29.2	31.3	24.9	13.9	5.3	-2.1	-9.7	-14.1	-10.7	-6.5	-3.3	-2.1	-3.1	-4.2	-4.3	-2.2
21.0	50.4	12.0	23.6	25.6	21.0	13.3	6.8	1.1	-6.2	-8.2	-4.9	-2.7	-1.3	0.7	0.1	-1.1	-1.4	-0.7
17.5	83.2	10.0	19.6	21.0	19.3	16.9	14.1	10.4	2.2	-2.7	2.8	6.7	6.3	7.3	5.0	2.5	1.5	0.8
14.0	137.	8.4	16.5	17.6	19.2	22.4	25.3	24.7	12.8	3.1	12.6	19.9	17.7	15.6	10.2	6.0	4.0	2.0
10.5	226.	7.1	9.9	13.8	19.9	23.5	26.8	21.7	6.0	-1.7	2.4	13.7	22.1	19.3	14.8	9.1	5.9	4.1
7.0	373.	6.2	7.9	12.5	18.9	19.9	18.3	13.4	2.0	-3.3	-0.9	7.1	13.9	13.9	12.7	8.5	6.0	4.9
3.5	614.	2.4	3.4	7.8	12.9	12.6	9.0	4.2	-1.3	-3.7	-3.5	1.7	6.1	7.3	7.2	4.8	3.4	2.7
0.0	1013.		1.4	4.4	4.7	2.9	0.1	-3.7	-4.3	-1.8	-2.6	-3.9	-1.7	1.5	2.1	-0.2	-0.4	-0.6

JUNE ZONAL MEAN ZONAL WIND (m/s)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	4.4	0.0	-16.9	-30.5	-26.3	-21.1	-3.4	9.4	-13.7	-82.4	-40.0	12.4	17.4	5.5	-0.9	-6.7	-2.9
119.0	.000042	3.2	6.3	-20.3	-33.7	-29.3	-25.3	-11.5	3.3	-7.1	-40.1	-19.3	23.9	24.0	9.1	0.7	-6.2	-2.6
115.5	.000069	4.0	7.9	-16.9	-28.6	-24.2	-21.9	-13.5	2.2	4.4	-14.1	5.6	40.4	36.5	18.7	7.9	-0.4	-0.2
112.0	.00011	5.9	11.7	-10.7	-21.3	-16.6	-16.5	-13.1	2.7	13.9	5.3	24.3	53.9	48.3	29.4	17.4	7.3	3.7
108.5	.00019	7.6	15.4	-6.1	-14.8	-10.7	-12.1	-12.3	2.7	18.8	15.4	33.6	60.5	54.0	35.0	22.2	11.2	5.7
105.0	.00031	9.4	18.6	-0.5	-9.6	-5.9	-8.8	-11.7	2.0	19.5	17.8	35.5	61.0	54.0	34.9	22.0	10.9	5.5
101.5	.00051	11.0	21.6	3.8	-4.9	-2.2	-6.6	-11.6	0.0	16.1	13.6	30.5	56.2	49.5	30.7	18.6	8.3	4.2
98.0	.00084	12.6	24.8	8.3	0.0	2.0	-4.2	-11.7	-3.0	10.2	5.5	21.3	47.4	41.4	23.7	12.8	4.1	2.1
94.5	.0014	14.5	28.5	14.1	6.3	7.6	-0.2	-10.5	-6.4	4.2	-4.0	9.7	36.9	30.5	14.0	5.0	-1.3	-0.7
91.0	.0023	16.5	32.4	20.0	14.4	16.1	6.5	-6.4	-6.4	0.0	-12.7	-2.5	22.5	17.3	2.1	-6.0	-6.4	-4.3
87.5	.0038	17.9	35.3	24.2	20.8	25.4	16.2	2.6	-0.1	-0.5	-19.7	-14.4	8.1	1.8	-12.5	-16.8	-16.9	-8.6
84.0	.0062	19.0	37.6	26.6	22.1	30.6	24.1	5.3	2.3	-4.8	-27.9	-25.8	-12.6	-20.4	-22.0	-29.3	-25.4	-12.9
80.5	.0100	20.4	40.2	28.8	26.4	47.5	32.4	6.8	-4.2	-15.5	-37.2	-34.9	-29.2	-37.4	-36.4	-39.5	-31.1	-15.8
77.0	.0170	21.6	42.6	30.9	31.4	57.1	42.8	10.8	-8.2	-24.1	-42.3	-39.9	-41.4	-60.0	-40.0	-47.8	-34.7	-17.6
73.5	.0280	22.1	43.6	32.3	37.7	68.0	55.5	18.7	-4.8	-25.4	-40.0	-40.6	-40.8	-57.1	-64.8	-63.3	-37.4	-19.0
70.0	.0460	22.4	44.1	33.7	45.1	79.8	60.6	30.0	2.8	-19.6	-32.7	-38.2	-51.4	-60.8	-67.2	-65.7	-39.1	-19.9
66.5	.0760	22.5	44.4	35.2	53.2	91.0	83.8	42.8	10.8	-13.1	-26.1	-35.7	-50.2	-60.0	-65.7	-64.5	-39.0	-19.8
63.0	0.12	23.0	45.3	37.9	61.1	99.7	94.6	53.8	16.6	-10.3	-23.7	-35.8	-47.7	-56.0	-62.3	-61.4	-37.8	-19.2
59.5	0.21	24.2	47.7	42.3	68.8	106.1	99.6	58.7	21.6	-0.6	-25.5	-39.2	-46.1	-52.1	-47.7	-47.6	-35.7	-18.1
56.0	0.34	25.8	50.9	47.5	75.3	110.1	100.7	57.0	18.0	-12.0	-30.2	-42.8	-45.0	-47.6	-42.8	-43.0	-32.5	-16.5
52.5	0.56	26.9	53.0	52.1	79.3	110.4	97.6	52.4	12.4	-16.8	-35.0	-43.9	-42.7	-41.6	-38.0	-38.6	-28.2	-14.3
49.0	0.92	27.2	53.6	54.9	79.6	106.0	91.3	48.3	10.8	-16.2	-33.4	-41.8	-40.2	-35.9	-33.8	-34.6	-23.2	-11.8
45.5	1.52	27.1	53.3	56.4	75.9	96.4	81.8	44.9	13.7	-11.3	-26.5	-36.9	-35.2	-30.8	-29.8	-30.2	-18.9	-9.6
42.0	2.51	27.0	53.1	56.3	71.5	83.1	68.4	39.9	15.2	-10.0	-21.3	-28.9	-28.0	-25.3	-25.3	-25.6	-15.8	-8.0
38.5	4.14	26.9	53.0	60.9	66.9	67.6	51.3	29.7	9.9	-13.7	-21.0	-23.7	-21.7	-19.5	-20.0	-20.8	-13.6	-6.9
35.0	6.83	26.3	51.8	61.9	60.9	51.9	33.9	16.1	-0.1	-21.0	-24.0	-20.8	-17.0	-14.9	-15.4	-16.4	-11.8	-6.0
31.5	11.3	24.0	47.3	58.2	52.7	37.6	20.8	6.1	-8.2	-23.7	-23.9	-18.3	-13.7	-11.6	-11.9	-12.6	-10.3	-5.2
28.0	18.5	20.7	40.7	50.3	43.4	26.3	12.6	2.1	-10.1	-21.0	-20.0	-15.7	-11.6	-9.4	-9.8	-9.6	-8.3	-4.2
24.5	30.6	17.6	34.7	42.1	36.3	19.9	9.2	2.3	-7.1	-16.2	-15.7	-13.2	-10.0	-7.6	-7.1	-6.8	-5.8	-2.9
21.0	50.4	14.8	29.1	35.1	29.4	17.9	10.4	5.1	-2.9	-10.0	-10.6	-0.7	-7.0	-3.6	-3.2	-3.2	-2.8	-1.4
17.5	83.2	11.9	23.5	29.0	25.4	20.0	17.7	12.6	3.2	-6.2	-4.4	-3.0	0.3	4.0	2.7	0.9	0.4	0.2
14.0	137.	9.4	18.4	23.2	22.5	24.5	29.9	25.0	11.9	-1.7	2.2	0.6	10.7	14.1	9.0	4.8	3.4	1.7
10.5	226.	6.5	11.1	14.6	19.3	25.7	31.5	22.2	3.2	-6.9	-6.5	2.1	14.6	18.7	13.0	7.2	5.2	2.7
7.0	373.	4.0	7.3	12.7	18.0	19.7	20.9	14.5	0.6	-6.4	-4.0	0.1	9.8	12.6	10.4	6.6	5.7	3.3
3.5	614.	1.5	1.7	6.7	11.8	12.3	9.8	4.8	-2.0	-4.1	-4.2	-1.4	4.1	6.4	6.2	3.9	3.5	2.0
0.0	1013.		2.8	5.9	5.7	3.6	0.3	-4.2	-6.1	-2.2	-1.3	-3.5	-0.9	1.5	1.8	0.6	-0.5	0.3

JULY ZONAL MEAN ZONAL WIND (m/s)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	6.0	11.9	-5.5	-30.9	-33.6	-10.0	7.0	14.4	-17.6	-42.2	-22.1	11.4	18.4	11.1	-2.3	-11.2	-5.7
119.0	.000042	4.8	9.5	-6.4	-33.6	-38.1	-22.2	0.9	9.3	-10.3	-21.3	-2.3	22.6	25.0	14.6	-1.0	-10.9	-5.5
115.5	.000069	5.7	11.3	-4.9	-28.3	-30.0	-18.4	-0.5	8.8	1.3	3.1	21.4	38.1	37.6	24.4	6.4	-6.7	-2.9
112.0	.00011	7.6	14.9	0.8	-20.9	-23.0	-12.9	0.4	9.6	10.7	21.0	38.1	52.4	40.0	34.7	15.8	1.9	1.0
108.5	.00019	9.4	18.4	6.0	-14.6	-17.1	-8.5	1.2	9.7	15.3	30.1	47.0	58.0	54.5	30.6	20.3	5.4	2.7
105.0	.00031	10.8	21.4	10.2	-9.8	-12.7	-6.5	1.6	8.8	15.6	31.0	40.0	58.9	54.3	30.1	19.9	4.9	2.5
101.5	.00051	12.2	24.1	13.9	-5.6	-9.3	-3.6	1.3	6.0	12.0	27.0	44.2	53.7	40.5	35.0	16.4	2.2	1.1
98.0	.00084	13.7	27.0	18.0	-1.0	-6.4	-1.6	1.0	3.6	6.0	19.7	35.2	44.9	41.4	20.0	10.7	-2.1	-1.1
94.5	.0014	15.4	30.4	23.1	5.1	-0.1	2.0	1.0	1.1	0.0	10.8	24.0	33.4	30.6	18.6	3.0	-7.7	-3.9
91.0	.0023	17.2	33.8	28.4	12.6	8.2	8.8	5.8	1.2	-4.0	2.9	12.7	20.4	17.5	6.9	-7.1	-15.0	-7.6
87.5	.0038	18.0	35.5	32.6	18.7	17.3	17.9	13.9	6.2	-4.2	-3.4	1.0	0.4	2.4	-7.3	-18.9	-23.0	-11.7
84.0	.0062	18.1	35.7	35.5	19.3	27.3	27.4	20.8	10.7	-2.1	-7.5	-7.8	-6.4	-13.9	-24.2	-31.4	-30.3	-15.4
80.5	.0100	18.5	36.4	37.2	23.3	34.6	34.8	25.0	10.6	-1.7	-8.8	-13.7	-20.8	-33.5	-40.9	-41.6	-35.9	-18.2
77.0	.0170	19.2	37.9	38.3	27.7	42.6	42.3	30.0	12.8	-0.7	-7.0	-15.6	-31.5	-50.2	-55.7	-50.5	-40.4	-20.5
73.5	.0280	20.0	39.3	39.7	33.0	51.1	50.5	38.1	16.7	2.1	-3.7	-15.1	-38.0	-61.4	-60.1	-56.6	-43.7	-22.2
70.0	.0460	20.9	41.1	41.7	39.8	60.5	50.0	42.3	20.4	5.2	-1.5	-15.0	-41.2	-60.0	-71.2	-50.5	-45.9	-23.3
66.5	.0760	22.2	43.8	45.1	47.7	70.0	60.6	47.3	22.2	5.2	-3.1	-17.2	-42.7	-65.0	-70.1	-50.1	-46.2	-23.5
63.0	0.12	24.3	47.9	50.3	58.2	78.5	71.9	49.0	21.2	-0.3	-7.8	-21.7	-44.7	-61.8	-65.5	-55.7	-44.3	-22.5
59.5	0.21	26.9	53.0	57.3	65.4	86.2	73.6	45.0	15.5	-6.9	-15.0	-28.7	-47.2	-57.9	-60.4	-50.6	-40.4	-20.5
56.0	0.34	29.4	57.9	64.7	74.2	89.9	72.4	39.0	6.6	-13.7	-24.2	-38.3	-40.0	-64.1	-63.0	-45.2	-35.8	-18.2
52.5	0.56	30.5	60.1	70.0	80.1	91.3	60.0	31.6	-1.8	-23.0	-33.3	-42.0	-48.9	-60.2	-46.5	-38.6	-30.7	-15.6
49.0	0.92	30.4	59.8	72.6	82.2	89.0	64.7	27.2	-3.7	-23.7	-38.1	-44.2	-47.2	-40.0	-41.0	-34.3	-28.3	-12.9
45.5	1.52	29.7	58.5	73.6	81.1	83.0	58.8	23.2	-9.5	-18.6	-30.5	-41.1	-43.1	-41.1	-38.0	-29.4	-20.4	-10.4
42.0	2.51	29.0	57.2	74.8	79.7	74.9	50.4	22.5	0.7	-17.2	-26.3	-35.3	-38.9	-34.9	-30.5	-24.4	-16.8	-6.5
38.5	4.14	28.4	55.9	76.4	77.9	66.3	39.4	16.2	-4.0	-23.0	-26.6	-38.6	-29.9	-28.2	-24.4	-19.5	-13.9	-7.1
35.0	6.83	27.3	53.8	76.5	74.0	54.9	27.8	7.5	-11.2	-31.3	-28.4	-27.1	-24.5	-22.3	-18.8	-15.2	-11.6	-6.9
31.5	11.3	25.0	49.3	72.4	66.2	43.5	18.9	1.9	-14.5	-31.3	-27.4	-24.7	-20.4	-17.0	-14.3	-12.0	-9.9	-6.0
28.0	18.5	21.9	43.2	63.8	55.7	33.2	13.5	0.9	-12.7	-26.4	-23.8	-21.4	-16.9	-13.1	-11.0	-9.5	-7.8	-4.0
24.5	30.6	19.5	38.4	53.9	45.8	26.9	11.4	2.3	-8.1	-19.2	-19.4	-18.0	-13.9	-10.2	-8.2	-6.9	-6.4	-2.7
21.0	50.4	17.0	33.4	45.5	38.0	23.9	12.6	5.7	-2.9	-12.4	-14.1	-14.1	-10.2	-6.9	-4.0	-3.4	-2.7	-1.4
17.5	83.2	13.8	27.2	38.2	32.0	24.3	10.0	13.2	3.0	-7.2	-8.2	-8.5	-4.3	2.0	2.4	0.9	0.2	0.1
14.0	137.	11.1	21.8	30.5	26.9	27.4	38.5	25.6	9.9	-4.1	-2.9	-1.0	3.5	12.6	9.6	5.0	3.1	1.6
10.5	226.	7.0	9.1	12.1	17.9	20.8	33.1	21.7	2.3	-7.1	-7.6	-3.6	4.5	18.4	15.0	7.8	5.6	4.2
7.0	373.	4.3	5.7	9.6	15.4	20.0	22.4	14.6	0.1	-6.1	-4.7	-3.1	3.0	12.1	11.0	6.5	5.7	4.9
3.5	614.	2.3	1.8	6.3	11.2	12.5	10.3	4.6	-2.2	-3.4	-3.6	-3.0	1.1	5.7	6.4	3.6	3.3	3.4
0.0	1013.		1.9	6.0	6.9	5.1	0.7	-4.5	-6.4	-2.3	-0.4	-3.8	-1.9	0.9	1.9	0.8	-0.1	0.1

AUGUST ZONAL MEAN ZONAL WIND (m/s)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	11.1	21.8	-2.0	-24.8	-16.2	4.5	14.3	-0.7	-24.2	-35.7	-13.3	18.1	25.5	17.3	4.3	-8.8	-4.5
119.0	.000042	10.0	19.7	-4.5	-27.0	-17.4	3.2	11.4	-2.4	-16.0	-19.1	2.1	26.0	30.5	19.7	4.6	-9.1	-4.6
115.5	.000069	10.7	21.1	-1.4	-21.9	-11.5	8.5	13.5	0.7	-4.0	1.9	22.2	41.3	41.5	27.9	10.8	-6.4	-2.7
112.0	.00011	12.2	24.1	3.7	-15.1	-4.4	14.3	16.4	3.8	4.4	17.1	37.3	53.0	51.5	38.7	18.4	0.4	0.2
108.5	.00019	13.6	26.7	7.8	-10.0	0.4	18.0	17.7	4.5	8.5	24.5	44.4	58.4	56.0	41.0	22.1	3.3	1.7
105.0	.00031	14.5	28.6	10.6	-6.9	3.0	19.4	17.5	3.4	8.2	25.3	46.1	58.3	56.7	40.7	21.9	3.2	1.6
101.5	.00051	15.3	30.1	12.4	-4.9	4.1	19.4	15.9	0.2	4.1	20.0	40.2	53.7	51.5	37.2	19.0	1.1	0.6
98.0	.00084	15.9	31.3	14.1	-3.3	5.0	19.0	13.9	-3.8	-2.0	13.5	32.1	46.0	44.5	31.2	14.3	-2.4	-1.2
94.5	.0014	16.6	32.7	16.2	-1.0	6.8	19.8	13.0	-7.1	-7.6	5.7	22.8	38.2	38.3	23.2	7.8	-7.2	-3.6
91.0	.0023	17.5	34.4	19.2	3.0	10.8	22.7	14.5	-8.0	-11.2	-0.7	13.8	28.8	24.0	13.5	-0.6	-13.4	-6.8
87.5	.0038	18.0	35.5	21.4	7.7	15.9	27.7	19.0	-6.4	-12.0	-6.7	5.7	18.3	13.0	2.0	-0.1	-20.7	-10.5
84.0	.0062	18.2	35.7	22.7	8.2	25.1	30.7	20.6	-1.3	-11.0	-8.4	-8.8	0.8	-1.8	-11.7	-16.6	-28.0	-14.2
80.5	.0100	18.2	35.8	23.7	12.2	30.7	42.2	20.0	3.4	-8.6	-7.3	-3.3	-1.6	-18.2	-23.9	-23.4	-33.1	-16.8
77.0	.0170	18.2	35.9	24.5	16.0	38.2	47.7	30.8	12.0	-4.1	-2.8	-1.8	-7.1	-28.8	-34.5	-29.9	-36.0	-18.7
73.5	.0280	18.5	36.4	24.5	19.2	41.3	53.6	48.6	21.2	2.7	3.2	1.3	-10.2	-34.4	-41.9	-34.6	-39.0	-19.8
70.0	.0460	19.3	38.0	25.0	22.5	40.3	50.3	53.3	20.6	7.9	7.7	3.3	-12.3	-38.3	-46.5	-37.1	-39.9	-20.3
66.5	.0760	21.3	42.0	26.7	26.3	51.0	63.9	57.6	32.0	8.9	9.7	3.6	-14.6	-39.2	-44.6	-38.7	-38.5	-19.5
63.0	0.12	24.6	48.4	30.6	30.7	56.1	60.2	57.1	30.6	5.8	10.1	3.3	-18.1	-39.3	-41.5	-33.5	-34.2	-17.4
59.5	0.21	28.6	56.4	37.8	36.7	57.6	65.0	51.3	24.0	1.7	0.8	1.0	-22.0	-39.3	-37.4	-28.6	-27.6	-14.0
56.0	0.34	32.6	64.3	47.2	44.0	58.2	61.0	42.6	13.5	-6.5	3.1	-4.3	-27.1	-38.3	-33.4	-23.6	-21.4	-10.9
52.5	0.56	35.4	69.6	56.1	50.6	56.9	54.6	33.5	2.3	-16.5	-0.1	-12.5	-29.7	-36.2	-29.2	-19.4	-16.7	-8.5
49.0	0.92	36.6	72.0	62.6	55.2	53.9	47.0	26.0	-3.6	-22.0	-18.1	-19.2	-30.9	-33.7	-25.7	-16.5	-13.1	-6.7
45.5	1.52	36.7	72.2	66.7	50.0	49.8	38.9	20.0	-6.7	-24.1	-20.4	-22.2	-30.6	-30.5	-22.6	-13.9	-10.4	-5.3
42.0	2.51	36.2	71.3	70.3	60.8	45.8	30.3	13.2	-8.9	-27.2	-22.4	-23.5	-28.0	-26.5	-19.3	-11.4	-8.3	-4.2
38.5	4.14	35.2	69.4	73.5	63.7	42.6	21.8	5.0	-14.4	-32.0	-27.1	-24.8	-23.9	-21.8	-16.1	-9.9	-6.5	-3.3
35.0	6.83	33.5	65.9	74.6	64.4	38.0	14.3	-2.1	-18.8	-38.1	-29.0	-25.1	-21.3	-17.2	-12.6	-6.9	-6.2	-2.6
31.5	11.3	30.4	59.9	71.6	60.8	33.5	9.3	-6.1	-19.9	-35.1	-28.0	-24.0	-18.9	-13.0	-9.1	-5.6	-4.3	-2.2
28.0	18.5	25.7	50.7	63.5	53.2	27.8	7.3	-4.3	-17.8	-30.2	-24.9	-21.2	-16.2	-10.2	-6.8	-4.4	-3.2	-1.6
24.5	30.6	21.4	42.1	53.9	44.9	23.4	7.5	-1.1	-12.0	-22.3	-20.0	-17.8	-13.2	-7.9	-4.6	-2.9	-1.8	-0.9
21.0	50.4	18.0	35.4	46.0	37.5	21.5	10.1	3.5	-6.6	-16.5	-15.6	-13.8	-9.4	-3.9	-1.2	-0.3	0.0	0.0
17.5	83.2	14.7	29.0	38.3	30.7	22.5	17.6	11.6	-2.1	-14.1	-11.6	-8.3	-3.8	3.7	4.7	3.3	2.3	1.2
14.0	137.	11.9	23.4	27.8	24.8	25.8	29.6	24.4	4.4	-13.1	-7.3	-1.4	3.8	13.9	12.0	7.0	4.5	2.3
10.5	226.	9.1	18.5	14.5	20.6	27.8	32.9	20.9	1.8	-7.7	-8.2	-3.9	4.7	18.7	17.3	9.6	7.0	4.3
7.0	373.	6.0	7.5	12.0	17.2	21.1	23.5	14.8	0.0	-6.6	-6.3	-3.3	3.0	12.6	12.5	7.8	6.6	4.4
3.5	614.	3.1	2.9	7.8	12.4	12.3	10.4	4.8	-2.3	-3.7	-3.6	-3.1	0.8	6.0	7.2	4.4	3.8	2.6
0.0	1013.		0.1	3.3	5.8	4.0	-0.3	-4.7	-6.5	-2.3	0.0	-3.3	-2.0	1.0	2.1	0.5	-0.1	0.1

SEPTEMBER ZONAL MEAN ZONAL WIND (m/s)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	3.8	7.5	5.6	3.7	6.9	6.3	1.1	-11.9	-22.9	-21.6	-7.5	12.4	23.1	20.5	14.5	11.6	5.9
119.0	.000042	2.9	5.7	3.7	2.8	7.3	8.3	3.9	-6.0	-16.5	-12.9	0.4	17.1	25.4	20.9	13.7	10.5	5.3
115.5	.000069	3.5	6.9	6.5	7.6	14.3	16.8	12.6	1.6	-4.1	2.0	14.5	28.3	33.8	26.8	17.3	12.1	6.2
112.0	.00011	5.0	9.9	11.5	14.3	21.8	24.6	19.6	8.6	4.9	12.8	25.2	38.0	42.3	34.0	22.8	15.7	8.0
108.5	.00019	6.3	12.3	14.9	18.2	26.0	28.7	22.9	11.9	9.2	18.2	30.4	42.5	46.6	37.7	26.0	18.1	9.2
105.0	.00031	6.8	13.4	16.2	19.6	27.1	29.2	22.7	11.1	8.6	18.2	30.6	42.8	46.9	38.2	26.7	18.6	9.4
101.5	.00051	6.8	13.4	16.0	18.8	25.7	27.0	19.6	7.2	4.3	14.1	26.7	30.4	44.2	36.2	25.1	17.8	9.0
98.0	.00084	6.5	12.8	14.6	16.8	22.9	23.3	15.0	1.9	-1.7	7.8	20.3	33.7	30.4	32.3	22.2	15.9	8.1
94.5	.0014	5.9	11.7	12.8	14.4	19.8	19.8	10.9	-3.0	-7.3	1.6	13.7	27.1	33.4	27.1	18.2	13.2	6.7
91.0	.0023	5.3	10.4	11.1	12.1	17.6	17.5	8.5	-5.9	-10.8	-2.8	8.2	21.0	27.1	21.2	13.2	9.7	4.9
87.5	.0038	4.2	8.2	9.6	10.6	16.5	17.0	8.2	-6.6	-12.4	-5.7	4.3	15.9	21.1	14.8	7.8	6.4	3.3
84.0	.0062	2.7	5.2	8.9	10.6	21.6	20.4	4.0	-7.0	-15.5	-0.4	-1.7	13.9	19.3	6.4	3.6	4.4	2.3
80.5	.0100	1.7	3.2	9.6	13.5	23.8	22.7	4.7	-0.0	-18.9	-13.1	-3.0	12.2	15.7	3.2	1.8	4.2	2.2
77.0	.0170	0.9	1.7	10.6	17.0	27.4	27.6	9.6	-4.4	-16.5	-11.9	-0.2	12.5	12.9	0.9	1.4	4.7	2.4
73.5	.0280	-0.3	-0.5	9.8	20.3	32.9	34.7	17.9	4.0	-10.0	-7.2	3.9	13.4	11.0	0.1	1.8	5.5	2.8
70.0	.0460	-1.0	-1.9	9.0	23.0	38.2	42.2	27.2	14.0	-3.1	-0.9	7.9	13.6	9.5	1.1	3.3	6.6	3.3
66.5	.0760	-0.8	-1.5	8.9	25.3	42.9	48.1	35.0	23.0	3.8	6.5	11.8	12.8	7.2	3.3	5.9	8.8	4.4
63.0	0.12	0.7	1.4	9.8	27.4	46.5	52.1	38.1	27.9	10.7	13.2	15.3	11.0	3.9	5.5	9.6	12.3	6.3
59.5	0.21	4.0	7.9	13.5	29.9	48.3	53.4	38.6	25.6	10.7	16.9	16.0	7.8	1.5	7.0	12.9	16.0	8.1
56.0	0.34	8.7	17.2	20.0	32.7	48.0	52.0	35.3	18.3	4.1	14.6	13.2	4.6	0.5	9.1	15.4	19.2	9.8
52.5	0.56	13.6	26.0	27.3	34.9	45.4	48.0	30.2	10.5	-3.4	5.8	7.6	2.5	-0.3	9.5	17.0	21.5	10.9
49.0	0.92	17.5	34.5	33.6	36.4	41.4	42.5	25.0	4.2	-10.3	-1.3	4.3	1.0	-1.3	8.8	16.9	21.7	11.0
45.5	1.52	20.6	40.5	39.5	38.0	36.7	35.4	20.0	-0.3	-16.5	-0.1	0.8	-1.1	-1.0	7.6	15.0	19.9	10.1
42.0	2.51	23.3	46.0	46.0	40.9	32.2	28.8	13.3	-6.0	-22.0	-12.2	-4.8	-3.4	-2.0	5.9	12.0	16.6	8.4
38.5	4.14	25.8	50.0	54.8	44.9	28.6	17.5	4.9	-10.6	-26.8	-18.2	-10.0	-6.4	-1.9	4.1	8.6	12.8	6.5
35.0	6.83	27.2	53.5	61.6	46.4	25.1	9.2	-2.7	-14.9	-28.2	-22.1	-13.4	-7.4	-2.1	3.3	6.0	8.9	4.5
31.5	11.3	26.4	52.0	64.2	40.8	21.8	3.2	-6.9	-10.3	-28.2	-22.9	-15.4	-0.8	-2.2	3.0	4.6	6.0	3.0
28.0	18.5	23.5	46.3	61.1	47.9	19.6	1.0	-7.6	-15.5	-26.8	-21.5	-18.7	-0.2	-2.0	2.5	3.9	4.4	2.3
24.5	30.6	20.9	41.2	53.6	42.8	19.0	2.8	-4.9	-12.0	-21.0	-17.8	-13.5	-7.7	-1.1	2.7	4.0	4.0	2.0
21.0	50.4	18.8	37.1	46.1	36.8	19.9	7.3	0.5	-7.0	-15.8	-13.1	-0.2	-4.1	1.5	4.6	4.9	4.0	2.1
17.5	83.2	15.9	31.4	36.6	31.2	23.1	16.2	9.4	-1.1	-12.7	-0.6	-2.7	2.1	7.8	8.9	7.0	4.6	2.4
14.0	137.	13.2	26.1	28.0	25.5	27.6	29.1	22.7	0.8	-10.3	-3.9	4.3	10.9	17.5	14.8	9.0	5.7	2.9
10.5	226.	6.2	10.9	17.6	24.0	27.5	30.3	20.1	3.4	-6.4	-0.7	0.1	11.1	21.1	18.2	11.0	7.4	4.4
7.0	373.	3.7	7.8	15.2	20.9	21.0	21.4	13.1	0.2	-6.0	-4.6	-1.7	6.7	14.1	14.1	9.7	6.0	4.2
3.5	614.	2.0	2.8	9.2	14.6	13.0	10.0	3.7	-2.5	-4.0	-3.9	-2.8	2.4	6.7	8.4	5.7	3.7	2.4
0.0	1013.		2.1	5.8	5.9	3.5	-1.1	-4.4	-6.2	-2.1	0.1	-3.3	-2.0	0.9	2.6	1.1	0.1	0.2

Table B5 (cont.)

OCTOBER ZONAL MEAN ZONAL WIND (m/s)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	5.7	11.2	6.3	9.1	14.0	-1.7	-27.1	-21.0	18.3	21.0	15.1	9.9	12.0	10.4	6.6	8.5	3.3
119.0	.000042	5.4	10.5	6.0	9.8	16.7	3.5	-17.0	-10.9	23.6	22.4	14.7	9.7	11.9	8.5	4.4	4.4	2.3
115.5	.000069	6.0	11.9	9.2	16.4	25.0	15.1	-1.9	5.4	34.9	28.7	19.8	16.0	17.3	12.2	6.3	5.0	2.5
112.0	.00011	8.0	15.8	15.3	23.3	34.2	28.9	11.3	18.6	44.5	34.5	25.3	22.9	24.1	18.3	11.1	8.1	4.1
108.5	.00019	9.4	18.5	19.2	27.9	39.4	31.9	18.4	25.8	49.7	37.7	28.6	27.3	28.7	22.7	14.7	10.6	5.4
105.0	.00031	9.8	19.2	20.1	28.8	40.4	32.7	19.6	26.9	49.8	37.2	29.0	28.4	30.6	24.8	16.8	12.1	6.2
101.5	.00051	9.3	18.3	18.6	26.6	37.6	29.4	15.8	23.3	46.2	34.0	28.2	27.0	30.0	24.8	17.2	12.7	6.4
98.0	.00084	8.3	16.3	15.3	22.2	32.3	23.2	9.1	16.9	40.3	29.2	22.4	24.4	28.3	23.8	16.8	12.6	6.4
94.5	.0014	6.7	13.2	10.7	16.2	25.4	15.5	1.4	10.0	34.5	24.7	19.0	21.8	26.4	22.6	16.0	12.1	6.2
91.0	.0023	4.7	9.2	4.7	9.1	17.6	7.7	-6.6	4.5	30.6	22.0	17.3	20.7	25.6	21.9	15.4	11.7	6.0
87.5	.0038	2.9	5.7	-3.2	1.1	9.7	0.6	-11.2	0.6	28.6	21.5	17.7	21.5	26.1	22.1	15.1	12.1	6.2
84.0	.0062	1.0	3.6	-10.9	-3.1	7.0	-6.7	-25.9	-7.8	16.8	15.2	14.7	21.7	29.8	24.4	15.7	14.3	7.3
80.5	.0100	1.0	2.1	-14.3	-6.3	2.6	-11.4	-31.9	-20.9	-3.4	6.6	8.5	23.0	33.2	27.1	18.0	17.8	9.8
77.0	.0170	0.1	0.2	-14.7	-6.3	1.2	-10.8	-32.1	-28.1	-15.5	-7.8	7.0	26.1	36.6	30.2	21.1	21.3	10.8
73.5	.0280	-1.0	-1.9	-14.9	-3.5	3.8	-6.3	-25.2	-26.5	-18.6	-7.6	10.4	29.7	39.8	34.1	24.1	23.7	12.0
70.0	.0460	-1.7	-3.3	-14.7	-0.9	8.2	1.7	-14.1	-15.9	-12.4	-0.3	18.7	33.5	42.2	38.0	27.7	26.5	13.5
66.5	.0760	-2.1	-4.1	-14.0	1.4	12.7	8.0	-2.3	-0.7	-0.7	11.2	25.2	36.4	43.4	41.7	32.2	30.4	15.4
63.0	0.12	-2.3	-4.5	-13.6	3.0	16.2	13.5	7.2	11.3	11.0	22.6	33.7	37.8	42.8	44.7	37.3	35.1	17.8
59.5	0.21	-1.6	-3.2	-12.3	4.6	19.0	17.3	11.4	14.6	14.8	28.1	37.7	38.0	42.6	46.8	41.6	39.4	20.0
56.0	0.34	0.4	0.8	-0.1	6.3	20.8	19.3	11.3	9.7	10.7	28.0	38.7	37.5	42.7	47.4	44.1	42.6	21.6
52.5	0.56	3.2	6.3	-6.3	7.4	21.4	19.7	9.3	3.2	4.1	21.8	34.0	36.4	41.1	46.1	46.2	43.9	22.3
49.0	0.92	6.2	12.1	-1.0	8.2	19.8	19.1	8.6	0.1	-1.7	16.0	31.7	35.1	37.3	43.1	44.3	42.9	21.8
45.5	1.52	9.4	18.6	4.1	9.3	17.9	17.3	8.7	-0.9	-6.5	12.3	27.9	31.7	32.2	38.0	40.2	39.3	19.9
42.0	2.51	13.6	26.7	11.1	11.4	15.9	14.4	6.7	-4.3	-11.0	5.5	20.6	25.7	27.0	31.7	33.7	33.7	17.1
38.5	4.14	18.2	35.9	20.5	14.4	13.7	10.2	1.0	-10.6	-17.2	-3.3	11.2	18.4	21.7	25.2	26.3	27.1	13.8
35.0	6.83	21.8	42.9	29.1	17.7	11.0	4.6	-6.8	-17.8	-24.1	-12.0	2.1	11.4	16.3	19.5	19.9	20.6	10.4
31.5	11.3	23.3	45.8	36.1	21.0	8.1	-1.4	-10.4	-20.2	-27.8	-18.3	-4.6	5.3	11.4	14.9	15.9	16.2	8.2
28.0	18.5	21.4	42.2	37.2	23.2	6.8	-4.8	-11.8	-19.2	-27.2	-18.7	-6.0	0.9	8.0	11.5	12.9	13.0	6.6
24.5	30.6	17.2	34.0	36.2	24.6	8.4	-3.2	-8.6	-15.7	-21.7	-15.3	-7.3	0.2	6.3	9.6	10.8	10.5	5.4
21.0	50.4	14.0	27.6	33.0	24.5	11.7	2.1	-4.4	-11.3	-17.5	-11.2	-3.5	2.2	7.4	10.0	9.9	8.6	4.4
17.5	83.2	12.2	24.0	27.5	22.8	16.8	11.7	5.0	-6.2	-16.5	-6.7	3.1	0.2	12.0	13.1	10.6	7.3	3.7
14.0	137.	9.9	19.4	21.5	21.2	23.4	26.0	19.5	4.7	-11.3	-0.4	12.3	10.3	20.6	17.0	12.2	7.1	3.0
10.5	226.	6.5	11.5	18.8	24.6	28.0	27.3	19.5	3.7	-3.8	-2.0	7.6	19.4	21.2	19.1	14.3	9.8	6.0
7.0	373.	3.8	7.8	15.0	21.0	21.3	19.3	11.5	0.2	-4.2	-3.2	3.5	12.1	16.1	15.9	12.1	8.3	5.2
3.5	614.	1.3	2.4	8.8	14.4	13.3	9.1	2.8	-2.6	-3.8	-4.3	-1.2	4.0	8.0	10.2	7.6	4.7	2.8
0.0	1013.		3.5	7.0	5.8	2.2	-0.6	-4.5	-4.7	-1.9	-1.6	-4.1	-1.9	1.3	3.6	1.5	0.0	-0.3

NOVEMBER ZONAL MEAN ZONAL WIND (m/s)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	2.6	5.1	4.6	10.0	11.3	-3.2	-30.3	-62.5	-0.3	24.7	23.1	4.7	-4.1	-12.3	-0.4	4.5	2.3
119.0	.000042	2.7	5.4	5.7	12.5	16.1	5.1	-24.1	-30.6	-6.2	19.4	16.1	0.6	-7.0	-16.1	-12.2	1.6	0.8
115.5	.000069	3.6	7.1	9.3	18.8	25.0	19.2	-2.6	-14.2	5.4	19.7	15.1	3.1	-4.4	-13.5	-11.0	1.7	0.9
112.0	.00011	6.5	12.9	17.4	28.6	37.2	33.1	15.9	4.4	15.4	21.7	16.7	8.4	2.1	-7.2	-6.0	4.8	2.5
108.5	.00019	8.5	16.8	22.7	34.7	44.1	41.4	26.7	15.4	21.5	23.0	18.2	12.0	7.7	-1.5	-1.1	8.1	4.1
105.0	.00031	9.0	17.7	23.7	36.0	46.3	43.1	29.6	18.7	22.7	22.4	18.4	15.2	11.2	2.8	2.6	10.7	5.5
101.5	.00051	8.2	16.2	21.5	33.3	42.2	39.7	28.4	15.9	19.9	20.2	17.5	16.2	13.3	5.3	5.2	12.9	6.5
98.0	.00084	6.7	13.2	17.1	27.7	35.7	32.4	18.6	9.8	14.4	16.7	16.2	16.5	14.9	7.5	7.7	14.7	7.5
94.5	.0014	4.6	9.0	10.8	19.8	26.5	22.3	8.6	0.5	8.3	13.3	15.2	17.4	17.2	10.5	10.5	16.8	8.5
91.0	.0023	1.8	3.6	2.6	10.0	15.3	10.9	-1.7	-7.4	3.7	11.7	16.4	20.5	21.4	14.8	14.4	19.5	9.9
87.5	.0038	-0.9	-1.7	-7.2	-1.9	2.5	-1.3	-11.5	-13.7	1.8	13.4	20.0	26.2	27.7	20.2	17.4	22.5	11.4
84.0	.0062	-2.9	-6.8	-17.2	-13.0	-0.8	-15.5	-30.1	-23.8	-7.6	11.3	20.2	30.7	37.4	24.4	19.1	25.7	13.0
80.5	.0100	-4.8	-9.4	-24.3	-22.7	-23.2	-28.2	-41.0	-30.4	-25.4	-0.2	16.9	36.3	43.1	28.6	21.4	28.0	14.2
77.0	.0170	-6.7	-13.1	-29.2	-29.0	-31.6	-35.7	-40.4	-61.0	-30.5	-7.1	17.1	41.6	48.2	33.2	24.2	29.2	14.8
73.5	.0280	-6.5	-16.8	-32.5	-31.6	-34.5	-38.1	-60.9	-61.9	-30.5	-4.3	22.8	40.0	56.2	38.4	26.5	28.9	14.7
70.0	.0460	-9.6	-18.9	-33.5	-31.3	-34.2	-37.1	-47.1	-43.8	-30.2	4.8	31.8	57.4	61.3	43.5	26.7	28.5	14.4
66.5	.0760	-9.6	-18.9	-32.7	-30.2	-32.9	-34.4	-41.0	-33.1	-18.6	15.5	42.2	65.4	66.4	48.3	31.4	28.5	14.5
63.0	0.12	-9.2	-18.1	-31.7	-29.1	-30.9	-31.6	-37.1	-25.6	-10.0	24.3	50.7	70.1	69.3	52.7	35.0	29.9	15.2
59.5	0.21	-8.3	-16.3	-30.3	-27.5	-28.8	-29.8	-37.3	-26.0	-7.6	28.2	53.0	70.9	71.0	56.4	38.9	32.6	16.6
56.0	0.34	-6.5	-12.8	-27.5	-25.1	-26.2	-28.2	-30.5	-32.9	-12.0	21.5	49.9	69.8	72.3	58.8	42.3	35.9	18.2
52.5	0.56	-4.5	-9.0	-24.5	-23.1	-23.5	-24.9	-30.5	-38.6	-18.6	15.1	46.9	67.5	72.1	59.5	44.6	38.4	19.5
49.0	0.92	-2.6	-6.1	-21.6	-21.6	-21.9	-21.6	-34.6	-35.5	-19.9	11.9	42.9	64.1	68.9	57.6	45.1	39.8	20.2
45.5	1.52	-0.8	-1.5	-18.9	-19.8	-20.2	-17.6	-26.6	-27.2	-15.8	13.0	39.9	58.2	61.6	51.7	42.6	38.8	19.7
42.0	2.51	1.1	2.1	-15.5	-17.6	-17.1	-12.2	-19.3	-21.6	-13.4	13.2	34.6	46.6	51.6	44.3	38.3	36.5	18.0
38.5	4.14	3.2	6.4	-11.3	-14.7	-13.1	-8.2	-15.5	-20.3	-14.4	8.1	25.5	36.3	40.3	36.8	33.3	31.1	15.8
35.0	6.83	5.3	10.5	-6.3	-10.5	-0.7	-6.6	-14.7	-22.9	-19.2	-0.2	14.6	24.4	29.4	29.4	28.7	26.4	13.4
31.5	11.3	7.2	14.3	-0.2	-6.0	-7.4	-7.2	-14.4	-24.1	-23.4	-0.0	5.6	14.7	20.4	22.8	24.2	22.0	11.2
28.0	18.5	7.1	14.0	5.6	0.3	-6.2	-7.6	-13.2	-22.3	-23.4	-11.1	0.5	8.0	14.1	17.9	19.6	17.5	8.9
24.5	30.6	6.7	13.2	10.5	4.9	-1.3	-6.3	-11.0	-19.6	-20.6	-10.0	-0.0	5.3	11.2	14.8	16.0	14.2	7.2
21.0	50.4	7.4	14.6	15.4	10.2	4.4	-0.7	-7.0	-15.5	-16.2	-6.2	1.6	6.4	12.0	14.1	13.8	11.2	5.7
17.5	83.2	8.5	16.7	19.8	16.4	12.1	8.1	1.5	-0.4	-13.1	-0.2	8.7	13.1	17.1	15.7	12.9	8.4	4.3
14.0	137.	8.9	17.6	22.1	21.2	20.9	20.6	15.6	1.1	-7.9	8.2	20.0	24.1	24.4	18.6	12.9	6.5	3.3
10.5	226.	4.0	9.3	17.1	22.7	23.8	24.2	17.8	3.8	-2.0	1.9	15.7	27.9	24.6	18.6	13.3	7.9	3.1
7.0	373.	1.4	4.8	12.5	19.8	19.9	16.7	9.8	0.5	-3.6	-1.9	8.0	18.8	18.7	15.7	11.5	6.1	1.8
3.5	614.	-0.1	0.3	7.0	13.5	12.7	8.1	2.6	-1.8	-3.6	-4.0	1.2	7.7	10.1	10.1	7.1	3.1	0.2
0.0	1013.		0.7	5.6	7.0	3.5	-1.0	-4.3	-3.7	-1.8	-3.6	-4.8	-1.0	2.0	3.2	1.3	0.2	-1.7

DECEMBER ZONAL MEAN ZONAL WIND (m/s)

LOG-P ALT(km)	PRESSURE (mb)	80S	70S	60S	50S	40S	30S	20S	10S	LATITUDE EQ	10N	20N	30N	40N	50N	60N	70N	80N
122.5	.000025	-0.7	-1.4	1.7	9.4	11.4	-1.7	-34.8	-38.6	15.1	37.7	20.4	-2.8	-0.8	-24.5	-23.2	-3.0	-1.5
119.0	.000042	-0.3	-0.5	3.4	12.7	17.4	0.7	-16.3	-19.6	19.8	30.2	10.6	-0.0	-11.6	-29.6	-28.0	-6.6	-3.4
115.5	.000069	1.0	2.0	6.0	20.0	28.2	24.5	7.0	5.0	30.0	27.3	6.5	-7.9	-6.8	-26.7	-26.2	-6.2	-3.2
112.0	.00011	4.8	9.4	17.7	31.3	40.9	30.7	28.2	25.5	39.9	27.4	6.1	-3.3	-2.2	-19.6	-20.3	-2.5	-1.3
108.5	.00019	7.3	14.4	24.1	38.3	48.7	48.7	40.3	37.9	46.4	27.9	6.9	1.5	4.1	-12.9	-14.1	1.5	0.6
105.0	.00031	7.8	15.3	25.3	39.8	50.4	50.9	44.1	42.0	48.1	27.3	7.6	5.0	8.8	-7.4	-0.1	5.1	2.6
101.5	.00051	6.7	13.2	22.8	36.7	47.1	47.5	41.1	39.8	45.9	25.7	7.7	7.4	12.6	-2.9	-4.7	8.3	4.2
98.0	.00084	4.9	9.6	17.7	30.5	39.9	39.6	33.0	32.8	40.8	23.0	7.5	9.5	16.1	1.7	-0.2	11.6	5.9
94.5	.0014	2.4	4.7	10.8	21.8	29.7	28.6	22.1	23.6	34.3	20.2	7.9	12.6	21.0	7.4	5.1	15.3	7.8
91.0	.0023	-0.9	-1.7	1.5	10.8	17.1	15.4	10.3	15.3	29.4	19.3	10.8	18.2	28.0	15.1	11.4	19.1	9.8
87.5	.0038	-3.5	-6.8	-10.3	-2.7	2.1	1.0	-1.4	8.1	27.7	22.5	18.0	27.4	37.1	22.9	15.5	23.3	11.8
84.0	.0062	-4.9	-9.7	-23.5	-19.5	-13.1	-15.7	-20.1	-0.1	23.7	24.7	24.2	31.8	53.4	28.2	16.6	27.8	14.1
80.5	.0100	-6.7	-13.1	-34.0	-33.8	-31.7	-32.0	-31.5	-10.9	12.7	18.1	25.2	40.6	58.9	30.4	17.7	31.1	15.8
77.0	.0170	-8.9	-17.5	-42.2	-45.3	-46.0	-44.2	-39.3	-18.9	2.1	12.7	26.8	50.1	67.0	34.9	19.8	33.1	16.8
73.5	.0280	-10.8	-21.2	-47.9	-62.2	-64.5	-62.0	-43.0	-21.0	-1.7	13.0	30.9	59.8	74.4	40.1	22.8	34.1	17.3
70.0	.0460	-12.1	-23.9	-61.0	-64.7	-67.8	-66.6	-44.4	-20.6	-2.1	14.8	36.2	68.9	81.6	46.1	25.0	35.0	17.7
66.5	.0760	-12.6	-24.8	-61.0	-64.0	-67.2	-66.2	-46.1	-23.0	-3.8	15.1	40.8	75.4	87.2	52.7	29.3	36.0	18.3
63.0	0.12	-12.5	-24.6	-49.8	-61.7	-64.1	-66.0	-61.5	-30.9	-10.7	13.1	42.0	76.9	90.0	59.3	35.3	38.0	19.3
59.5	0.21	-11.8	-23.3	-47.7	-48.4	-60.2	-66.5	-60.6	-43.9	-21.3	5.1	38.4	72.5	90.8	65.8	42.2	41.3	21.0
56.0	0.34	-10.4	-20.4	-44.5	-44.8	-46.4	-66.8	-69.5	-67.4	-32.0	-7.7	25.3	65.6	90.5	71.0	48.6	44.9	22.8
52.5	0.56	-8.2	-16.2	-40.7	-41.8	-42.1	-64.6	-73.1	-66.1	-40.2	-18.6	15.4	50.4	88.6	73.1	52.7	47.0	23.9
49.0	0.92	-6.8	-11.5	-36.5	-37.2	-38.3	-60.9	-70.4	-63.4	-40.2	-21.0	11.0	54.2	83.3	70.7	53.5	47.6	24.2
45.5	1.52	-3.8	-7.5	-32.1	-33.5	-34.5	-44.7	-60.5	-61.5	-32.3	-14.4	11.4	48.7	73.1	63.2	51.7	47.1	23.9
42.0	2.51	-2.5	-4.9	-28.0	-29.2	-29.7	-36.3	-47.5	-38.6	-28.5	-6.7	12.8	40.2	58.4	53.8	48.9	46.1	23.4
38.5	4.14	-1.5	-2.9	-23.4	-24.0	-24.2	-28.6	-35.5	-31.4	-22.7	-3.6	11.1	29.4	44.9	44.5	45.5	44.2	22.5
35.0	6.83	-0.6	-1.2	-18.3	-18.6	-19.0	-22.1	-26.3	-27.3	-23.7	-6.4	6.1	19.3	32.1	35.8	41.6	40.9	20.8
31.5	11.3	0.2	0.4	-12.7	-13.2	-14.1	-16.5	-19.6	-23.0	-22.0	-7.6	2.6	12.7	22.4	28.5	35.7	34.9	17.7
28.0	18.5	-0.8	-1.5	-7.4	-8.2	-9.4	-12.0	-14.9	-17.9	-17.9	-7.5	1.6	9.8	15.9	22.7	28.9	27.9	14.1
24.5	30.6	-1.2	-2.4	-2.8	-3.4	-6.1	-7.8	-11.0	-13.9	-13.4	-6.4	1.9	7.2	12.9	18.5	23.2	22.3	11.3
21.0	50.4	0.0	0.0	2.6	2.9	0.6	-2.8	-6.8	-9.4	-7.9	-1.1	4.7	9.0	13.9	16.7	19.2	18.0	9.1
17.5	83.2	1.6	3.1	8.6	11.1	9.6	5.3	1.2	-2.3	-1.4	6.0	12.1	16.0	19.0	17.6	16.6	14.4	7.3
14.0	137.	2.8	5.5	13.3	19.0	20.2	16.5	13.1	6.8	4.8	15.3	24.3	28.8	27.1	19.1	14.8	11.5	5.8
10.5	226.	5.1	4.6	10.6	19.2	22.3	20.6	11.6	0.1	-1.9	4.6	21.7	33.9	27.0	17.0	10.7	7.9	5.2
7.0	373.	3.9	3.1	10.6	19.9	19.3	13.4	5.9	-0.9	-3.9	-0.7	13.4	23.4	21.1	14.2	8.9	6.1	4.4
3.5	614.	1.1	-1.0	5.7	13.3	12.2	6.3	0.8	-1.9	-3.7	-4.2	3.7	10.7	11.7	8.9	5.5	3.4	2.8
0.0	1013.		0.8	4.9	5.6	3.0	-1.2	-4.1	-2.6	-1.8	-4.9	-4.9	0.0	2.9	3.2	1.5	0.3	-0.4

REFERENCES

Angell, J.K., and J. Korshover, 1970: Quasi-Bienniel, Annual, and Semi-Annual Zonal Wind and Temperature Harmonic Amplitudes and Phases in the Stratosphere and Lower Mesosphere of the Northern Hemisphere. *J. Geophys. Res.*, Vol. 75, pp. 543-550.

Aso, T., and R.A. Vincent, 1982: Some Direct Comparisons of Mesospheric Winds Observed at Kyoto and Adelaide. *J. Atmos. Terr. Phys.*, Vol. 44, p. 267.

Bates, D.R., 1959: Some Problems Concerning the Terrestrial Atmosphere above the 100 km level. *Proc. R. Soc. London, Ser. A, 253*, pp. 451-462.

Belmont, A.D., 1985: Comparisons of Time-Periodic Variations in Temperature and Wind from Meteorological Rockets and Satellites. *Adv. Space Res.*, Vol. 5, No. 7, pp. 115-123.

Belmont, A.D., D.G. Dartt, and G.D. Nastrom, 1975: Variations of Stratospheric Zonal Winds, 20-65 km, 1961-1971. *J. Appl. Meteor.*, Vol. 14, pp. 585-594.

Belmont, A.D., D.G. Dartt, and G.D. Nastrom, 1974: Periodic Variations in Stratospheric Zonal Wind from 20 to 65 km, at 80°N to 70°S. *Quart. J. Roy. Meteor. Soc.*, Vol. 100, pp. 203-211.

Carter, D.A., and B.B. Balsley, 1982: The Summer Wind Field Between 80 and 93 km Observed by the MST Radar at Poker Flat, Alaska (65°N). *J. Atmos. Sci.*, Vol. 39, p. 2905.

Charney, J.G., and M.E. Stern, 1962: On the Stability of Internal Baroclinic Jets in a Rotating Atmosphere. *J. Atmos. Sci.*, Vol. 19, pp. 159- 172.

CIRA, 1972: *COSPAR International Reference Atmosphere*, edited by A.C. Strickland, Akademie-Verlag, Berlin.

Clark, R.R., 1983: Upper Atmosphere Observations of Winds and Tides with the UNH Meteor Radar System at Durham 43°N (1977, 1978, and 1979). *J. Atmos. Terr. Phys.*, Vol. 45, p. 621.

Crane, A.J., 1977: "Uses of Satellite Data in Studies of Stratospheric Dynamics, Ph.D. Thesis, Oxford University.

Crane, A.J., 1979a: Aspects of the Energetics of the Upper Stratosphere during the January - February 1973 Major Sudden Warming. *Quart. J. Roy. Meteor. Soc.*, Vol. 105, pp. 185-206.

Crane, A.J., 1979b: Annual and Semiannual Waves in the Temperature of the Mesosphere as Deduced from Nimbus 6 PMR Measurements. *Quart. J. Roy. Meteor. Soc.*, Vol. 105, pp. 509-520.

Curtis, P.D., J.Y. Houghton, G.D. Peskett, and C.D. Rodgers, 1974: The Pressure Modulator Radiometer for Nimbus F. *Proc. Roy. Soc. Lond., A337*, pp 135-150.

Dickinson, R.E., 1973: Baroclinic Instability of an Unbounded Zonal Shear Flow in a Compressible Atmosphere. *J. Atmos. Sci.*, Vol. 30, pp. 1520-1527.

Dunkerton, T.J., and D.P. Delisi, 1985: Climatology of the Equatorial Lower Stratosphere. *J. Atmos. Sci.*, Vol. 42, pp. 376-396.

Ellis, P., G. Holah, J.T. Houghton, T.S. Jones, G. Peckham, G.D. Peskett, D.R. Pick, C.D. Rodgers, K.H. Roscoe, R. Sandwell, S.D. Smith, and E.J. Williamson, 1973: The Selective Chopper Radiometer for Nimbus 5. *Proc. Roy. Soc. Lond., A334*, pp. 149-170.

Gelman, M.E., A.J. Miller, K.W. Johnson, and R.M. Nagatani, 1986: Detection of Long Term Trends in Global Stratospheric Temperature from NMC Analyses Derived from NOAA Satellite Data. *Adv. Sp. Res.*, Vol. 6, pp. 17-26.

Groves, G.V., 1972: Annual and Semi-Annual Zonal Wind Components and Corresponding Temperature and Density Variations, 60-130 km. *Planet. Space Sci.*, Vol. 20, pp. 2099-2112.

Hamilton, K., 1982: Rocketsonde Observations of the Mesospheric Semiannual Oscillation at Kwajalein. *Atmos-Ocean*, Vol. 20, pp. 281-286.

Harris, R.G., A. Thomasell, Jr., and J.G. Welch, 1966: "Studies of Techniques for the Analysis and Prediction of Temperature in the Ocean, Part III: Automated Analysis and Prediction". Interim Report, prepared by Travelers Research Center, Inc. for U.S. Naval Oceanographic Office, Contract #N62306-1675, 97 pp.

Hedin, A.E., 1983: A Revised Thermospheric Model Based on Mass Spectrometer and Incoherent Scatter Data: MSIS-83. *J. Geophys. Res.*, Vol. 88, pp. 10,170-10,185.

Hedin, A.E., 1987: MSIS-86 Thermospheric Model. *J. Geophys. Res.*, Vol. 92, pp. 4649-4662.

Hedin, A.E., H.B. Niemann, W.T. Kasprzak, and A. Seiff, 1983: Global Empirical Model of the Venus Thermosphere. *J. Geophys. Res.*, Vol. 88, pp. 73- 83.

Hirota, I., 1978: Equatorial Waves in the Upper Stratosphere and Mesosphere in Relation to the Semiannual Oscillation of the Zonal Wind. *J. Atmos. Sci.*, Vol. 35, pp. 714-722.

Hitchman, M.H., and C.B. Leovy, 1986: Evolution of the Zonal Mean State in the Equatorial Middle Atmosphere during October 1978-May 1979. *J. Atmos. Sci.*, Vol. 43, pp. 3159-3176.

Holton, J.R., 1975: The Dynamic Meteorology of the Stratosphere and Mesosphere. *Meteorology Monograph No. 37*, 216 pp., American Meteorological Society, Boston, Massachusetts.

Holton, J.R., 1979: *An Introduction to Dynamic Meteorology*. 2nd Ed. Academic Press, New York.

Hopkins, R.H., 1975: Evidence of Polar-Tropical Coupling in Upper Stratospheric Zonal Wind Anomalies. *J. Atmos. Sci.*, Vol. 32, pp. 712-719.

Kantor, A.J., and A.E. Cole, 1964: Zonal and Meridional Winds to 120 km. *J. Geophys. Res.*, Vol. 69, pp. 5131-5140.

Labitzke, K., A.H. Manson, J.J. Barnett, and M. Corney, 1987: Comparison of Geostrophic and Observed Winds in the Upper Mesosphere over Saskatoon, Canada. *J. Atmos. Terr. Phys.*, Vol. 49, pp. 987-997.

List, R.J., 1958: *Smithsonian Meteorological Tables*, Smithsonian Misc. Collections, Vol. 114.

Manson, A.H., C.E. Meek, and J.B. Gregory, 1981: Winds and Waves (10 Minutes-30 Days In the Mesosphere and Lower Thermosphere at Saskatoon (52°N, 107°W, L = 4.3) During the Year, October 1979 to July 1980. *J. Geophys. Res.*, Vol. 8, p. 9615.

Manson, A.H., C.E. Meek, M. Massebeuf, J.L. Fellous, W.G. Elford, R.A. Vincent, R.L. Craig, R.G. Roper, S. Avery, B.B. Balsley, G.J. Fraser, M.J. Smith, R.R. Clark, S. Kato, T. Tsuda, and A. Ebel, 1985: Mean Winds of the Mesosphere and Lower Thermosphere (60-110 km): A Global Distribution from Radar Systems (MF, Meteor, VHF). *Adv. Space Res.*, Vol. 5, No. 7, pp. 135-144.

Manson, A.H., C.E. Meek, M. Massebeuf, J.L. Fellous, W.G. Elford, R.A. Vincent, R.L. Craig, R.G. Roper, S. Avery, B.B. Balsley, G.J. Fraser, M.J. Smith, R.R. Clark, S. Kato, and T. Tsuda, 1986. *Adv. Space Res.* (in press).

Massebeuf, M., R. Bernard, J.L. Fellous, and M. Glass, 1979: The Mean Zonal Circulation in the Meteor Zone Above Garchy (France) and Kiruna (Sweden). *J. Atmos. Terr. Phys.*, Vol. 41, p. 647.

Matsuno, T., 1970: Vertical Propagation of Stationary Planetary Waves in the Winter Northern Hemisphere. *J. Atmos. Sci.*, Vol. 27, pp. 871- 883.

McGregor, J., and W.A. Chapman, 1978: Observations of the Annual and Semi-Annual Waves in the Stratosphere using Nimbus 5 SCR Data. *J. Atmos. Terr. Phys.*, Vol. 40, pp. 677-684.

Middle Atmosphere Program, Handbook for MAP, 1985, Vol. 16, edited by K. Labitzke, J.J. Barnett, and B. Edwards, University of Illinois, Urbana.

Murgatroyd, R.J., 1969: The Structure and Dynamics of the Stratosphere. *The Global Circulation of the Atmosphere*, G.A. Corby, Ed., London, Roy. Meteor. Soc., pp. 159-195.

Oort, A.H., 1983: *Global Atmospheric Circulation Statistics, 1958-1983*. NOAA Professional Paper 14, National Oceanic and Atmospheric Admin., 180 pp. For sale by U.S. Government Printing Office, Washington, D.C. 20402.

Quiroz, R.S, and A.J. Miller, 1967: Note on the Semi-Annual Wind Variation in the Equatorial Stratosphere. *Mon. Wea. Rev.*, Vol. 95, pp. 635- 641.

Reed, R.J., 1966: Zonal Wind Behavior in the Equatorial Stratosphere and Lower Mesosphere. *J. Geophys. Res.*, Vol. 71, pp. 4223-4233.

Reed, R.J., and D.G. Rogers, 1962: The Circulation of the Tropical Stratosphere in the Years 1954-1960. *J. Atmos. Sci.*, Vol. 19, pp. 127-135.

Reed, R.J., and C.L. Vlcek, 1969: The Annual Temperature Variation in the Lower Tropical Stratosphere. *J. Atmos. Sci.*, Vol. 26, pp. 163-167.

Rodgers, C.D., 1976: Retrieval of Atmospheric Temperature and Composition from Remote Measurements of Thermal Radiation. *Geo. Space Phys.*, Vol. 14, pp. 609-624.

Salby, M., and R.G. Roper, 1980: Long-Period Oscillations in the Meteor Region. *J. Atmos. Sci.*, Vol. 37, p. 237.

Schoeberl, M.R., and S.T. Zalesak, 1976: "A Critical Analysis of Climatological Wind Data Used in the Forecast of Radioactive Debris Cloud Movement", NRL Memorandum Report 3366, Naval Research Laboratory, Washington, D.C., 21 pp.

Smith, M.J., 1981: "Upper Atmospheric Circulation and Wave Motion", Ph.D. Thesis, Univ. Canterbury, Christchurch, New Zealand.

U.S. Standard Atmosphere, 1976, U.S. Government Printing Office, Washington, D.C., 1976.

van Loon, H., K. Labitzke, and R.L. Jenne, 1972: Half-Yearly Wave in the Stratosphere. *J. Geophys. Res.*, Vol. 77, pp. 3846-3855.

Vincent, R.A., and T.J. Stubbs, 1979: A Study of Motions in the Winter Mesosphere Using the Partial Reflection Technique. *Planet. Space Sci.*, Vol. 2, p. 441.

Vyas, N., 1984: "Numerical Modeling of Atmospheric Processes", Ph. D. Thesis, Oxford Univeristy.

Walker, J.C.G., 1965: Analytic Representation for Upper Atmosphere Densities Based on Jacchia's Static Diffusion Models. *J. Atmos. Sci.*, Vol. 22, p. 462.

NASA
National Aeronautics and Space Administration

Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA TM-100697		

4. Title and Subtitle

Monthly Mean Global Climatology of Temperature, Wind, Geopotential Height, and Pressure for 0 - 120 km

5. Report Date

February 1988

6. Performing Organization Code

616

7. Author(s)

Eric L. Fleming, Sushil Chandra, Mark R. Schoeberl, and John J. Barnett

8. Performing Organization Report No.

88B0092

10. Work Unit No.

9. Performing Organization Name and Address

Goddard Space Flight Center
Greenbelt, Maryland 20771

11. Contract or Grant No.

12. Sponsoring Agency Name and Address

National Aeronautics and Space Administration
Washington, D.C. 20546-0001

13. Type of Report and Period Covered

Technical Memorandum

14. Sponsoring Agency Code

15. Supplementary Notes

Eric L. Fleming is affiliated with the Applied Research Corporation, Landover, Maryland; John J. Barnett is affiliated with the Department of Atmospheric Physics, Clarendon Laboratory, Oxford, Great Britain; and Sushil Chandra and Mark R. Schoeberl are affiliated with Goddard Space Flight Center.

16. Abstract This report presents a monthly mean climatology of temperature, wind and geopotential height with nearly pole-to-pole coverage (80°S-80°N) for 0-120 km which can be used as a function of altitude and pressure. The purpose is to provide a reference for various atmospheric research and analysis activities. Data sources and methods of computation are described; in general, hydrostatic and thermal wind balance are maintained at all levels and latitudes. As observed in a series of cross sectional plots, this climatology accurately reproduces most of the characteristic features of the atmosphere such as the equatorial wind and the general structure of the tropopause, stratopause, and mesopause. A series of zonal wind profiles is also presented comparing this climatological wind with monthly mean climatological direct wind measurements in the upper mesosphere and lower thermosphere. The temperature and zonal wind climatology at stratospheric levels is compared with corresponding data from the National Meteorological Center, and general agreement is observed between the two data sets. Tables of the climatological values as a function of latitude and height for each month are contained in Appendix B. These tables are also contained on an IBM-compatible floppy diskette available upon request from: Dr. Sushil Chandra, Code 616, NASA-Goddard Space Flight Center, Greenbelt, MD, 20771.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Reference Atmosphere Climatological Data Middle Atmospheric Winds	Unclassified - Unlimited Subject Category 47

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of pages	22. Price
Unclassified	Unclassified		

NASA FORM 1626 OCT 86