[N]OAA
[Profe]ssional Paper 8

DEPARTMENT OF COMMERCE
UNITED STATES OF AMERICA

The Interannual Variability of Atmospheric Circulation Statistics

Rockville, Md.
October 1977

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

NOAA

Professional Paper 8

The Interannual Variability of Atmospheric Circulation Statistics

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U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps, Secretary
National Oceanic and Atmospheric Administration
Richard A. Frank, Administrator

Preface

I would like to dedicate this publication to the memory of Victor P. Starr, emeritus professor at the Massachusetts Institute of Technology (MIT). Through his numerous inspiring papers and the education of many generations of students at MIT, to one of which I was fortunate to belong, Victor Starr has initiated and brought to fruition a new approach in the study of climate. In this approach, atmospheric and oceanic observations are interpreted in the light of basic physical laws, such as the conservation of mass, angular momentum, water vapor, and energy, thereby shedding light on how the climate system operates. It is my hope that the present paper will prove to be a meaningful link in the long chain of publications started by Starr and his collaborators at MIT in the late 1940's toward the ultimate goal of a better understanding of the earth's climate.

The particular research described in this paper has grown out of a discussion several years ago with Dr. Joseph Smagorinsky, the Director of the Geophysical Fluid Dynamics Laboratory, NOAA (GFDL), on the importance of estimating "error" limits for the atmospheric circulation statistics presented in an earlier NOAA Professional Paper. The author is very grateful to him for his stimulus and constant support.

Valuable comments on the manuscript were made by Drs. Jerry D. Mahlman, Syukuro Manabe, and Kikuro Miyakoda. The output of the GFDL general circulation model ZODIAC was generously provided by Dr. Manabe to test the adequacy of the rawinsonde network described in Appendix B. Mrs. Hilda Philander, Mr. Melvin Rosenstein, and Mr. Philip Tunison and his coworkers were most helpful in the preparation of the various figures and tables. Mrs. Betty M. Williams expertly typed the manuscript in its various phases of evolution. The author would like to thank all these people for their great support and enthusiasm.

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For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - (Paper cover)
Stock Number 003-017-00395-7

The Interannual Variability of Atmospheric Circulation Statistics

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ABSTRACT.—The year-to-year variability of various zonal mean general circulation parameters is described, based on daily data from about 600 Northern Hemisphere rawinsonde stations for the two 5-yr periods May 1958 through April 1963, and May 1968 through April 1973. Most of the statistics presented are based on the 1958–1963 sample. The parameters studied include the wind components, temperature, geopotential height, and specific humidity, as well as their variances in time and space and their meridional and vertical transports. The main body of the report consists of tables and graphs of interannual standard deviations computed for the different calendar months as a function of latitude and pressure. A comparison between the results for the first and second 5-yr periods shows that the statistics do not depend generally on the specific 5-yr period chosen. Together with the results for the 1958–1963 mean conditions given in an earlier paper by Oort and Rasmusson, the present compilation should give a reasonably complete and representative picture of recent climatic conditions in the atmosphere of the Northern Hemisphere.

1. INTRODUCTION

Traditionally, the climate of the earth has been studied using observations taken near the earth's surface. Temperatures, pressures, and precipitation amounts have been recorded over the inhabited earth for several decades and locally in western Europe for more than 2 centuries. Often such records show—after considerable smoothing—weak, but unmistakable long-term trends. In the case of surface temperature, Mitchell (1963) discovered a slow world-wide heating from around 1880 to the early 1940's of about 0.4°C. This heating was followed by a slow cooling from the 1940's up to the early 1970's. Other indirect measures of the climate and its variability are found in historical records of the area covered by snow and ice, of sea surface temperatures, and of many other parameters (e.g., Lamb 1972).

In the case of historical records, one generally discovers a long-term trend only after considerable manipulation such as applying running averages or other smoothing devices. Raw data series usually exhibit a large degree of random variability obscuring any mean trend (e.g., van Loon and Williams 1976), and only diurnal, semiannual, and annual cycles can be clearly distinguished as periodicities. The apparently random year-to-year variability will be the topic of the present paper. By itself, the range of the naturally occurring year-to-year variations is a very interesting and economically important element of the climate issue (e.g., Schneider 1976). If the variability is large it may, for example, span the range of both favorable and unfavorable conditions for growing certain crops.

Another aspect of the present work is that it extends and completes an earlier investigation (Oort and Rasmusson 1971) of the mean structure of the atmosphere for the 5-yr period, May 1958 through April 1963. Some of the unique features of the earlier study were the length of record (longer than any previous one used to study the atmosphere in such depth), the extensive network of rawinsonde stations, and the consistent method of analyzing the different meteorological fields for each calendar month. The present work will supply the needed measure of uncertainty (due to both natural variability and errors in data and analysis) in the earlier, basic statistics. A further practical use of the present statistics may be as input for stochastic climate models (Hasselmann 1976) and as a basic reference to check the validity of climatic information generated by general circulation models. For example, these statistics can establish within the limits of the present data if the model results of a particular January simulation fall within the range of naturally occurring January values or not.

The basic data set is the same collection of 5 years (May 1958–April 1963) of Northern Hemisphere rawinsonde data as was used previously by Oort and Rasmusson (1971). It covers not only the atmosphere near the earth's surface but also the free atmosphere up to a height of about 20 km. A legitimate question is the relevance of only 5 years of data in the light of long-term trends such as those shown in Mitchell's curves. Thus, of necessity the present effort is only a beginning, and the results need to be tested and improved by taking longer and more samples. However, the author will present evidence in subsection 5.3 that the main features of the statistics presented here are fairly representative of present climatic conditions. The evidence is based on the preliminary results of a comparable study for a more recent 5-yr sample for the period May 1968 through April 1973.

The question arises as to what measure or measures one should use to show the general character of the year-to-year variations. Presentation of all results for each year individually would clearly take up too much space, and would also probably overwhelm the reader. Therefore, it was decided to focus this study on the variability in terms of interannual standard deviations for the various zonal-mean parameters. Although one can probably think of several other relevant measures such as, for example, the range of the extreme values, the year-to-year standard deviation seems to be one of the more stable measures (although not as economically interesting as measures of local variability) and also easy to compute from the present, relatively short samples. The standard deviations will be given mainly in tabular form as a function of latitude and pressure. They are based on the 60 individual monthly-mean zonal cross-sections from the period May 1958 through April 1963. These results will be discussed in Section 4, but, because of their volume, the actual tables will be presented in Appendix A. The selection of the parameters will follow closely the list of variables used in Oort and Rasmusson (1971). Thus, simple linear quantities like the wind components, temperature, geopotential height, and specific humidity will be discussed first, followed by their variances and finally their covariances with the meridional and vertical velocities. Cross-sections of the standard deviations will be shown for a "typical" month irrespective of the season (see definition (1) in subsection 4.2), for the two extreme months, January and July, and for the year as a whole.

A coarser measure of the year-to-year variability will be presented in Section 5. There the basic variables will not only be averaged in time and zonally, but also vertically before standard deviations are computed. The only remaining functional dependence will be with latitude. Several diagrams will illustrate the latitudinal dependence for the basic atmospheric variables.

2. NOTATION AND DEFINITIONS

The following notation will be used throughout this publication:

a	= radius of the earth
c_p	= specific heat at constant pressure
E	$= c_pT + gZ + Lq$ = total energy per unit mass, or
	= contribution from transient plus stationary eddies (used as subscript)
EKE	$= ([\overline{u'^2}] + [\overline{v'^2}] + [\bar{u}^{*2}] + [\bar{v}^{*2}])/2$ = eddy kinetic energy per unit mass
g	= acceleration due to gravity
H	$= c_pT + gZ$ = sensible heat plus potential energy per unit mass
KE	$= (u^2+v^2)/2$ = kinetic energy per unit mass
L	= heat of condensation
M	= contribution from mean meridional circulation (used as subscript)
MKE	$= ([\bar{u}]^2 + [\bar{v}]^2)/2$ = mean kinetic energy per unit mass

p = pressure

p_o = pressure at ground level (where there are no mountains $p_o = 1012.5$ mb)

p_T = top level of vertical integration = 75 mb

q = specific humidity (usually in units of g water vapor per kg moist air)

t = time

T = temperature

u = zonal wind component (positive if eastward)

v = meridional wind component (positive if northward)

w = vertical wind component

Z = geopotential height

λ = geographic longitude

ρ = density

$\sigma(A)$ = standard deviation of A

ϕ = geographic latitude

ω = $dp/dt \simeq -\rho g w$ = "vertical" pressure velocity (positive if downward)

$\bar{A} = (t_2 - t_1)^{-1} \int_{t_1}^{t_2} A\, dt$ = time average of A

$A' = A - \bar{A}$ = departure from time average of A

$[A] = (2\pi)^{-1} \int_o^{2\pi} A\, d\lambda$ = zonal average of A

$A^* = A - [A]$ = departure from zonal average of A

$\hat{A} = (p_o - p_T)^{-1} \int_{p_T}^{p_o} A\, dp$ = mass weighted "vertical" average of A

$A'' = A - \hat{A}$ = deviation from "vertical" average of A

$\tilde{A} = \int_o^{\pi/2} A \cos\phi\, d\phi$ = meridional average of A over Northern Hemisphere

$A''' = A - \tilde{A}$ = deviation from meridional average of A

$[\overline{A^2}]_E = [\overline{A'^2}] + [\bar{A}^{*2}]$

Examples of nomenclature follow:

(1) $[\overline{A^2}] = [\overline{A'^2}] + [\bar{A}^{*2}] + [\bar{A}]^2$

where $[\overline{A'^2}]$ = variance of A resulting from transient eddies

$[\bar{A}^{*2}]$ = variance of A resulting from standing (or stationary) eddies

(2) $[\overline{vA}] = [\overline{v'A'}] + [\bar{v}^*\bar{A}^*] + [\bar{v}][\bar{A}]$

where $[\overline{v'A'}]$ = meridional transport of A resulting from transient eddies[1]

$[\bar{v}^*\bar{A}^*]$ = meridional transport of A resulting from standing eddies

$[\bar{v}][\bar{A}]$ = meridional transport of A resulting from (standing) mean meridional circulations

(3) $[\overline{\omega A}] = [\overline{\omega' A'}] + [\bar{\omega}^*\bar{A}^*] + [\bar{\omega}][\bar{A}]$

where $[\overline{\omega' A'}]$ = vertical transport of A resulting from transient eddies[1]

$[\bar{\omega}^*\bar{A}^*]$ = vertical transport of A resulting from standing eddies

$[\bar{\omega}][\bar{A}]$ = vertical transport of A resulting from (standing) mean meridional circulations

(4) $\widehat{[\overline{vA}]} = \widehat{[\overline{v'A'}]} + \widehat{[\bar{v}^*\bar{A}^*]} + \widehat{[\bar{v}]''[\bar{A}]''} + \widehat{[\bar{v}]}\widehat{[\bar{A}]}$

$= \widehat{[\overline{vA}]}_E + \widehat{[\overline{vA}]}_M + \widehat{[\bar{v}]}\widehat{[\bar{A}]}$

where $\widehat{[\overline{v'A'}]}$ = vertical average of meridional transport of A resulting from transient eddies[1]

$\widehat{[\bar{v}^*\bar{A}^*]}$ = vertical average of meridional transport of A resulting from standing eddies

$\widehat{[\bar{v}]''[\bar{A}]''}$ = vertical average of meridional transport of A resulting from mean meridional circulations

$= \widehat{[\overline{vA}]}_M$

$\widehat{[\bar{v}]}\widehat{[\bar{A}]}$ = meridional transport of A resulting from a net flow of mass across latitude circles (in general, very small).

[1] The transient eddies as defined here include the contributions by transient mean meridional circulations. However these contributions have been found to be very small (Starr and White 1954).

3. NATURE OF BASIC DATA.

The principal data source is the MIT General Circulation Library which contains daily rawinsonde reports for the 5-yr period, May 1958 through April 1963. These data were collected and processed under the direction of the late Victor P. Starr at MIT. Because the procedures used to arrive at the final general circulation statistics have been described extensively before (Oort and Rasmusson 1971), only a few of the more important steps will be mentioned here. In addition, the rawinsonde data from a later 5-yr period, May 1968 through April 1973, have recently been processed at GFDL in a fashion similar to the 1958–1963 data. (The data from the intervening period, May 1963 through April 1968, will be processed in the near future.) Their spatial distribution is also much the same as those of the earlier sample described below.

After some initial crude checks, the daily reports were used to compute monthly mean statistics for each of the nearly 600 stations, and for each of the 60 individual months. These statistics consisted of averages, variances, and covariances of the wind components, temperature, geopotential height, and specific humidity. Only those stations were used in the further analyses that reported more than 10 days of the possible 30 or 31 days in the month. Some properties of the station network will be discussed with the aid of figures 1 through 3. In figure 1 the number of Northern Hemisphere stations is given as a function of pressure. Both at low levels below 850 mb and at high levels above 100 mb there is a marked decrease from the almost 600 good reporting stations in the middle troposphere. Some improvement with time in the network is evident considering the two curves for January 1959 and 1963. The latitudinal distribution at 500 mb in figure 2, as well as the map of the two-dimensional distribution of stations in figure 3, clearly show the data gaps south of about 25°N in the Tropics.

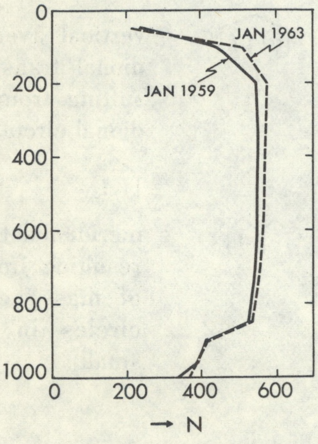

FIGURE 1.—Number of Northern Hemisphere rawinsonde stations used in the analyses for January 1959 and 1963 as a function of pressure.

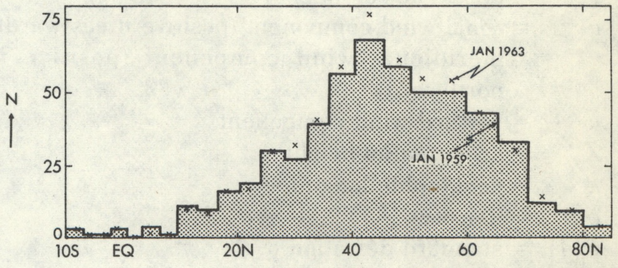

FIGURE 2.—Number of rawinsonde stations in 5° latitude-wide belts used in the 500-mb analyses for January 1959 and 1963.

Values of the statistics at regular grid points were obtained from the values at the rawinsonde stations through an objective analysis technique using the zonal average of all data in a latitudinal belt as a first guess. The objective analysis technique is called CRAM (Conditional Relaxation Analysis

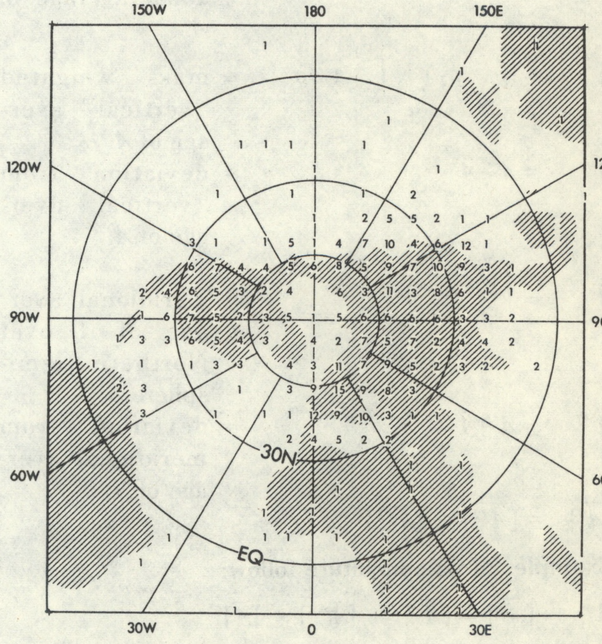

FIGURE 3.—Horizontal distribution of rawinsonde stations over the Northern Hemisphere at 500 mb for January 1959. The values represent the number of stations in a square of about 1000×1000 km^2 on the polar stereographic map.

Method) and has been described by Harris et al. (1966). The next step was to average the fields with respect to longitude and construct zonal-mean latitude versus pressure cross-sections. These sets of 60 individual monthly cross-sections form the basic input for the present study of the year-to-year variability. The variability will be expressed principally in the form of zonal cross-sections of the standard deviation computed from the zonal-mean cross-sections for the 5 individual years.

4. YEAR-TO-YEAR VARIABILITY OF ZONAL MEAN PARAMETERS

4.1 Representativeness of results

The value of the climate statistics published previously by Oort and Rasmusson (1971) would be greatly enhanced if one could present an adequate measure of their uncertainty. This uncertainty depends on many factors which, however, may be grouped into two general categories. The first category is associated with data deficiencies and analysis problems. It includes the errors in the basic reports, the gaps in the time series at each station, and most importantly the spatial gaps in the station coverage over the globe. The second category is perhaps more physically interesting. It contains the real year-to-year differences that would be measured if one had the relevant data everywhere, all the time.

In the tabulations of standard deviations to be discussed here, the two categories of uncertainty are both present and cannot be separated. It is even uncertain if the values will underestimate or overestimate the true variability. For example, let us consider the probable situation that only variations over data-rich (generally land) areas are sampled sufficiently and that our analysis method (with a zonal average of the data as first guess) would tend to miss any possible real variations over data-sparse (generally ocean) areas. This could lead to either an over- or underestimate depending on the degree of compensation between the two areas. The sampling problem associated with the non-uniform distribution of the rawinsonde stations over the hemisphere is discussed further in Appendix B. There, certain experiments with the output from a full general circulation model are described that are directly relevant to the present problem. Based on these model experiments one may infer that the spatial gaps in the rawinsonde network do not greatly affect the present results concerning the year-to-year spread. At least in the Northern Hemisphere, the sampling problem seems to be less serious than one might have thought and the present results seem in most cases to be a true measure of the year-to-year variability. For further information see Appendix B. Other sources of error include errors in the reports and incompleteness of the time series at a particular station, both of which would probably lead to greater departures from normal and thus to an overestimate of the true variability. Taking all factors together it seems most likely that the present variability values will tend to give slight overestimates of the true variability.

The basic averaging interval was chosen as 1 month. This averaging period should be long enough to remove the variability due to synoptic weather systems and shorter lived phenomena. More slowly varying phenomena related to, for example, the index cycle may still affect the average (see, e.g., McGuirk et al. 1975). Ideally the choice of interval should depend on the shape of the time spectra of the parameters and on the location of spectral gaps. In practice, however, the spectral gaps (if present at all) are not very distinct and their position in the spectrum varies with geographical location, parameters, and height in the atmosphere. In working with actual time series it has been our experience that for most parameters the variability will decrease monotonically with increasing averaging interval as the interval is increased from a month to a year. This would suggest in general a rather flat spectrum (provided the annual cycle and its higher harmonics have been filtered out). An example of the effect of the averaging interval is shown in figure 4 for the meridional eddy heat transport averaged both zonally and vertically. Shown are the data points for the 5 individual years as well as two dashed curves for the 5-yr average plus and minus the interannual standard deviation (see definitions 2, 3, and 4 in subsection 4.2). The large seasonal variation in the magnitude of the variability as shown in figure 4 also seems to justify our choice of 1 month as basic averaging interval.

It is of some interest to separate the total eddy heat flux into its transient and standing components. This was done for the winter months in figure 5. It shows that the total flux is generally less variable from year to year than one would expect if its two components were uncorrelated. Actual computations of the correlation coefficient between the anomalies in the transient and standing eddy heat

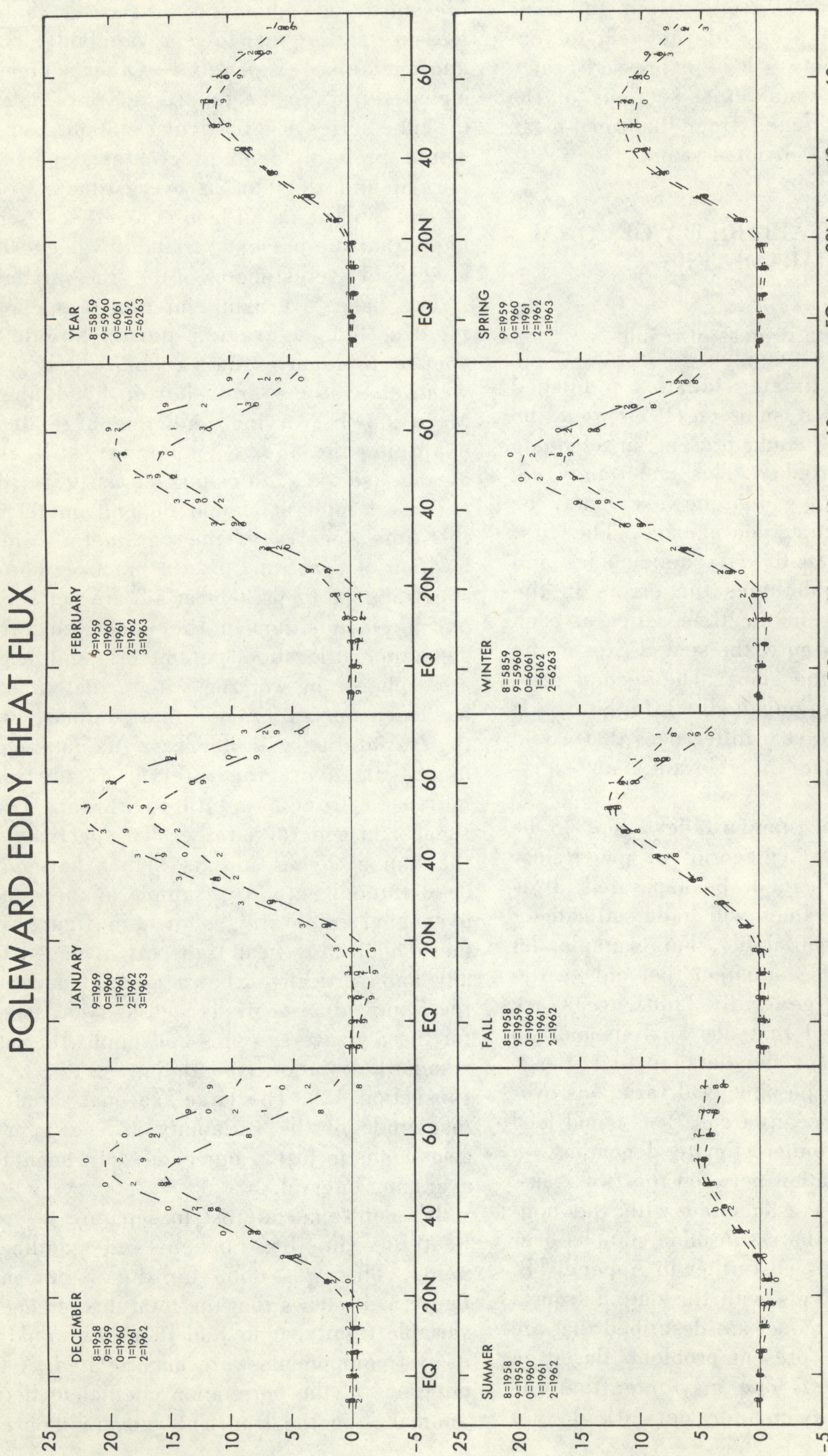

FIGURE 4.—Influence of averaging interval on the magnitude of the interannual variability in the vertical mean northward heat flux. Shown are the fluxes due to transient plus stationary eddies for the 3 winter months (top), the 4 seasons (bottom) and the year (top right) in units of m/s · °C. Dashed curves indicate the 5-yr average plus and minus the interannual standard deviation.

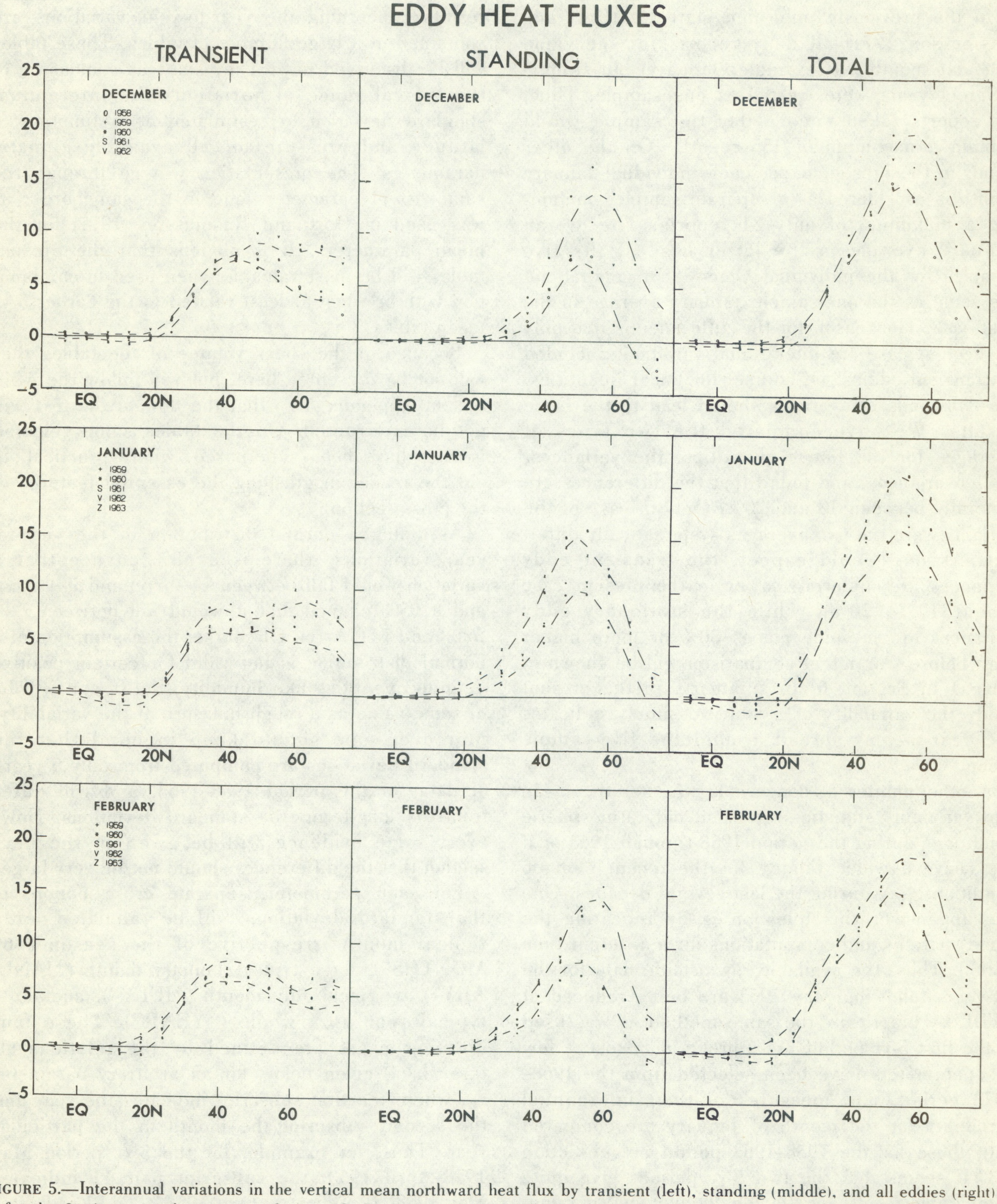

FIGURE 5.—Interannual variations in the vertical mean northward heat flux by transient (left), standing (middle), and all eddies (right) for the 3 winter months in units of m/s · °C. Dashed curves indicate the 5-yr average plus and minus the interannual standard deviation.

fluxes give values of about -0.3 (Oort 1975) in middle and high latitudes.

In the previously published statistics (Oort and Rasmusson 1971) all daily reports for the same calendar month (for example, January) but from 5 different years were treated as one sample. Thus, for reports taken once a day the sample would contain a maximum of 155 reports. On the other hand, in the present paper each individual January month is considered as a separate sample, containing a maximum of only 31 reports. The overall January average in the latter case of the five samples for the individual years is in general not the same as the one-sample January average in the first case. The reason for the difference is that only in the first case are interannual variations included as transient eddies. Of course, for linear quantities, the two kinds of averages should lead to the same results. We have compared the two types of averages for the linear quantities, the variances, and covariances, and found that the differences are generally between 10 and 20%. Only in case of the variances are the two averages systematically different. As one would expect, the transient eddy variances are uniformly lower in the present case (about 10 to 20%), while the stationary eddy variances are in some places 50% or more higher than before. An actual comparison will be shown in table 1 in Section 6. In summary, in the present study the variability of a statistic simply indicates the year-to-year spread around the five-sample mean.

Another matter of concern is whether the mean and variability statistics represent only atmospheric conditions during the period 1958 through 1963 or if they have a wider validity for the recent climatic conditions, say during the last several decades. One way to answer this question is by repeating the same analyses and computations for a different time period. Thus, the available rawinsonde data for the 10 years following May 1963 are being reduced at GFDL by practically the same method as was used in the first 5-yr period. As a preliminary test, a few key parameters have been selected from the 1968–1973 period, and measures of their interannual variability for the month of January are compared with those for the 1958–1963 period in subsection 5.3. It seems that the two 5-yr periods give quite comparable results for the zonally averaged parameters. Thus one may tentatively conclude that the general circulation statistics evaluated for the 1958–1963 period are representative for conditions during the last few decades.

4.2 Discussion of tables

As mentioned in the introduction, the basic results concerning the year-to-year variations are contained in a large number of tables. These tables will be discussed now. They show as a measure of the typical range of variations the interannual standard deviation (σ) estimated as a function of latitude and pressure for all available climatic parameters. The presentation will go through the same list of parameters and in the same order as was used in Oort and Rasmusson (1971) for the mean parameters. It is obvious that the present tables will be most valuable when used in combination with or when at least related to the earlier 5-yr mean tables.

Because of the sheer volume of the tables they will not be presented here, but will follow the main text in Appendix A so that the flow of the text will not be interrupted. On the tables some selected isolines have been superposed, where practical, to aid the reader in grasping the essential features of the cross-section.

Assuming a normal distribution of the year-to-year variations, there is a 68% chance that a variation would fall between $\bar{x} - \sigma(x)$ and $\bar{x} + \sigma(x)$, and a 95% chance that it would fall between $\bar{x} - 2\sigma(x)$ and $\bar{x} + 2\sigma(x)$. Of course, the assumption of a normal distribution is not valid for certain positive definite quantities like humidity, but σ still will be of some value as a rough measure of the variability. Moreover, one should keep in mind that the standard deviations are computed from only 5 years of data for the period 1958–1963, and will differ from the long-term true standard deviations. However, some evidence will be given in the next section that the differences should not be very large.

For each parameter, separate cross-sections of the standard deviations will be tabulated for a typical month irrespective of the season ("60 MONTHS"), for a typical January month ("JANUARY"), a typical July month ("JULY"), and for a typical year as a whole ("YEAR"). These four different cases are defined by the relations (1) through (4) given below for an arbitrary parameter x_{ij}, where the first subscript indicates the year and the second subscript the month in the particular year. Thus, for example, for the 5-yr period May 1958–April 1963, the subscript pair 11 indicates May 1958, 12 indicates June 1958, . . . 21 indicates May 1959, . . . 512 indicates April 1963. The arbitrary parameter x may be a linear parameter like $[\overline{T}]$, a variance like $[\overline{T'^2}]$, or covariance like $[\overline{v'T'}]$.

For the "60 MONTHS" case:

$$\sigma(x) = \left\{ \sum_{i=1}^{5} \sum_{j=1}^{12} \left[x_{ij} - \left(\sum_{k=1}^{5} x_{kj}/5 \right) \right]^2 \Big/ 60 \right\}^{1/2}. \quad (1)$$

For the "JANUARY" case:

$$\sigma(x) = \left\{ \sum_{i=1}^{5} \left[x_{i9} - \left(\sum_{k=1}^{5} x_{k9}/5 \right) \right]^2 \Big/ 5 \right\}^{1/2}. \quad (2)$$

For the "JULY" case:

$$\sigma(x) = \left\{ \sum_{i=1}^{5} \left[x_{i3} - \left(\sum_{k=1}^{5} x_{k3}/5 \right) \right]^2 \Big/ 5 \right\}^{1/2}. \quad (3)$$

For the "YEAR" case:

$$\sigma(x) = \left\{ \sum_{i=1}^{5} \left[\left(\sum_{j=1}^{12} x_{ij}/12 \right) - \left(\sum_{k=1}^{5} \sum_{j=1}^{12} x_{kj}/60 \right) \right]^2 \Big/ 5 \right\}^{1/2}. \quad (4)$$

From these relations it is clear that in the 60 MONTHS case the standard deviations were evaluated from the 60 cross-sections of the deviations from the normal annual variation, while in the JANUARY, JULY, and YEAR cases the standard deviations were based on only five individual January, July, and yearly cross-sections, respectively.

For the sake of economy, no results are shown for calendar months other than January and July, but the statistics are available at GFDL. As in the earlier publication, the entries in the tables are given at every 5° latitude between 10°S and 75°N and for the 11 levels of analysis between 1000 and 50 mb. The lowest line in each table, labeled "MEAN", represents just the pressure-weighted mean of the σ-values at the 11 levels. Thus these values should be quite different from the σ-values of the vertical mean parameters to be presented in the next section.

As regards the results, the highest variability was found in general in winter (JANUARY), the lowest in summer (JULY), an intermediate value for a typical month irrespective of the season (60 MONTHS), and a very low variability from one entire year to another one (YEAR). In the following discussions the interannual variability will be always discussed in terms of the value of one standard deviation away from the 5-yr mean.

4.2a. Variability in mean values (Tables A1 through A7)

The zonal wind component (table A1) does not show its highest year-to-year variability in the region of the subtropical jet but rather at stratospheric levels in the Tropics and in the polar regions. In the Tropics the main contributor is the well-known quasi-biennial oscillation, while at high latitudes longer-term variations seem to play a major role (see Oort and Rasmusson 1971, pp. 314, 315). The general magnitude of the standard deviation is about 0.5 to 1 m/s in the lower troposphere, 1 to 2 m/s in the upper troposphere, while it reaches a magnitude of almost 10 m/s in the equatorial lower stratosphere.

The meridional wind component (table A2) shows a more uniform variability of the order of 0.5 m/s. This variability is quite large compared with the mean values of the meridional velocities of at most 2 to 3 m/s, and proportionally much larger than in the case of the zonal wind velocity. This is probably largely due to the difficulties involved in determining the small mean meridional velocities based on a fairly coarse data network. On the other hand, it is not inconceivable that the true variability could also be large.

The variability in the zonal-mean vertical wind component (table A3) is subject to the same degree of uncertainty as the zonal-mean meridional wind component from which it was derived. Because the highest vertical velocities are found in the middle troposphere, it is also the place where the table shows the highest variability (of the order of 10^{-4} mb/s).

The temperature pattern (table A4) shows, just as the zonal wind pattern, a high variability in the upper troposphere and lower stratosphere with values of the order of 1 to 2°C. The highest values of about 5°C are found in the polar stratosphere.

The geopotential height (table A5) is, of course, related to the vertically integrated temperature. Thus, again maxima in variability are found at high levels in the Tropics (20 to 40 gpm) and in polar regions (20 to 100 gpm).

In contrast to the other parameters, the specific humidity (table A6) shows the highest year-to-year variability near the ground. This is understandable in view of the strong decrease of specific humidity with height. Values of about 0.2 to 0.5 g/kg are computed at low levels in the Tropics where the air tends to be most humid.

The kinetic energy (table A7) exhibits high variability (about 50 $m^2 \cdot s^{-2}$) in the vicinity of the subtropical jet, and as before in the case of u, T, and Z, large standard deviations in the tropical and polar stratosphere.

4.2b. Variability in variances (Tables B1a through B6b)

The standard deviations in the transient zonal wind variance (table B1a) are rather uniform in the upper troposphere with values of the order of 10 $m^2 \cdot s^{-2}$. Surprisingly, for the year as a whole the interannual differences are somewhat larger than for either January or July. There does not seem to be an easy explanation for this large variance. The standing eddy component (table B1b) shows the highest standard deviations in middle latitudes at jet stream levels (of the order of 20 $m^2 \cdot s^{-2}$ or more).

In case of the transient meridional wind variance (table B2a) the year-to-year variations are strongest in the upper troposphere at middle and high latitudes with values ranging between 10 and 20 $m^2 \cdot s^{-2}$. The standing eddies (table B2b) vary over about the same range but only at high latitudes.

Year-to-year variations in the standing vertical wind variance (table B3) are computed to have a maximum in the middle troposphere in middle and high latitudes of about 5 to 10 $\times$ 10^{-8} $mb^2 \cdot s^{-2}$. Compared with the mean values, these variations are percentagewise higher than for the horizontal wind components. The difficulty in estimating the mean vertical motion field from the horizontal wind field probably leads to larger errors and deviations in this case. No estimates of the transient vertical wind variance could be made because of the (at present) insurmountable problem of computing instantaneous vertical velocities based only on the rawinsonde network.

As for most previously discussed parameters, interannual differences in the transient eddy temperature variance (table B4a) are again large wherever the values of the variance itself are large. Thus, the highest values between about 5 and 10°C^2 are found at high latitudes near the ground and in the stratosphere. The cross-sections for the standing eddy variances (table B4b) are very similar to those for the transient eddy ones.

The standing eddy geopotential height variance (table B5) shows very large σ-values at high latitudes, between 5000 and 10,000 gpm^2 in winter and about 2000 gpm^2 in summer. Compared with the mean variances published previously, the σ-values are very large, almost of the same magnitude. In this respect, this variance seems to be unique. The transient eddy geopotential height variance could not be evaluated because no individual monthly analyses were made for this component.

Finally, the transient humidity variance (table B6a) shows interannual differences of about 0.4 $g^2 \cdot kg^{-2}$ in the Tropics in the lower troposphere. The standing component (table B6b) appears to be most variable in the subtropics with σ-values over 1 $g^2 \cdot kg^{-2}$, but very small elsewhere.

4.2c. Variability in meridional transports (Tables C1a through C4c)

The interannual variability in the meridional transport of eastward momentum associated with transient eddies (table C1a) is found to be of the order of 5 to 10 $m^2 \cdot s^{-2}$ above 500 mb in the extratropics and smaller elsewhere. The σ-values for the standing eddies (table C1b) are very similar to those for the transient eddies. In the case of mean meridional transports (table C1c), the variability reaches values of about 10 $m^2 \cdot s^{-2}$ above 300 mb both in the Tropics and at higher latitudes. Relative to the 5-yr mean values the standard deviations in the transports are very much larger than those found in the previous parameter sets, probably reflecting problems in measuring mean meridional velocities.

The transient and standing eddy poleward fluxes of sensible heat (tables C2a and C2b) show interannual differences of the order of 2 to 5°C $\cdot$ m/s at middle and high latitudes, considerably smaller than the mean values of the fluxes. The mean meridional flux (table C2c) shows a high variability of 10 to 20°C $\cdot$ m/s above 300 mb. However, this result may not be very important because the mean meridional flux of sensible heat is more than compensated by the mean meridional flux of geopotential energy.

The year-to-year variability in the standing eddy flux of geopotential energy (table C3a) is generally as large as or larger than the mean value of the flux. It is about 100 gpm $\cdot$ m/s at high latitudes above 400 mb. In the case of the mean meridional flux of geopotential energy (table C3b), the variability is about 2000 gpm $\cdot$ m/s near the surface and from 2000 to 10,000 gpm $\cdot$ m/s above 300 mb at all latitudes. As was mentioned before, if one considers the total energy transport a large part of this geopotential energy flux is balanced by the mean meridional fluxes of sensible and latent heat.

The transient eddy poleward flux of water vapor (table C4a) shows a low interannual variability relative to the long-term mean flux (about 10%) with σ-values of about 0.5 g/kg · m/s below 700 mb in middle and high latitudes. Just as in the case of the fluxes of momentum and sensible heat, the standing eddy patterns (table C4b) are practically identical to the transient eddy patterns. The variability in the mean meridional flux (table C4c) is much higher, especially in the Tropics with $\sigma-$ values up to 5 g/kg · m/s or more. One of the reasons for this is, of course, the high variability in the mean meridional velocities as was discussed before.

4.2d. Variability in vertical transports (Tables D1a through D5b)

The problems in the determination of the vertical velocity are reflected in the large apparent year-to-year variations of the vertical transports. Thus the σ-values are frequently as large as or larger than the long-term mean transports, with the notable exception of the water vapor fluxes. Only the contributions due to standing eddies and mean meridional circulations could be evaluated.

The interannual variability in the standing eddy vertical flux of eastward momentum (table D1a) is found to be a maximum in the middle troposphere of the order of 5×10^{-4} mb · m · s^{-2}. The mean meridional circulation component (table D1b) appears to be subject to similar but somewhat stronger variations of 5 to 10×10^{-4} mb · m · s^{-2}.

The standing eddy covariance between the vertical and meridional wind components (table D2) undergoes year-to-year variations with a maximum σ-value of about 4×10^{-4} mb · m · s^{-2} at high latitudes.

The variability in the standing eddy vertical flux of sensible heat (table D3a) shows its highest values of 2 to 4×10^{-4} mb/s · °C in middle and high latitudes in the lower troposphere. For the mean meridional flux (table D3b) one finds maximum σ-values of 5 to 10×10^{-4} mb/s · °C in the middle troposphere.

The standing eddy vertical flux of geopotential energy (table D4a) shows high σ-values of 5 to 10×10^{-3} mb/s · gpm in the upper troposphere at middle and high latitudes with much smaller values elsewhere. Again the fluctuations in the mean meridional flux (table D4b) are greater and reach σ-values of 20 to 40×10^{-3} mb/s · gpm in the upper troposphere in winter.

Finally, the standing eddy vertical transport of water vapor (table D5a) exhibits a rather uniform pattern of variability with maximum standard deviations of 0.5×10^{-4} mb/s · g/kg in the lower troposphere. In middle latitudes these values are only about 30% of the long-term mean transports. As was the case for the other variables, the variability for the mean meridional component (table D5b) is larger than for the eddy component, with maximum σ-values of about 5×10^{-4} mb/s · g/kg in the Tropics (again about 30% of the long-term mean transports).

5. YEAR-TO-YEAR VARIABILITY OF VERTICAL AND ZONAL MEAN PARAMETERS

In the present section interannual variations of the same variables as before will be considered, but after they have been integrated both in the zonal and vertical directions. Thus the actual zonal and vertical mean values (x) for each individual year will be shown graphically as a function of latitude together with dashed curves of $\bar{x} + \sigma(x)$ and $\bar{x} - \sigma(x)$. This method of presentation may provide an easier grasp of the essential features of the variability than the table format used previously. The first subsection will deal with a year, the second with a month as basic time interval. Intercomparison of the results for both subsections should give insight in the increase of variance when decreasing the averaging interval from one year to one month.

5.1 One year as basic time unit

The basic results are shown in a series of graphs grouped together in the form of panels. Thus figure 6 shows the elementary quantities, figure 7 their variances, and figures 8 and 9 the meridional fluxes. Before going into a detailed description of the individual graphs, some general remarks will be made about the plots.

The actual values for the 5 individual years (May 1958–April 1959, May 1959–April 1960, ..., May 1962–April 1963) are plotted as five different symbols as indicated on each panel. Because of the considerable reduction of the original diagrams, the distinction between data points is not always clear. However, this problem does not seem to be serious since the principal aim is to show the general spread between different years. This spread is further emphasized by two dashed curves indicating the 5-yr average plus and minus the standard deviation. The abscissa in each graph runs from 12°S to 76°N, the data points being plotted at 6° intervals. South of the Equator the results should not be trusted much, not only because of the sparseness of the data but also because of the proximity of the border of the polar stereographic map used to analyze the fields.

The time-scale of the eddies included in the transient eddy variances and fluxes ranges from the period associated with the response of the rawinsonde balloon, i.e., a few minutes, to the period of 1 year. However, the diurnal period and higher harmonics are excluded since only 00 GMT observations were used. The principal contributors are, first of all, the cyclone and anticylone systems with time scales from about 2 to 10 days and secondly the annual cycle. As we will see later, this last cycle is particularly important in the temperature and humidity variances at high latitudes. In contrast with the transient eddies, the standing eddies contribute little to the variances and fluxes, at least on an annual basis. This is because the time-averaging smooths out most of the zonal anomalies on horizontal maps.

The first column of three graphs in figure 6 gives the meridional profiles of the zonal wind component, the mean kinetic energy, and the eddy kinetic energy. The profile of the zonal wind shows easterlies south of about 15°N and westerlies north of it with a maximum of about 11 m/s near 40°N. The interannual variations are largest at high latitudes, of the order of a few m/s. The mean kinetic energy is defined by MKE $= \frac{1}{2}([\bar{u}]^2 + [\bar{v}]^2)$, where the mean meridional component can actually be neglected since it is several orders of magnitude smaller than the zonal component. There is a clear maximum in MKE near 35°N where the subtropical jet is found. The profile of the eddy kinetic energy defined by EKE $= \frac{1}{2}([\overline{u'^2} + \bar{u}^{*2}] + [\overline{v'^2} + \bar{v}^{*2}])$ indicates a rather high and uniform level of eddy activity north of 30°N. As will be seen later in figure 7, the transient components of u and v clearly dominate the eddy kinetic energy and away from the subtropical jet they even determine to a large extent the total kinetic energy. Interannual variations are of the order of 5 $m^2 \cdot s^{-2}$, comparable with those in MKE.

The second column of three graphs in figure 6 shows the mean temperature, geopotential height, and specific humidity. All three quantities have a maximum in the inner Tropics. Interannual variations appear to be small and do not depend much on latitude.

The variances of the zonal and meridional wind components, temperature, and specific humidity are depicted in figure 7. As was mentioned before, practically all the eddy variance is explained by the transient eddies. The stationary eddies appear to account for only 10% or less of the total variance. If one disregards the peak in $[\overline{u'^2}]$ near 30°N, associated with the seasonal cycle in the zonal-mean jet stream, the north-south and east-west variances look very much alike. This is in agreement with the almost identical patterns for the two components for different calendar months discussed in our previous publication (Oort and Rasmusson 1971). The interannual variations generally increase with latitude, but are everywhere small compared with the 5-yr mean values. Only in the case of humidity (because of its strong decrease with latitude) does the year-to-year variability decrease with latitude. The variability is especially large in the standing component in the subtropics.

In the three columns of diagrams in figure 8 the fluxes of momentum, sensible heat, and latent heat are shown.[2] Each column is further broken down into the transient eddy, standing eddy, mean meridional circulation contributions, and the total flux itself. In the case of momentum, the transient eddies clearly dominate the transport, except near 60°N where transient and standing eddies are equally important. Interannual variability is found to be relatively large in the standing and mean meridional components. In the second column, the mean meridional and total fluxes of sensible heat plus potential energy, H, are given instead of those of sensible heat, because the fluxes of sensible heat and geopotential energy largely compensate each other and may not be meaningful by themselves. As is well known, the eddies dominate the heat flux at middle and high latitudes, while the mean meridional circulation is of greater importance at low latitudes. (The strong southward fluxes south of the Equator are probably not realistic.) The interannual

[2] The transports of sensible heat, latent heat, and total energy in figure 8 and later figures are given in units of m/s · °C, m/s · g/kg, and m/s · °C, respectively. To convert to the same units of 10^3 W · m/kg, multiply by 1.0, 2.5, and 1.0, respectively.

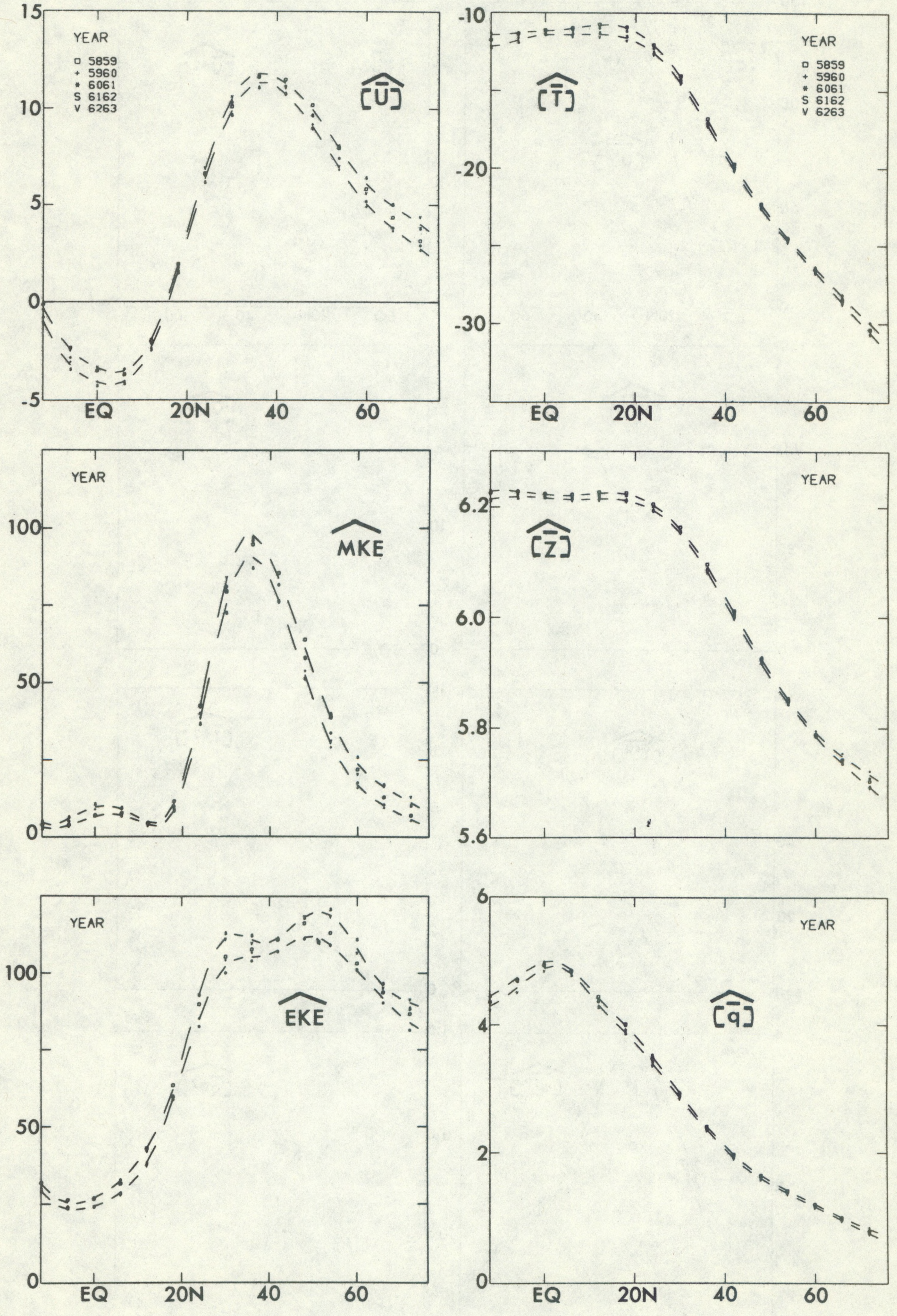

FIGURE 6.—Meridional profiles of the zonal and vertical mean values for the zonal wind in units of m/s, the temperature in °C, the mean kinetic energy in $m^2 \cdot s^{-2}$, the geopotential height in 10^3 gpm, the eddy kinetic energy in $m^2 \cdot s^{-2}$, and the specific humidity in g/kg. Shown are data points for the 5 individual yr May 1958–April 1959, ... , May 1962–April 1963. The two dashed curves indicate the 5-yr mean value plus and minus the interannual standard deviation.

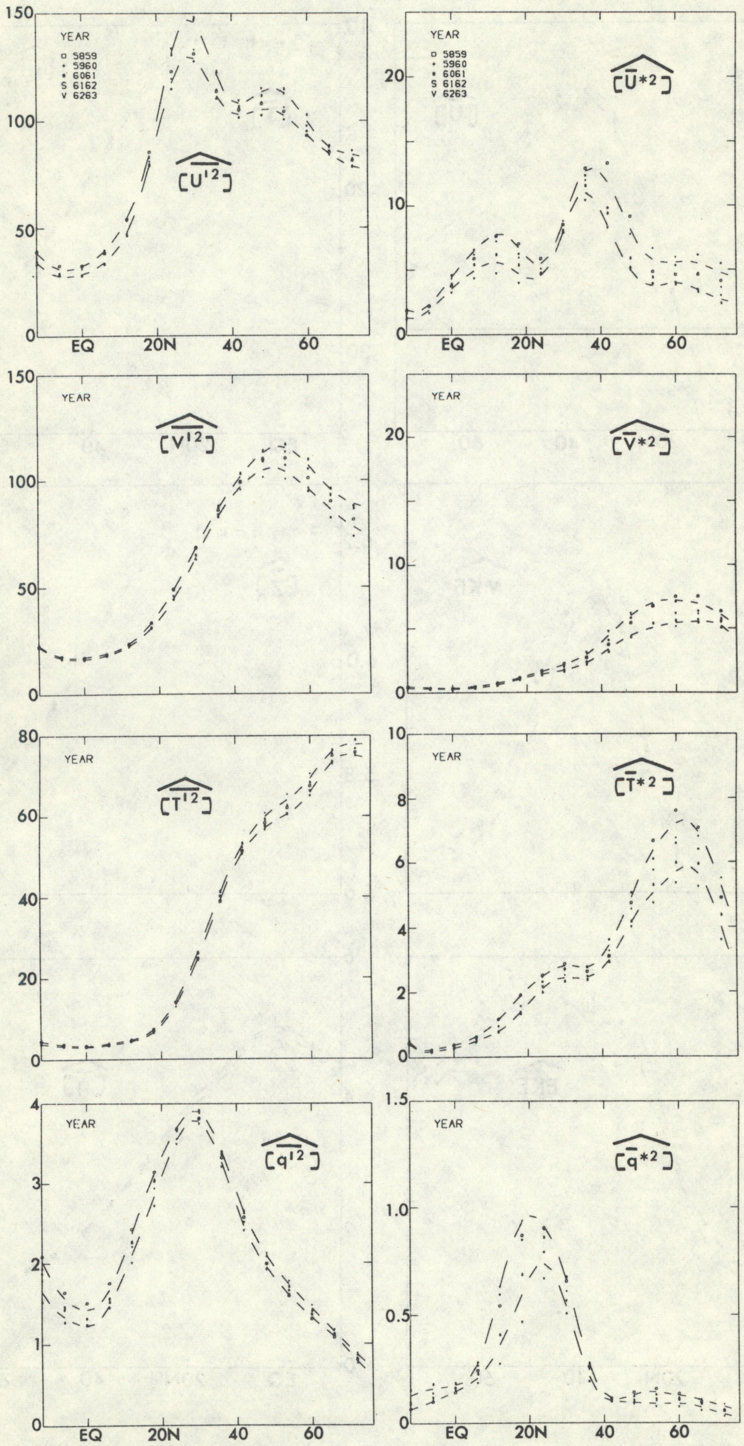

FIGURE 7.—Same as figure 6 but shows the transient and standing eddy variances of the zonal wind in units of $m^2 \cdot s^{-2}$, of meridional wind in $m^2 \cdot s^{-2}$, of the temperature in °C^2, and of the specific humidity in $g^2 \cdot kg^{-2}$.

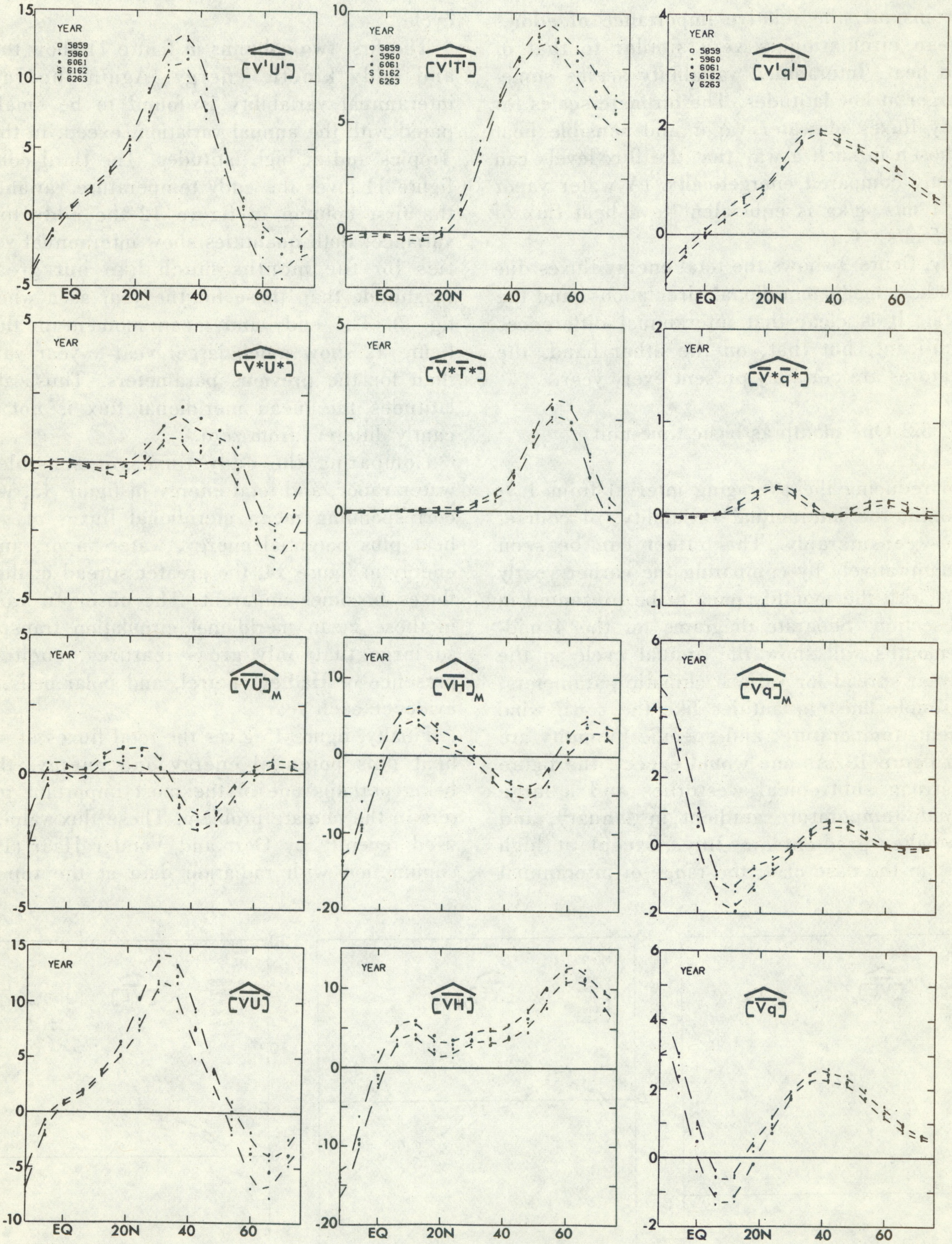

FIGURE 8.—Same as figure 6 but shows the momentum flux in units of $m^2 \cdot s^{-2}$, the sensible heat (or sensible heat plus potential energy, H) flux in m/s · °C, and the humidity flux in m/s · g/kg. Shown are the fluxes associated with transient eddies, standing eddies, mean meridional circulations, and the total.

variability for the eddies is largest at middle and high latitudes, while that for the mean circulation does not appear to vary with latitude. For the water vapor transport, the relative importance of eddies and mean circulation is very similar to that of sensible heat. Interannual variability seems somewhat larger at low latitudes. The ordinate scales for the eddy fluxes of water vapor and sensible heat were chosen in such a way that the flux levels can be directly compared energetically. (A water vapor flux of 1 m/s · g/kg is equivalent to a heat flux of about 2.5 m/s · °C.)

Finally, figure 9 shows the total energy fluxes due to all eddies, mean meridional circulations, and the sum total. It is clear that interannual differences are significant, but that, on the other hand, the main features are certainly present every year.

5.2 One month as basic time unit

When reducing the averaging interval from 1 yr to 1 month, the interannual variability, of course, increases considerably. This effect can be seen more quantitatively by comparing the earlier yearly diagrams with the monthly ones to be presented in this subsection. Separate diagrams for the 4 mid-season months will show the annual cycle in the year-to-year spread for various climatic parameters.

The simple linear quantities like the zonal wind component, temperature, and specific humidity are given in figure 10. As one would expect, the figure shows strong subtropical westerlies and a large north-south temperature gradient in January, and much weaker gradients in July. Except at high latitudes, in the case of u, the range of interannual variations is found to remain about the same throughout the year. This range is generally small compared with the amplitude of the normal annual cycle.

The first two columns in figure 11 show the mean and eddy kinetic energy. Again the range of interannual variability is found to be small compared with the annual variation, except in the inner Tropics and at high latitudes. The third column in figure 11 gives the eddy temperature variance, and the first column in figure 12 the eddy humidity variance. Both quantities show interannual variabilities for the months much like but greater in magnitude than those for the year as a whole (see fig. 7). The eddy and mean momentum fluxes in figure 12 show much larger year-to-year variations than for the previous parameters. Thus, at many latitudes the mean meridional flux is not significantly different from zero.

Comparing the eddy fluxes of sensible heat, water vapor, and total energy in figure 13, with the corresponding mean meridional fluxes of sensible heat plus potential energy, water vapor, and total energy in figure 14, the greater spread in the mean fluxes becomes apparent. The observed variability in these mean meridional circulation transports is so large that only gross features, such as the presence of Hadley, Ferrel, and polar cells, are in evidence each year.

Finally, figure 15 gives the total fluxes of sensible heat plus potential energy and energy, the last being perhaps one of the most important parameters in the climate problem. These flux values were used recently by Oort and Vonder Haar (1976) in conjunction with radiation data at the top of the

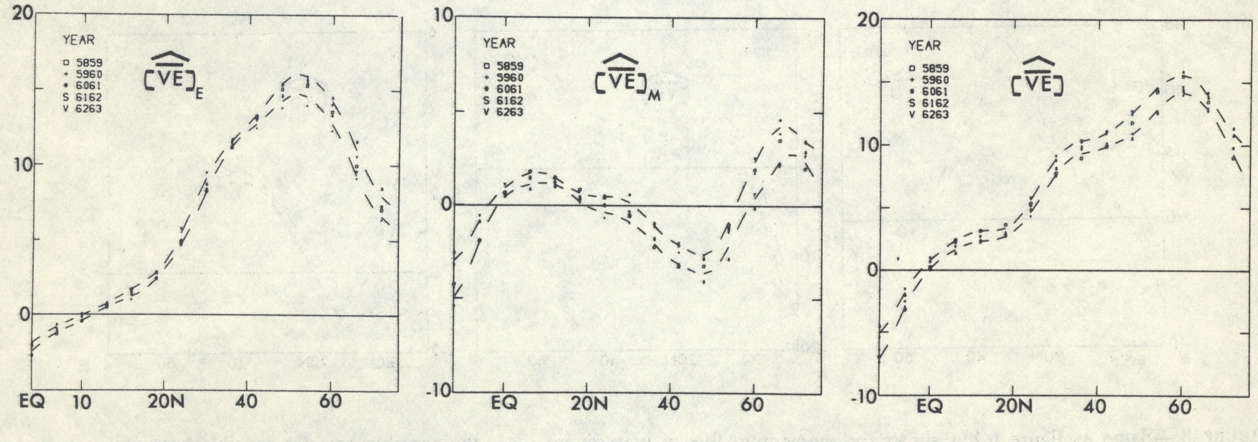

FIGURE 9.—Same as figure 6 but shows the eddy fluxes, the mean meridional circulation fluxes, and the total fluxes of energy in units of m/s · °C.

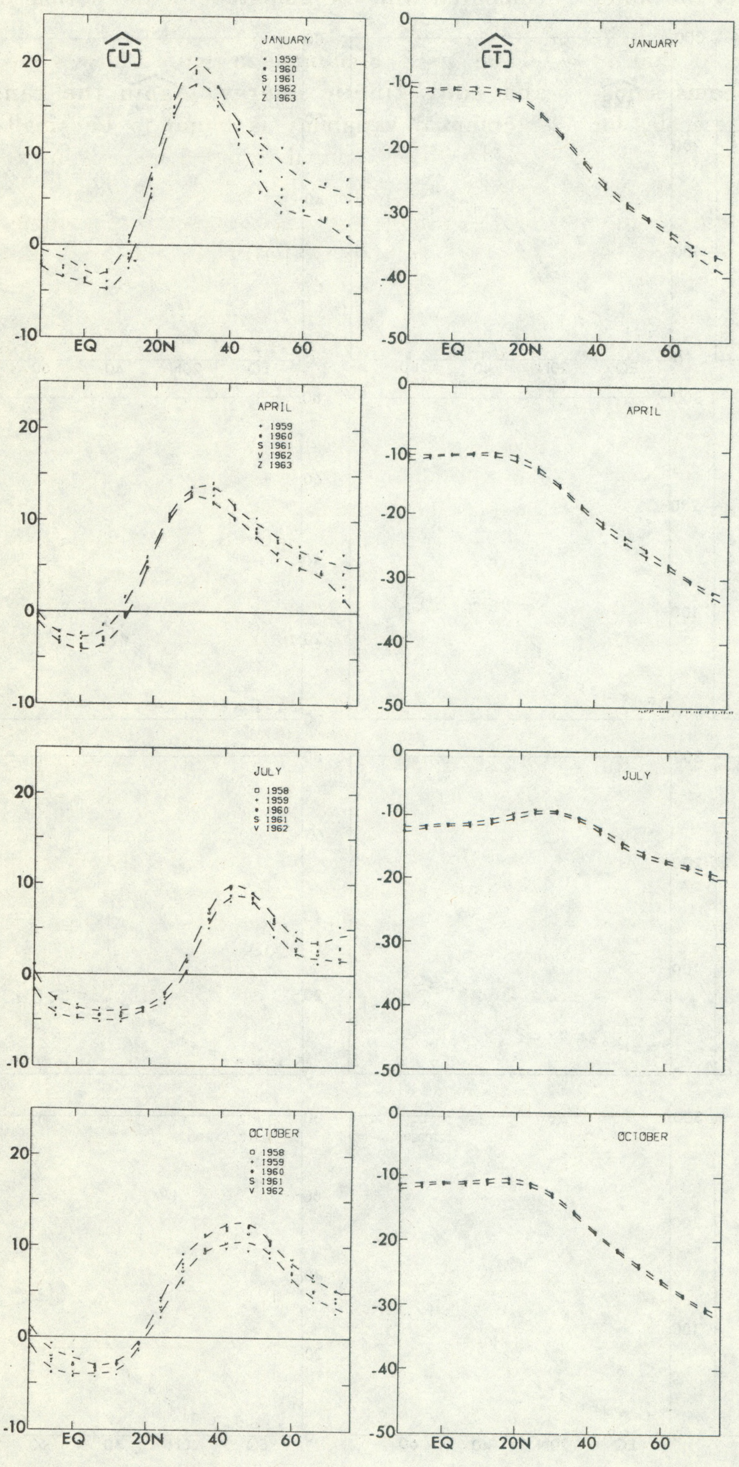

Figure 10.—Meridional profiles of the zonal and vertical mean values for the zonal wind in units of m/s, for the temperature in °C, and for the specific humidity in g/kg. Shown are data points for the 4 midseason months from May 1958 through April 1963. The two dashed curves indicate the 5-yr mean value plus and minus the interannual standard deviation.

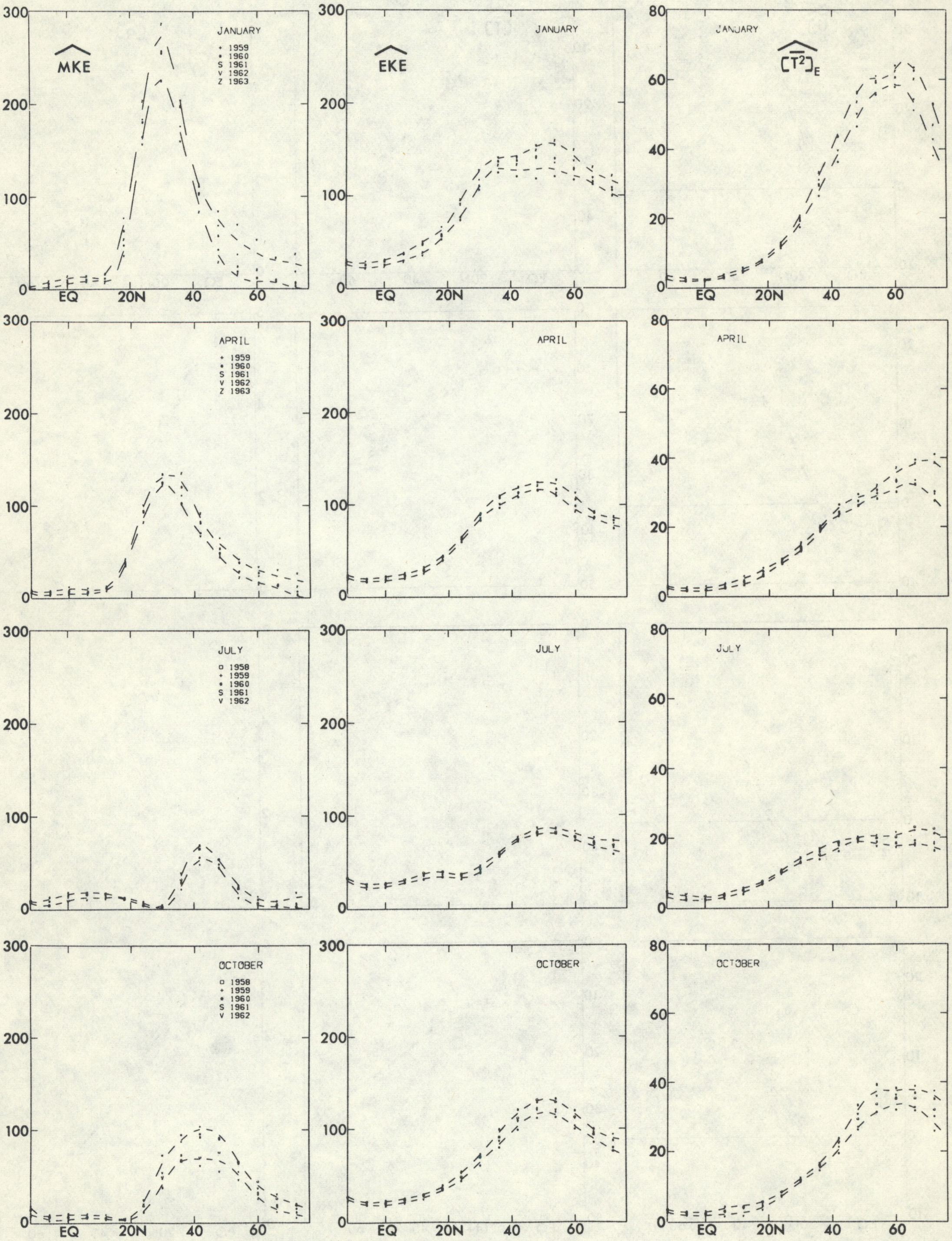

FIGURE 11.—Same as figure 10 but shows the mean and eddy kinetic energy in units of $m^2 \cdot s^{-2}$, and the eddy temperatu in $°C^2$.

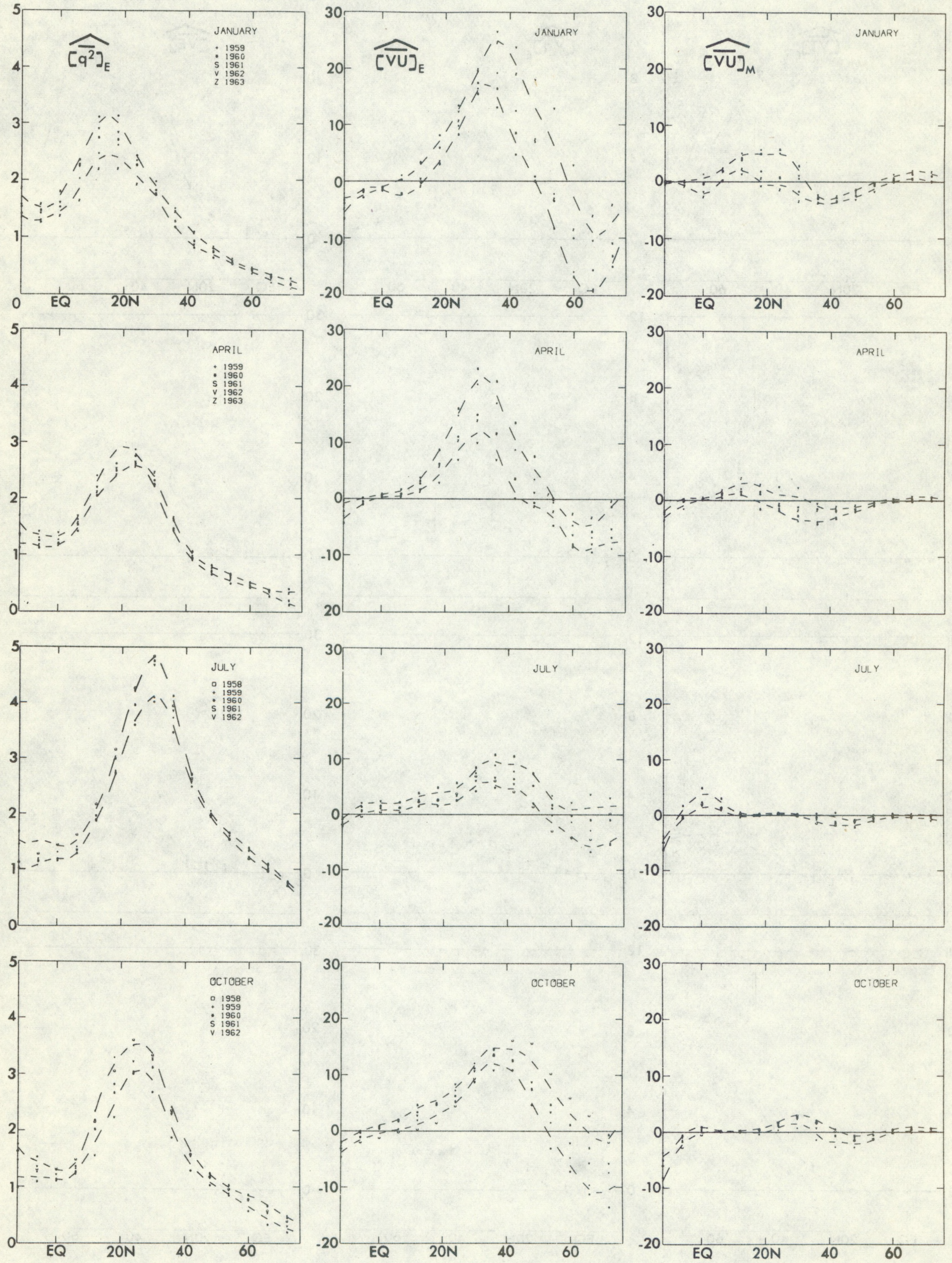

FIGURE 12.—Same as figure 10 but shows the eddy humidity variance in units of $g^2 \cdot kg^{-2}$, and the eddy and mean meridional circulation fluxes of momentum in $m^2 \cdot s^{-2}$.

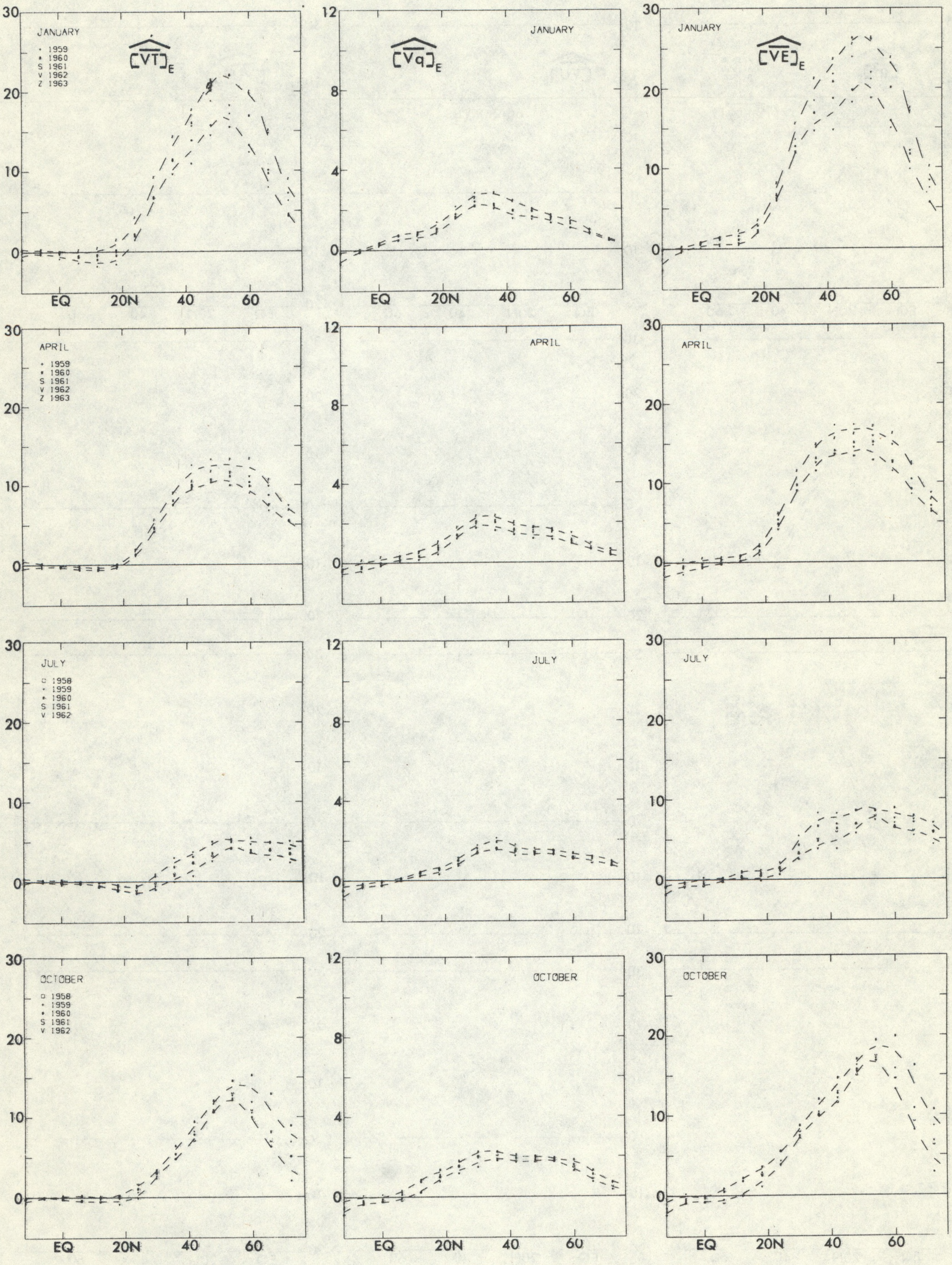

FIGURE 13.—Same as figure 10 but shows the eddy fluxes of sensible heat in units of m/s · °C, of water vapor in m/s g/kg, and of energy in m/s · °C.

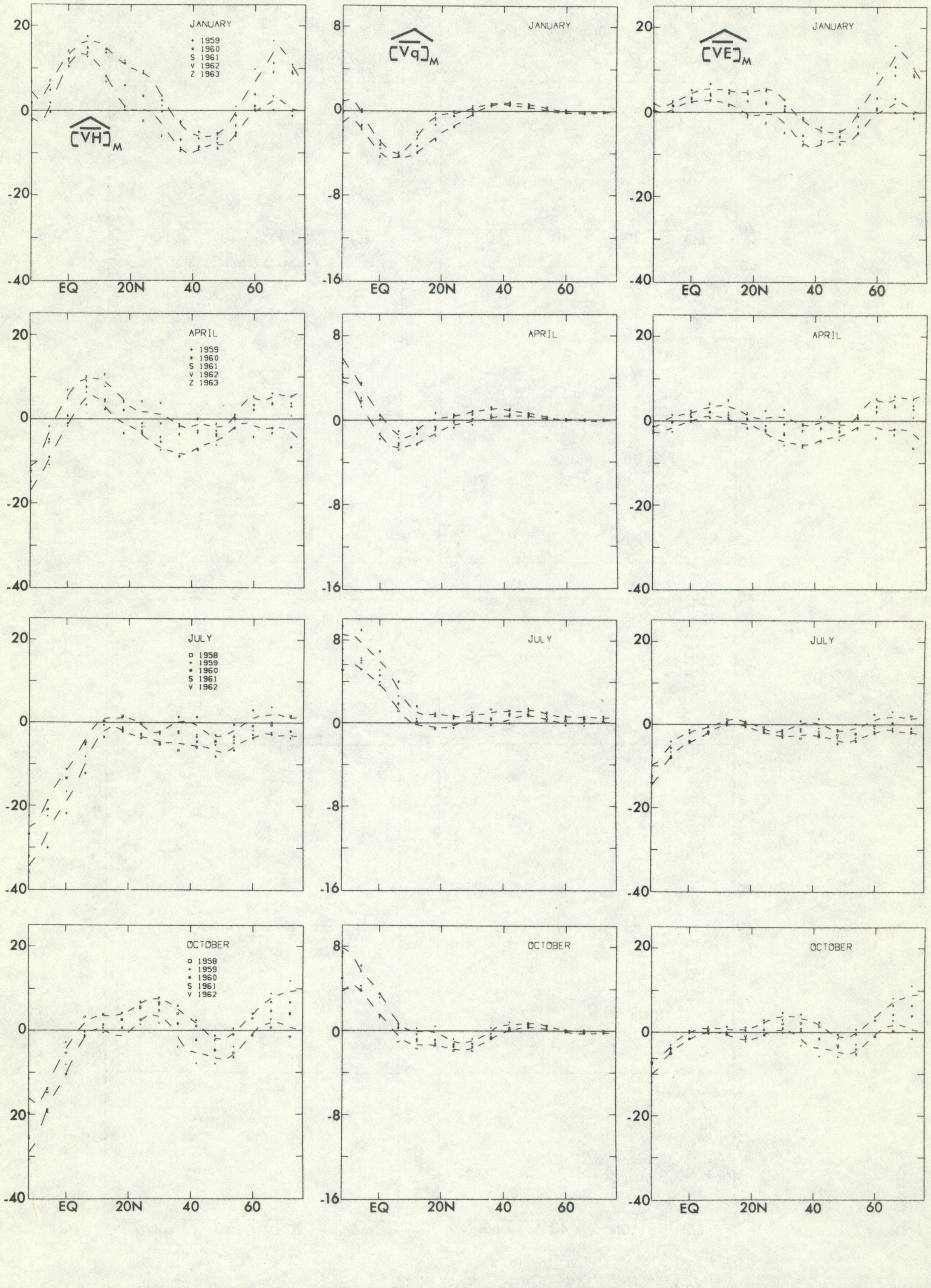

FIGURE 14.—Same as figure 10 but shows the mean meridional circulation fluxes of sensible heat plus potential energy in units of m/s · °C, of water vapor in m/s · g/kg, and of total energy in m/s · °C.

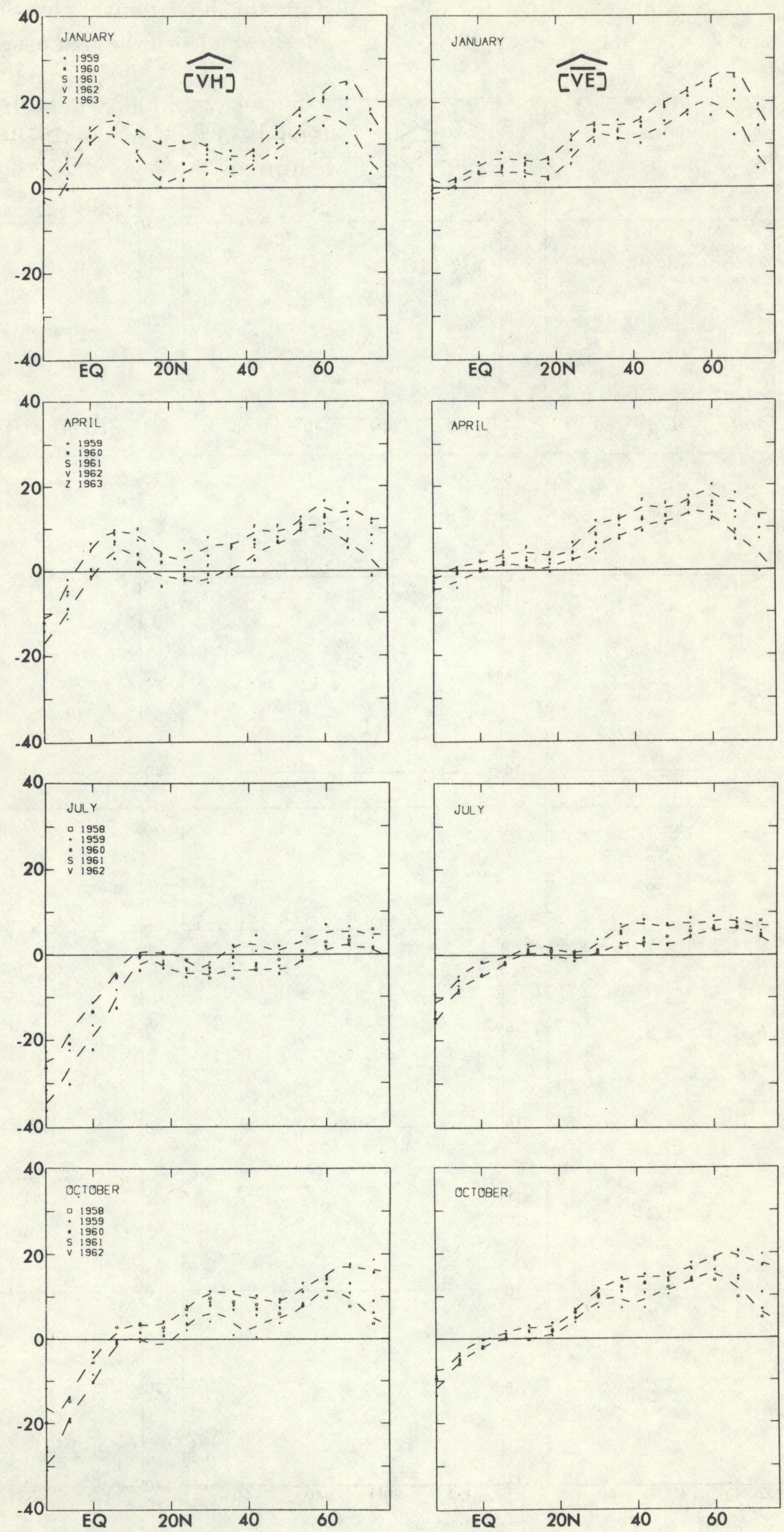

FIGURE 15.—Same as figure 10 but shows the total fluxes of sensible heat plus potential energy (H) and total energy (E), both of m/s · °C.

atmosphere and oceanic heat storage values to infer, as a residue, the energy flux by ocean currents.

5.3. Intercomparison of 1958–1963 and 1968–1973 periods

In the introduction the question was raised as to whether the 1958–1963 statistics described in the present paper are more generally valid. In other words, are the statistics representative for recent climatic conditions or not? This question was investigated through an analysis of the same parameters for a later 5-yr period, May 1968 through April 1973. The results for the month of January are given in a series of graphs. Thus figures 16 through 21 show a comparison between the two 5-yr periods for the same vertical and zonal mean parameters as were shown before in figures 10 through 15.

From a study of the figures, the close correspondence between the two 5-yr periods becomes evident for all parameters. This seems to be true for both the 5-yr mean values and the interannual standard deviations. There are only a few differences which will be discussed next.

(1) In figure 16 the zonal wind component shows a higher variability near its peak at 30°N in the 1968–1973 than in the 1958–1963 period. This same feature is also seen in the curves for the mean kinetic energy in figure 17. Both differences could very well be real.

(2) The humidity curves in figure 16 show slightly lower values in equatorial latitudes for the later period, while the humidity variances in figure 18 near 15°N are also significantly lower. Both effects may be real. However, they could also in part be due to a systematic bias toward too low humidity values in the U.S. humidity sensors during the later period (see, e.g., Teweles 1970).

(3) All energy flux terms containing the mean meridional cell contributions show substantial differences between the 1958–1963 and 1968–1973 periods south of the Equator. Almost certainly these differences are not real. They must be caused by

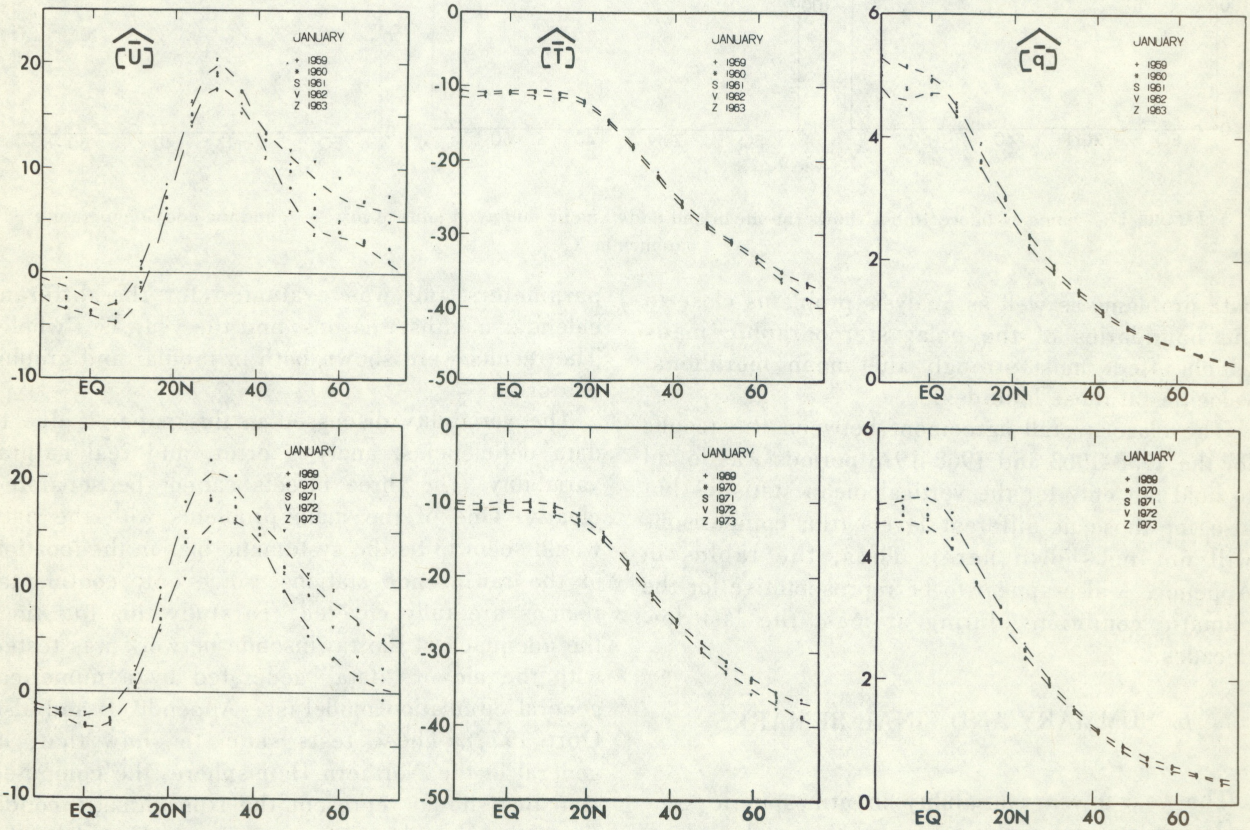

FIGURE 16.—Comparison of meridional profiles for January for the 5-yr periods 1959–1963 and 1969–1973. Shown are the zonal and vertical mean values for the zonal wind in units of m/s, for the temperature in °C, and for the specific humidity in g/kg. The dashed curves indicate the 5-yr mean values plus and minus the interannual standard deviation.

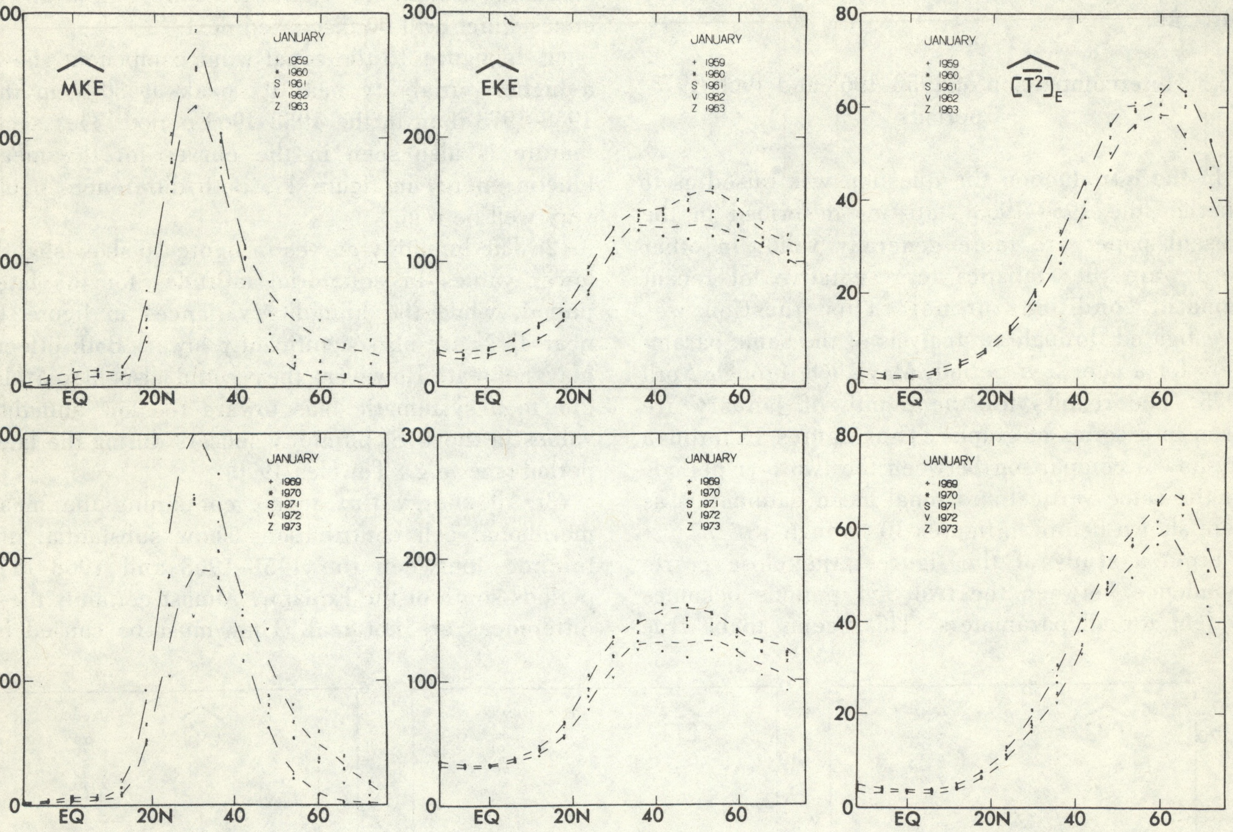

FIGURE 17.—Same as figure 16 but shows the mean and eddy kinetic energy in units of $m^2 \cdot s^{-2}$, and the eddy temperature variance in °C².

data problems as well as analysis problems close to the boundaries of the polar stereographic maps which affect most strongly the mean meridional velocities at those latitudes.

The close overall agreement between the results for the 1958–1963 and 1968–1973 periods was found to hold not only for the vertical mean statistics but also for those at different levels (the comparisons will not be shown here). Thus, the tables in Appendix A also appear to be representative for the climatic conditions during at least the last few decades.

6. SUMMARY AND FINAL REMARKS

The year-to-year variability in atmospheric general circulation statistics was investigated based on two extensive 5-yr sets of Northern Hemisphere rawinsonde data. The variability was expressed in standard deviations for the various zonal mean parameters and was evaluated for the different calendar months, seasons, and the year as a whole. The results were shown both in tabular and graphical form.

The variability discussed in this paper is due to data deficiencies, analysis error, and real natural variability. The three effects cannot be separated clearly. One of the main problems with the data would seem to be the systematic bias in the location of the rawinsonde stations, since only continental regions are fully covered. To study this question, the adequacy of the rawinsonde network was tested with the aid of "data" generated by a numerical general circulation model (see Appendix B and also Oort 1977). These tests seem to show that, in general in the Northern Hemisphere, the computed statistics should represent the true climatic conditions, and that they are not seriously biased by the station network.

Some of the results for the year-to-year variability of various zonal mean parameters (discussed exten-

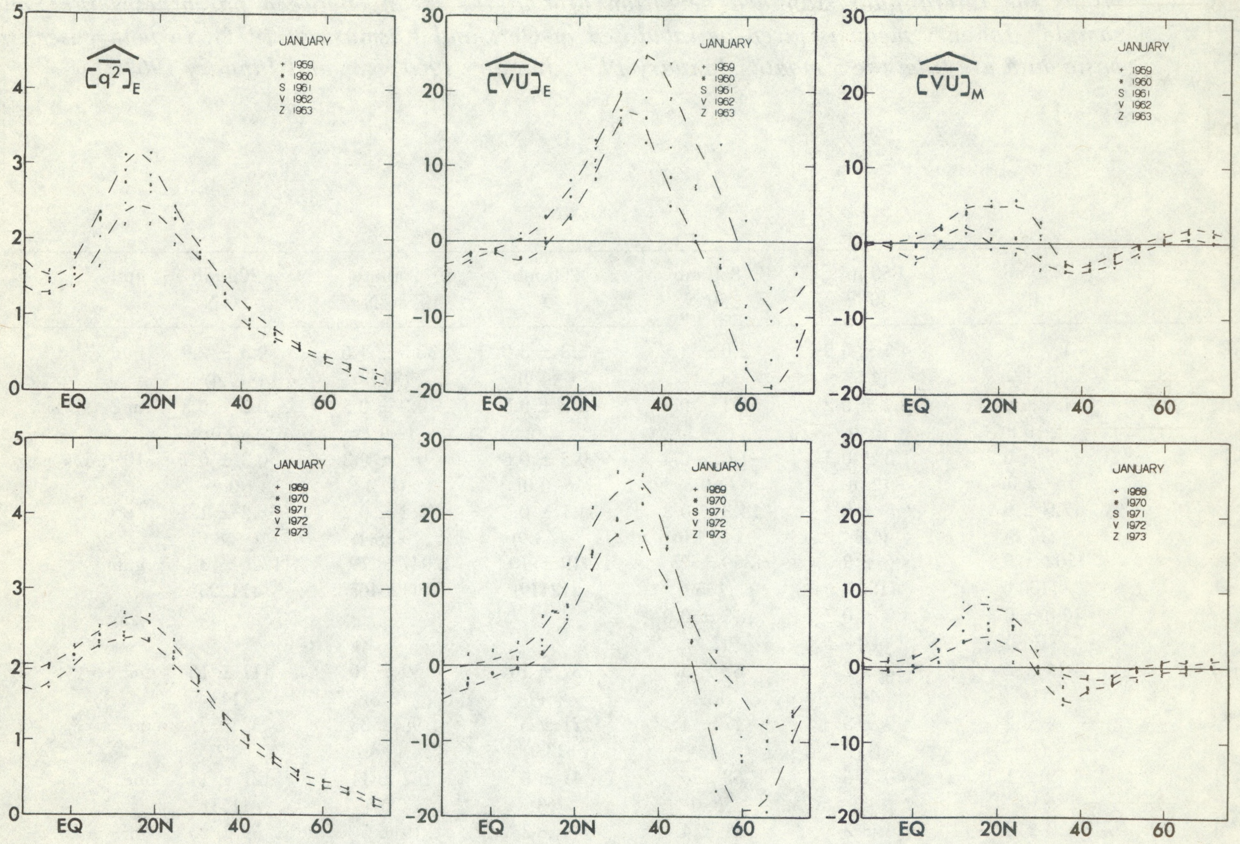

FIGURE 18.—Same as figure 16 but shows the eddy humidity variance in units of $g^2 \cdot kg^{-2}$, and the eddy and mean meridional circulation fluxes of momentum in $m^2 \cdot s^{-2}$.

sively in subsection 4.2) are summarized and compared with the actual zonal mean values in table 1. Better than through words, a study of this table will give the reader a proper perspective of the reliability and the relative magnitude of the computed range of variability compared with the long-term mean values for the different parameters. In table 1 only January data are shown for two levels in the vertical (850 and 200 mb) and at three latitudes (0°, 30°N, and 60°N). The actual entries for each parameter in the table are the mean values computed as the average of the five different .(and individually analyzed) January 1959, January 1960 . . . January 1963 samples plus or minus the year-to-year standard deviation around this mean (from the tables in Appendix A). Underneath between parentheses, one finds a different mean value taken from Oort and Rasmusson (1971) which was computed by lumping all data for the 5 January months together in one sample. The following comments may help in the proper interpretation of the results.

(1) In the case of the first six linear parameters, the two types of averages should be the same. However, in practice due to slight differences in the methods of analysis and in the data checking procedure the averages are different (this is particularly true for $[\bar{v}]$ and $[\bar{\omega}]$). Nevertheless, the estimate of the standard deviation should still be a fairly accurate measure of the year-to-year variability around the 5-yr mean value.

(2) In the case of the transient and standing eddy variances and covariances, the differences in the two types of averages are probably largely real and related to the inclusion of the year-to-year variation as a transient eddy in the first, but not in the second average (for further discussion see subsection 4.1).

A comparison between the 1958–1963 statistics mainly used here and preliminary statistics computed for the later 5-yr period, 1968–1973, in section 5 showed that the chosen measure of interannual variability is relatively stable and there-

TABLE 1.—*Time and zonal mean values of various parameters for the "five-sample" January mean, plus or minus the interannual standard deviation around the mean. Between parentheses the "one-sample" January mean is given as tabulated in Oort and Rasmusson (1971). In both cases, the basic data are from the 5 months January 1959, January 1960, . . . and January 1963.*

	850 mb 0°	850 mb 30°N	850 mb 60°N	200 mb 0°	200 mb 30°N	200 mb 60°N	units
$[\bar{u}]$	−1.9 ± 1.1	4.7 ± 0.9	2.0 ± 1.5	−5.3 ± 3.0	38.5 ± 1.6	9.3 ± 2.9	m/s
	(−1.9)	(4.5)	(2.1)	(−4.9)	(39.8)	(9.4)	
$[\bar{v}]$	−1.4 ± 0.2	0.2 ± 0.2	−0.1 ± 0.4	2.2 ± 0.3	0.3 ± 0.5	0.1 ± 0.3	m/s
	(−0.8)	(0.2)	(−0.3)	(2.6)	(−0.1)	(0.0)	
$[\bar{\omega}]$	−1.3 ± 0.2	1.3 ± 0.3	−1.0 ± 0.4	−0.7 ± 0.6	0.7 ± 0.3	0.3 ± 0.7	10^{-4}mb/s
	(−1.0)	(2.6)	(−0.5)	(−0.0)	(1.3)	(0.2)	
$[\bar{T}]$	17.6 ± 0.4	6.5 ± 0.3	−14.3 ± 0.3	−54.1 ± 0.4	−55.2 ± 0.2	−58.2 ± 1.8	°C
	(17.8)	(6.8)	(−14.0)	(−53.9)	(−55.1)	(−58.0)	
$[\bar{Z}]$	1502 ± 3	1506 ± 9	1350 ± 25	12419 ± 10	12047 ± 19	11226 ± 38	gpm
	(1503)	(1507)	(1350)	(12419)	(12046)	(11223)	
$[\bar{q}]$	10.8 ± 0.3	4.0 ± 0.2	1.3 ± 0.0				g/kg
	(10.7)	(4.1)	(1.3)				
$[\overline{u'^2}]$	14 ± 2	38 ± 2	52 ± 3	57 ± 10	159 ± 10	111 ± 16	$m^2 \cdot s^{-2}$
	(16)	(44)	(59)	(89)	(213)	(144)	
$[\bar{u}^{*2}]$	4 ± 2	9 ± 5	17 ± 4	21 ± 5	96 ± 33	32 ± 7	$m^2 \cdot s^{-2}$
	(10)	(7)	(13)	(33)	(99)	(23)	
$[\overline{v'^2}]$	8 ± 1	40 ± 5	58 ± 6	41 ± 5	162 ± 11	121 ± 14	$m^2 \cdot s^{-2}$
	(10)	(43)	(64)	(63)	(207)	(151)	
$[\bar{v}^{*2}]$	0 ± 0	4 ± 2	11 ± 4	4 ± 3	19 ± 5	59 ± 20	$m^2 \cdot s^{-2}$
	(1)	(3)	(6)	(5)	(24)	(44)	
$[\bar{\omega}^{*2}]$	5.5 ± 1.1	5.9 ± 1.9	5.7 ± 2.4	4.7 ± 0.7	15.1 ± 5.2	7.5 ± 0.7	$10^{-8}mb^2 \cdot s^{-2}$
	(11.8)	(5.8)	(2.0)	(6.6)	(14.1)	(4.7)	
$[\overline{T'^2}]$	0.8 ± 0.3	13.7 ± 2.1	36.6 ± 4.8	2.6 ± 0.5	13.7 ± 1.3	28.5 ± 3.5	°C^2
	(1.2)	(16.8)	(44.4)	(2.8)	(16.1)	(37.2)	
$[\bar{T}^{*2}]$	0.4 ± 0.1	11.0 ± 2.6	52.8 ± 4.7	0.6 ± 0.1	8.0 ± 2.4	12.4 ± 3.0	°C^2
	(0.3)	(9.8)	(44.3)	(0.8)	(7.3)	(7.8)	
$[\bar{Z}^{*2}]$	0.4 ± 0.3	8.8 ± 4.2	34.8 ± 12.4	3.2 ± 1.0	41.9 ± 10.6	278.4 ± 65.1	10^2gpm^2
	(0.3)	(6.2)	(18.8)	(2.9)	(31.4)	(206.5)	
$[\overline{q'^2}]$	3.6 ± 0.4	3.6 ± 0.3	0.6 ± 0.1				$g^2 \cdot kg^{-2}$
	(3.7)	(4.0)	(0.7)				
$[\bar{q}^{*2}]$	0.4 ± 0.2	1.4 ± 0.3	0.4 ± 0.1				$g^2 \cdot kg^{-2}$
	(0.3)	(1.4)	(0.3)				
$[\overline{v'u'}]$	0.8 ± 0.8	1.0 ± 1.1	0.1 ± 1.8	−10.0 ± 2.2	33.2 ± 8.5	4.3 ± 8.6	$m^2 \cdot s^{-2}$
	(0.2)	(1.5)	(1.8)	(−4.4)	(35.8)	(5.0)	
$[\bar{v}^*\bar{u}^*]$	−1.0 ± 0.3	0.1 ± 1.6	−1.1 ± 3.3	−2.5 ± 2.9	23.2 ± 8.0	−19.5 ± 7.4	$m^2 \cdot s^{-2}$
	(−0.4)	(−0.1)	(−1.5)	(−1.9)	(19.4)	(−19.2)	
$[\overline{v'T'}]$	−0.1 ± 0.3	9.4 ± 1.4	11.0 ± 2.4	0.1 ± 0.6	1.6 ± 2.7	5.2 ± 1.9	m/s · °C
	(−1.2)	(8.7)	(12.7)	(0.5)	(2.3)	(6.4)	
$[\bar{v}^*\bar{T}^*]$	0.1 ± 0.1	3.8 ± 1.8	13.2 ± 3.6	0.0 ± 0.2	4.1 ± 2.3	10.7 ± 3.1	m/s · °C
	(−0.0)	(3.6)	(10.1)	(0.0)	(2.2)	(9.8)	
$[\overline{v'q'}]$	0.6 ± 0.3	4.1 ± 0.7	1.7 ± 0.3				m/s · g/kg
	(0.6)	(4.5)	(2.0)				
$[\bar{v}^*\bar{q}^*]$	0.1 ± 0.1	1.5 ± 0.5	1.3 ± 0.4				m/s · g/kg
	(0.1)	(1.2)	(0.8)				

fore represents well the recent climatic conditions in the atmosphere. The present variability statistics complement an earlier compilation of mean statistics for the 1958–1963 period (Oort and Rasmusson 1971). Together the two publications should give a fairly complete and definitive picture of the recent climate of the Northern Hemispheric atmosphere below 50 mb.

As a next step in this type of research, the climate in the Southern Hemisphere should probably receive major emphasis. Excellent preliminary studies have been made by, among others, Newell et al. (1972, 1974), Peixóto (1973) and van Loon et al. (1972). Unfortunately, the spatial data gaps in the Southern Hemisphere rawinsonde network are very large, and many computed statistics, such as for instance the mean meridional circulation and standing eddy transports, will generally not represent the true climatic conditions (Oort 1977). Therefore, additional information, presumably from satellites or aircraft dropsondes, should be merged with the conventional rawinsonde data before one can arrive at a satisfactory description of the global climate.

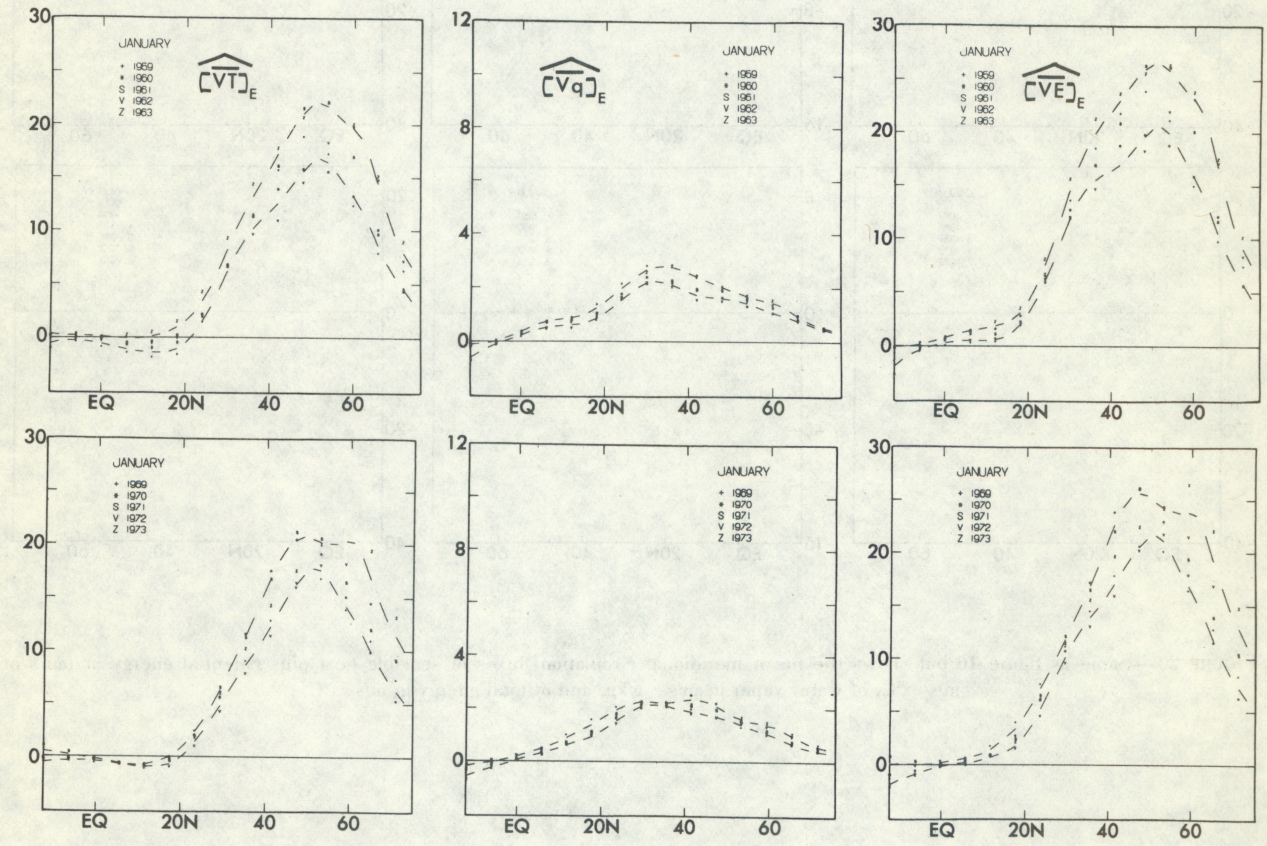

FIGURE 19.—Same as figure 16 but shows the eddy fluxes of sensible heat in units of m/s · °C, of water vapor in m/s · g/kg, and of energy in m/s · °C.

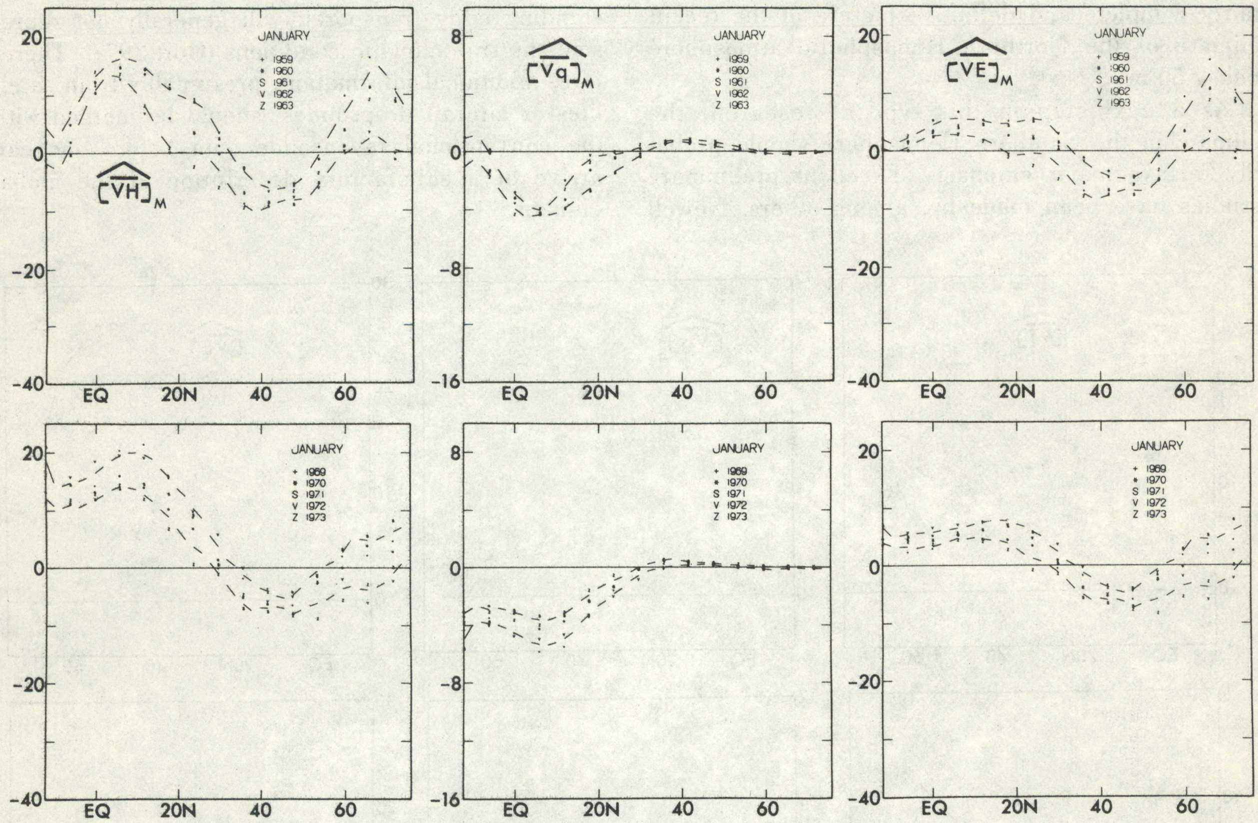

FIGURE 20.—Same as figure 16 but shows the mean meridional circulation fluxes of sensible heat plus potential energy in units of m/s · °C, of water vapor in m/s · g/kg, and of total energy in m/s · °C.

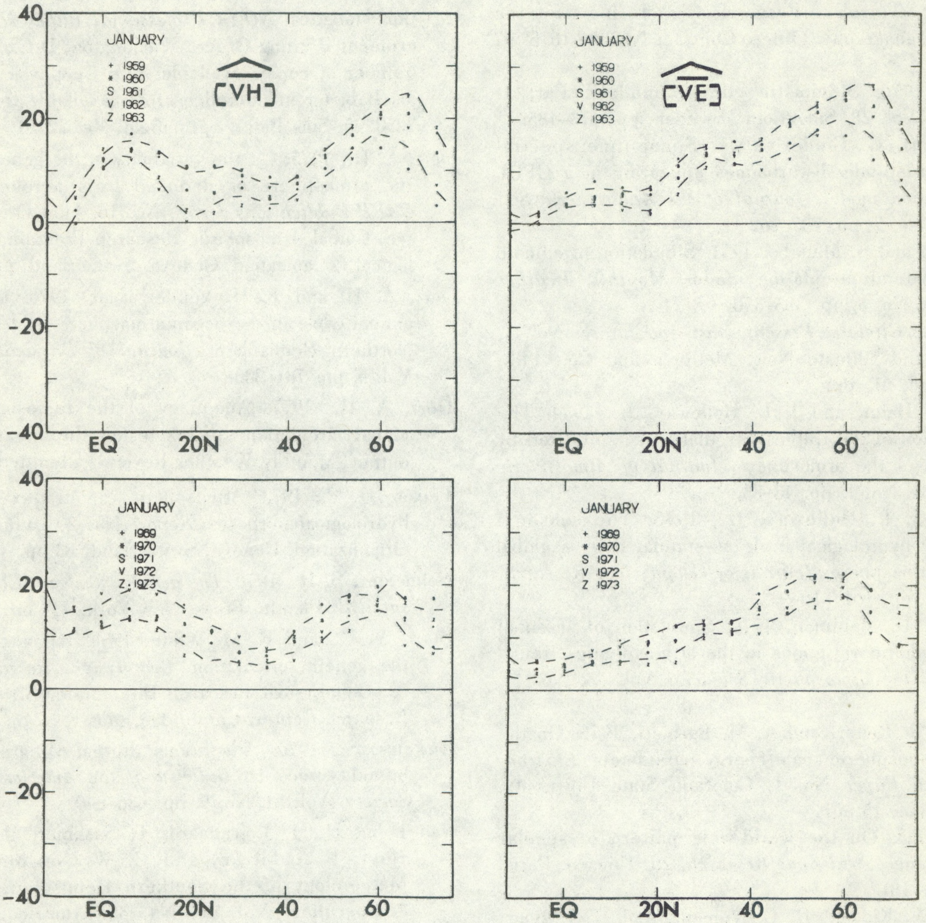

FIGURE 21.—Same as figure 16 but shows the total fluxes of sensible heat plus potential energy and total energy, both in units of m/s · °C.

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Appendix A

Tables of Interannual Standard Deviations of Zonal Mean Statistics

Interannual standard deviations for the various general circulation parameters are presented in tabular form. The results are shown for a typical month irrespective of the season ("60 MONTHS"), for a typical January month ("JANUARY"), a typical July month ("JULY"), and for a typical year as a whole ("YEAR"). These four different cases are defined by relations (1) through (4) given in subsection 4.2. The bottom line in each table, labeled "MEAN", represents the pressure-weighted mean of the σ-values at the 11 levels. For a discussion of the results one is again referred to the earlier subsection 4.2.

The tables in this appendix are grouped in four sections. Section A contains the standard deviations of the mean values, section B the standard deviations of the variances, section C the standard deviations of the meridional transports, and section D the standard deviations of the vertical transports. A listing of the tables follows.

Section A. Mean Values

Section B. Variances

Section C. Meridional Transports

TABLE C1a.—Interannual standard deviation of the northward transport of westerly momentum by transient eddies $\sigma([\overline{v'u'}])$.

TABLE C1b.—Interannual standard deviation of the northward transport of westerly momentum by stationary eddies $\sigma([\bar{v}^*\bar{u}^*])$.

TABLE C1c.—Interannual standard deviation of the northward transport of westerly momentum by mean meridional circulation $\sigma([\bar{v}]''[\bar{u}])$.

TABLE C2a.—Interannual standard deviation of the northward transport of sensible heat (c_pT) by transient eddies $\sigma([\overline{v'T'}])$.

TABLE C2b.—Interannual standard deviation of the northward transport of sensible heat by stationary eddies $\sigma([\bar{v}^*\bar{T}^*])$.

TABLE C2c.—Interannual standard deviation of the northward transport of sensible heat by mean meridional circulation $\sigma([\bar{v}]''[\bar{T}]'')$.

TABLE C3a.—Interannual standard deviation of the northward transport of potential energy by stationary eddies $\sigma([\bar{v}^*\bar{Z}^*])$.

TABLE C3b.—Interannual standard deviation of the northward transport of potential energy by mean meridional circulation $\sigma([\bar{v}]''[\bar{Z}]'')$.

TABLE C4a.—Interannual standard deviation of the northward transport of water vapor by transient eddies $\sigma([\overline{v'q'}])$.

TABLE C4b.—Interannual standard deviation of the northward transport of water vapor by stationary eddies $\sigma([\bar{v}^*\bar{q}^*])$.

TABLE C4c.—Interannual standard deviation of the northward transport of water vapor by mean meridional circulation $\sigma([\bar{v}]''[\bar{q}])$.

Section D. Vertical Transports

TABLE D1a.—Interannual standard deviation of the vertical transport of westerly momentum by stationary eddies $\sigma([\bar{\omega}^*\bar{u}^*])$.

TABLE D1b.—Interannual standard deviation of the vertical transport of westerly momentum by mean meridional circulation $\sigma([\bar{\omega}]'''[\bar{u}])$.

TABLE D2.—Interannual standard deviation of the vertical transport of southerly momentum by stationary eddies $\sigma([\bar{\omega}^*\bar{v}^*])$.

TABLE D3a.—Interannual standard deviation of the vertical transport of sensible heat (c_pT) by stationary eddies $\sigma([\bar{\omega}^*\bar{T}^*])$.

TABLE D3b.—Interannual standard deviation of the vertical transport of sensible heat by mean meridional circulation $\sigma([\bar{\omega}]''' [\bar{T}]''')$.

TABLE D4a.—Interannual standard deviation of the vertical transport of potential energy (gZ) by stationary eddies $\sigma([\bar{\omega}^*\bar{Z}^*])$.

TABLE D4b.—Interannual standard deviation of the vertical transport of potential energy by mean meridional circulation $\sigma([\bar{\omega}]''' [\bar{Z}]''')$.

TABLE D5a.—Interannual standard deviation of the vertical transport of water vapor by stationary eddies $\sigma([\bar{\omega}^*\bar{q}^*])$.

TABLE D5b.—Interannual standard deviation of the vertical transport of water vapor by mean meridional circulation $\sigma([\bar{\omega}]''' [\bar{q}])$.

TABLE A1.—*Interannual standard deviation of the zonal wind component $\sigma([\bar{u}])$, m/s*

$\sigma([\bar{u}])$								60 MONTHS										
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	11.2	10.9	10.2	8.4	5.9	3.7	2.1	1.4	1.3	1.2	1.1	1.2	1.8	2.5	3.4	3.6	3.6	3.3
100	1.6	1.9	2.0	1.7	1.4	1.1	1.0	1.1	1.2	1.1	1.0	1.0	1.4	1.8	2.2	2.5	2.6	2.6
200	1.6	2.1	2.3	2.0	1.8	1.6	1.5	1.6	1.6	1.4	1.4	1.3	1.5	1.6	1.7	1.7	1.8	2.2
300	1.3	1.5	1.6	1.4	1.4	1.2	1.1	1.3	1.3	1.2	1.3	1.3	1.6	1.7	1.7	1.6	1.7	2.3
400	1.1	1.2	1.2	1.0	1.0	0.9	0.9	0.9	1.0	1.0	1.1	1.2	1.5	1.6	1.6	1.5	1.7	2.3
500	1.0	1.0	0.9	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1.1	1.3	1.4	1.5	1.4	1.5	2.0
700	0.7	0.8	1.0	0.7	0.6	0.6	0.5	0.6	0.7	0.8	0.7	0.8	1.1	1.2	1.2	1.1	1.2	1.6
850	0.8	0.7	1.0	0.7	0.5	0.5	0.5	0.5	0.7	0.6	0.6	0.7	1.0	1.1	1.0	1.0	1.1	1.4
900	0.6	0.6	0.8	0.6	0.4	0.5	0.4	0.5	0.6	0.6	0.5	0.7	1.0	1.1	1.0	0.9	1.0	1.2
950	0.4	0.5	0.7	0.4	0.3	0.4	0.4	0.5	0.6	0.6	0.5	0.7	1.0	1.0	1.0	0.9	0.9	1.0
1000	0.4	0.5	0.7	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.4	0.6	0.8	0.9	0.9	0.7	0.7	0.8
MEAN	1.0	1.1	1.3	1.0	0.9	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.2	1.4	1.4	1.4	1.5	1.8
								JANUARY										
50	11.7	11.4	11.1	9.4	6.7	4.1	2.6	2.3	2.1	1.6	1.0	2.0	3.9	5.4	6.8	6.7	5.8	4.1
100	0.9	0.9	0.6	0.4	0.8	1.2	1.0	1.3	2.0	2.0	1.0	1.5	3.1	4.3	4.9	4.8	4.4	3.9
200	1.0	2.4	3.0	2.8	3.0	3.3	2.9	2.0	1.6	1.4	1.0	1.8	2.7	3.0	2.9	2.8	2.9	3.2
300	1.8	2.9	3.1	2.8	2.9	2.7	1.7	1.7	2.2	1.6	0.6	1.5	2.6	2.5	1.9	1.9	2.8	3.6
400	1.7	2.2	2.2	2.0	1.9	1.6	1.0	1.0	1.2	1.2	1.1	2.0	2.9	2.7	1.9	1.8	2.7	3.3
500	1.7	1.6	1.1	1.1	1.4	1.3	1.1	1.0	1.4	1.3	0.9	1.7	2.5	2.4	1.7	1.7	2.5	2.9
700	0.8	0.7	1.1	0.7	0.8	0.7	0.6	0.6	1.0	0.9	0.4	1.4	2.3	2.1	1.5	1.5	1.9	2.1
850	0.8	0.8	1.1	0.6	0.4	0.4	0.4	0.6	0.9	0.6	0.3	1.3	2.0	1.9	1.5	1.4	1.6	1.6
900	0.6	0.7	0.8	0.4	0.3	0.4	0.4	0.5	0.8	0.6	0.5	1.3	1.9	1.9	1.5	1.3	1.5	1.4
950	0.6	0.7	0.8	0.4	0.3	0.4	0.4	0.5	0.7	0.5	0.5	1.3	1.8	1.8	1.5	1.2	1.2	1.3
1000	0.7	0.8	0.9	0.4	0.2	0.2	0.3	0.5	0.6	0.5	0.6	1.1	1.5	1.5	1.2	0.9	0.9	0.9
MEAN	1.2	1.4	1.5	1.3	1.4	1.4	1.1	1.0	1.3	1.1	0.7	1.5	2.4	2.4	2.0	1.9	2.3	2.6
								JULY										
50	6.6	6.4	6.1	5.2	3.8	2.6	1.7	0.9	0.4	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4
100	1.8	2.0	2.0	1.8	1.3	0.6	0.6	0.9	0.9	0.9	0.8	0.7	0.5	0.5	0.5	0.6	0.9	1.2
200	1.6	1.8	1.8	1.5	1.4	0.7	0.7	0.9	1.5	1.6	1.2	0.9	0.7	1.1	1.1	1.1	1.7	1.8
300	1.7	1.4	1.0	0.9	0.9	0.3	0.5	0.7	0.8	0.9	1.2	0.9	0.6	1.3	1.3	1.5	2.3	2.6
400	1.4	1.1	0.9	0.6	0.6	0.4	0.5	0.6	0.8	0.8	1.0	0.8	0.8	1.2	1.2	1.1	1.7	2.2
500	0.9	0.7	0.7	0.6	0.7	0.6	0.4	0.6	0.7	0.7	0.9	0.7	0.7	1.1	1.1	1.0	1.4	1.7
700	0.8	0.6	0.9	0.5	0.6	0.8	0.4	0.4	0.5	0.6	0.6	0.4	0.5	0.8	0.9	0.8	0.9	1.2
850	0.6	0.5	0.5	0.4	0.6	0.5	0.2	0.4	0.4	0.5	0.6	0.4	0.5	0.7	0.7	0.6	0.7	1.0
900	0.5	0.4	0.4	0.3	0.5	0.4	0.2	0.3	0.4	0.5	0.5	0.3	0.4	0.6	0.6	0.5	0.6	0.8
950	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.4	0.4	0.3	0.3	0.5	0.6	0.5	0.4	0.5	0.6
1000	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.4	0.4	0.3	0.4	0.5	0.5	0.4	0.2	0.3	0.5
MEAN	1.0	0.9	0.9	0.7	0.7	0.5	0.4	0.6	0.7	0.8	0.8	0.6	0.6	0.9	0.9	0.9	1.2	1.5
								YEAR										
50	7.7	7.6	7.3	6.2	4.4	2.7	1.3	0.6	0.6	0.6	0.5	0.4	0.6	1.0	1.4	1.5	1.5	1.3
100	1.0	0.9	0.8	0.5	0.3	0.3	0.5	0.6	0.7	0.6	0.5	0.4	0.6	0.9	1.1	1.2	1.1	1.0
200	1.0	1.3	1.4	0.9	0.7	0.7	0.7	0.6	0.6	0.5	0.4	0.5	0.6	0.7	0.8	0.9	0.9	0.9
300	0.6	0.8	0.8	0.6	0.5	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.5	0.7	0.7	0.7	0.8	1.0
400	0.5	0.5	0.5	0.3	0.3	0.2	0.2	0.3	0.4	0.3	0.3	0.5	0.6	0.6	0.6	0.6	0.8	0.9
500	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.4	0.5	0.5	0.5	0.6	0.7	0.8
700	0.3	0.5	0.8	0.5	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.4	0.4	0.5	0.6	0.5
850	0.4	0.4	0.7	0.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.3	0.3	0.4	0.5	0.4
900	0.3	0.4	0.6	0.3	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.4	0.3	0.3	0.4	0.4	0.4
950	0.2	0.3	0.4	0.2	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.3	0.4	0.3	0.3	0.3	0.3	0.3
1000	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.3	0.3	0.3	0.3	0.2	0.1	0.1
MEAN	0.5	0.6	0.7	0.5	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.5	0.5	0.5	0.6	0.7	0.7

TABLE A2.—*Interannual standard deviation of the meridional wind component $\sigma([\bar{v}])$, m/s*

σ ([v̄])								60 MONTHS										
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.9	0.8	0.7	0.5	0.3	0.3	0.2	0.3	0.3	0.4	0.5	0.5	0.5	0.6	0.8	0.9	0.9	0.9
100	0.6	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.4	0.3	0.4
200	0.7	0.7	0.6	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.5
300	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.3	0.4	0.4	0.5	0.7
400	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.6
500	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.5
700	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
850	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
900	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.4
950	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
1000	0.5	0.5	0.5	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5
MEAN	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.5
JANUARY																		
50	1.6	1.3	1.0	0.7	0.4	0.3	0.4	0.4	0.4	0.4	0.6	0.7	0.6	0.4	0.8	1.0	1.2	0.8
100	0.6	0.3	0.3	0.5	0.5	0.6	0.8	0.7	0.5	0.5	0.3	0.1	0.1	0.1	0.1	0.3	0.4	0.2
200	0.4	0.4	0.3	0.6	0.6	0.6	0.7	0.6	0.5	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.4	0.3
300	0.5	0.4	0.1	0.1	0.5	0.6	0.8	0.7	0.4	0.3	0.4	0.5	0.4	0.5	0.6	0.4	0.3	0.3
400	0.3	0.3	0.3	0.3	0.3	0.5	0.6	0.5	0.3	0.4	0.6	0.7	0.5	0.5	0.5	0.5	0.3	0.4
500	0.2	0.4	0.4	0.4	0.3	0.4	0.5	0.4	0.2	0.3	0.3	0.5	0.4	0.4	0.6	0.4	0.1	0.4
700	0.3	0.2	0.2	0.3	0.2	0.1	0.3	0.2	0.2	0.4	0.4	0.3	0.2	0.3	0.4	0.4	0.1	0.3
850	0.4	0.2	0.2	0.1	0.3	0.3	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.1
900	0.3	0.3	0.4	0.1	0.2	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.4	0.5	0.4	0.4
950	0.3	0.4	0.6	0.3	0.1	0.2	0.1	0.1	0.2	0.3	0.2	0.3	0.3	0.3	0.4	0.6	0.6	0.5
1000	0.6	0.8	0.9	0.5	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.5	0.6	0.7	0.7
MEAN	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3
JULY																		
50	0.4	0.4	0.4	0.3	0.2	0.1	0.2	0.3	0.3	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.2
100	0.5	0.3	0.3	0.2	0.2	0.3	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1
200	0.9	0.5	0.4	0.4	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.4
300	0.6	0.5	0.6	0.5	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.2	0.4	0.8
400	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.5
500	0.4	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.1	0.3	0.4	0.5
700	0.6	0.6	0.4	0.2	0.1	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.3
850	0.6	0.6	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2
900	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.3	0.2	0.3	0.4	0.3	0.2	0.1	0.1	0.2	0.2	0.2
950	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.1	0.3	0.4	0.4	0.2	0.2	0.3	0.3	0.3	0.3
1000	0.6	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.4	0.4
MEAN	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.4
YEAR																		
50	0.4	0.3	0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.4	0.4	0.3
100	0.3	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1
200	0.3	0.4	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
300	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2
400	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
700	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1
850	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
900	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
950	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1000	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2
MEAN	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

TABLE A3.—*Interannual standard deviation of the vertical velocity $\sigma([\bar{\omega}])$, 10^{-4} mb/s*

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
$\sigma([\bar{\omega}])$ 60 MONTHS																		
50	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3
100	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.5	0.6
200	0.6	0.4	0.6	0.5	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.5	0.7	0.8
300	1.1	0.7	0.8	0.7	0.5	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.4	0.6	0.9	0.9
400	1.3	0.9	0.9	0.7	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.7	0.9	1.0
500	1.3	1.0	0.9	0.7	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.8	0.9
700	1.0	0.9	0.8	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.7
850	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.5
900	0.4	0.4	0.3	0.4	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.4
950	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
1000	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
MEAN	0.8	0.6	0.6	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.7
JANUARY																		
50	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.3	0.4
100	0.3	0.4	0.6	0.4	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.3	0.4	0.4	0.6	0.6	0.8
200	0.7	0.4	0.6	0.7	0.3	0.3	0.4	0.2	0.3	0.2	0.1	0.2	0.4	0.6	0.7	1.0	1.0	0.8
300	1.2	0.4	0.6	1.1	0.6	0.5	0.7	0.4	0.5	0.3	0.3	0.4	0.6	0.9	0.8	1.2	1.3	0.7
400	1.5	0.6	0.8	1.3	0.6	0.5	0.7	0.4	0.5	0.3	0.6	0.6	0.7	1.1	0.9	1.1	1.3	0.6
500	1.6	0.7	0.9	1.2	0.5	0.4	0.7	0.5	0.4	0.4	0.7	0.7	0.7	1.1	0.8	1.0	1.2	0.5
700	1.2	0.8	0.6	1.2	0.5	0.3	0.6	0.6	0.3	0.4	0.8	0.6	0.5	0.8	0.5	0.5	0.6	0.5
850	0.6	0.7	0.2	0.9	0.5	0.2	0.4	0.4	0.3	0.2	0.5	0.3	0.3	0.5	0.4	0.2	0.3	0.7
900	0.4	0.5	0.2	0.7	0.4	0.1	0.2	0.3	0.3	0.2	0.4	0.2	0.2	0.4	0.3	0.2	0.2	0.6
950	0.3	0.3	0.1	0.5	0.3	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.3	0.2	0.1	0.1	0.4
1000	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1
MEAN	1.0	0.5	0.6	0.9	0.4	0.3	0.5	0.4	0.3	0.3	0.5	0.4	0.5	0.7	0.6	0.7	0.8	0.6
JULY																		
50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1
100	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
200	0.7	0.2	0.3	0.2	0.4	0.4	0.3	0.5	0.5	0.2	0.2	0.3	0.3	0.1	0.2	0.2	0.3	0.3
300	1.2	0.4	0.4	0.4	0.6	0.9	0.4	0.8	0.9	0.4	0.4	0.5	0.4	0.2	0.3	0.4	0.4	0.4
400	1.3	0.5	0.6	0.4	0.7	1.0	0.4	1.0	1.1	0.5	0.5	0.6	0.5	0.2	0.5	0.6	0.6	0.6
500	1.2	0.5	0.9	0.5	0.8	1.0	0.3	1.0	1.0	0.4	0.5	0.7	0.5	0.2	0.5	0.6	0.7	0.7
700	0.5	0.5	0.7	0.4	0.6	0.7	0.3	0.7	0.8	0.3	0.3	0.6	0.5	0.1	0.5	0.3	0.5	0.6
850	0.2	0.3	0.3	0.2	0.3	0.4	0.3	0.4	0.4	0.3	0.1	0.4	0.4	0.2	0.3	0.2	0.3	0.4
900	0.1	0.3	0.2	0.1	0.2	0.3	0.2	0.3	0.3	0.2	0.1	0.3	0.3	0.1	0.2	0.2	0.3	0.3
950	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2
1000	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1
MEAN	0.7	0.4	0.5	0.3	0.5	0.6	0.3	0.6	0.7	0.3	0.3	0.4	0.4	0.2	0.3	0.3	0.4	0.4
YEAR																		
50	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1
100	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.2
200	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.3	0.2
300	0.4	0.2	0.4	0.4	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.3	0.4	0.3
400	0.5	0.3	0.5	0.4	0.2	0.3	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.4	0.3
500	0.6	0.3	0.5	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.4	0.2
700	0.5	0.4	0.4	0.3	0.1	0.2	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1
850	0.3	0.3	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
900	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
950	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAN	0.3	0.3	0.3	0.3	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2

TABLE A4.—*Interannual standard deviation of the temperature $\sigma([\bar{T}])$, °C*

σ ([T])								60 MONTHS										
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	2.3	2.2	2.0	1.8	1.3	0.9	0.8	0.9	0.9	0.8	0.8	0.7	0.7	0.9	1.2	1.7	2.4	3.2
100	1.6	0.8	0.6	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.7	1.0	1.4	2.0	2.5
200	0.8	0.5	0.4	0.5	0.6	0.6	0.6	0.5	0.4	0.4	0.5	0.5	0.6	0.7	1.0	1.2	1.6	1.9
300	0.6	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.9
400	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.7
500	0.4	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.7	0.8
700	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.7	0.9
850	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.8	1.0
900	0.3	0.3	0.2	0.3	0.4	0.5	0.5	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.7	0.9	1.1
950	0.4	0.4	0.3	0.3	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.8	0.9	1.1
1000	0.6	0.6	0.4	0.3	0.4	0.4	0.2	0.3	0.4	0.3	0.3	0.4	0.4	0.5	0.7	0.8	0.9	1.1
MEAN	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.9	1.1
								JANUARY										
50	2.2	2.0	1.6	1.3	1.2	1.1	1.5	1.8	1.7	1.4	1.0	0.5	0.4	1.1	2.1	3.3	6.5	5.4
100	1.5	0.6	0.6	1.0	0.8	0.5	0.3	0.5	0.7	0.8	0.7	0.4	0.4	1.2	2.2	3.1	4.0	4.7
200	0.9	0.5	0.4	0.6	0.7	0.8	0.7	0.4	0.2	0.3	0.6	0.7	0.9	1.2	1.8	2.4	2.9	3.1
300	0.7	0.4	0.3	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.4	0.4	0.3	0.4	0.5	0.9	1.3	1.4
400	0.6	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.5	0.3	0.4	0.6	0.6	0.5	0.5	0.6	0.7
500	0.4	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.4	0.6	0.6	0.6	0.5	0.5	0.6	0.8
700	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.7
850	0.1	0.1	0.4	0.7	0.6	0.4	0.4	0.3	0.3	0.4	0.3	0.2	0.1	0.2	0.3	0.4	0.4	0.8
900	0.1	0.2	0.3	0.5	0.5	0.4	0.3	0.2	0.3	0.3	0.3	0.2	0.1	0.2	0.6	0.6	0.4	1.0
950	0.3	0.5	0.4	0.3	0.4	0.4	0.3	0.2	0.3	0.2	0.3	0.2	0.1	0.3	0.8	0.9	0.5	0.8
1000	0.5	0.7	0.6	0.3	0.3	0.4	0.2	0.4	0.4	0.2	0.3	0.3	0.2	0.5	0.9	0.9	0.6	1.0
MEAN	0.5	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.6	0.8	1.0	1.1	1.4
								JULY										
50	2.5	2.3	2.2	1.9	1.4	0.9	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.5	0.6	0.6	0.6	0.6
100	1.7	1.0	0.6	0.5	0.7	0.8	0.7	0.6	0.4	0.4	0.3	0.2	0.3	0.5	0.7	0.8	0.7	0.5
200	0.9	0.5	0.4	0.6	0.7	0.8	0.6	0.3	0.2	0.4	0.5	0.5	0.4	0.6	0.9	0.9	0.7	0.5
300	0.5	0.3	0.2	0.3	0.5	0.6	0.5	0.3	0.2	0.3	0.6	0.6	0.6	0.6	0.6	0.4	0.3	0.3
400	0.4	0.3	0.3	0.4	0.5	0.5	0.4	0.3	0.2	0.3	0.4	0.5	0.5	0.5	0.3	0.2	0.2	0.4
500	0.4	0.3	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.3	0.4	0.5	0.5	0.4	0.3	0.2	0.3	0.4
700	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.4	0.6
850	0.5	0.2	0.1	0.1	0.3	0.4	0.4	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.5	0.8
900	0.4	0.3	0.2	0.1	0.3	0.4	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.5	0.7
950	0.3	0.4	0.4	0.2	0.3	0.3	0.1	0.1	0.2	0.3	0.2	0.2	0.3	0.4	0.5	0.4	0.4	0.6
1000	0.3	0.5	0.5	0.4	0.4	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.7
MEAN	0.5	0.4	0.3	0.3	0.4	0.5	0.4	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5
								YEAR										
50	2.1	1.9	1.7	1.4	0.9	0.5	0.5	0.6	0.6	0.5	0.5	0.4	0.5	0.6	0.7	0.8	0.9	1.1
100	1.3	0.5	0.3	0.4	0.5	0.5	0.4	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9
200	0.7	0.4	0.2	0.4	0.5	0.5	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6
300	0.5	0.3	0.1	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.4
400	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.3	0.3
500	0.3	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.4
700	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.4
850	0.1	0.2	0.2	0.3	0.4	0.4	0.4	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.5
900	0.2	0.2	0.1	0.2	0.4	0.5	0.4	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.5
950	0.3	0.3	0.2	0.2	0.4	0.4	0.3	0.1	0.1	0.0	0.1	0.2	0.2	0.3	0.3	0.2	0.3	0.4
1000	0.4	0.5	0.3	0.1	0.3	0.3	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.3
MEAN	0.4	0.3	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5

TABLE A5.—*Interannual standard deviation of the geopotential height* $\sigma([\bar{Z}])$, *gpm*

$\sigma([\bar{Z}])$								60 MONTHS										
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	35	37	42	38	30	24	20	19	19	23	27	28	33	35	43	55	80	111
100	57	29	18	21	22	23	23	21	18	20	22	20	20	22	29	41	97	73
200	19	12	10	13	15	16	17	16	15	17	17	16	17	18	21	26	33	43
300	10	7	7	8	9	11	12	12	12	13	14	14	16	17	20	23	30	36
400	6	5	5	6	7	7	8	8	9	11	13	12	13	15	18	24	31	37
500	3	4	3	4	5	6	7	7	7	9	11	11	11	13	16	22	29	35
700	2	3	2	2	3	3	4	5	7	8	9	8	9	10	13	17	21	24
850	3	3	2	2	2	2	3	4	6	8	9	9	8	9	12	15	19	23
900	3	3	3	2	2	2	3	5	7	9	10	9	9	10	12	15	18	24
950	3	4	5	3	3	2	4	6	7	9	11	10	9	10	13	15	18	21
1000	4	5	6	4	3	3	5	7	8	10	11	10	10	11	13	15	18	20
MEAN	10	7	6	6	7	7	9	9	9	11	12	12	12	13	16	21	27	34
								JANUARY										
50	36	38	45	41	34	29	25	25	31	35	33	30	33	23	40	102	180	265
100	67	41	26	23	23	25	23	22	20	23	26	24	19	25	54	89	127	154
200	22	13	10	11	12	13	14	17	19	22	20	20	24	30	38	47	59	70
300	12	8	6	5	5	6	10	15	18	20	18	21	26	33	38	38	39	45
400	8	6	5	4	6	6	9	13	14	16	17	20	25	32	39	43	47	53
500	4	3	3	3	4	6	8	11	12	14	15	16	19	28	35	40	44	49
700	3	3	2	1	1	2	4	4	6	12	14	14	15	20	26	29	32	37
850	3	3	3	6	6	3	3	5	9	14	15	12	13	19	25	27	29	36
900	3	3	4	5	4	3	4	6	10	15	17	13	14	19	24	26	29	34
950	3	5	5	5	4	3	5	7	11	16	17	13	14	20	26	27	29	33
1000	4	7	6	5	3	3	5	8	12	16	17	13	16	22	27	29	31	33
MEAN	12	8	6	6	6	7	9	11	13	16	17	16	19	25	33	39	46	53
								JULY										
50	25	22	31	30	25	22	21	18	17	20	25	27	30	28	27	26	27	29
100	56	28	19	25	26	27	22	12	8	13	21	23	24	22	18	15	18	21
200	17	11	9	14	20	21	15	9	7	9	16	19	21	18	13	9	11	15
300	8	6	4	7	12	14	12	7	5	6	10	13	17	15	13	12	11	14
400	4	4	5	6	9	9	7	6	7	10	10	9	12	11	12	13	13	13
500	2	3	3	4	7	8	7	6	4	3	4	7	11	10	11	13	15	16
700	2	1	2	3	2	2	4	4	3	3	3	5	8	8	10	12	13	12
850	3	1	2	2	2	2	3	3	2	4	4	5	7	8	9	11	11	9
900	3	1	3	2	2	2	3	3	2	3	4	5	7	8	10	11	12	13
950	5	3	6	5	4	2	3	4	3	4	4	6	8	9	10	11	12	11
1000	6	4	8	7	5	3	4	6	5	4	4	6	8	8	9	11	12	9
MEAN	9	6	5	7	8	9	8	6	4	6	8	10	12	12	11	12	13	14
								YEAR										
50	28	31	37	33	25	19	14	12	12	16	19	19	20	20	22	27	39	56
100	51	25	14	15	17	20	20	15	12	15	16	14	11	10	12	18	25	31
200	16	9	6	8	12	14	14	11	10	11	11	9	7	5	4	9	14	19
300	8	5	4	5	7	9	9	8	7	7	8	7	7	6	3	6	11	17
400	5	3	3	4	5	5	6	5	3	3	5	5	5	5	5	9	14	20
500	2	2	2	3	4	5	6	5	2	3	5	4	5	4	5	9	13	19
700	1	2	1	1	2	2	2	2	3	3	3	3	4	4	4	5	7	10
850	2	2	1	1	1	1	1	2	2	3	3	2	3	4	5	5	6	7
900	1	1	1	1	1	1	1	2	3	3	3	2	3	4	5	6	6	7
950	1	1	1	1	2	1	1	2	3	3	3	2	3	4	5	6	6	6
1000	2	3	2	2	2	2	2	3	4	4	4	2	3	5	5	6	6	7
MEAN	8	5	3	4	5	6	6	5	5	5	6	5	5	5	5	8	11	15

TABLE A6.—*Interannual standard deviation of the specific humidity $\sigma([\bar{q}])$, g/kg*

$\sigma([\bar{q}])$ — 60 MONTHS

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
850	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
900	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
950	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1000	0.4	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
MEAN	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

JANUARY

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.6	0.5	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
850	0.5	0.5	0.3	0.2	0.3	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
900	0.4	0.4	0.3	0.1	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
950	0.4	0.4	0.3	0.2	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1
1000	0.4	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
MEAN	0.3	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

JULY

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
700	0.4	0.3	0.3	0.2	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
850	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2
900	0.3	0.2	0.1	0.2	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
950	0.4	0.4	0.4	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
1000	0.4	0.7	0.8	0.4	0.3	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1
MEAN	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

YEAR

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
400	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
500	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
850	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1
900	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1
950	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1
1000	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
MEAN	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE A7.—*Interannual standard deviation of the kinetic energy* $\sigma([\overline{KE}])$, $10^2 m^2 \cdot s^{-2}$

σ ([$\overline{\text{KE}}$]) 60 MONTHS

P (MB)	5°S	10°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.61	0.57	0.55	0.51	0.41	0.29	0.17	0.10	0.10	0.11	0.12	0.18	0.30	0.41	0.56	0.63	0.63	0.54
100	0.07	0.07	0.11	0.14	0.13	0.12	0.13	0.18	0.25	0.24	0.19	0.19	0.25	0.31	0.36	0.38	0.38	0.31
200	0.10	0.10	0.15	0.13	0.18	0.28	0.38	0.49	0.50	0.39	0.38	0.30	0.27	0.27	0.27	0.22	0.19	0.19
300	0.07	0.06	0.07	0.06	0.08	0.15	0.24	0.40	0.45	0.33	0.30	0.26	0.25	0.23	0.20	0.16	0.17	0.21
400	0.04	0.05	0.05	0.05	0.03	0.06	0.13	0.23	0.23	0.20	0.19	0.20	0.21	0.21	0.19	0.14	0.14	0.19
500	0.03	0.04	0.04	0.04	0.03	0.04	0.09	0.14	0.16	0.14	0.13	0.15	0.17	0.16	0.15	0.11	0.11	0.13
700	0.03	0.03	0.04	0.04	0.03	0.03	0.03	0.06	0.08	0.08	0.06	0.07	0.08	0.09	0.08	0.06	0.06	0.07
850	0.04	0.02	0.02	0.02	0.03	0.03	0.02	0.03	0.04	0.05	0.04	0.04	0.05	0.05	0.05	0.04	0.05	0.06
900	0.03	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.06
950	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.05	0.05	0.06
1000	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.04	0.05	0.05	0.05	0.05	0.06	0.06
MEAN	0.04	0.04	0.06	0.05	0.06	0.08	0.11	0.17	0.19	0.16	0.15	0.14	0.15	0.15	0.15	0.12	0.12	0.13

JANUARY

P (MB)	5°S	10°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.82	0.72	0.58	0.41	0.23	0.11	0.06	0.11	0.16	0.15	0.16	0.41	0.79	1.13	1.46	1.47	1.26	0.75
100	0.06	0.10	0.12	0.13	0.15	0.21	0.26	0.35	0.59	0.57	0.27	0.31	0.61	0.83	0.87	0.83	0.73	0.55
200	0.04	0.10	0.12	0.08	0.31	0.66	0.81	0.76	0.59	0.37	0.31	0.46	0.60	0.57	0.48	0.37	0.36	0.35
300	0.03	0.04	0.04	0.04	0.18	0.37	0.38	0.73	0.97	0.54	0.10	0.31	0.45	0.39	0.28	0.17	0.21	0.30
400	0.03	0.04	0.04	0.05	0.04	0.13	0.19	0.35	0.35	0.32	0.27	0.35	0.38	0.28	0.18	0.13	0.21	0.27
500	0.01	0.03	0.03	0.04	0.02	0.08	0.16	0.25	0.32	0.27	0.17	0.24	0.27	0.21	0.14	0.11	0.17	0.16
700	0.02	0.03	0.04	0.03	0.03	0.02	0.06	0.10	0.16	0.13	0.06	0.10	0.15	0.14	0.10	0.07	0.09	0.09
850	0.01	0.01	0.01	0.02	0.03	0.03	0.02	0.04	0.07	0.07	0.04	0.07	0.10	0.11	0.10	0.06	0.07	0.08
900	0.01	0.02	0.02	0.02	0.03	0.03	0.02	0.03	0.06	0.06	0.03	0.05	0.07	0.10	0.09	0.09	0.10	0.09
950	0.01	0.02	0.02	0.01	0.02	0.02	0.02	0.03	0.06	0.05	0.02	0.05	0.07	0.10	0.10	0.10	0.10	0.08
1000	0.02	0.02	0.03	0.01	0.01	0.01	0.02	0.02	0.04	0.03	0.02	0.04	0.06	0.08	0.09	0.09	0.09	0.07
MEAN	0.02	0.04	0.04	0.04	0.08	0.16	0.21	0.28	0.34	0.25	0.14	0.21	0.29	0.28	0.23	0.18	0.20	0.20

JULY

P (MB)	5°S	10°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.14	0.16	0.27	0.45	0.50	0.43	0.29	0.15	0.05	0.04	0.03	0.01	0.01	0.01	0.02	0.02	0.02	0.02
100	0.04	0.06	0.11	0.19	0.18	0.10	0.10	0.09	0.05	0.04	0.06	0.07	0.06	0.04	0.03	0.05	0.07	0.06
200	0.06	0.11	0.20	0.18	0.16	0.11	0.07	0.08	0.14	0.20	0.22	0.16	0.08	0.06	0.08	0.13	0.20	0.20
300	0.09	0.06	0.09	0.07	0.06	0.05	0.03	0.03	0.05	0.09	0.20	0.16	0.03	0.11	0.16	0.19	0.32	0.40
400	0.04	0.05	0.06	0.04	0.02	0.02	0.03	0.02	0.04	0.07	0.12	0.09	0.05	0.10	0.13	0.11	0.17	0.23
500	0.02	0.04	0.05	0.04	0.03	0.03	0.01	0.02	0.04	0.07	0.09	0.06	0.04	0.08	0.10	0.08	0.08	0.09
700	0.04	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.03	0.04	0.05	0.03	0.02	0.05	0.05	0.04	0.03	0.06
850	0.07	0.03	0.02	0.03	0.03	0.02	0.02	0.01	0.02	0.03	0.03	0.02	0.02	0.02	0.03	0.03	0.02	0.04
900	0.05	0.03	0.02	0.03	0.03	0.02	0.01	0.01	0.02	0.02	0.03	0.03	0.01	0.01	0.02	0.02	0.04	0.07
950	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.01	0.03	0.05
1000	0.01	0.00	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01	0.02	0.04	0.05	0.04	0.03	0.01	0.02	0.04
MEAN	0.04	0.04	0.06	0.06	0.05	0.04	0.03	0.03	0.05	0.06	0.09	0.07	0.04	0.06	0.07	0.08	0.10	0.13

YEAR

P (MB)	5°S	10°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.32	0.31	0.32	0.30	0.24	0.17	0.09	0.06	0.04	0.04	0.04	0.06	0.12	0.19	0.24	0.25	0.23	0.19
100	0.02	0.02	0.06	0.08	0.07	0.05	0.06	0.08	0.10	0.09	0.08	0.09	0.12	0.17	0.19	0.18	0.14	0.11
200	0.04	0.03	0.05	0.03	0.08	0.13	0.18	0.21	0.15	0.09	0.10	0.10	0.12	0.16	0.16	0.11	0.09	0.08
300	0.03	0.02	0.02	0.02	0.05	0.06	0.07	0.15	0.16	0.11	0.05	0.05	0.10	0.13	0.11	0.07	0.10	0.13
400	0.02	0.01	0.02	0.01	0.01	0.01	0.05	0.10	0.09	0.04	0.02	0.06	0.08	0.11	0.09	0.06	0.10	0.13
500	0.01	0.01	0.02	0.01	0.01	0.01	0.04	0.07	0.07	0.04	0.04	0.06	0.06	0.08	0.06	0.04	0.06	0.07
700	0.01	0.02	0.03	0.03	0.02	0.01	0.01	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.03	0.02	0.03	0.03
850	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.03	0.02	0.01	0.01	0.02
900	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.03	0.02	0.01	0.01	0.02
950	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.02	0.02	0.03
1000	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.02	0.03	0.03	0.03	0.03	0.03	0.03
MEAN	0.02	0.02	0.02	0.02	0.03	0.03	0.05	0.07	0.07	0.05	0.04	0.05	0.06	0.08	0.08	0.05	0.06	0.07

TABLE B1a.—*Interannual standard deviation of the variance of the zonal wind component resulting from transient eddies $\sigma([\overline{u'^2}])$, $m^2 \cdot s^{-2}$*

$\sigma([\overline{u'^2}])$								60 MONTHS										
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	13	12	11	8	6	5	5	6	6	7	8	9	11	12	15	15	16	19
100	9	7	9	9	7	7	9	9	8	8	7	7	8	10	10	9	10	11
200	10	8	8	7	7	7	10	11	13	12	11	9	10	11	12	9	9	12
300	8	7	6	5	4	5	7	7	9	11	11	10	11	11	11	11	13	15
400	5	4	3	3	3	4	5	6	7	8	9	9	10	10	12	11	12	14
500	3	2	3	2	2	3	4	4	5	6	6	6	7	7	8	8	9	13
700	3	2	2	2	2	2	3	3	3	3	4	4	4	4	4	4	5	6
850	2	1	2	2	2	1	1	2	2	3	3	3	4	4	3	3	4	6
900	1	1	1	1	1	1	1	2	2	3	3	4	4	4	4	4	6	7
950	1	0	1	0	0	0	1	2	2	2	3	3	4	4	4	4	5	6
1000	1	0	0	0	0	0	1	1	2	2	3	4	4	4	4	4	6	7
MEAN	4	3	4	3	3	3	4	5	5	6	6	6	7	7	7	7	8	10
								JANUARY										
50	5	6	7	7	5	4	4	6	8	7	8	10	17	26	32	27	18	16
100	8	7	8	9	8	9	12	12	10	5	4	5	7	14	17	15	12	10
200	6	9	10	11	12	14	16	14	10	9	13	11	10	14	16	10	9	11
300	4	10	11	7	5	6	7	3	9	16	13	9	12	17	17	7	3	7
400	6	7	6	5	5	6	4	3	6	10	9	10	15	14	13	13	10	7
500	3	4	2	2	4	5	4	4	5	4	4	2	6	8	6	9	10	9
700	5	3	2	2	3	5	5	5	4	6	6	4	2	3	3	5	8	10
850	1	2	2	2	1	1	2	2	2	4	6	5	5	3	3	3	7	10
900	2	2	2	1	0	1	2	3	3	5	5	4	5	5	6	7	11	13
950	2	1	1	1	0	1	2	3	3	4	3	3	4	5	6	7	10	10
1000	2	2	1	1	1	1	3	3	3	3	3	4	4	5	6	6	8	8
MEAN	4	5	5	4	4	5	6	5	5	7	7	6	6	8	9	8	8	9
								JULY										
50	16	15	12	9	5	4	3	3	4	5	4	2	1	1	1	1	1	3
100	3	4	12	12	8	6	3	2	3	4	4	3	3	4	4	3	5	5
200	5	9	8	7	7	6	7	10	12	10	7	7	10	9	7	8	12	15
300	8	7	6	3	2	3	3	4	5	6	8	12	14	10	10	9	15	16
400	4	3	3	3	2	3	3	2	3	4	5	6	5	5	8	7	11	14
500	2	3	4	3	2	2	2	2	3	4	3	4	5	3	6	7	7	5
700	5	4	3	2	2	3	3	3	3	3	2	3	4	4	4	2	2	4
850	3	2	3	3	3	2	2	2	3	3	3	3	3	3	3	3	4	6
900	2	2	3	3	3	3	2	2	2	2	2	3	3	3	2	2	4	7
950	1	1	1	1	1	1	1	2	2	1	2	4	4	3	2	1	3	4
1000	0	1	1	0	0	0	1	1	1	1	2	4	4	3	3	2	2	3
MEAN	4	4	4	4	3	3	3	3	4	4	4	5	6	5	5	5	7	8
								YEAR										
50	38	37	35	37	35	24	15	10	7	4	3	7	13	18	22	20	18	15
100	4	4	8	11	11	6	7	11	11	7	4	5	9	12	12	11	9	8
200	7	4	4	8	14	16	15	22	22	15	6	6	10	11	6	3	3	5
300	5	5	5	6	9	8	8	21	25	17	9	8	10	9	8	4	4	7
400	3	3	2	2	2	1	7	15	15	9	4	5	6	7	6	4	5	7
500	2	2	2	1	1	1	4	9	8	5	3	4	6	5	3	1	3	3
700	2	1	1	1	1	1	1	2	4	3	2	2	3	3	1	0	2	1
850	2	1	1	1	1	1	1	1	2	2	1	1	2	3	2	1	1	1
900	1	1	1	1	1	1	1	1	2	2	1	1	2	3	2	2	3	3
950	1	1	0	0	1	1	1	1	2	2	1	1	2	3	3	3	3	3
1000	1	1	0	0	1	1	1	1	2	1	1	2	3	3	3	3	3	3
MEAN	3	2	2	3	4	4	5	9	10	7	3	4	5	6	4	3	3	4

TABLE B1b.—*Interannual standard deviation of the variance of the zonal wind component resulting from stationary eddies $\sigma([\bar{u}^{*2}])$, $m^2 \cdot s^{-2}$*

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
$\sigma([\bar{u}^{*2}])$ 60 MONTHS																		
50	0	0	0	1	1	1	1	2	3	5	6	7	8	6	7	8	6	6
100	2	4	5	7	9	8	5	5	7	11	12	9	8	5	6	6	5	7
200	3	4	6	8	11	13	8	12	16	20	20	15	12	8	8	7	5	6
300	1	1	2	4	6	7	7	15	21	17	16	14	13	10	9	8	6	8
400	0	0	1	1	2	2	7	12	12	12	12	11	10	10	8	6	5	6
500	0	0	0	1	2	3	5	8	8	8	9	8	9	8	6	5	4	5
700	0	0	1	2	3	3	2	3	4	4	4	4	4	4	3	3	3	3
850	0	0	1	2	2	2	1	1	2	2	2	2	3	3	2	2	3	2
900	0	1	1	2	2	2	1	1	2	2	1	2	3	3	2	2	2	2
950	0	0	1	1	2	2	1	1	2	2	1	2	2	2	2	2	2	2
1000	0	0	0	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1
MEAN	1	1	2	3	4	4	4	7	8	8	8	8	7	6	5	4	4	4
JANUARY																		
50	0	1	1	1	1	1	1	4	5	7	8	15	21	14	8	10	14	15
100	6	10	11	11	14	14	5	6	10	13	8	11	21	13	3	3	9	15
200	1	2	5	11	22	26	10	25	33	21	11	13	22	13	7	6	5	8
300	1	3	5	9	16	16	7	39	52	33	14	19	27	19	11	8	3	7
400	1	1	2	3	5	3	17	33	25	26	18	18	23	18	11	7	4	7
500	0	1	1	1	3	2	13	22	20	18	12	14	19	16	11	6	3	5
700	1	1	0	1	1	1	3	7	10	7	5	8	12	10	6	4	2	3
850	1	1	2	2	1	1	1	4	5	3	3	5	8	7	4	4	3	2
900	1	2	2	2	2	1	1	4	6	3	2	4	7	7	4	4	3	1
950	1	1	2	2	2	1	0	3	5	3	1	3	6	6	4	4	3	2
1000	1	1	1	1	1	0	1	3	4	3	1	2	4	4	3	3	2	1
MEAN	1	2	3	4	7	7	7	17	19	14	9	11	16	12	7	5	3	5
JULY																		
50	0	0	0	0	1	1	1	1	1	1	2	2	1	0	0	1	1	1
100	3	2	2	4	7	8	6	4	3	5	6	4	0	1	1	1	1	1
200	5	6	4	2	5	11	12	7	6	7	10	5	3	4	3	1	3	5
300	3	4	2	2	3	5	6	4	4	8	7	3	3	7	4	2	6	10
400	2	2	1	1	1	1	2	2	3	3	2	2	4	5	3	2	5	7
500	1	1	1	2	4	3	1	0	1	2	2	2	4	4	3	2	4	6
700	0	1	2	5	8	7	3	1	2	2	2	2	3	3	2	1	3	4
850	0	1	2	5	6	5	3	2	1	1	1	1	3	3	2	1	2	2
900	1	1	2	4	5	4	2	1	1	1	1	1	2	2	1	0	1	2
950	0	0	1	2	3	3	2	1	1	1	1	1	2	1	0	0	1	1
1000	0	0	1	1	2	2	1	1	1	0	0	1	1	1	0	0	0	1
MEAN	2	2	2	3	5	5	4	2	2	3	3	2	3	4	2	1	3	4
YEAR																		
50	0	0	0	0	0	0	0	0	0	1	1	2	1	1	1	1	1	1
100	1	1	2	2	2	2	1	1	1	2	3	2	1	1	1	1	1	2
200	1	1	1	2	3	4	3	2	1	3	4	4	2	1	1	1	2	1
300	0	0	1	1	2	2	1	1	0	2	3	4	3	2	2	2	2	1
400	0	0	0	0	0	0	0	1	1	1	2	3	2	2	2	2	1	1
500	0	0	0	0	0	0	0	0	0	1	2	2	2	2	1	1	1	1
700	0	0	1	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1
850	0	0	1	1	1	1	1	0	0	1	1	1	0	0	0	1	1	1
900	0	0	1	1	1	1	1	1	0	0	1	1	1	0	0	0	1	1
950	0	0	1	1	1	1	1	1	0	0	0	1	1	0	0	0	1	1
1000	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1
MEAN	0	0	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1

TABLE B2a.—*Interannual standard deviation of the variance of the meridional wind component resulting from transient eddies* $\sigma([\overline{v'^2}])$, $m^2 \cdot s^{-2}$

$\sigma([\overline{v'^2}])$

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
60 MONTHS																		
50	8	7	5	4	2	2	2	3	4	4	5	6	8	9	12	14	17	21
100	5	3	4	4	4	3	4	5	6	6	6	6	7	9	11	12	12	12
200	6	4	4	3	4	6	9	12	13	13	14	12	13	13	13	12	12	14
300	4	3	3	3	4	5	8	9	10	11	13	14	15	15	15	14	16	18
400	3	2	2	2	3	4	5	6	7	9	12	14	15	14	13	13	15	17
500	2	1	1	1	2	2	3	4	5	7	8	9	10	10	10	9	10	13
700	2	1	1	1	1	1	1	2	3	4	4	5	5	5	5	5	6	8
850	2	0	1	1	1	1	1	2	3	3	3	4	4	3	3	3	4	6
900	1	0	1	1	1	1	2	2	3	3	3	4	4	3	3	3	4	5
950	1	0	1	1	0	1	2	2	2	2	3	3	4	3	3	4	5	6
1000	1	1	2	1	1	1	1	1	2	2	2	4	4	4	4	4	5	5
MEAN	2	2	2	2	2	2	4	5	6	6	7	8	9	9	8	8	9	11
JANUARY																		
50	3	3	5	7	4	2	2	4	5	5	8	12	18	19	21	17	15	19
100	9	5	7	9	7	7	8	9	12	14	13	10	10	12	12	10	9	8
200	9	5	5	4	5	9	11	12	11	17	22	24	25	18	14	11	12	14
300	6	5	7	7	8	10	11	11	12	14	18	24	28	18	7	6	10	14
400	3	3	4	5	7	10	12	11	10	16	25	29	29	18	10	6	7	12
500	2	1	2	4	5	5	5	7	10	13	15	15	15	11	7	5	9	10
700	0	1	1	1	2	2	3	5	6	7	6	5	6	6	6	4	4	5
850	1	1	1	1	1	1	2	4	5	6	6	6	7	7	6	4	4	5
900	1	0	1	1	1	1	2	4	5	4	5	6	6	6	4	4	6	6
950	0	0	1	1	1	1	1	2	3	3	4	4	4	4	5	7	9	8
1000	1	0	0	1	1	1	1	2	3	2	3	4	4	4	5	8	10	8
MEAN	3	2	3	4	4	5	6	7	8	11	13	14	14	11	8	6	8	9
JULY																		
50	4	3	3	4	2	2	1	2	3	3	3	2	1	2	3	3	3	3
100	3	4	2	3	2	2	2	3	4	4	3	1	3	4	4	7	8	7
200	4	4	4	4	4	5	5	3	8	9	6	3	6	6	10	13	14	15
300	6	4	3	2	1	2	2	2	5	5	7	4	2	7	15	19	21	24
400	3	1	1	1	1	2	1	2	4	4	3	2	3	5	9	10	11	10
500	2	3	2	3	2	1	1	2	3	3	2	3	4	5	6	5	7	9
700	2	1	1	0	1	1	2	2	2	2	2	2	2	3	3	3	7	10
850	2	1	2	1	1	1	1	1	1	1	1	1	2	1	1	2	2	2
900	1	1	2	1	1	1	1	1	1	1	1	3	3	2	2	3	5	9
950	2	1	2	2	1	1	1	1	1	1	2	3	3	2	1	2	4	7
1000	3	1	1	1	2	1	1	1	1	1	1	3	4	4	3	2	4	6
MEAN	3	2	2	2	1	2	2	2	3	3	3	2	3	4	6	7	9	10
YEAR																		
50	2	2	2	2	1	1	1	2	3	2	2	3	4	6	6	7	7	5
100	2	2	3	3	2	2	2	4	5	4	3	3	4	6	8	8	8	7
200	1	1	1	1	1	2	5	7	6	5	4	5	8	11	12	9	9	9
300	1	1	2	1	1	2	4	5	5	3	3	6	10	11	10	9	10	12
400	1	1	1	0	1	1	3	4	4	3	4	6	8	10	9	7	10	13
500	0	1	1	1	1	1	2	3	3	2	3	4	5	7	7	6	6	8
700	1	0	0	1	1	0	1	1	1	1	1	2	3	4	3	3	3	4
850	1	1	0	0	0	0	1	1	1	1	1	2	2	2	2	2	2	4
900	1	1	1	0	0	1	1	1	1	1	2	2	2	2	1	1	1	2
950	1	1	1	0	0	1	1	1	1	1	1	2	2	2	2	2	2	3
1000	1	1	1	0	0	1	1	1	1	1	2	3	3	3	3	3	3	3
MEAN	1	1	1	1	1	1	2	3	3	2	2	4	5	6	6	5	6	7

TABLE B2b.—*Interannual standard deviation of the variance of the meridional wind component resulting from stationary eddies* $\sigma([\bar{v}^{*2}])$, $m^2 \cdot s^{-2}$

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
σ ([v̄ *2]) 60 MONTHS																		
50	0	0	0	0	0	0	0	0	0	1	1	3	6	10	15	17	16	14
100	0	0	0	0	1	1	1	2	2	3	3	4	6	9	12	13	12	11
200	0	0	1	1	2	3	4	4	6	8	8	9	11	12	12	11	9	8
300	0	0	0	0	1	1	2	3	4	6	7	9	11	12	11	10	9	9
400	0	0	0	0	0	0	1	2	3	4	6	8	10	11	12	10	8	9
500	0	0	0	0	0	0	0	1	2	3	4	7	8	9	9	8	7	6
700	0	0	0	0	0	0	0	0	1	1	2	3	5	5	5	4	3	3
850	0	0	0	0	0	0	0	0	1	1	1	2	2	3	3	2	2	2
900	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	1	2
950	0	0	0	0	0	0	0	0	1	1	1	1	1	1	2	2	1	1
1000	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
MEAN	0	0	0	0	0	1	1	1	2	3	4	5	6	7	8	7	6	6
JANUARY																		
50	0	0	0	0	0	0	0	1	1	1	4	9	17	27	37	38	33	21
100	0	0	1	1	2	3	3	2	2	3	4	7	11	18	19	19	17	12
200	1	1	3	5	7	9	9	7	5	7	10	14	18	21	20	16	12	7
300	0	1	1	2	3	4	6	6	5	6	10	16	19	21	19	14	10	4
400	0	0	0	0	0	1	1	2	3	4	8	15	18	20	19	14	12	9
500	0	0	0	0	0	1	1	1	3	4	9	14	15	15	13	11	9	5
700	0	0	0	0	0	0	1	1	2	3	5	7	9	9	8	8	7	4
850	0	0	0	0	0	0	1	1	2	2	3	4	4	5	4	4	4	3
900	0	0	0	0	0	0	1	2	2	2	3	3	3	3	3	3	2	2
950	0	0	0	0	0	0	1	1	2	1	2	2	2	2	3	3	2	1
1000	0	0	0	0	0	0	1	1	1	1	1	1	1	2	3	2	1	1
MEAN	0	0	1	1	1	2	2	3	3	4	6	10	12	13	12	10	8	5
JULY																		
50	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	1	0	0
100	0	0	0	0	1	1	2	2	2	2	3	2	1	1	1	1	1	1
200	0	0	0	0	1	1	2	2	3	5	8	5	3	4	4	4	2	2
300	0	0	0	0	0	1	1	1	2	4	5	4	2	4	6	7	5	4
400	0	0	0	0	0	0	1	1	1	2	2	2	2	3	5	6	5	3
500	0	0	0	0	1	1	1	1	1	1	2	2	2	3	4	5	5	3
700	0	0	0	0	0	0	0	1	1	1	1	1	1	1	2	3	3	3
850	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2
900	1	1	0	0	0	0	1	2	2	1	0	0	1	0	1	1	1	1
950	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	1	1
1000	0	0	0	0	0	0	0	1	1	0	1	1	1	1	1	0	0	1
MEAN	0	0	0	0	0	1	1	1	1	2	2	2	2	2	3	4	3	2
YEAR																		
50	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	3	3	3
100	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
200	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	2	1	1
300	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	1	1	2
400	0	0	0	0	0	0	0	0	0	1	1	1	1	2	1	1	1	1
500	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
700	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0
850	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
950	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MEAN	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

TABLE B3.—*Interannual standard deviation of the variance of the vertical velocity resulting from stationary eddies $\sigma([\bar{\omega}^{*2}])$, $10^{-8} mb^2 \cdot s^{-2}$*

$\sigma([\bar{\omega}^{*2}])$									60 MONTHS									
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4
100	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.6	0.5	0.6	0.8	0.9	0.9	1.1	1.2
200	1.5	1.2	1.2	1.4	1.8	2.0	1.9	2.8	3.9	3.9	2.9	2.0	2.1	2.3	2.5	2.6	3.2	3.7
300	3.5	3.0	3.2	3.5	4.9	5.3	4.5	6.2	8.7	8.7	6.6	4.2	4.7	4.4	4.3	4.3	5.5	7.1
400	4.6	4.4	4.9	4.9	7.2	8.0	6.7	7.4	10.3	10.7	8.8	6.3	6.8	6.1	5.4	5.1	7.3	9.7
500	4.3	4.6	5.3	5.0	7.2	8.3	7.6	6.9	8.6	9.1	8.0	6.1	6.7	6.2	5.6	5.2	7.5	10.4
700	2.3	2.8	3.4	3.0	3.8	4.9	5.4	4.3	4.2	4.8	4.1	3.1	4.2	4.4	4.4	3.7	4.8	6.7
850	0.9	0.9	1.1	1.2	1.5	1.5	1.6	1.6	1.5	1.8	1.5	1.3	1.9	2.1	2.2	2.1	2.6	3.1
900	0.5	0.4	0.5	0.6	0.8	0.8	0.8	0.8	0.9	1.0	0.8	0.8	1.2	1.4	1.4	1.3	1.7	1.9
950	0.2	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.5	0.6	0.5	0.5	0.7	0.7
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1
MEAN	2.2	2.3	2.5	2.5	3.5	4.1	3.8	3.9	4.8	5.1	4.2	3.1	3.6	3.5	3.4	3.2	4.3	5.6
									JANUARY									
50	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.3
100	0.3	0.2	0.2	0.3	0.2	0.2	0.5	0.5	0.5	0.3	0.4	0.3	0.3	0.6	0.8	0.8	1.2	0.9
200	1.8	1.4	0.7	1.3	0.7	1.3	2.6	4.4	5.2	2.9	2.3	2.2	1.9	1.5	0.7	2.8	4.1	2.0
300	2.6	2.0	1.8	2.0	2.0	2.2	3.5	9.7	12.2	5.3	4.2	5.2	4.6	3.5	0.8	4.3	6.6	3.5
400	3.7	3.4	3.3	2.6	3.0	2.4	2.7	11.1	15.5	7.1	4.1	7.5	6.2	4.8	2.1	4.4	8.2	5.8
500	3.8	3.4	3.2	3.2	3.8	2.3	2.5	9.2	14.0	8.0	4.2	6.9	6.2	4.6	3.2	3.6	8.2	9.9
700	2.3	2.4	2.3	3.0	3.5	2.1	2.0	3.9	6.2	3.9	2.0	2.8	3.5	3.2	3.6	2.9	5.4	10.1
850	0.8	1.2	1.1	1.2	1.3	0.7	0.7	0.9	1.9	1.9	0.7	0.4	1.1	1.9	2.4	2.4	3.0	5.8
900	0.4	0.7	0.6	0.6	0.6	0.4	0.5	0.4	1.1	1.4	0.7	0.3	0.6	1.2	1.6	1.6	2.0	3.6
950	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.4	0.7	0.4	0.3	0.3	0.5	0.7	0.7	0.8	1.3
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1
MEAN	2.0	1.9	1.7	1.9	2.1	1.5	1.9	5.1	7.1	4.0	2.3	3.3	3.2	2.7	2.0	2.8	4.9	5.6
									JULY									
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1
100	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.7	0.2	0.3	0.3	0.3	0.2
200	0.7	0.6	0.7	1.1	1.6	1.4	0.9	1.3	1.2	2.0	2.8	2.2	2.3	0.9	0.5	1.0	1.6	1.3
300	0.8	1.3	1.5	2.4	5.8	5.3	1.5	4.3	2.0	4.1	5.9	3.5	3.3	1.9	1.1	1.6	3.1	3.5
400	0.8	1.5	2.5	3.5	9.1	8.1	1.7	6.0	2.3	5.6	8.3	4.5	4.1	2.9	2.0	2.3	4.0	5.0
500	1.5	1.3	2.8	4.7	8.6	7.4	2.5	6.0	2.6	6.0	9.3	4.7	3.9	2.8	2.1	2.2	3.1	4.5
700	1.9	1.2	2.4	2.7	3.9	4.5	3.1	3.6	2.5	4.0	5.7	2.2	2.1	1.1	1.0	1.0	1.1	2.6
850	0.8	0.4	0.7	0.7	1.0	1.6	1.4	1.1	1.3	1.6	2.0	0.9	0.7	0.2	0.3	0.2	0.2	0.3
900	0.4	0.3	0.4	0.4	0.5	0.7	0.7	0.6	0.8	0.9	1.0	0.6	0.4	0.1	0.2	0.1	0.1	0.2
950	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.0	0.1	0.1	0.1	0.1
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
MEAN	1.0	0.9	1.5	2.2	4.0	3.8	1.6	3.0	1.7	3.2	4.6	2.4	2.1	1.3	1.0	1.1	1.6	2.3
									YEAR									
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0
100	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.1	0.2	0.2	0.1
200	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.4	1.0	0.9	0.3	0.2	0.2	0.4	0.5	0.5	0.5
300	0.5	0.6	1.3	0.9	0.6	0.8	0.8	0.4	0.7	2.0	1.7	0.4	0.5	0.5	0.7	1.0	1.2	1.3
400	0.6	1.1	2.0	1.3	1.0	1.4	1.3	0.6	1.1	2.7	2.2	0.7	0.8	0.6	0.7	1.2	1.8	2.2
500	0.9	1.3	2.0	1.3	0.9	1.4	1.5	0.9	1.2	2.6	2.2	0.9	0.8	0.5	0.6	1.0	1.8	2.6
700	0.9	0.9	1.0	0.6	0.7	1.0	1.1	0.7	0.8	1.4	1.1	0.5	0.4	0.4	0.6	0.7	1.2	1.7
850	0.3	0.3	0.3	0.2	0.3	0.5	0.5	0.3	0.3	0.5	0.4	0.2	0.2	0.3	0.3	0.4	0.6	0.7
900	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.4
950	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
MEAN	0.5	0.6	0.9	0.6	0.5	0.7	0.8	0.5	0.6	1.3	1.1	0.4	0.4	0.4	0.4	0.7	1.0	1.3

TABLE B4a.—*Interannual standard deviation of the variance of the temperature resulting from transient eddies* $\sigma([\overline{T'^2}])$, °C²

$\sigma\ ([\overline{T'^2}])$								60 MONTHS										
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	1.8	2.0	2.9	3.0	2.4	1.6	1.5	1.7	1.5	1.4	1.7	2.1	3.1	4.0	5.8	7.2	8.7	10.4
100	1.8	1.5	1.1	1.1	1.1	1.1	1.2	1.1	1.0	0.9	1.1	1.5	2.3	3.2	4.1	5.0	5.8	6.3
200	0.7	0.9	0.8	1.1	1.4	1.0	1.0	1.3	1.5	1.7	1.9	2.1	2.6	2.7	3.2	3.6	4.0	4.4
300	0.5	0.6	0.8	1.2	1.3	1.0	1.0	1.2	1.1	0.9	1.2	1.4	1.5	1.5	1.5	1.6	2.0	2.4
400	0.5	0.7	0.8	1.0	1.1	0.9	0.8	0.8	0.9	1.2	1.5	1.8	1.8	1.9	2.3	2.2	2.3	2.6
500	0.9	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.9	1.1	1.5	1.8	1.7	2.0	2.7	2.7	2.9	3.4
700	0.7	0.5	0.4	0.6	0.7	0.6	0.6	0.7	0.9	1.2	1.6	2.1	2.5	2.8	3.2	3.1	3.0	3.6
850	0.6	0.5	0.6	0.6	0.7	0.6	0.7	1.0	1.1	1.5	1.9	2.4	2.7	3.2	3.5	3.3	3.2	4.0
900	0.4	0.3	0.4	0.4	0.5	0.5	0.6	0.8	1.0	1.3	1.7	2.3	2.5	3.0	3.7	3.6	3.5	4.3
950	0.2	0.2	0.3	0.4	0.4	0.4	0.6	0.7	0.9	1.2	1.6	1.9	2.3	3.2	4.4	4.1	3.8	4.7
1000	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.6	0.9	0.9	1.3	1.7	2.1	3.4	5.0	4.2	4.0	5.5
MEAN	0.7	0.6	0.6	0.8	0.8	0.7	0.7	0.8	1.0	1.2	1.5	1.9	2.1	2.5	3.1	3.1	3.2	3.8
								JANUARY										
50	1.3	1.1	2.3	4.1	3.6	2.9	1.6	1.8	1.7	0.9	1.1	3.3	6.3	8.0	10.9	12.0	14.2	17.4
100	2.3	1.3	1.0	0.8	0.4	0.6	1.0	1.1	0.9	0.9	1.5	1.8	1.9	3.3	5.9	9.1	11.5	10.9
200	1.0	1.0	0.5	1.0	1.6	1.0	0.8	1.2	1.3	1.7	2.4	3.1	2.8	1.9	3.5	5.0	4.9	4.2
300	0.5	0.5	0.9	1.0	0.9	1.0	1.7	2.0	1.7	1.3	1.1	1.5	1.2	1.0	0.7	1.1	1.8	1.9
400	0.7	0.5	0.5	0.6	0.7	0.6	0.3	0.4	0.5	0.8	1.6	2.4	2.6	1.6	1.2	2.8	3.8	3.0
500	1.8	1.9	1.0	0.6	0.9	1.1	0.9	0.9	1.3	1.9	2.6	3.3	3.1	1.4	1.6	2.8	3.2	2.7
700	0.3	0.4	0.3	1.5	1.8	1.1	0.4	0.9	1.3	1.7	1.7	2.8	3.2	2.7	3.5	5.0	5.5	4.4
850	0.2	0.1	0.3	0.9	0.9	0.9	1.0	1.6	2.1	2.2	2.5	3.2	3.3	4.3	4.8	5.1	5.1	3.8
900	0.1	0.2	0.2	0.4	0.4	0.4	0.9	1.4	1.8	1.9	2.0	3.2	3.5	4.5	6.5	6.4	5.2	3.2
950	0.1	0.2	0.2	0.2	0.2	0.3	0.9	1.0	1.4	1.5	1.9	2.9	3.1	5.2	7.8	7.0	5.9	5.5
1000	0.1	0.2	0.4	0.4	0.4	0.4	1.0	0.7	1.4	1.3	1.5	2.3	2.3	5.2	8.7	7.2	6.6	8.2
MEAN	0.8	0.7	0.6	0.9	1.0	0.8	0.8	1.1	1.3	1.6	1.9	2.7	2.7	2.6	3.5	4.6	4.9	4.2
								JULY										
50	1.8	1.4	1.2	1.6	1.3	1.2	1.5	1.5	0.9	1.0	1.4	1.4	1.7	1.4	1.7	2.7	4.0	5.6
100	1.5	1.5	1.1	1.1	1.3	1.3	1.1	0.7	1.0	0.8	1.0	0.7	0.4	0.5	0.4	1.0	1.7	2.4
200	1.0	1.1	0.9	1.1	1.2	0.6	0.6	0.9	1.2	1.4	1.3	0.9	1.5	1.5	2.1	2.5	3.1	2.3
300	0.6	1.1	0.8	1.6	1.6	0.7	0.4	1.2	1.5	1.1	0.9	0.7	1.2	1.6	1.8	2.2	2.5	2.0
400	0.8	1.3	0.8	0.8	1.0	0.6	0.3	0.4	0.8	0.6	1.2	1.4	1.4	1.4	1.9	2.5	2.2	1.7
500	0.2	0.5	0.9	0.9	0.6	0.4	0.4	0.7	1.1	1.5	1.1	0.9	1.1	1.0	1.7	3.1	4.4	4.3
700	1.4	0.8	0.4	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7	1.0	1.3	0.9	1.4	2.7	2.8	2.0
850	0.5	0.3	0.3	0.5	0.8	0.4	0.3	0.4	0.4	0.4	0.6	0.9	1.1	1.2	1.9	2.2	2.0	1.4
900	0.3	0.3	0.4	0.6	0.7	0.5	0.4	0.5	0.5	0.4	0.5	0.8	1.2	1.2	1.9	2.8	3.2	2.8
950	0.2	0.2	0.3	0.8	0.7	0.4	0.4	0.3	0.5	0.4	0.4	0.8	1.3	1.3	1.6	1.4	1.0	1.9
1000	0.1	0.1	0.4	1.1	0.9	0.2	0.3	0.4	0.3	0.2	0.5	0.7	0.9	0.5	0.9	1.2	1.6	2.8
MEAN	0.7	0.8	0.6	0.8	0.8	0.5	0.4	0.6	0.8	0.8	0.8	0.9	1.1	1.1	1.6	2.4	2.7	2.3
								YEAR										
50	2.9	3.0	3.7	4.0	3.5	2.3	2.0	2.0	1.6	1.0	0.9	0.8	1.0	1.8	3.5	6.2	8.8	12.1
100	1.1	1.2	0.8	0.9	0.5	0.7	0.7	0.3	0.3	1.0	1.6	1.5	1.5	2.3	4.3	7.0	9.5	11.8
200	0.3	0.5	0.2	0.3	0.5	0.4	0.5	0.9	1.1	0.9	0.9	1.6	2.4	3.3	5.0	6.3	7.8	9.9
300	0.3	0.3	0.2	0.4	0.4	0.5	0.7	0.9	1.0	1.4	1.9	1.4	0.9	1.4	1.8	2.0	2.4	2.6
400	0.4	0.4	0.2	0.2	0.3	0.2	0.4	0.7	1.2	1.8	1.7	1.3	1.9	2.2	1.8	1.4	2.1	3.1
500	0.4	0.3	0.3	0.2	0.2	0.2	0.4	0.6	1.0	1.2	1.2	1.8	2.8	3.0	2.4	1.2	1.1	1.8
700	0.4	0.2	0.2	0.3	0.3	0.2	0.4	0.7	1.1	1.0	0.9	1.7	2.6	2.6	1.8	0.8	1.7	2.8
850	0.6	0.3	0.4	0.3	0.2	0.3	0.5	0.6	1.1	1.1	0.4	1.8	3.1	3.4	3.2	2.2	2.4	3.1
900	0.4	0.2	0.4	0.2	0.1	0.2	0.5	0.7	1.2	1.1	0.5	1.8	2.9	3.9	5.0	4.6	3.9	3.2
950	0.5	0.2	0.3	0.2	0.2	0.3	0.5	0.8	1.1	1.0	1.0	1.7	2.9	3.9	4.9	5.9	5.8	4.0
1000	1.0	0.4	0.2	0.2	0.1	0.2	0.4	0.8	0.8	1.0	0.8	1.2	2.2	4.2	6.1	6.0	7.2	11.9
MEAN	0.5	0.4	0.3	0.3	0.3	0.3	0.5	0.7	1.0	1.2	1.1	1.6	2.3	2.8	3.0	2.9	3.6	4.6

TABLE B4b.—*Interannual standard deviation of the variance of the temperature resulting from stationary eddies* $\sigma([\bar{T}^{*2}])$, °C²

			σ ([$\bar{T}^{*2}$])					60 MONTHS									
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.1	0.2	0.3	0.6	0.8	1.0	1.0	1.2	1.5	1.8	2.0	2.8	4.6	6.4	8.4	9.3	9.0	7.5
100	0.3	0.4	0.4	0.6	0.8	1.0	1.1	1.0	1.0	1.3	1.6	2.2	3.7	5.9	8.2	8.9	8.5	7.2
200	0.1	0.1	0.1	0.2	0.4	0.6	1.0	1.3	1.4	1.9	2.0	2.1	3.2	4.4	5.5	5.4	4.7	3.5
300	0.1	0.1	0.1	0.2	0.2	0.3	0.7	1.1	1.3	1.4	1.2	1.1	1.3	1.6	1.6	1.7	1.5	1.2
400	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.7	0.8	0.9	1.0	1.7	2.4	2.6	2.7	2.6	2.3	2.1
500	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.7	1.2	1.4	2.5	3.3	3.3	3.5	3.4	3.0	2.8
700	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.6	1.1	1.7	2.1	3.2	3.9	4.0	4.2	4.2	3.9	3.5
850	0.0	0.1	0.2	0.3	0.7	1.2	1.6	1.6	1.6	2.1	2.8	3.6	4.5	5.2	5.6	6.4	6.1	5.0
900	0.1	0.1	0.2	0.3	0.6	1.1	1.4	1.4	1.6	2.2	2.8	3.5	4.8	5.6	6.6	8.1	7.9	6.2
950	0.1	0.2	0.2	0.2	0.4	0.7	1.0	1.1	1.4	2.1	2.6	3.3	5.1	6.8	9.3	11.5	11.7	9.5
1000	0.2	0.2	0.2	0.3	0.4	0.5	0.8	1.0	1.6	2.1	2.1	3.6	5.8	7.5	10.4	13.4	14.9	13.3
MEAN	0.1	0.1	0.1	0.2	0.3	0.5	0.7	0.9	1.1	1.5	1.9	2.6	3.5	4.2	4.9	5.3	5.0	4.3
								JANUARY										
50	0.1	0.1	0.3	0.3	0.5	0.5	0.2	0.5	0.8	1.7	2.6	3.7	4.6	5.9	9.1	10.2	9.3	9.1
100	0.4	0.5	0.5	0.5	1.0	1.3	1.1	1.0	0.5	2.3	4.1	4.9	5.4	5.9	6.2	4.9	3.4	4.5
200	0.1	0.1	0.1	0.2	0.2	0.3	0.6	1.3	2.4	3.6	3.7	3.2	2.3	2.7	3.0	2.4	2.7	3.8
300	0.1	0.1	0.1	0.2	0.3	0.4	0.9	1.7	2.3	2.1	1.0	1.0	1.2	1.0	0.5	0.2	0.4	0.8
400	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.7	1.1	1.5	1.1	1.5	2.0	1.5	2.2	2.7	2.2	1.5
500	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	1.2	2.9	2.0	2.9	3.0	1.6	2.7	3.2	2.3	1.3
700	0.0	0.0	0.1	0.2	0.2	0.3	0.7	1.5	2.9	3.8	3.1	4.3	3.7	2.2	3.5	4.9	4.2	2.7
850	0.1	0.1	0.1	0.2	0.3	0.4	0.8	1.6	2.6	3.4	4.6	5.9	5.9	5.9	4.7	6.2	7.4	6.0
900	0.1	0.2	0.4	0.3	0.3	0.5	0.9	1.5	2.5	3.7	5.1	5.5	5.9	7.4	7.1	7.5	10.2	9.2
950	0.0	0.1	0.1	0.2	0.3	0.7	1.3	1.8	2.7	4.2	5.0	5.3	6.7	5.8	9.7	13.6	14.6	12.9
1000	0.1	0.1	0.3	0.5	0.7	1.0	1.8	2.1	3.6	4.8	3.7	5.3	8.1	7.2	9.5	14.2	18.5	16.6
MEAN	0.1	0.1	0.1	0.2	0.3	0.4	0.7	1.2	2.1	3.1	3.0	3.7	3.8	3.3	3.9	4.7	4.7	4.1
								JULY										
50	0.1	0.2	0.3	0.4	0.6	0.7	0.9	1.1	1.8	2.0	1.7	1.2	1.0	0.6	0.7	0.9	0.8	0.7
100	0.4	0.2	0.1	0.5	0.7	0.6	1.3	1.8	2.0	1.8	0.9	0.3	0.3	0.4	0.4	0.3	0.2	0.3
200	0.1	0.1	0.1	0.2	0.5	1.3	1.3	0.6	0.5	1.0	1.9	2.0	1.0	0.6	0.5	0.4	0.2	0.5
300	0.0	0.1	0.2	0.2	0.3	0.4	0.6	0.7	1.4	2.3	2.1	1.5	1.3	1.1	1.2	1.5	1.2	0.6
400	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.9	1.5	1.1	0.9	1.1	1.0	1.0	1.5	1.4	1.2
500	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.6	0.9	0.5	0.5	0.7	0.9	1.0	1.4	1.5	1.4
700	0.1	0.0	0.0	0.1	0.3	0.4	0.3	0.1	0.4	0.7	0.4	0.7	0.9	0.8	0.6	0.9	1.4	1.5
850	0.0	0.1	0.2	0.5	0.8	1.1	1.1	1.3	1.4	1.3	1.3	1.5	1.1	0.6	0.2	0.3	0.5	0.7
900	0.3	0.1	0.2	0.3	0.6	0.8	0.6	0.8	1.7	2.0	2.7	1.9	1.3	0.7	1.1	1.0	1.4	2.0
950	0.1	0.2	0.2	0.3	0.4	0.6	0.3	0.5	1.3	1.7	2.5	2.6	2.2	2.0	2.0	1.2	1.5	2.3
1000	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.6	1.1	1.1	1.1	1.4	1.6	1.6	1.3	1.1	1.2	1.3
MEAN	0.1	0.1	0.1	0.2	0.4	0.5	0.5	0.6	1.0	1.3	1.2	1.1	1.0	0.9	0.8	1.0	1.1	1.1
								YEAR										
50	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	0.8	0.7	0.8	1.2	1.5	1.9	2.0	1.7	1.2
100	0.1	0.3	0.3	0.3	0.5	0.7	0.5	0.4	0.3	0.1	0.1	0.2	0.5	1.1	1.6	1.7	1.4	0.7
200	0.1	0.0	0.1	0.1	0.2	0.4	0.5	0.3	0.2	0.4	0.4	0.3	0.6	1.1	1.4	1.2	1.0	0.8
300	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.4	0.5	0.4	0.2	0.1	0.2	0.3	0.3	0.1	0.1	0.1
400	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.3	0.4	0.3	0.2	0.3
500	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.4	0.5	0.4	0.5	0.7
700	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.3	0.3	0.4	0.6	0.5	0.4	0.6	0.8
850	0.0	0.0	0.1	0.1	0.3	0.7	1.0	0.8	0.7	0.5	0.4	0.7	1.0	1.2	1.0	0.6	0.5	0.9
900	0.0	0.0	0.0	0.1	0.3	0.6	0.7	0.6	0.5	0.3	0.4	0.8	1.2	1.6	1.6	0.9	0.8	0.7
950	0.1	0.1	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.3	0.4	0.8	1.6	2.1	2.3	1.7	1.3	1.1
1000	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.9	1.7	2.2	2.4	2.8	3.2	3.6
MEAN	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.8	0.9	0.8	0.8	0.8

TABLE B5.—*Interannual standard deviation of the variance of the geopotential height resulting from stationary eddies $\sigma([\bar{Z}^{*2}])$, $10^2 gpm^2$*

			$\sigma([\overline{Z}^{*2}])$				60 MONTHS											
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.4	1.0	2.5	2.3	3.2	4.6	5.7	6.6	8.8	11.4	16.3	24.7	39.0	55.7	76.8	82.8	89.2	87.5
100	2.0	1.5	1.4	2.5	3.5	5.6	7.2	8.1	9.6	9.6	13.6	24.4	38.4	52.0	61.5	58.8	55.7	55.5
200	0.6	0.7	0.8	1.3	1.7	2.2	3.7	5.7	8.7	11.8	17.4	31.9	49.3	58.3	58.3	50.2	37.8	31.8
300	0.2	0.2	0.4	0.6	0.9	1.3	1.8	3.2	6.9	13.4	18.9	33.4	51.1	58.8	55.9	46.1	36.2	30.2
400	0.1	0.2	0.4	0.6	1.1	1.3	2.1	3.7	7.3	12.9	16.0	27.5	41.9	47.3	43.6	36.6	29.5	28.6
500	0.1	0.1	0.2	0.3	0.4	0.6	1.0	2.3	5.5	9.2	11.3	19.3	29.6	33.4	30.3	26.3	23.1	27.9
700	0.1	0.2	0.2	0.5	0.9	0.7	1.1	2.3	4.7	5.8	6.4	9.4	14.0	16.6	15.6	11.8	9.3	8.9
850	0.2	0.2	0.2	0.2	0.4	0.6	0.9	1.3	2.0	3.0	4.2	6.2	9.5	11.3	10.2	7.1	4.8	5.7
900	0.3	0.3	0.3	0.4	0.6	0.9	1.4	1.9	2.3	3.1	4.1	6.1	9.5	11.2	9.6	6.7	5.2	9.5
950	0.2	0.6	0.8	0.5	0.6	1.0	2.4	2.6	2.5	3.2	4.2	6.4	10.3	12.2	10.4	6.6	5.6	7.2
1000	0.4	0.5	0.5	0.5	0.6	1.1	2.9	3.1	2.7	3.1	4.2	6.6	10.8	12.9	11.5	6.9	6.7	7.6
MEAN	0.4	0.4	0.4	0.7	1.0	1.4	2.1	3.3	5.5	8.0	10.7	18.2	27.9	32.9	31.9	26.8	22.0	21.6
									JANUARY									
50	0.5	1.2	3.2	3.0	4.1	5.4	6.6	8.3	11.8	16.9	25.5	37.0	53.7	77.4	111.9	115.5	103.2	96.5
100	3.0	1.7	1.6	1.6	1.8	2.8	2.0	6.1	8.4	9.9	17.6	26.7	33.8	54.8	91.9	92.6	59.3	33.8
200	0.8	1.0	1.0	1.5	2.4	2.9	3.5	7.2	10.6	16.9	12.7	14.1	15.6	26.4	65.1	75.5	51.7	32.7
300	0.3	0.3	0.3	0.6	1.2	1.6	1.6	5.4	16.3	34.4	27.0	30.1	31.1	28.3	53.9	64.9	47.2	24.1
400	0.0	0.1	0.2	0.2	0.5	0.8	1.7	5.9	18.3	33.3	27.4	38.6	45.4	49.5	68.5	65.1	42.8	21.5
500	0.1	0.2	0.3	0.3	0.3	0.5	1.8	6.1	15.4	25.3	20.7	27.9	35.5	39.5	50.4	48.1	29.7	12.7
700	0.2	0.2	0.3	0.7	1.2	1.1	1.9	4.6	10.4	14.2	13.5	15.0	15.0	14.5	22.4	22.5	11.7	3.8
850	0.2	0.2	0.3	0.4	0.5	0.7	1.1	2.1	4.2	6.9	8.2	10.8	14.8	12.6	12.4	13.6	9.0	4.7
900	0.3	0.3	0.3	0.4	0.5	0.7	1.2	2.2	4.2	6.4	7.7	11.0	16.8	14.6	8.9	10.4	9.0	6.2
950	0.2	0.2	0.2	0.3	0.5	0.8	1.8	2.5	3.9	6.1	7.9	11.9	20.2	19.0	9.8	8.9	9.6	6.3
1000	0.4	0.4	0.3	0.4	0.5	0.7	1.8	3.1	4.3	6.0	8.2	12.0	21.1	21.1	12.7	9.0	10.2	5.5
MEAN	0.5	0.4	0.4	0.6	0.9	1.2	1.9	4.9	11.0	17.7	16.2	20.7	24.9	28.0	42.0	43.7	29.0	15.2
									JULY									
50	0.3	0.7	2.0	1.7	1.8	2.6	3.1	1.6	0.6	1.3	2.5	5.1	8.4	9.2	9.4	10.6	9.9	8.2
100	1.1	1.2	1.0	0.7	2.5	9.3	12.6	9.7	7.5	7.9	10.9	13.6	16.2	13.5	13.0	16.1	15.3	12.2
200	0.3	0.3	0.9	2.0	2.5	1.1	1.6	4.3	6.7	8.9	5.3	8.9	15.7	16.8	18.9	24.7	21.3	13.2
300	0.2	0.3	1.0	1.1	1.5	1.3	0.9	0.9	1.4	2.5	2.0	4.4	11.4	12.9	16.1	21.1	15.6	7.1
400	0.2	0.2	0.1	0.3	0.7	1.1	2.8	3.5	6.2	11.4	11.0	3.6	6.4	8.3	9.4	12.1	8.5	4.2
500	0.2	0.2	0.2	0.3	0.5	0.9	1.3	1.8	4.6	3.4	2.9	3.0	4.3	5.5	6.4	7.7	6.6	5.4
700	0.2	0.2	0.2	0.5	0.8	0.9	1.6	1.9	1.9	1.8	2.6	3.1	3.1	3.1	3.4	3.6	2.8	1.9
850	0.2	0.3	0.4	0.4	0.7	1.1	1.5	1.9	2.5	2.5	3.1	3.8	3.6	2.6	2.1	2.2	1.6	1.7
900	0.3	0.5	0.6	0.7	1.0	1.3	1.0	1.7	2.8	3.0	3.4	4.5	4.3	2.6	1.8	2.3	2.0	1.6
950	0.5	1.1	1.5	0.9	1.1	1.3	1.5	1.7	3.0	3.5	4.0	5.1	4.8	2.6	1.6	1.9	1.6	0.6
1000	0.6	0.7	0.9	0.9	1.0	1.3	2.5	2.3	4.4	4.4	4.2	4.9	4.5	2.4	1.3	1.5	1.4	1.1
MEAN	0.3	0.4	0.5	0.7	1.1	1.8	2.5	2.8	3.9	4.6	4.6	5.1	7.2	7.2	7.9	9.9	8.1	5.2
									YEAR									
50	0.3	0.6	1.7	1.3	2.0	3.1	4.0	3.8	3.2	3.4	4.4	5.7	7.5	12.0	21.2	19.8	14.2	9.1
100	1.0	0.6	0.8	1.0	1.8	4.2	4.9	3.3	2.2	2.7	4.3	4.9	6.8	10.6	12.7	11.6	8.9	6.0
200	0.4	0.3	0.3	0.4	0.5	1.0	1.6	1.6	1.4	2.4	4.5	4.3	5.4	8.8	8.6	7.7	5.4	2.4
300	0.1	0.1	0.1	0.3	0.4	0.4	0.7	0.6	1.9	2.2	3.5	3.9	6.5	9.7	8.5	7.1	5.9	4.9
400	0.1	0.1	0.1	0.1	0.2	0.4	0.9	1.8	3.3	2.5	2.3	3.2	4.6	6.2	4.1	3.3	3.8	4.5
500	0.1	0.1	0.1	0.2	0.2	0.3	0.6	0.8	1.9	1.0	1.5	2.2	3.1	4.2	2.7	2.3	3.2	3.3
700	0.1	0.1	0.1	0.4	0.7	0.3	0.3	0.6	1.5	1.2	0.9	1.4	1.9	2.7	2.0	1.4	1.1	0.8
850	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.4	0.5	0.8	1.4	1.8	1.2	0.7	0.2	0.5
900	0.2	0.2	0.2	0.2	0.2	0.4	0.7	0.8	0.8	0.6	0.5	0.6	1.3	1.7	1.3	0.7	0.4	1.9
950	0.2	0.2	0.1	0.2	0.3	0.5	1.4	1.4	0.9	0.6	0.5	0.6	1.4	1.9	1.4	0.6	0.4	1.0
1000	0.3	0.3	0.2	0.2	0.1	0.2	1.2	2.0	0.6	0.7	0.6	0.7	1.5	1.9	1.5	0.7	0.5	1.0
MEAN	0.2	0.2	0.2	0.3	0.5	0.7	1.1	1.2	1.5	1.4	2.0	2.4	3.5	5.1	4.4	3.7	3.1	2.7

TABLE B6a.—*Interannual standard deviation of the variance of the specific humidity resulting from transient eddies $\sigma([\overline{q'^2}])$, $g^2 \cdot kg^{-2}$*

$\sigma([\overline{q'^2}])$

60 MONTHS

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
700	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
850	0.6	0.5	0.5	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
900	0.4	0.4	0.4	0.3	0.3	0.3	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
950	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
1000	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2
MEAN	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

JANUARY

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
700	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0
850	1.1	0.7	0.4	0.5	0.2	0.3	0.1	0.4	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1
900	0.7	0.5	0.3	0.4	0.1	0.3	0.1	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
950	0.5	0.4	0.3	0.5	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1
1000	0.3	0.3	0.3	0.5	0.3	0.2	0.5	0.6	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
MEAN	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0

JULY

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.0	0.0	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.3	0.2	0.3	0.5	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.0	0.0
850	0.9	0.6	0.2	0.2	0.2	0.1	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1
900	0.7	0.5	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
950	0.6	0.6	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3
1000	0.5	0.6	0.4	0.2	0.2	0.2	0.1	0.2	0.4	0.4	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.2
MEAN	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

YEAR

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2
400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
500	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.4	0.3	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
850	0.4	0.2	0.1	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.1
900	0.3	0.2	0.1	0.2	0.3	0.5	0.4	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1
950	0.3	0.1	0.1	0.1	0.3	0.7	0.6	0.3	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1
1000	0.4	0.1	0.2	0.2	0.2	0.4	0.5	0.3	0.1	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2
MEAN	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

TABLE B6b.—*Interannual standard deviation of the variance of the specific humidity resulting from stationary eddies* $\sigma([\bar{q}^{*2}])$, $g^2 \cdot kg^{-2}$

$\sigma([\bar{q}^{*2}])$							60 MONTHS											
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
850	0.1	0.1	0.1	0.3	0.7	1.0	0.9	0.7	0.6	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
900	0.2	0.1	0.1	0.3	0.9	1.4	1.1	0.8	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1
950	0.2	0.2	0.1	0.3	1.0	1.7	1.3	0.8	0.6	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1
1000	0.2	0.2	0.1	0.2	0.5	0.7	0.6	0.7	0.7	0.5	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.1
MEAN	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
								JANUARY										
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
850	0.1	0.1	0.2	0.5	1.0	1.5	1.1	0.4	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1
900	0.1	0.1	0.2	0.5	1.3	1.9	1.2	0.4	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1
950	0.2	0.1	0.2	0.4	1.4	2.1	1.2	0.4	0.2	0.4	0.3	0.2	0.1	0.1	0.2	0.2	0.1	0.1
1000	0.2	0.2	0.1	0.3	0.7	0.8	0.4	0.3	0.4	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1
MEAN	0.1	0.1	0.1	0.2	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
								JULY										
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.7	0.9	0.4	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
850	0.1	0.1	0.1	0.2	0.3	0.4	0.7	0.6	0.5	0.6	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1
900	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.7	0.9	0.8	0.4	0.2	0.2	0.2	0.2	0.2	0.1	0.1
950	0.3	0.2	0.1	0.1	0.2	0.2	0.5	0.8	1.0	0.8	0.4	0.2	0.2	0.3	0.3	0.2	0.2	0.1
1000	0.3	0.2	0.2	0.1	0.1	0.2	0.5	1.0	1.0	0.8	0.4	0.2	0.2	0.1	0.3	0.3	0.2	0.1
MEAN	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
								YEAR										
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
850	0.0	0.0	0.0	0.1	0.3	0.5	0.5	0.3	0.2	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
900	0.1	0.0	0.0	0.1	0.4	0.7	0.6	0.3	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0
950	0.1	0.1	0.0	0.1	0.5	0.8	0.6	0.3	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
1000	0.2	0.2	0.1	0.1	0.2	0.4	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1
MEAN	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE C1a.—*Interannual standard deviation of the northward transport of westerly momentum by transient eddies* $\sigma([\overline{v'u'}])$, $m^2 \cdot s^{-2}$

$\sigma([\overline{v'u'}])$ 60 MONTHS																		
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	4.3	4.0	3.4	2.9	2.0	1.7	1.7	2.0	2.3	2.8	3.2	3.3	4.4	5.7	8.3	9.6	11.2	14.8
100	3.8	2.7	2.5	3.0	2.7	2.5	2.6	3.3	3.4	2.7	2.5	2.3	2.5	3.1	4.2	4.9	4.5	5.0
200	4.7	3.7	3.8	3.2	2.7	3.8	5.2	6.8	7.6	6.9	6.9	6.3	5.2	4.4	4.5	4.3	4.6	5.2
300	3.1	2.3	2.5	2.9	2.7	2.9	3.8	5.5	6.2	6.3	7.7	7.8	6.3	5.7	6.8	7.4	8.8	10.6
400	2.5	2.0	1.6	1.6	1.7	2.1	2.8	3.5	4.0	4.8	5.7	6.0	5.9	5.8	5.8	6.0	6.5	6.8
500	1.7	1.0	1.0	1.2	1.5	1.7	2.0	2.1	2.4	3.3	3.9	3.9	3.9	4.2	4.5	5.1	5.8	5.9
700	1.5	0.9	0.6	0.9	1.5	1.4	1.3	1.3	1.7	2.3	2.4	2.3	2.4	2.2	2.2	2.4	2.6	3.5
850	1.6	0.9	0.8	0.8	1.0	1.2	1.2	1.4	1.5	1.6	1.7	1.9	1.9	1.6	1.6	1.7	2.0	2.7
900	1.0	0.7	0.6	0.6	0.8	0.9	1.1	1.5	1.8	1.8	1.8	2.0	2.3	2.0	2.1	2.0	2.2	3.0
950	0.6	0.5	0.5	0.4	0.5	0.6	0.9	1.4	1.7	1.6	1.6	1.9	2.2	2.1	2.3	2.3	2.6	3.5
1000	0.6	0.5	0.5	0.4	0.6	0.6	0.8	1.1	1.4	1.4	1.6	1.8	1.9	1.9	2.2	2.1	2.4	3.2
MEAN	2.1	1.5	1.4	1.5	1.6	1.8	2.2	2.8	3.2	3.4	3.8	3.8	3.5	3.4	3.7	4.0	4.4	5.0
JANUARY																		
50	3.4	2.5	1.3	2.0	1.9	1.3	1.9	2.3	2.5	2.6	3.5	3.9	5.2	9.7	16.6	19.9	20.1	16.9
100	4.0	4.1	3.4	4.4	2.9	2.1	3.8	4.3	3.2	3.0	2.4	1.7	2.4	5.3	7.9	9.4	9.0	9.2
200	6.1	2.4	2.2	2.3	1.9	2.5	3.9	7.1	8.5	6.2	4.9	4.2	4.6	7.2	8.6	8.8	9.2	7.3
300	3.2	1.3	3.1	4.5	3.8	2.7	2.6	5.2	6.3	4.9	6.6	8.5	6.9	6.5	8.4	10.6	12.0	7.3
400	1.0	1.0	1.0	1.5	1.7	2.1	1.7	4.0	6.1	6.4	5.9	6.8	7.4	8.7	10.5	11.2	9.5	5.6
500	1.7	0.5	0.9	0.8	0.8	1.0	0.8	1.2	3.0	5.6	5.2	3.8	4.3	7.1	8.5	9.8	10.5	6.3
700	1.3	0.5	0.6	0.6	0.7	0.9	1.0	1.5	3.3	5.4	4.9	3.5	3.0	1.6	3.3	5.3	5.3	4.2
850	1.9	0.8	0.8	0.9	1.4	1.4	1.2	1.5	1.1	2.4	3.2	3.3	2.8	2.2	1.8	1.6	3.1	3.2
900	1.0	0.8	0.7	0.6	0.8	0.8	1.2	1.8	1.8	2.1	2.4	2.7	3.0	3.2	3.0	2.1	2.4	3.8
950	0.5	0.8	0.7	0.5	0.5	0.3	1.0	1.7	1.6	1.9	2.3	2.7	2.9	3.1	3.5	3.2	3.1	4.2
1000	0.6	0.8	0.7	0.6	0.8	0.6	0.6	1.2	1.2	2.0	2.9	3.0	2.8	2.4	1.9	2.0	2.7	4.1
MEAN	2.1	1.2	1.3	1.6	1.5	1.4	1.6	2.8	3.8	4.4	4.4	4.2	4.1	4.8	6.0	7.1	7.3	5.3
JULY																		
50	3.1	2.5	1.6	3.0	2.3	1.9	1.9	1.4	1.1	0.8	0.8	0.8	1.1	1.5	2.5	2.4	1.8	1.8
100	1.6	2.6	2.7	3.3	2.6	1.9	2.3	2.6	1.7	1.4	1.4	1.9	1.7	1.7	1.8	1.4	0.6	1.6
200	3.9	4.4	3.0	2.6	1.5	1.2	2.3	3.4	3.8	4.2	3.4	5.8	6.9	3.9	2.0	2.1	3.4	6.3
300	3.6	2.6	1.5	1.4	1.4	1.7	2.0	2.4	2.4	2.9	5.4	7.7	7.8	4.0	3.4	6.4	9.2	11.9
400	3.2	1.9	1.3	0.5	0.8	0.8	1.0	0.8	0.9	0.9	1.9	3.1	3.9	3.3	3.0	4.1	5.2	7.7
500	2.2	1.5	1.0	0.5	0.6	0.7	1.0	1.0	0.6	1.4	2.2	1.7	1.6	2.2	2.9	4.5	5.1	5.0
700	1.5	0.6	0.5	0.9	1.5	0.9	1.1	0.7	0.8	1.1	1.1	1.0	2.0	2.0	1.3	1.4	1.1	1.7
850	1.4	0.4	0.4	0.5	1.0	0.7	0.7	0.6	0.6	0.5	0.9	1.2	1.1	0.9	1.7	2.2	2.1	2.0
900	0.9	0.1	0.2	0.7	1.2	1.1	0.9	0.6	0.6	0.8	1.4	1.5	1.2	1.0	1.3	1.5	1.2	1.6
950	0.8	0.3	0.3	0.4	0.7	0.5	0.5	0.5	0.5	0.9	1.5	1.6	1.4	1.1	1.1	1.2	1.6	2.7
1000	1.2	0.5	0.4	0.7	1.2	1.1	0.6	0.5	0.5	0.7	1.4	1.3	0.7	0.7	1.0	0.9	1.4	1.9
MEAN	2.0	1.5	1.1	1.1	1.2	1.0	1.2	1.3	1.3	1.5	2.1	2.7	3.0	2.2	2.0	2.8	3.3	4.2
YEAR																		
50	4.4	4.0	2.9	1.3	0.5	0.4	0.8	1.3	1.2	1.2	1.0	0.8	1.2	2.0	3.6	4.7	5.4	5.6
100	0.4	0.9	0.7	0.5	0.3	0.2	0.8	1.4	1.0	0.4	0.6	0.8	1.0	1.6	2.3	2.2	1.5	1.4
200	1.6	1.2	1.2	0.9	0.7	0.7	1.4	2.8	2.7	2.7	3.0	2.3	1.0	2.0	3.1	2.6	1.3	1.7
300	1.2	0.8	0.5	0.5	0.6	0.4	1.3	2.4	2.6	3.0	3.7	3.1	2.4	2.2	3.7	3.0	1.2	1.9
400	0.8	0.7	0.7	0.5	0.4	0.6	1.2	2.2	1.5	1.9	2.8	2.7	2.1	1.9	2.1	1.9	1.2	2.8
500	0.5	0.3	0.4	0.3	0.4	0.6	1.0	1.5	1.3	1.9	2.0	1.7	1.7	2.0	2.4	2.2	1.7	1.3
700	0.8	0.3	0.1	0.3	0.4	0.3	0.4	0.4	0.2	0.8	1.0	0.5	0.7	0.9	0.9	0.8	1.0	1.2
850	1.4	0.6	0.2	0.4	0.5	0.5	0.4	0.5	0.4	0.4	0.8	0.6	0.8	0.8	0.5	0.5	0.7	0.8
900	0.9	0.4	0.4	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.8	0.8	0.8	0.7	0.4	0.2	0.4	0.8
950	0.5	0.2	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.7	0.9	0.9	0.7	0.7	0.7	0.9	1.3
1000	0.3	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.7	0.9	0.8	0.6	0.9	0.8	0.7	0.8
MEAN	0.8	0.5	0.4	0.4	0.4	0.5	0.8	1.3	1.1	1.4	1.7	1.4	1.2	1.4	1.8	1.6	1.1	1.4

TABLE C1b.—*Interannual standard deviation of the northward transport of westerly momentum by stationary eddies* $\sigma([\bar{v}^*\bar{u}^*])$, $m^2 \cdot s^{-2}$

$\sigma([\bar{v}^*\bar{u}^*])$								60 MONTHS									
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.0	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.8	1.6	2.3	2.8	3.9	4.9	6.0	6.1	5.8	5.1
100	0.6	0.7	1.0	1.2	1.6	1.8	1.6	2.2	2.8	3.5	3.4	3.2	3.6	3.9	4.5	5.0	5.4	6.9
200	0.7	1.3	1.9	2.0	2.3	2.5	3.0	4.4	5.2	6.8	6.0	5.5	6.2	6.1	5.3	5.0	5.3	5.7
300	0.4	0.5	0.7	0.9	1.4	2.0	3.0	4.2	4.5	5.4	5.5	5.9	7.3	7.4	6.4	6.0	6.0	6.4
400	0.2	0.2	0.3	0.4	0.7	1.2	2.2	3.3	3.6	3.9	4.0	4.6	5.9	6.6	5.8	5.3	5.4	5.7
500	0.1	0.1	0.2	0.3	0.6	0.8	1.4	2.1	2.6	2.9	3.0	3.3	4.4	5.2	4.8	4.2	3.9	4.4
700	0.2	0.2	0.3	0.4	0.6	0.6	0.5	0.9	1.5	1.6	1.6	1.9	2.4	2.8	2.8	2.2	1.9	2.3
850	0.3	0.3	0.3	0.5	0.6	0.6	0.5	0.7	1.0	1.0	1.0	1.5	1.8	1.9	1.8	1.3	1.2	1.7
900	0.6	0.5	0.4	0.6	0.7	0.7	0.5	0.6	1.0	1.0	1.0	1.4	1.6	1.6	1.7	1.4	1.0	1.2
950	0.5	0.4	0.4	0.6	0.7	0.7	0.6	0.7	0.9	0.9	0.9	1.2	1.5	1.4	1.5	1.1	0.8	1.0
1000	0.2	0.2	0.3	0.5	0.6	0.5	0.4	0.5	0.7	0.7	0.6	0.9	1.2	1.2	1.1	0.8	0.6	0.6
MEAN	0.3	0.4	0.6	0.7	0.9	1.1	1.4	2.1	2.5	3.0	2.9	3.2	3.9	4.2	3.9	3.5	3.4	3.9
								JANUARY									
50	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.5	1.1	2.4	3.4	4.9	7.8	10.5	11.6	11.1	10.8	9.3
100	1.1	1.4	1.7	2.3	3.5	4.1	2.7	3.4	4.8	5.7	4.3	4.4	5.1	6.2	7.8	7.5	4.5	6.0
200	0.7	1.7	2.9	3.8	5.0	3.8	4.6	9.4	8.0	8.3	8.0	6.3	5.7	6.8	7.4	7.5	4.9	3.4
300	0.2	0.6	1.3	1.9	2.9	3.1	2.7	4.2	4.2	6.1	9.7	10.0	10.8	10.9	11.0	10.2	6.7	3.1
400	0.3	0.4	0.6	0.9	1.3	1.7	3.1	5.0	4.7	4.8	8.0	8.7	9.2	10.4	10.1	8.9	6.6	2.8
500	0.1	0.1	0.4	0.7	1.2	1.1	1.5	2.0	2.0	4.0	6.3	6.0	5.4	6.8	8.3	7.7	5.3	3.6
700	0.2	0.3	0.4	0.4	0.4	0.5	0.8	1.8	2.6	2.9	3.1	3.3	3.1	3.9	5.2	4.3	3.0	3.3
850	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.8	1.6	1.7	1.6	1.6	1.5	2.7	3.3	2.7	2.6	3.1
900	0.4	0.4	0.4	0.6	0.6	0.4	0.4	0.5	1.4	1.7	1.0	1.0	0.9	2.1	3.1	2.9	2.5	2.3
950	0.6	0.6	0.5	0.6	0.6	0.4	0.5	0.6	1.2	1.5	0.8	0.5	0.6	1.5	2.5	2.3	1.9	1.6
1000	0.4	0.4	0.3	0.3	0.3	0.3	0.5	0.6	0.8	0.9	0.8	0.4	0.4	0.9	1.1	1.1	0.9	0.8
MEAN	0.3	0.5	0.8	1.2	1.6	1.6	1.7	3.0	3.3	4.0	4.9	4.8	4.8	5.7	6.6	6.0	4.3	3.2
								JULY									
50	0.0	0.0	0.1	0.3	0.6	0.5	0.3	0.5	0.6	0.6	0.7	0.5	0.1	0.4	0.5	0.4	0.2	0.7
100	0.6	0.5	0.7	1.2	1.8	1.6	0.8	1.3	2.4	2.2	1.7	1.4	1.2	1.2	1.3	1.1	0.5	0.3
200	0.6	1.2	1.7	1.4	1.8	2.2	2.0	1.6	3.5	5.4	3.8	1.9	1.5	2.0	2.5	2.1	1.4	0.9
300	0.3	0.4	0.4	0.5	0.7	1.3	1.6	1.6	2.5	3.8	3.1	2.6	2.4	1.7	2.0	2.2	1.7	2.2
400	0.2	0.3	0.3	0.3	0.5	0.6	0.6	0.9	1.0	1.7	1.7	1.8	2.0	1.7	1.7	2.0	2.8	2.7
500	0.1	0.2	0.3	0.3	0.2	0.5	0.5	0.8	0.9	0.6	0.5	0.8	1.5	1.6	1.5	1.4	1.7	1.9
700	0.2	0.2	0.6	1.0	1.4	1.5	1.0	0.5	0.7	0.5	0.3	0.5	0.9	1.1	1.2	1.2	1.2	1.3
850	0.4	0.4	0.4	0.8	1.1	1.0	0.9	0.8	0.5	0.4	0.3	0.3	0.6	0.7	0.8	0.7	0.8	1.0
900	0.6	0.4	0.6	1.2	1.2	1.0	1.0	0.9	0.5	0.5	0.3	0.2	0.4	0.6	0.6	0.6	0.7	0.7
950	0.3	0.3	0.6	1.2	1.2	0.9	0.8	0.5	0.3	0.3	0.2	0.2	0.4	0.5	0.5	0.5	0.6	0.5
1000	0.1	0.3	0.5	1.0	1.2	0.9	0.4	0.2	0.3	0.3	0.2	0.4	0.3	0.4	0.3	0.4	0.4	0.4
MEAN	0.3	0.4	0.6	0.8	1.0	1.1	0.9	0.9	1.3	1.6	1.2	1.1	1.2	1.3	1.4	1.4	1.3	1.4
								YEAR									
50	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.6	0.7	0.9	0.9	1.0	0.8
100	0.2	0.2	0.3	0.3	0.3	0.6	0.6	0.4	0.4	0.6	0.6	0.4	0.4	0.5	0.7	0.9	1.2	1.4
200	0.3	0.3	0.5	0.4	0.5	1.0	1.1	0.9	1.0	1.0	1.0	0.8	0.5	0.7	0.9	1.1	1.3	1.3
300	0.1	0.1	0.1	0.1	0.2	0.5	0.7	0.9	1.1	1.4	1.4	1.2	1.0	0.8	1.0	1.0	0.9	0.7
400	0.0	0.0	0.1	0.1	0.1	0.2	0.4	0.6	0.5	0.6	1.0	1.0	0.8	1.2	1.2	0.9	0.6	0.5
500	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.7	0.7	0.6	0.8	1.0	0.8	0.6	0.7
700	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.5	0.5	0.4	0.4	0.5
850	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.3	0.2	0.2	0.2	0.4	0.3	0.2	0.2	0.4
900	0.3	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.3	0.3	0.2	0.3	0.4	0.4	0.2	0.2	0.3
950	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2
1000	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.2
MEAN	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.5	0.6	0.7	0.6	0.6	0.7

TABLE C1c.—*Interannual standard deviation of the northward transport of westerly momentum by mean meridional circulation $\sigma([\bar{v}]''[\bar{u}])$, $m^2 \cdot s^{-2}$*

$\sigma([\bar{v}]''[\bar{u}])$								60 MONTHS										
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	13.3	11.4	9.2	6.0	3.6	2.8	2.2	2.6	3.3	3.8	4.2	4.4	5.3	7.5	12.3	13.8	14.6	12.6
100	2.5	1.4	1.0	1.3	1.9	2.4	3.4	6.0	7.6	6.7	4.4	2.9	2.5	2.5	3.0	3.5	2.8	2.3
200	4.3	4.9	7.4	6.9	5.2	5.6	6.7	10.5	13.0	10.1	8.3	6.0	4.7	2.8	2.3	2.1	2.5	2.4
300	1.8	2.2	2.9	2.2	1.2	2.0	3.7	5.4	6.5	6.1	6.1	5.0	4.1	3.1	2.5	1.9	1.9	2.5
400	0.9	1.4	1.6	1.4	0.9	1.0	2.0	2.8	3.0	3.2	3.4	2.9	2.5	2.2	2.0	1.5	1.7	2.1
500	0.8	1.0	1.0	1.1	0.7	0.5	1.0	1.8	2.3	2.3	1.8	1.6	1.7	1.3	1.2	1.1	1.1	1.0
700	1.0	1.0	1.3	1.1	0.6	0.6	0.4	1.0	1.4	1.2	0.9	1.0	1.0	0.8	0.7	0.5	0.5	0.5
850	2.8	1.5	1.1	0.8	0.8	0.9	0.4	0.3	0.6	0.7	0.9	1.0	1.1	0.8	0.5	0.4	0.5	0.5
900	2.0	1.3	1.0	0.8	0.8	0.8	0.5	0.3	0.5	0.8	0.9	1.1	1.2	0.8	0.4	0.4	0.6	0.6
950	1.4	1.1	0.8	0.8	0.8	0.9	0.8	0.5	0.4	0.7	0.8	1.1	1.3	0.9	0.5	0.4	0.6	0.7
1000	1.1	1.0	0.8	0.8	0.8	0.9	0.8	0.5	0.3	0.5	0.6	0.8	0.9	0.8	0.6	0.4	0.6	0.9
MEAN	1.8	1.7	1.9	1.7	1.3	1.4	1.9	2.9	3.6	3.2	2.7	2.3	2.0	1.6	1.3	1.2	1.2	1.3
								JANUARY										
50	23.9	20.4	17.4	10.5	4.3	1.7	1.2	1.2	3.1	5.8	9.3	10.8	10.5	10.7	14.4	20.7	29.1	22.2
100	1.8	1.2	0.9	1.2	0.5	2.9	6.6	10.5	13.7	13.5	7.9	5.0	3.7	4.2	4.8	3.7	3.5	2.3
200	1.0	3.4	7.7	7.6	6.9	9.6	9.3	12.5	14.7	6.1	5.8	3.0	1.0	2.5	2.7	2.9	2.9	2.7
300	1.7	2.9	4.3	3.1	1.5	3.2	8.2	10.9	11.2	6.3	4.8	4.4	5.0	3.8	2.0	0.7	1.3	1.1
400	1.0	0.8	1.3	2.6	1.7	1.6	4.1	4.5	3.2	3.6	5.4	5.8	4.5	3.1	2.0	1.2	1.0	1.9
500	0.9	0.9	1.4	1.8	0.9	0.4	1.7	2.2	3.2	4.3	1.8	3.0	2.9	1.8	1.6	1.0	0.6	0.4
700	0.3	0.6	1.7	1.6	0.8	0.4	0.7	2.1	3.0	2.3	1.0	0.4	0.5	0.4	0.4	0.5	0.5	0.5
850	0.3	0.3	1.2	1.2	1.5	1.9	0.6	0.5	1.0	0.9	1.0	1.7	2.2	1.8	0.8	0.3	0.5	0.3
900	0.4	0.3	0.5	0.5	0.7	1.6	0.8	0.2	0.6	0.7	0.9	2.1	2.6	1.9	0.8	0.5	1.1	1.0
950	0.7	0.6	0.4	0.4	0.4	1.5	1.2	0.3	0.6	0.6	0.9	2.1	2.4	1.5	0.5	0.7	1.6	1.7
1000	1.1	1.2	1.1	0.9	0.6	1.2	1.3	0.4	0.4	0.5	1.0	1.6	1.5	1.0	0.4	0.7	1.6	2.1
MEAN	0.8	1.2	2.1	2.2	1.7	2.3	3.5	4.6	5.1	3.9	2.8	2.7	2.5	2.0	1.5	1.2	1.3	1.3
								JULY										
50	3.8	3.0	4.0	4.5	4.0	3.9	5.2	4.8	1.6	1.0	1.0	0.3	0.4	0.3	0.4	0.4	0.4	0.5
100	2.2	1.9	1.1	1.1	3.4	4.5	2.6	1.7	1.1	0.7	1.6	1.4	0.7	0.3	0.2	0.2	0.2	0.5
200	5.1	7.1	7.9	6.3	3.0	1.0	1.0	0.5	0.5	2.3	4.9	3.9	3.2	1.8	0.9	0.4	0.6	1.1
300	1.7	3.1	3.5	2.7	1.8	1.0	0.8	0.3	0.6	2.6	4.0	2.3	2.4	2.3	1.1	1.5	2.2	3.8
400	0.8	1.9	1.6	0.9	0.7	0.5	0.2	0.1	0.1	0.6	1.6	1.7	2.4	2.2	1.4	0.9	1.2	1.7
500	0.8	0.8	0.7	0.7	0.6	0.3	0.2	0.2	0.2	0.5	0.8	1.1	1.3	1.0	0.4	0.4	0.8	0.9
700	2.1	1.5	0.9	0.5	0.5	0.6	0.3	0.2	0.2	0.3	0.5	0.6	0.9	0.6	0.3	0.2	0.2	0.5
850	4.5	2.5	0.9	0.3	0.2	0.3	0.4	0.2	0.1	0.4	0.5	0.2	0.4	0.4	0.3	0.1	0.2	0.2
900	3.4	1.9	0.9	0.3	0.3	0.5	0.6	0.3	0.1	0.4	0.7	0.5	0.5	0.4	0.2	0.2	0.5	0.8
950	1.8	1.1	0.7	0.3	0.2	0.4	0.5	0.2	0.1	0.3	0.6	0.6	0.7	0.5	0.3	0.2	0.5	0.9
1000	1.2	0.7	0.5	0.3	0.2	0.4	0.4	0.2	0.1	0.1	0.4	0.6	0.8	0.5	0.3	0.2	0.3	0.6
MEAN	2.3	2.3	1.9	1.3	1.0	0.8	0.6	0.3	0.3	0.9	1.6	1.3	1.4	1.1	0.6	0.4	0.7	1.1
								YEAR										
50	3.0	2.5	2.7	2.5	1.6	0.8	0.3	0.4	0.1	0.4	0.8	1.0	0.8	0.6	2.3	3.3	3.3	2.3
100	0.5	0.2	0.2	0.4	0.5	0.2	0.3	0.4	1.1	1.5	1.3	0.9	0.5	0.3	0.4	0.5	0.3	0.5
200	1.8	1.7	1.9	1.1	0.6	0.7	1.5	2.6	3.1	2.5	1.8	1.0	1.1	1.2	0.9	0.3	0.4	0.5
300	0.4	0.5	1.0	0.7	0.2	0.4	1.0	1.4	1.8	2.3	2.4	1.7	1.4	1.2	0.9	0.4	0.4	0.6
400	0.2	0.6	0.7	0.6	0.3	0.1	0.5	0.8	1.0	0.8	0.9	0.9	0.9	0.8	0.5	0.5	0.6	0.6
500	0.3	0.4	0.2	0.4	0.3	0.0	0.1	0.4	0.5	0.4	0.4	0.4	0.6	0.5	0.2	0.3	0.3	0.3
700	0.3	0.2	0.4	0.5	0.1	0.2	0.0	0.3	0.5	0.4	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.1
850	1.1	0.4	0.2	0.2	0.3	0.3	0.1	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.0	0.1
900	0.7	0.5	0.4	0.2	0.3	0.4	0.2	0.0	0.1	0.2	0.3	0.4	0.4	0.3	0.1	0.0	0.0	0.0
950	0.5	0.6	0.4	0.2	0.3	0.4	0.3	0.1	0.0	0.1	0.2	0.4	0.5	0.3	0.1	0.0	0.1	0.1
1000	0.4	0.6	0.5	0.3	0.3	0.3	0.3	0.2	0.1	0.0	0.1	0.2	0.3	0.2	0.1	0.0	0.1	0.1
MEAN	0.7	0.5	0.5	0.5	0.3	0.3	0.4	0.7	0.9	0.9	0.8	0.6	0.6	0.5	0.4	0.2	0.3	0.3

TABLE C2a.—*Interannual standard deviation of the northward transport of sensible heat (c_pT) by transient eddies $\sigma([\overline{v'T'}])$ (units in m/s · °C are equivalent with 10^3 W · m/kg)*

P (MB)	10 S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
$\sigma([\overline{v'T'}])$				60 MONTHS														
50	0.9	0.9	1.1	1.2	0.8	0.5	0.5	0.6	0.7	0.8	1.1	1.5	1.9	2.0	2.9	4.1	5.8	9.0
100	1.6	1.1	0.9	1.0	0.8	0.7	0.6	0.7	0.9	0.9	0.9	1.0	1.4	1.4	1.5	1.9	2.2	2.8
200	1.2	0.7	0.6	0.7	0.9	1.0	1.3	1.6	1.8	1.6	1.7	2.0	2.4	2.0	2.0	2.2	2.5	2.9
300	0.6	0.6	0.5	0.6	0.6	0.7	1.0	1.3	1.4	1.5	1.6	1.5	1.5	1.4	1.5	1.5	1.9	2.3
400	0.5	0.4	0.3	0.4	0.5	0.6	0.8	1.0	1.1	1.0	1.2	1.5	1.4	1.3	1.5	1.6	2.0	2.5
500	0.5	0.4	0.3	0.3	0.4	0.5	0.7	0.7	0.7	0.9	1.1	1.2	1.3	1.3	1.3	1.5	1.6	2.3
700	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.6	0.8	1.1	1.2	1.4	1.4	1.5	1.6	1.7	2.2
850	0.4	0.3	0.4	0.4	0.4	0.4	0.5	0.7	0.8	1.1	1.3	1.3	1.5	1.6	1.6	1.7	1.8	2.1
900	0.3	0.2	0.3	0.3	0.3	0.4	0.5	0.6	0.8	1.1	1.3	1.4	1.5	1.5	1.5	1.6	1.8	2.1
950	0.2	0.2	0.2	0.2	0.3	0.3	0.5	0.7	0.8	0.8	1.0	1.2	1.5	1.4	1.7	1.9	2.0	2.4
1000	0.2	0.2	0.3	0.3	0.3	0.3	0.5	0.9	0.7	0.6	0.7	0.9	1.2	1.2	1.7	2.0	2.3	2.8
MEAN	0.6	0.4	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.3	1.5	1.4	1.5	1.7	1.9	2.3
								JANUARY										
50	0.6	0.6	0.6	0.3	0.7	0.7	0.9	1.2	1.4	1.1	2.4	4.3	5.0	4.5	6.4	10.6	14.7	17.1
100	1.9	1.8	1.5	1.8	1.5	0.7	0.5	1.1	1.5	1.1	0.9	3.0	3.0	3.4	2.6	2.1	2.4	2.5
200	1.0	0.6	0.6	1.0	1.2	1.2	0.9	1.9	2.7	2.5	2.6	3.2	3.0	2.0	1.9	2.6	2.6	2.2
300	0.7	1.0	1.1	0.8	0.9	1.4	1.5	1.7	2.5	3.1	2.3	1.5	1.0	0.9	1.4	1.7	0.8	2.4
400	1.1	0.6	0.2	0.3	0.6	0.8	0.7	0.9	1.5	1.3	1.4	1.6	1.3	1.4	2.2	3.0	2.9	2.7
500	0.7	0.4	0.4	0.5	0.5	0.7	1.3	0.9	1.2	1.7	1.3	1.4	1.7	1.7	1.9	2.2	2.1	3.2
700	0.4	0.2	0.3	0.6	0.9	1.1	0.8	0.3	0.8	1.3	1.3	1.5	1.4	1.5	1.9	2.1	2.0	1.9
850	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.9	1.4	2.1	2.3	1.6	1.2	2.0	2.4	2.8	2.9	2.4
900	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.6	1.1	2.0	2.1	1.6	1.6	2.0	2.9	3.0	2.5	2.4
950	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.9	1.5	1.3	1.0	1.3	1.9	3.1	3.3	3.0	3.2
1000	0.2	0.1	0.3	0.4	0.3	0.3	0.3	0.2	0.7	0.9	0.9	1.2	1.7	1.7	2.4	2.9	3.1	3.9
MEAN	0.7	0.5	0.5	0.6	0.7	0.8	0.8	0.9	1.4	1.7	1.6	1.7	1.6	1.7	2.1	2.4	2.3	2.5
								JULY										
50	0.4	0.3	0.8	1.4	1.5	1.1	0.5	0.4	0.4	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.4	0.3
100	1.2	1.2	0.9	0.7	0.6	0.6	0.8	0.8	1.0	0.8	0.7	0.7	0.9	0.6	0.4	0.7	0.9	1.6
200	1.6	0.9	0.8	0.5	0.5	0.5	0.2	0.6	1.1	1.7	1.6	1.6	2.1	1.1	1.5	1.3	1.3	1.4
300	0.4	0.3	0.2	0.4	0.3	0.4	0.5	0.7	0.8	0.9	0.8	1.1	1.5	1.2	1.8	0.5	1.4	2.1
400	0.4	0.2	0.3	0.2	0.2	0.3	0.3	0.5	0.7	0.9	0.5	0.3	0.4	0.9	1.0	0.9	1.4	1.8
500	0.4	0.5	0.4	0.3	0.3	0.2	0.2	0.4	0.6	0.6	0.6	0.7	1.1	1.4	1.3	1.8	1.7	1.1
700	0.7	0.2	0.1	0.1	0.2	0.2	0.2	0.4	0.4	0.3	0.3	0.4	0.7	0.6	0.7	0.7	1.1	0.9
850	0.3	0.3	0.2	0.1	0.2	0.3	0.2	0.1	0.2	0.3	0.3	0.7	1.0	0.8	0.9	0.5	1.0	1.1
900	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.5	0.5	0.5	0.8	1.1	0.7	0.5	0.5	1.0	1.1
950	0.3	0.2	0.2	0.0	0.1	0.1	0.2	0.4	0.4	0.4	0.5	0.6	0.7	0.5	0.4	0.6	1.0	1.0
1000	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.3	0.4	0.5	0.7	0.6	0.8	1.2
MEAN	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.7	0.6	0.7	1.0	0.9	0.9	0.9	1.2	1.2
								YEAR										
50	0.9	0.8	0.8	0.6	0.2	0.1	0.2	0.4	0.3	0.2	0.5	0.8	1.1	1.3	2.0	2.3	2.7	3.8
100	0.7	0.5	0.2	0.4	0.3	0.3	0.2	0.2	0.3	0.4	0.3	0.3	0.5	0.8	0.8	1.1	1.3	1.6
200	0.4	0.3	0.3	0.5	0.6	0.2	0.4	0.5	0.3	0.5	0.8	0.8	0.9	0.8	1.0	1.6	1.9	1.9
300	0.2	0.2	0.2	0.3	0.2	0.1	0.2	0.6	0.7	0.7	0.9	0.6	0.7	0.5	0.5	0.8	0.8	1.0
400	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.6	0.4	0.4	0.8	0.8	0.6	0.7	0.9	1.0	1.0	1.0
500	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.6	0.4	0.3	0.6	0.5	0.2	0.6	1.0	1.2	1.3
700	0.2	0.2	0.1	0.1	0.1	0.2	0.4	0.6	0.6	0.3	0.2	0.3	0.5	0.6	0.7	0.8	0.7	1.1
850	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.4	0.5	0.3	0.3	0.4	0.5	0.5	0.7	0.9	0.6	0.8
900	0.3	0.2	0.1	0.2	0.2	0.3	0.3	0.5	0.5	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.9
950	0.4	0.3	0.1	0.1	0.1	0.2	0.4	0.6	0.5	0.2	0.4	0.6	0.8	1.3	1.8	2.0	2.1	2.3
1000	0.6	0.4	0.2	0.2	0.1	0.2	0.3	0.5	0.4	0.2	0.5	0.5	0.5	1.3	1.7	2.1	2.3	2.4
MEAN	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.5	0.4	0.5	0.5	0.6	0.6	0.8	1.1	1.2	1.4

TABLE C2b.—*Interannual standard deviation of the northward transport of sensible heat by stationary eddies $\sigma([\bar{v}^*\bar{T}^*])$, m/s · °C*

σ ([v̄* T̄*])								60 MONTHS									
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.5	0.8	1.1	1.6	2.9	4.3	6.3	6.4	5.8	5.1
100	0.2	0.2	0.2	0.3	0.6	0.8	0.8	0.8	0.8	0.8	1.1	1.6	2.4	3.0	3.8	4.3	4.1	3.6
200	0.2	0.2	0.2	0.3	0.5	0.7	0.9	1.1	1.5	2.0	2.0	2.1	2.4	2.8	3.1	3.1	2.9	3.1
300	0.1	0.1	0.2	0.2	0.4	0.6	0.7	0.8	1.0	1.2	1.2	1.2	1.5	1.8	1.9	1.8	1.5	1.9
400	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.2	1.6	1.5	1.6	1.4	1.5	2.2
500	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.5	0.7	1.1	1.4	1.7	1.5	1.8	1.7	1.7	2.3
700	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.6	0.9	1.3	1.5	1.7	1.9	2.3	2.1	1.7	1.8
850	0.1	0.1	0.1	0.1	0.3	0.4	0.5	0.7	0.9	1.1	1.5	1.7	1.9	2.4	3.2	3.2	2.6	2.1
900	0.1	0.1	0.1	0.1	0.2	0.4	0.6	0.8	0.9	1.1	1.3	1.6	1.9	2.5	3.7	4.2	3.7	3.0
950	0.2	0.2	0.1	0.1	0.2	0.3	0.5	0.7	0.8	0.9	1.2	1.5	1.9	2.6	4.4	5.1	4.4	3.7
1000	0.1	0.2	0.2	0.2	0.2	0.4	0.5	0.6	0.8	0.7	1.0	1.4	1.8	2.5	4.4	5.5	4.7	3.7
MEAN	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.3	1.5	1.8	2.1	2.6	2.7	2.4	2.4
								JANUARY										
50	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.3	0.4	0.6	1.3	2.7	4.6	7.0	9.6	8.2	5.9	2.3
100	0.2	0.2	0.2	0.4	0.9	1.4	1.2	0.7	0.4	0.7	1.1	1.1	1.3	2.1	3.1	4.3	5.6	5.0
200	0.2	0.2	0.2	0.2	0.4	0.8	1.5	1.8	2.3	3.2	3.7	3.3	2.8	2.7	3.1	3.6	4.7	4.4
300	0.2	0.2	0.3	0.4	0.8	1.3	1.5	1.0	0.9	1.3	1.1	1.6	1.9	1.7	1.4	1.8	2.4	3.4
400	0.1	0.1	0.1	0.2	0.4	0.5	0.4	0.4	0.5	1.2	2.0	2.8	3.7	2.8	1.7	1.5	2.2	2.5
500	0.0	0.1	0.1	0.2	0.3	0.5	0.3	0.1	0.7	1.7	2.7	3.6	4.1	2.8	1.9	0.9	1.7	3.0
700	0.1	0.1	0.1	0.2	0.3	0.4	0.7	1.0	1.5	2.5	3.5	3.9	4.1	3.5	3.1	1.8	1.7	2.5
850	0.1	0.1	0.1	0.2	0.4	0.6	0.7	1.3	1.8	2.3	3.4	3.8	3.4	3.2	3.6	2.8	2.0	2.6
900	0.1	0.1	0.1	0.1	0.2	0.4	0.8	1.4	1.8	2.0	2.7	3.1	3.2	3.6	5.4	5.0	3.4	3.7
950	0.1	0.1	0.1	0.1	0.1	0.3	0.8	1.5	1.7	1.7	2.3	2.5	2.1	3.1	6.5	7.1	4.8	4.4
1000	0.1	0.1	0.2	0.3	0.3	0.4	0.9	1.3	1.6	1.4	1.8	2.3	1.5	2.2	5.5	7.1	5.0	3.5
MEAN	0.1	0.1	0.1	0.2	0.4	0.6	0.8	0.9	1.2	1.9	2.6	3.0	3.1	2.8	3.0	2.7	2.8	3.2
								JULY										
50	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.2	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.3	0.4
100	0.2	0.2	0.3	0.6	1.0	1.1	0.9	1.0	0.9	1.0	0.9	0.4	0.4	0.3	0.4	0.5	0.6	0.6
200	0.2	0.1	0.1	0.3	0.5	0.8	1.0	1.6	2.3	2.1	1.9	1.1	0.4	0.9	1.2	1.3	1.4	1.5
300	0.1	0.0	0.1	0.2	0.1	0.3	0.6	0.8	1.1	1.2	1.3	1.0	0.7	0.8	0.9	0.9	0.6	1.3
400	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.6	0.9	1.1	1.1	0.8	0.6	0.6	0.5	1.4	1.3	1.4
500	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.4	0.8	0.8	0.8	0.7	0.5	0.6	0.5	1.0	1.5	1.6
700	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.6	0.8	0.7	0.7	0.6	0.4	0.1	0.2	0.9	1.2	1.2
850	0.1	0.0	0.1	0.1	0.1	0.3	0.6	0.7	0.5	0.6	0.9	0.8	0.6	0.5	0.6	1.1	1.2	0.8
900	0.1	0.0	0.1	0.2	0.3	0.4	0.8	0.8	0.7	0.9	1.3	1.1	0.7	0.5	0.8	0.8	0.8	0.7
950	0.2	0.2	0.1	0.2	0.2	0.4	0.6	0.5	0.6	0.9	1.3	1.2	0.7	0.5	0.9	0.7	0.6	0.6
1000	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.4	0.7	0.6	0.9	0.9	0.4	0.3	0.6	0.6	0.4	0.4
MEAN	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.0	1.0	0.8	0.5	0.5	0.6	1.0	1.1	1.1
								YEAR										
50	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.9	1.4	1.5	1.3	0.8
100	0.1	0.1	0-1	0.1	0.2	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.6	0.7	0.7	0.9
200	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.3	0.5	0.4	0.2	0.4	0.6	0.6	0.4	0.5
300	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.5	0.6	0.6	0.5	0.5
400	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.3	0.4	0.3
500	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.2
700	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4
850	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.6	0.6
900	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.2	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.9	0.9
950	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.3	0.2	0.1	0.2	0.2	0.4	0.4	0.4	0.6	1.0	1.0
1000	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.6	0.9	0.8
MEAN	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.5	0.5

TABLE C2c.—*Interannual standard deviation of the northward transport of sensible heat by mean meridional circulation* $\sigma([\bar{v}]''[\bar{T}]'')$, *m/s · 10°C*

σ ([v̄]" [T̄]")								60 MONTHS									
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	4.8	4.2	3.8	3.1	2.1	1.6	1.5	1.8	1.9	1.7	1.6	1.4	1.5	1.5	2.0	2.1	2.2	2.4
100	1.1	2.6	1.9	1.9	2.1	1.9	1.9	2.1	2.0	1.5	1.0	0.7	0.6	0.5	0.6	0.7	0.7	0.8
200	2.5	2.6	2.3	2.1	1.8	1.6	1.4	1.5	1.5	1.3	1.2	1.0	0.9	0.6	0.6	0.6	0.7	0.8
300	0.9	0.9	0.8	0.6	0.5	0.6	0.5	0.5	0.6	0.6	0.8	0.7	0.7	0.6	0.6	0.5	0.7	1.1
400	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4
500	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.6	0.5	0.5	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
850	1.4	1.0	0.9	0.7	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.4	0.5	0.5
900	1.2	1.0	1.0	0.8	0.7	0.8	0.7	0.6	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.7	0.7
950	1.2	1.2	1.1	0.9	0.7	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.9
1000	1.8	1.8	1.7	1.2	0.9	1.0	1.1	1.0	1.0	0.9	0.8	0.8	0.9	0.9	0.9	0.8	0.9	1.1
MEAN	1.1	1.0	0.8	0.7	0.6	0.7	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5
								JANUARY										
50	9.1	7.5	5.8	4.1	2.4	1.6	1.8	1.8	1.9	2.1	2.3	2.1	1.8	1.5	2.1	2.4	3.2	3.2
100	3.5	3.0	2.0	2.8	3.2	2.9	3.0	2.7	2.5	2.2	1.3	0.8	0.6	0.7	0.8	0.9	0.7	0.7
200	1.5	1.3	1.1	2.5	2.6	1.9	1.3	1.4	1.4	0.6	0.7	0.4	0.3	0.5	0.7	0.9	0.8	0.5
300	1.0	0.9	0.6	0.3	0.4	0.8	0.9	0.7	0.7	0.5	0.5	0.6	0.7	0.6	0.6	0.3	0.4	0.5
400	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.3
500	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.5	0.5	0.7	0.7	0.4	0.3	0.4	0.5	0.5	0.4	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3
850	1.0	0.4	0.3	0.4	0.8	1.2	1.1	0.6	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.2	0.2	0.3
900	1.0	0.7	0.7	0.3	0.5	1.1	1.1	0.6	0.4	0.3	0.3	0.5	0.7	0.7	0.6	0.7	0.8	0.8
950	1.1	1.1	1.4	0.8	0.4	1.2	1.5	1.1	0.7	0.4	0.4	0.7	0.8	0.7	0.7	0.8	1.0	1.0
1000	2.4	2.5	2.8	1.7	0.7	1.4	1.9	1.6	0.8	0.6	1.0	1.1	0.9	0.8	1.1	1.0	1.3	1.2
MEAN	0.9	0.8	0.7	0.8	0.8	0.9	0.9	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
								JULY										
50	2.6	2.2	2.1	2.1	1.5	1.2	1.5	1.6	0.7	0.6	0.9	0.7	0.7	0.7	0.6	0.5	0.5	0.8
100	2.0	1.7	1.2	0.8	1.4	1.8	1.2	1.0	1.3	1.3	1.1	0.7	0.4	0.2	0.2	0.3	0.3	0.6
200	3.2	1.7	1.7	1.9	1.4	0.7	1.1	0.9	0.3	0.8	1.0	0.7	0.7	0.6	0.5	0.3	0.4	0.6
300	0.9	1.0	1.0	0.9	0.7	0.6	0.6	0.5	0.4	0.5	0.6	0.3	0.4	0.6	0.6	0.6	1.1	1.6
400	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.3
500	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	1.0	0.8	0.6	0.4	0.3	0.5	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.1	0.1	0.2
850	1.5	1.3	1.0	0.9	0.7	0.6	0.7	0.6	0.6	0.6	0.5	0.2	0.3	0.4	0.4	0.3	0.3	0.3
900	1.5	1.3	1.2	1.1	0.9	1.0	1.1	0.9	0.7	0.6	0.7	0.4	0.3	0.3	0.4	0.7	0.7	0.7
950	1.2	1.1	1.1	1.1	0.9	0.9	0.9	0.5	0.5	0.6	0.8	0.6	0.5	0.5	0.7	1.0	1.0	1.1
1000	1.8	1.2	1.1	0.9	0.9	0.9	0.7	0.4	0.4	0.6	0.7	0.5	0.6	0.6	0.7	0.9	1.1	1.4
MEAN	1.1	0.9	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.5	0.3	0.3	0.3	0.4	0.3	0.4	0.6
								YEAR										
50	1.6	1.4	1.3	1.2	0.9	0.6	0.3	0.6	0.7	0.7	0.7	0.6	0.4	0.2	0.8	0.9	0.8	0.6
100	1.1	0.7	0.4	0.5	0.8	0.8	0.6	0.3	0.4	0.5	0.4	0.3	0.2	0.1	0.1	0.2	0.1	0.2
200	0.9	1.4	1.3	1.1	0.7	0.4	0.5	0.6	0.5	0.4	0.3	0.2	0.2	0.3	0.3	0.1	0.1	0.2
300	0.2	0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
400	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
500	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
850	0.6	0.3	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1
900	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
950	0.3	0.6	0.7	0.4	0.3	0.4	0.3	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2
1000	0.6	1.1	1.1	0.7	0.4	0.4	0.4	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3
MEAN	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

TABLE C3a.—*Interannual standard deviation of the northward transport of potential energy by stationary eddies $\sigma([\bar{v}^*\bar{Z}^*])$ · (Units in 10^2 gpm · m/s are equivalent with 10^3 W · m/kg)*

			$\sigma([\overline{v}^*\overline{Z}^*])$						60 MONTHS									
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.00	0.01	0.03	0.04	0.04	0.05	0.07	0.10	0.15	0.22	0.33	0.43	0.68	1.01	1.57	1.80	1.85	1.63
100	0.07	0.04	0.04	0.08	0.11	0.16	0.21	0.23	0.23	0.25	0.27	0.30	0.42	0.54	0.67	0.72	0.65	0.81
200	0.04	0.04	0.05	0.08	0.11	0.17	0.22	0.26	0.30	0.39	0.42	0.46	0.55	0.57	0.60	0.54	0.56	0.63
300	0.02	0.02	0.02	0.03	0.05	0.08	0.10	0.13	0.17	0.22	0.36	0.45	0.54	0.52	0.51	0.52	0.58	0.67
400	0.01	0.01	0.01	0.02	0.03	0.04	0.06	0.09	0.13	0.17	0.27	0.34	0.43	0.35	0.38	0.44	0.70	0.89
500	0.01	0.01	0.01	0.01	0.02	0.03	0.05	0.08	0.09	0.12	0.20	0.26	0.26	0.18	0.27	0.48	0.65	0.64
700	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.05	0.08	0.10	0.13	0.15	0.14	0.10	0.10	0.12	0.16	0.23
850	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.07	0.09	0.10	0.10	0.10	0.08	0.07	0.10	0.16
900	0.02	0.02	0.02	0.02	0.02	0.03	0.05	0.06	0.07	0.09	0.11	0.11	0.13	0.13	0.12	0.09	0.10	0.21
950	0.02	0.02	0.02	0.03	0.03	0.05	0.08	0.07	0.07	0.09	0.11	0.13	0.15	0.18	0.18	0.13	0.12	0.15
1000	0.01	0.02	0.03	0.03	0.04	0.05	0.07	0.07	0.07	0.08	0.10	0.11	0.13	0.17	0.20	0.15	0.11	0.12
MEAN	0.02	0.02	0.02	0.03	0.04	0.06	0.08	0.11	0.13	0.16	0.21	0.25	0.29	0.27	0.30	0.34	0.40	0.48
									JANUARY									
50	0.01	0.02	0.05	0.06	0.06	0.06	0.09	0.14	0.23	0.38	0.62	0.75	0.78	0.68	1.15	2.00	2.46	1.32
100	0.06	0.05	0.06	0.09	0.10	0.12	0.16	0.16	0.16	0.38	0.49	0.54	0.83	0.99	1.36	0.82	0.56	0.75
200	0.05	0.03	0.03	0.06	0.19	0.42	0.53	0.32	0.38	0.82	0.78	0.86	1.08	1.02	0.88	0.52	0.58	0.60
300	0.01	0.01	0.03	0.03	0.11	0.21	0.20	0.17	0.22	0.34	0.76	1.04	1.20	1.04	0.79	0.54	0.62	0.60
400	0.01	0.00	0.01	0.02	0.04	0.09	0.11	0.14	0.13	0.21	0.60	0.73	0.88	0.69	0.51	0.39	0.66	0.43
500	0.00	0.01	0.01	0.01	0.02	0.03	0.03	0.08	0.11	0.17	0.39	0.45	0.40	0.24	0.28	0.28	0.40	0.32
700	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.06	0.12	0.21	0.24	0.14	0.17	0.13	0.08	0.16	0.15	0.29
850	0.01	0.01	0.01	0.01	0.02	0.03	0.03	0.06	0.09	0.14	0.20	0.18	0.18	0.11	0.08	0.12	0.14	0.27
900	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.07	0.13	0.19	0.20	0.19	0.16	0.13	0.12	0.04	0.12
950	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.06	0.07	0.10	0.14	0.21	0.19	0.18	0.20	0.15	0.11	0.13
1000	0.01	0.01	0.02	0.02	0.02	0.04	0.05	0.09	0.12	0.09	0.09	0.13	0.16	0.18	0.17	0.15	0.14	0.16
MEAN	0.02	0.01	0.02	0.03	0.05	0.10	0.12	0.12	0.15	0.27	0.40	0.46	0.53	0.46	0.43	0.33	0.35	0.38
									JULY									
50	0.00	0.01	0.02	0.03	0.03	0.03	0.04	0.06	0.08	0.08	0.09	0.08	0.15	0.11	0.10	0.15	0.16	0.12
100	0.08	0.04	0.06	0.12	0.12	0.06	0.18	0.27	0.23	0.18	0.18	0.13	0.08	0.08	0.21	0.25	0.24	0.18
200	0.04	0.02	0.04	0.07	0.08	0.08	0.16	0.29	0.26	0.15	0.09	0.18	0.26	0.22	0.30	0.32	0.33	0.41
300	0.01	0.01	0.02	0.04	0.04	0.03	0.06	0.08	0.08	0.03	0.10	0.16	0.22	0.20	0.20	0.20	0.19	0.49
400	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.12	0.12	0.06	0.06	0.08	0.05	0.06	0.24	0.26	0.33
500	0.00	0.01	0.00	0.01	0.01	0.01	0.02	0.04	0.05	0.04	0.01	0.02	0.05	0.05	0.09	0.14	0.20	0.31
700	0.01	0.01	0.02	0.03	0.04	0.05	0.05	0.06	0.09	0.08	0.04	0.04	0.05	0.04	0.04	0.05	0.07	0.09
850	0.02	0.01	0.01	0.03	0.03	0.03	0.04	0.06	0.04	0.05	0.07	0.07	0.04	0.04	0.07	0.05	0.02	0.04
900	0.03	0.02	0.03	0.05	0.05	0.06	0.08	0.09	0.04	0.09	0.14	0.13	0.08	0.04	0.07	0.06	0.05	0.14
950	0.05	0.03	0.04	0.06	0.07	0.09	0.13	0.09	0.05	0.10	0.16	0.17	0.12	0.05	0.06	0.07	0.07	0.13
1000	0.02	0.03	0.04	0.07	0.07	0.07	0.09	0.05	0.03	0.07	0.15	0.17	0.13	0.06	0.06	0.06	0.06	0.09
MEAN	0.02	0.02	0.02	0.04	0.05	0.04	0.07	0.10	0.10	0.08	0.08	0.09	0.10	0.08	0.12	0.14	0.16	0.23
									YEAR									
50	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.04	0.04	0.06	0.08	0.09	0.10	0.08	0.14	0.20	0.19	0.18
100	0.04	0.02	0.01	0.02	0.04	0.07	0.10	0.09	0.05	0.07	0.08	0.05	0.08	0.18	0.24	0.22	0.20	0.25
200	0.02	0.01	0.02	0.02	0.02	0.02	0.03	0.05	0.07	0.07	0.08	0.09	0.09	0.18	0.21	0.22	0.19	0.13
300	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.03	0.04	0.09	0.09	0.09	0.16	0.19	0.22	0.22	0.16
400	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.05	0.04	0.07	0.06	0.04	0.08	0.10	0.09	0.10	0.09
500	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.05	0.03	0.05	0.06	0.04	0.05	0.07	0.07
700	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.03	0.03	0.01	0.02	0.01	0.03	0.03	0.02	0.01	0.03	0.05
850	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05
900	0.01	0.01	0.00	0.01	0.01	0.02	0.04	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05
950	0.01	0.01	0.01	0.01	0.02	0.04	0.08	0.07	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
1000	0.00	0.01	0.01	0.01	0.02	0.04	0.06	0.06	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.01
MEAN	0.01	0.01	0.00	0.01	0.01	0.02	0.03	0.03	0.03	0.03	0.05	0.04	0.05	0.08	0.09	0.09	0.09	0.09

TABLE C3b.—*Interannual standard deviation of the northward transport of potential energy by mean meridional circulation* $\sigma([\bar{v}]''[\bar{Z}]'')$, 10^3 *gpm · m/s*

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
σ ([v̄]" [Z̄"]) 60 MONTHS																		
50	13.1	11.2	9.8	8.0	5.6	4.4	4.1	5.2	6.0	6.3	6.8	6.8	7.8	8.4	12.1	12.8	13.0	13.9
100	4.7	3.9	2.9	3.0	3.3	3.1	3.3	3.8	3.9	3.4	2.6	2.1	2.0	2.1	2.6	3.1	3.0	4.0
200	3.7	3.8	3.3	2.9	2.6	2.3	2.1	2.2	2.4	2.0	2.0	1.6	1.6	1.2	1.3	1.4	1.8	2.1
300	1.6	1.5	1.4	1.0	0.9	1.0	0.9	0.9	0.9	0.9	1.0	1.0	0.1	0.8	0.8	0.8	1.0	1.6
400	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
500	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
700	0.9	0.8	0.8	0.7	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.7
850	2.3	1.7	1.4	1.2	1.0	1.2	1.0	0.8	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.8	1.0	1.2
900	2.1	1.7	1.6	1.3	1.1	1.3	1.2	1.1	1.2	1.1	1.1	1.1	1.1	1.0	1.0	1.3	1.6	1.9
950	2.0	1.9	1.8	1.5	1.2	1.4	1.5	1.4	1.5	1.4	1.4	1.4	1.5	1.5	1.5	1.7	2.0	2.5
1000	3.0	2.9	2.8	2.0	1.4	1.7	1.9	1.9	1.8	1.5	1.6	1.6	1.8	2.0	2.1	2.1	2.5	3.1
MEAN	1.7	1.5	1.3	1.1	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.9	1.0	1.3
JANUARY																		
50	23.6	19.4	14.8	10.7	6.3	4.4	5.0	5.6	6.6	8.1	10.3	11.1	10.4	8.7	12.7	14.1	14.9	11.1
100	5.2	4.5	3.0	4.3	5.0	4.6	5.0	5.0	5.3	5.6	4.1	3.0	2.3	2.9	3.3	3.9	3.2	3.1
200	2.2	1.9	1.6	3.7	3.8	2.9	2.0	2.2	2.3	1.0	1.3	0.9	0.6	1.1	1.6	2.2	1.9	1.3
300	1.7	1.5	1.0	0.5	0.7	1.3	1.5	1.2	1.0	0.6	0.7	0.8	1.0	0.9	0.8	0.5	0.6	0.9
400	0.5	0.2	0.2	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.4	0.5	0.4	0.3	0.3	0.2	0.2	0.4
500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1
700	0.7	0.7	1.0	1.0	0.6	0.4	0.5	0.8	0.8	0.6	0.3	0.2	0.3	0.2	0.3	0.5	0.5	0.6
850	1.6	0.7	0.4	0.5	1.3	2.1	1.9	1.0	0.8	0.7	0.7	0.7	1.0	1.2	0.9	0.4	0.4	0.6
900	1.6	1.2	1.1	0.5	0.7	1.8	2.0	1.1	0.7	0.7	0.6	1.1	1.5	1.4	1.5	1.7	2.2	2.0
950	1.9	1.8	2.3	1.3	0.7	2.1	2.6	2.0	1.2	0.7	0.7	1.6	1.7	1.4	1.8	2.2	3.0	2.9
1000	3.9	3.9	4.4	2.7	1.1	2.4	3.3	2.8	1.5	1.1	1.9	2.3	1.9	1.8	2.6	3.0	4.1	4.4
MEAN	1.4	1.2	1.1	1.2	1.2	1.4	1.5	1.3	1.1	0.9	0.8	0.8	0.8	0.8	1.0	1.1	1.1	1.1
JULY																		
50	8.2	6.6	6.3	5.9	4.3	3.3	4.1	4.4	1.9	1.9	2.9	2.7	3.0	3.2	2.9	3.1	3.2	5.7
100	3.3	2.8	2.0	1.3	2.3	3.0	2.0	1.7	2.3	2.4	2.2	1.8	1.1	0.7	0.8	1.0	1.2	2.6
200	4.5	2.3	2.3	2.7	2.0	1.0	1.6	1.4	0.5	1.2	1.5	1.1	1.2	1.1	0.9	0.5	0.8	1.5
300	1.5	1.6	1.7	1.4	1.1	0.9	0.9	0.8	0.7	0.8	0.9	0.5	0.6	0.8	0.8	0.8	1.4	2.2
400	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.3
500	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1
700	1.5	1.2	1.0	0.6	0.5	0.7	0.5	0.5	0.4	0.3	0.4	0.4	0.5	0.5	0.5	0.3	0.3	0.5
850	2.4	2.2	1.7	1.4	1.1	1.0	1.1	1.0	1.0	1.0	0.9	0.4	0.5	0.7	0.8	0.6	0.6	0.7
900	2.4	2.1	1.9	1.8	1.5	1.6	1.8	1.5	1.3	1.1	1.2	0.7	0.6	0.6	0.8	1.4	1.4	1.5
950	1.9	1.7	1.8	1.7	1.4	1.4	1.5	0.9	0.8	1.1	1.4	1.1	1.1	1.1	1.4	2.0	2.1	2.4
1000	3.1	1.9	1.7	1.6	1.4	1.4	1.2	0.7	0.8	1.1	1.3	1.1	1.2	1.1	1.5	1.8	2.3	3.0
MEAN	1.7	1.3	1.2	1.0	0.9	0.8	0.8	0.7	0.6	0.7	0.8	0.6	0.6	0.6	0.6	0.6	0.7	1.1
YEAR																		
50	4.4	3.7	3.4	3.1	2.4	1.6	0.8	1.8	2.1	2.2	2.7	2.6	1.7	1.2	4.5	5.9	5.4	3.6
100	1.8	1.1	0.6	0.8	1.3	1.3	1.0	0.6	0.9	1.0	0.9	0.7	0.5	0.4	0.6	0.8	0.5	1.0
200	1.4	2.0	1.9	1.5	1.0	0.6	0.8	0.9	0.8	0.6	0.4	0.3	0.4	0.6	0.5	0.3	0.4	0.6
300	0.4	0.6	0.7	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.4
400	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
500	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.3	0.2	0.2	0.3	0.1	0.2	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1
850	1.0	0.4	0.3	0.3	0.4	0.5	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
900	0.5	0.6	0.7	0.5	0.5	0.6	0.4	0.2	0.2	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.4
950	0.5	1.0	1.1	0.7	0.5	0.6	0.5	0.3	0.2	0.4	0.4	0.5	0.6	0.5	0.4	0.5	0.6	0.7
1000	1.0	1.7	1.8	1.1	0.6	0.7	0.7	0.6	0.4	0.2	0.3	0.4	0.5	0.5	0.7	0.8	0.9	1.0
MEAN	0.6	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3

TABLE C4a.—*Interannual standard deviation of the northward transport of water vapor by transient eddies $\sigma([\overline{v'q'}])$ · (units in g/kg · m/s; to convert to transport of latent heat in 10^3 W · m/kg multiply numbers in table by 2.5).*

σ ([$\overline{v'q'}$])

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
									60 MONTHS									
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
400	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
500	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2
700	0.5	0.4	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
850	0.5	0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.3
900	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4
950	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.6	0.6	0.6	0.6	0.5	0.4	0.4	0.5	0.6	0.6	0.6
1000	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.8	0.7	0.5	0.6	0.6	0.6	0.7	0.8	0.9	0.9	0.8
MEAN	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
									JANUARY									
50																		
100																		
200																		
300	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
400	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2
500	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.4	0.4
700	0.3	0.3	0.3	0.3	0.4	0.3	0.6	0.6	0.6	0.5	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.3
850	0.7	0.2	0.3	0.6	0.4	0.4	0.5	0.7	0.7	0.8	0.6	0.3	0.2	0.2	0.3	0.3	0.2	0.1
900	0.5	0.2	0.3	0.5	0.3	0.3	0.4	0.6	0.6	0.6	0.4	0.3	0.3	0.2	0.4	0.4	0.3	0.3
950	0.3	0.2	0.3	0.4	0.3	0.3	0.5	0.6	0.7	0.7	0.5	0.4	0.3	0.3	0.6	0.6	0.5	0.5
1000	0.1	0.1	0.2	0.4	0.3	0.2	0.3	0.5	0.6	0.6	0.6	0.5	0.4	0.3	0.4	0.4	0.5	0.5
MEAN	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
									JULY									
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2
400	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
500	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2
700	0.6	0.4	0.3	0.2	0.2	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.4	0.3	0.2	0.2
850	0.8	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.3	0.4	0.2	0.2	0.3
900	0.5	0.2	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.3
950	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.6	0.5	0.4	0.2	0.2	0.2	0.2	0.3
1000	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.3	0.5	0.5	0.5	0.4	0.3	0.2	0.2	0.3	0.4
MEAN	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2
									YEAR									
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1
700	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
850	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0
900	0.2	0.1	0.2	0.2	0.3	0.4	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3
950	0.2	0.1	0.1	0.1	0.3	0.4	0.2	0.3	0.3	0.1	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.4
1000	0.4	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.3	0.2	0.4	0.3	0.2	0.2	0.2	0.4	0.4	0.4
MEAN	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

TABLE C4b.—*Interannual standard deviation of the northward transport of water vapor by stationary eddies $\sigma([\bar{v}^*\bar{q}^*])$, g/kg · m/s*

$\sigma([\overline{v}^*\overline{q}^*])$

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
60 MONTHS																		
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
500	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
700	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
850	0.1	0.1	0.1	0.1	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.2
900	0.1	0.1	0.1	0.2	0.3	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.4	0.3
950	0.1	0.1	0.1	0.2	0.3	0.5	0.5	0.6	0.6	0.5	0.4	0.4	0.4	0.5	0.7	0.7	0.5	0.4
1000	0.1	0.1	0.1	0.2	0.3	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.7	0.7	0.5	0.4
MEAN	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
JANUARY																		
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
500	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
700	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.2
850	0.1	0.1	0.1	0.2	0.3	0.4	0.3	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.2	0.2
900	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.6	0.7	0.5	0.5	0.5	0.5	0.6	0.7	0.6	0.4	0.3
950	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.7	0.6	0.4	0.5	0.5	0.4	0.5	0.8	0.7	0.4	0.3
1000	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.6	0.7	0.5	0.5	0.5	0.3	0.4	0.6	0.6	0.4	0.2
MEAN	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
JULY																		
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
500	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1
700	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.3	0.3	0.1
850	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.6	0.4	0.3	0.2	0.1	0.2	0.2	0.2	0.4	0.4	0.1
900	0.2	0.1	0.1	0.1	0.1	0.3	0.5	0.7	0.7	0.6	0.3	0.2	0.1	0.2	0.3	0.3	0.3	0.1
950	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.6	0.6	0.6	0.5	0.3	0.1	0.2	0.3	0.3	0.2	0.2
1000	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.4	0.5	0.5	0.5	0.4	0.1	0.2	0.4	0.3	0.2	0.2
MEAN	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1
YEAR																		
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0
850	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
900	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
950	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1000	0.1	0.1	0.0	0.0	0.1	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1
MEAN	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TABLE C4c.—*Interannual standard deviation of the northward transport of water vapor by mean meridional circulation* $\sigma([\bar{v}]''[\bar{q}])$, *g/kg · m/s*

σ ([v̄]" [q̄])								60 MONTHS										
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2
400	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
500	0.7	0.5	0.4	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
700	1.6	1.6	1.6	1.2	0.8	0.9	0.8	0.7	0.5	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
850	4.9	3.7	3.2	2.8	2.2	2.3	1.7	1.3	1.1	0.9	0.9	0.7	0.7	0.5	0.5	0.4	0.5	0.5
900	4.8	4.2	3.9	3.3	2.7	2.9	2.4	1.9	1.8	1.4	1.4	1.1	1.0	0.8	0.6	0.7	0.7	0.7
950	4.8	5.0	5.0	3.8	3.2	3.4	3.1	2.4	2.3	1.9	1.8	1.5	1.4	1.2	1.1	1.0	1.0	1.1
1000	7.4	7.9	7.8	5.5	3.9	4.4	3.9	3.4	3.0	2.2	1.9	1.6	1.6	1.5	1.3	1.0	1.0	1.1
MEAN	1.7	1.5	1.5	1.2	0.9	0.9	0.8	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.3
								JANUARY										
50																		
100																		
200																		
300	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.5	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1
500	0.6	0.5	0.5	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0
700	1.5	1.6	2.0	1.7	0.8	0.5	0.5	0.6	0.6	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
850	3.4	1.5	0.8	1.2	2.5	3.4	2.5	1.1	0.7	0.6	0.4	0.3	0.4	0.4	0.3	0.1	0.1	0.1
900	4.0	2.8	2.7	1.1	1.6	3.4	3.1	1.4	0.7	0.6	0.4	0.6	0.6	0.5	0.5	0.4	0.4	0.3
950	4.9	4.7	6.0	3.4	1.6	4.2	4.4	2.7	1.3	0.7	0.5	0.9	0.8	0.5	0.5	0.5	0.4	0.3
1000	10.5	10.5	11.9	7.3	3.0	5.4	5.9	4.2	1.9	1.0	1.5	1.4	0.9	0.7	0.9	0.6	0.5	0.3
MEAN	1.6	1.4	1.5	1.0	0.7	1.1	1.0	0.6	0.4	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
								JULY										
50																		
100																		
200																		
300	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
400	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
500	0.5	0.3	0.4	0.4	0.4	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.3
700	2.4	2.0	1.9	1.1	0.9	1.3	1.0	0.8	0.7	0.5	0.5	0.5	0.6	0.6	0.5	0.3	0.2	0.3
850	5.4	4.7	3.7	3.1	2.5	2.3	2.4	2.0	1.9	1.7	1.4	0.5	0.6	0.9	1.0	0.6	0.5	0.5
900	5.7	5.2	4.7	4.3	3.6	4.0	4.2	3.2	2.6	2.1	2.2	1.1	0.8	0.8	1.0	1.4	1.3	1.2
950	4.9	4.9	5.1	4.7	3.8	3.7	3.7	2.1	1.9	2.2	2.6	1.7	1.5	1.4	1.7	2.2	2.0	1.9
1000	7.1	5.5	5.1	4.4	4.0	4.0	3.3	1.8	1.9	2.4	2.3	1.7	1.6	1.4	1.8	1.9	2.1	2.4
MEAN	1.9	1.6	1.5	1.3	1.0	1.0	0.9	0.7	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.5
								YEAR										
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.3	0.2	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
700	0.6	0.4	0.4	0.5	0.2	0.3	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
850	2.0	1.0	0.8	0.7	1.0	1.1	0.6	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1
900	1.3	1.5	1.7	1.2	1.2	1.3	0.9	0.3	0.3	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.1
950	1.4	2.7	2.9	1.8	1.3	1.5	1.2	0.7	0.4	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.3	0.2
1000	2.7	4.7	5.0	3.2	1.6	1.8	1.6	1.3	0.8	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3
MEAN	0.6	0.6	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

TABLE D1a.—*Interannual standard deviation of the vertical transport of westerly momentum by stationary eddies* $\sigma([\bar{\omega}^*\bar{u}^*])$, 10^{-4}*mb* · *m* · s^{-2}

$\sigma([\bar{\omega}^* \bar{u}^*])$									60 MONTHS									
P (MB)	10°S	5°S	Eq	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.5	0.7	0.8	0.8
100	0.2	0.2	0.3	0.4	0.6	0.5	0.8	0.7	1.0	1.3	1.3	1.2	1.3	1.2	1.2	1.3	1.6	2.3
200	0.7	0.7	0.7	1.2	2.0	1.8	2.8	2.8	4.1	4.5	3.6	2.7	2.8	2.4	1.9	2.0	2.2	3.2
300	0.7	0.7	0.7	1.2	2.2	2.2	3.2	4.2	6.2	5.9	4.7	3.9	4.1	3.5	2.6	2.9	2.9	4.2
400	0.8	0.7	0.8	1.0	1.6	2.0	3.1	3.9	5.3	5.3	4.7	3.8	3.9	3.6	3.3	3.7	3.6	4.7
500	0.7	0.8	0.8	1.0	1.3	1.9	2.4	3.4	4.4	4.2	3.6	2.8	3.4	3.0	3.4	4.0	3.6	4.3
700	0.8	0.8	0.9	1.0	1.6	1.5	2.1	2.2	2.1	2.1	1.7	1.6	2.0	2.2	2.6	2.6	2.3	2.5
850	0.5	0.6	0.6	0.9	1.2	1.1	1.5	1.2	0.9	1.0	0.9	0.9	1.1	1.3	1.6	1.7	1.5	1.5
900	0.4	0.6	0.6	0.7	0.9	0.9	1.1	0.9	0.6	0.7	0.7	0.7	0.8	0.9	1.1	1.2	1.0	1.1
950	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.5	0.6
1000	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
MEAN	0.6	0.6	0.6	0.9	1.3	1.4	2.0	2.3	3.0	2.9	2.5	2.1	2.3	2.2	2.2	2.4	2.3	2.9
									JANUARY									
50	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.3	0.4	0.7	1.1	0.5	0.7	1.4	1.2
100	0.3	0.4	0.5	0.5	0.5	0.3	0.4	0.5	0.4	0.5	1.0	1.7	1.8	1.6	0.4	1.4	2.2	3.1
200	0.7	0.7	0.8	1.1	1.1	1.1	2.4	2.8	5.2	2.3	2.9	3.9	2.4	2.0	1.5	1.9	2.0	2.7
300	0.9	0.7	1.2	1.4	1.0	2.7	4.7	4.8	8.9	2.6	4.4	5.3	3.7	3.7	4.4	4.4	2.6	2.4
400	1.0	0.9	1.0	1.0	0.7	2.8	5.0	4.0	7.0	2.3	5.8	5.8	3.6	4.4	5.6	6.1	4.1	2.8
500	0.6	0.7	0.9	0.8	0.4	2.8	4.8	3.0	6.1	2.3	3.9	3.4	2.9	4.6	5.9	6.5	4.4	2.9
700	0.5	0.6	0.4	0.4	0.5	1.5	1.9	1.0	2.2	0.8	1.0	0.8	2.3	3.8	4.0	3.2	2.3	2.6
850	0.5	0.6	0.6	0.3	0.2	0.4	0.5	0.5	0.2	0.4	0.4	0.5	1.6	2.4	2.2	1.4	0.9	1.1
900	0.4	0.5	0.5	0.4	0.2	0.3	0.3	0.5	0.5	0.4	0.4	0.4	1.1	1.7	1.8	1.0	0.4	0.8
950	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.4	0.3	0.2	0.2	0.6	1.0	1.1	0.7	0.4	0.7
1000	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2
MEAN	0.6	0.6	0.7	0.7	0.6	1.5	2.4	2.0	3.7	1.4	2.3	2.5	2.3	3.0	3.3	3.3	2.4	2.2
									JULY									
50	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1
100	0.4	0.3	0.3	0.4	0.4	0.8	0.8	0.3	0.4	0.7	1.1	0.9	0.4	0.2	0.4	0.6	0.4	0.2
200	0.5	0.8	0.8	1.0	1.6	2.6	2.1	1.7	1.3	1.9	2.3	2.0	1.6	1.1	1.1	1.1	0.9	0.8
300	0.5	0.7	0.9	0.7	1.6	1.7	1.3	1.8	1.3	2.2	2.6	2.3	1.0	2.2	2.1	1.0	0.8	1.2
400	0.5	0.5	0.8	0.6	1.1	1.5	1.0	1.7	1.2	2.9	2.3	1.8	0.5	2.4	2.3	0.7	0.7	2.4
500	0.7	0.6	0.9	1.1	0.8	0.7	1.2	1.3	1.6	3.4	1.6	0.7	1.0	1.6	1.9	0.7	0.6	1.8
700	0.2	0.8	1.4	1.1	2.0	2.3	2.2	0.8	1.3	2.0	0.7	0.5	1.0	0.6	0.8	0.6	0.7	1.0
850	0.1	0.6	0.8	0.5	1.5	1.4	1.1	0.5	1.1	1.3	0.7	0.5	0.9	0.4	0.3	0.4	0.3	0.4
900	0.1	0.6	0.7	0.4	1.2	1.2	0.8	0.3	0.7	0.8	0.5	0.4	0.6	0.3	0.2	0.3	0.2	0.4
950	0.1	0.2	0.3	0.2	0.6	0.7	0.5	0.1	0.3	0.4	0.3	0.3	0.3	0.1	0.2	0.1	0.1	0.2
1000	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0
MEAN	0.4	0.6	0.8	0.7	1.2	1.5	1.3	1.0	1.2	1.9	1.4	1.0	0.8	1.0	1.1	0.6	0.6	1.0
									YEAR									
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
100	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.1
200	0.2	0.3	0.1	0.4	0.5	0.2	0.5	0.3	0.5	0.4	0.4	0.6	0.5	0.5	0.3	0.2	0.1	0.3
300	0.3	0.3	0.3	0.4	0.4	0.6	0.6	0.3	0.5	0.7	0.9	0.9	0.6	0.5	0.4	0.6	0.5	0.4
400	0.2	0.2	0.3	0.3	0.2	0.4	0.4	0.3	0.4	0.6	0.7	0.7	0.8	0.6	0.7	1.0	1.0	0.7
500	0.1	0.1	0.3	0.4	0.3	0.2	0.3	0.2	0.4	0.8	0.8	0.4	0.7	0.5	0.7	0.8	0.9	0.8
700	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.6	0.5	0.3	0.5	0.4	0.5	0.4	0.5	0.4
850	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.2
900	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
950	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1000	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAN	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.3	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.4

TABLE D1b.—*Interannual standard deviation of the vertical transport of westerly momentum by mean meridional circulation* $\sigma([\bar{\omega}]''' [\bar{u}])$, 10^{-4}*mb · m · s*$^{-2}$

σ ([$\bar{\omega}$])‴ [$\bar{u}$])									60 MONTHS									
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	1.0	1.2	1.6	1.2	0.9	0.7	0.8	0.5	0.6	0.6	0.7	1.1	1.7	2.1	1.7	2.7	4.2	3.8
100	0.7	0.8	1.3	1.2	1.0	1.6	2.8	3.1	2.9	2.5	2.3	2.7	3.6	3.6	2.9	3.7	5.3	4.8
200	2.6	2.0	3.6	2.9	2.1	3.8	10.0	10.0	10.2	9.3	7.1	6.6	6.4	5.0	3.0	4.2	5.1	4.7
300	2.9	3.0	4.3	3.5	2.0	4.0	12.0	12.9	11.6	11.5	9.4	8.8	7.9	6.0	3.4	4.7	5.5	5.2
400	2.9	3.8	4.6	3.8	2.2	2.4	8.7	10.8	9.4	10.4	9.5	8.6	7.8	5.9	3.6	4.1	5.0	4.8
500	3.3	3.9	4.4	3.4	2.7	2.0	5.2	7.6	6.9	8.1	7.9	7.2	6.6	5.0	3.2	2.9	3.6	3.5
700	2.8	3.0	2.8	2.7	2.4	1.4	1.4	2.6	3.0	3.9	4.1	3.5	3.2	2.6	1.8	1.3	1.4	1.5
850	2.1	1.5	1.0	1.7	1.7	1.0	0.5	0.6	0.9	1.3	1.7	1.3	1.2	1.0	0.7	0.7	0.7	0.7
900	1.2	1.1	0.7	1.3	1.2	0.8	0.4	0.3	0.6	0.8	1.2	0.9	0.8	0.6	0.4	0.4	0.4	0.5
950	0.6	0.7	0.4	0.7	0.7	0.4	0.3	0.2	0.2	0.4	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.3
1000	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
MEAN	2.2	2.4	2.8	2.5	1.9	2.0	4.6	5.5	5.2	5.7	5.2	4.7	4.4	3.5	2.2	2.4	3.0	2.8
									JANUARY									
50	2.8	3.2	2.6	2.0	0.8	0.5	0.4	0.5	1.0	1.1	1.5	0.7	1.7	2.1	4.4	7.7	5.1	8.5
100	0.9	1.2	1.5	1.0	0.1	1.2	3.4	4.3	5.0	2.9	3.3	1.1	2.6	3.5	5.9	9.9	6.7	11.9
200	3.6	4.4	1.3	1.5	1.6	5.4	11.2	10.1	14.7	6.3	1.0	4.7	5.2	6.1	4.7	9.2	6.2	8.1
300	5.2	10.7	6.1	3.7	4.3	8.6	15.6	12.0	17.7	10.3	8.0	7.1	8.2	8.8	5.3	7.6	5.7	6.7
400	6.5	10.2	4.6	7.8	4.7	5.0	12.1	11.0	13.1	9.1	10.3	7.9	8.5	10.7	6.0	6.0	5.1	5.0
500	7.8	8.7	4.3	7.3	3.7	3.2	7.9	9.4	9.2	9.0	11.4	8.1	8.2	9.9	5.3	4.0	3.6	3.4
700	2.9	3.2	4.1	4.7	2.5	1.5	2.3	4.4	3.9	4.5	6.9	4.6	5.5	7.0	3.9	1.9	1.1	1.3
850	0.9	1.3	1.8	3.6	2.5	1.5	0.8	0.8	1.5	1.5	2.7	1.2	2.8	3.9	2.5	0.9	0.3	1.1
900	0.8	0.8	0.9	2.7	1.9	1.1	0.8	0.4	1.1	0.9	1.8	0.6	1.9	2.7	1.8	0.5	0.2	1.0
950	0.6	0.6	0.3	1.5	1.0	0.5	0.5	0.3	0.5	0.4	0.8	0.3	1.1	1.5	1.0	0.2	0.2	0.7
1000	0.1	0.2	0.0	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.4	0.2	0.1	0.1	0.2
MEAN	3.6	4.8	3.1	4.0	2.6	3.1	6.1	6.3	7.5	5.5	5.8	4.4	5.3	6.4	4.1	4.2	3.1	4.0
									JULY									
50	0.4	0.4	0.3	0.9	0.7	1.1	1.5	1.0	1.2	0.8	0.4	0.1	0.1	0.1	0.2	0.1	0.2	0.2
100	0.3	1.0	1.1	0.8	1.6	1.8	2.2	1.7	0.9	0.4	1.0	1.2	1.0	0.3	0.3	0.1	0.2	0.1
200	1.5	2.0	2.3	2.0	2.8	2.3	1.2	1.2	2.4	2.7	4.5	5.6	4.3	1.3	1.1	0.7	0.9	1.0
300	3.6	2.1	1.9	2.0	2.5	3.2	1.6	1.4	3.3	3.8	7.2	8.5	5.4	2.0	2.2	1.5	2.0	2.2
400	3.2	2.6	2.5	2.2	2.5	3.5	1.5	1.8	2.8	3.9	6.7	8.6	5.2	1.6	2.7	1.9	2.7	2.9
500	3.6	2.2	2.7	1.9	2.6	3.9	1.1	1.9	1.9	2.9	5.2	7.4	4.3	1.2	2.7	1.3	2.5	2.7
700	2.0	1.2	1.2	1.0	1.1	2.4	0.6	0.8	0.7	1.0	2.0	3.4	2.8	0.8	1.5	0.5	1.1	1.4
850	1.5	0.9	0.6	0.5	0.2	0.6	0.4	0.5	0.2	0.5	0.7	1.2	1.2	0.4	0.5	0.1	0.4	0.7
900	0.7	0.9	0.3	0.4	0.2	0.4	0.3	0.4	0.1	0.4	0.4	0.8	0.9	0.3	0.3	0.1	0.2	0.3
950	0.3	0.6	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.4	0.4	0.2	0.2	0.1	0.0	0.1
1000	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
MEAN	2.0	1.5	1.5	1.3	1.6	2.2	0.9	1.1	1.4	1.8	3.3	4.5	3.1	1.0	1.4	0.7	1.3	1.4
									YEAR									
50	1.0	0.5	0.2	0.4	0.6	0.4	0.4	0.1	0.0	0.1	0.1	0.2	0.5	0.8	0.6	0.3	0.8	1.0
100	0.4	0.2	0.2	0.5	0.3	0.1	0.4	0.6	0.9	0.5	0.8	0.9	1.5	1.9	1.2	0.5	1.2	1.4
200	0.9	1.4	0.5	0.9	0.1	1.1	2.7	3.2	2.7	1.8	2.6	2.4	2.6	2.7	1.1	1.1	2.0	1.3
300	0.8	1.6	0.6	1.2	0.3	1.2	2.6	3.3	2.3	2.3	3.5	2.7	2.6	2.5	0.8	2.1	2.6	1.7
400	1.1	1.4	1.5	1.6	0.5	0.3	1.4	2.6	1.9	2.4	4.0	2.7	2.2	2.1	1.0	1.9	2.3	1.7
500	1.6	0.9	2.5	1.5	0.9	0.4	0.8	1.8	1.6	2.4	3.6	2.4	2.0	1.9	1.1	1.3	1.7	1.1
700	1.7	0.8	2.7	2.0	0.5	0.6	0.2	0.5	0.6	1.1	1.5	1.0	1.0	1.2	0.7	0.6	0.6	0.3
850	1.2	0.4	1.1	1.2	0.4	0.4	0.3	0.1	0.1	0.3	0.6	0.5	0.3	0.5	0.3	0.2	0.2	0.1
900	0.8	0.3	0.6	0.8	0.3	0.2	0.2	0.1	0.1	0.2	0.4	0.4	0.2	0.4	0.2	0.1	0.1	0.0
950	0.4	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.0	0.0	0.1
1000	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0
MEAN	1.1	0.9	1.3	1.2	0.4	0.5	0.9	1.4	1.2	1.4	2.1	1.5	1.5	1.5	0.8	0.9	1.2	0.8

TABLE D2.—*Interannual standard deviation of the vertical transport of southerly momentum by stationary eddies* $\sigma([\bar{\omega}^*\bar{v}^*])$, 10^{-4}mb · m · s^{-2}

$\sigma([\bar{\omega}^* \bar{v}^*])$ — 60 MONTHS

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.8	1.3	1.4	1.7	1.9
100	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.7	1.0	0.9	0.8	1.0	1.4	2.2	2.5	2.6	3.0
200	0.4	0.5	0.5	0.8	1.0	1.3	1.7	2.4	2.9	3.3	2.9	2.5	2.6	3.0	3.6	3.4	3.0	3.8
300	0.4	0.6	0.7	1.1	1.3	1.5	2.1	3.2	3.6	3.7	3.8	3.8	3.7	4.4	5.1	4.1	3.6	5.1
400	0.3	0.4	0.4	0.6	1.0	1.3	1.7	2.2	2.6	3.7	4.6	4.1	4.0	4.9	5.5	4.4	4.3	5.4
500	0.3	0.3	0.3	0.5	0.8	1.0	1.2	1.8	2.2	3.2	3.6	3.5	4.0	4.6	4.8	4.1	3.9	5.5
700	0.3	0.3	0.3	0.4	0.6	0.7	1.0	1.1	1.2	1.8	1.7	1.9	2.6	3.0	3.0	2.3	2.1	3.1
850	0.2	0.3	0.3	0.4	0.6	0.5	0.7	0.7	0.8	1.0	1.0	1.1	1.5	1.6	1.4	1.3	1.2	1.6
900	0.2	0.3	0.2	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.7	0.9	1.1	1.1	1.0	1.0	0.9	1.1
950	0.1	0.2	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.5	0.6	0.5	0.6
1000	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2
MEAN	0.3	0.3	0.3	0.5	0.7	0.8	1.1	1.5	1.7	2.2	2.3	2.3	2.5	3.0	3.2	2.8	2.6	3.5

JANUARY

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.6	0.6	1.7	3.2	2.1	2.4	2.7
100	0.1	0.1	0.2	0.3	0.3	0.2	0.5	0.7	0.4	0.6	0.6	1.0	1.5	1.9	4.4	4.8	4.1	3.5
200	0.6	0.9	0.9	1.0	1.1	0.9	2.0	3.8	3.0	1.0	2.2	2.1	3.4	3.6	3.1	6.4	5.0	2.8
300	0.7	1.0	1.4	1.5	1.3	1.1	3.2	6.3	4.7	1.9	3.7	3.8	5.0	5.1	3.3	5.8	4.7	1.7
400	0.3	0.5	0.5	0.7	0.9	1.1	1.9	2.2	1.1	2.8	3.2	3.9	4.8	5.0	2.8	4.8	6.1	5.4
500	0.3	0.4	0.5	0.7	1.1	1.1	1.0	1.2	1.2	2.7	2.5	4.0	4.6	4.0	2.2	4.7	6.4	5.2
700	0.1	0.2	0.2	0.4	0.5	0.5	0.5	0.9	1.9	1.9	0.9	2.7	2.9	1.9	1.4	3.0	3.6	3.8
850	0.2	0.2	0.2	0.1	0.0	0.3	0.4	0.7	1.4	1.1	0.3	1.1	1.2	0.8	0.7	0.7	2.1	2.6
900	0.2	0.3	0.1	0.2	0.2	0.4	0.3	0.6	1.1	0.8	0.4	0.7	0.9	0.7	0.8	0.9	1.4	1.7
950	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.6	0.4	0.3	0.4	0.5	0.5	0.5	0.9	0.9	0.9
1000	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.4	0.3	0.2
MEAN	0.3	0.4	0.5	0.6	0.7	0.7	1.1	1.8	1.8	1.6	1.6	2.4	3.0	2.7	2.1	3.5	4.0	3.3

JULY

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
100	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.5	0.5	0.5	0.6	0.5	0.2	0.3	0.2	0.2	0.5	0.3
200	0.3	0.2	0.5	0.5	0.3	0.4	0.4	0.9	0.9	1.3	1.6	2.1	0.9	0.6	1.1	1.2	2.0	1.2
300	0.4	0.4	0.5	0.5	0.3	0.8	0.9	1.1	1.1	1.7	2.7	3.0	1.3	0.6	2.0	2.0	2.1	2.2
400	0.4	0.6	0.4	0.3	0.4	0.7	0.7	0.9	1.3	1.9	2.8	3.2	1.3	0.9	2.8	3.0	3.6	2.7
500	0.3	0.4	0.3	0.3	0.9	1.1	0.9	1.1	1.6	1.7	1.9	2.7	1.6	0.7	1.9	2.3	3.1	2.3
700	0.3	0.4	0.3	0.4	0.7	0.7	1.0	1.0	1.1	1.4	1.0	1.0	0.7	0.8	1.0	1.1	1.5	0.8
850	0.3	0.3	0.4	0.2	0.3	0.4	0.6	0.5	0.8	1.1	0.7	0.5	0.6	0.6	0.3	0.5	0.6	0.7
900	0.2	0.2	0.3	0.2	0.1	0.3	0.3	0.3	0.5	0.9	0.6	0.4	0.4	0.4	0.2	0.4	0.4	0.4
950	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.6	0.4	0.3	0.2	0.2	0.1	0.3	0.3	0.3
1000	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
MEAN	0.3	0.3	0.3	0.3	0.4	0.6	0.6	0.8	1.0	1.3	1.4	1.6	0.9	0.6	1.2	1.3	1.7	1.3

YEAR

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3
100	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.1	0.2	0.4	0.6
200	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.4	0.5	0.4	0.2	0.3	0.4	0.3	0.3	0.5
300	0.1	0.0	0.1	0.2	0.1	0.1	0.2	0.4	0.3	0.4	0.6	0.6	0.5	0.7	0.9	0.6	0.2	0.4
400	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.4	0.6	0.5	0.8	0.8	0.6	0.3	0.6
500	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.5	0.6	0.5	0.7	0.5	0.4	0.4	0.6
700	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.4	0.4	0.4	0.5	0.3	0.2	0.2	0.5
850	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.2
900	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2
950	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAN	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.4	0.3	0.5	0.4	0.3	0.2	0.4

TABLE D3a.—*Interannual standard deviation of the vertical transport of sensible heat (c_pT) by stationary eddies $\sigma([\bar{\omega}^*\bar{T}^*])$, 10^{-4}mb/s · °C*

$\sigma([\bar{\omega}^*\bar{T}^*])$																		
60 MONTHS																		
P (MB)	10°S	5°S	EQ	5N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.5	0.5	0.5	0.7	0.8	0.9
100	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.6	0.9	1.0	0.9	1.0	1.1	1.5
200	0.2	0.1	0.2	0.3	0.5	0.5	0.7	0.8	1.0	1.5	1.3	1.0	1.3	1.4	1.1	1.2	1.3	1.6
300	0.2	0.2	0.3	0.4	0.6	0.7	1.2	1.3	1.5	1.5	1.4	1.4	1.2	1.3	1.4	1.4	1.4	1.6
400	0.2	0.2	0.2	0.4	0.7	0.7	1.2	1.1	1.4	1.8	1.8	2.1	2.1	2.2	2.4	2.2	2.3	2.6
500	0.1	0.1	0.2	0.3	0.5	0.6	0.9	1.0	1.7	2.0	1.8	2.4	2.5	2.6	2.6	2.6	2.7	3.0
700	0.1	0.2	0.2	0.3	0.5	0.6	1.1	1.2	1.6	1.9	1.4	2.0	2.2	2.5	2.5	2.8	2.9	2.7
850	0.1	0.2	0.2	0.4	0.8	1.0	1.3	1.4	1.1	1.3	1.1	1.5	2.0	2.1	2.0	2.7	3.1	2.8
900	0.1	0.2	0.2	0.2	0.6	0.6	0.8	1.0	0.9	1.0	1.0	1.4	1.9	2.0	1.8	2.5	3.0	2.9
950	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.5	0.7	0.7	1.0	1.5	1.5	1.4	1.8	2.1	2.1
1000	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.5	0.6	0.5	0.8	0.9	0.6
MEAN	0.1	0.1	0.2	0.3	0.5	0.6	0.9	0.9	1.2	1.4	1.3	1.6	1.8	1.9	1.9	2.1	2.2	2.3
JANUARY																		
50	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.6	0.6	0.7	1.3	1.5	1.1
100	0.0	0.0	0.1	0.2	0.2	0.3	0.2	0.4	0.2	0.2	0.4	0.7	1.3	1.7	1.5	1.5	1.9	1.9
200	0.1	0.0	0.1	0.1	0.2	0.2	0.4	0.5	1.0	1.5	1.6	1.0	1.2	1.8	1.1	0.4	0.8	0.9
300	0.2	0.1	0.2	0.4	0.7	0.8	0.7	1.0	1.7	0.9	0.4	1.3	1.8	1.4	1.5	0.9	0.8	0.9
400	0.2	0.2	0.1	0.3	0.7	1.0	0.7	0.8	0.9	2.1	2.0	2.8	2.9	1.9	2.7	2.0	1.6	1.4
500	0.1	0.2	0.3	0.2	0.4	0.6	0.4	1.1	2.6	3.3	2.5	4.0	3.4	1.9	2.9	2.4	1.7	2.1
700	0.1	0.2	0.2	0.2	0.3	0.6	0.7	1.0	2.7	2.9	1.6	3.7	3.3	1.9	3.2	3.2	2.7	3.5
850	0.1	0.1	0.0	0.1	0.5	0.5	0.5	0.6	2.0	2.1	1.0	2.9	3.2	2.3	2.7	3.9	4.2	4.5
900	0.1	0.1	0.1	0.1	0.3	0.4	0.4	0.5	1.5	1.6	1.1	2.4	2.9	2.6	2.8	4.1	4.5	4.4
950	0.0	0.1	0.1	0.0	0.1	0.2	0.3	0.3	0.8	1.1	0.7	1.5	2.2	2.2	2.3	3.0	3.4	3.4
1000	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.4	0.2	0.5	0.8	0.9	0.8	1.2	1.4	1.0
MEAN	0.1	0.1	0.1	0.2	0.4	0.5	0.5	0.8	1.7	1.9	1.4	2.4	2.5	1.8	2.3	2.3	2.2	2.4
JULY																		
50	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2
100	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.1	0.1	0.2	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1
200	0.2	0.1	0.3	0.6	0.8	0.7	0.3	0.7	1.0	0.9	1.3	0.8	0.5	0.2	0.4	0.5	0.5	0.5
300	0.3	0.3	0.5	0.8	1.2	1.0	0.8	1.0	1.2	1.2	1.4	0.7	0.5	0.7	1.1	0.6	0.5	0.9
400	0.2	0.3	0.4	0.7	1.1	0.8	1.0	0.9	0.9	1.1	0.9	0.7	0.7	0.9	1.3	0.8	0.5	1.0
500	0.2	0.2	0.3	0.5	0.7	0.7	1.1	1.0	0.8	0.9	0.6	0.7	0.6	1.1	1.5	0.7	1.0	0.9
700	0.1	0.1	0.2	0.2	0.4	0.7	0.5	0.7	0.7	0.6	0.7	0.5	0.4	0.6	0.9	0.8	0.8	0.3
850	0.1	0.1	0.2	0.3	0.5	0.5	0.3	0.6	0.9	0.6	0.5	0.7	0.7	0.5	0.7	0.5	0.2	0.5
900	0.1	0.1	0.1	0.2	0.4	0.4	0.2	0.4	0.7	0.7	0.6	0.8	0.9	0.5	0.5	0.4	0.3	0.5
950	0.0	0.0	0.0	0.1	0.3	0.2	0.1	0.1	0.4	0.4	0.3	0.6	0.7	0.4	0.3	0.2	0.2	0.4
1000	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1
MEAN	0.1	0.1	0.2	0.4	0.6	0.6	0.5	0.6	0.7	0.7	0.7	0.6	0.5	0.6	0.8	0.6	0.5	0.5
YEAR																		
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2
100	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2
200	0.1	0.0	0.1	0.1	0.2	0.2	0.0	0.2	0.2	0.3	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.3
300	0.1	0.0	0.1	0.1	0.3	0.3	0.3	0.4	0.4	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2
400	0.1	0.0	0.0	0.1	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.2	0.4	0.4	0.2	0.3	0.3	0.8
500	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.2	0.1	0.3	0.3	0.3	0.6	0.5	0.2	0.3	0.4	1.1
700	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.4	0.6	0.4	0.2	0.3	0.3	0.8
850	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.2	0.2	0.3	0.4	0.4	0.2	0.3	0.3	0.6
900	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.1	0.3	0.3	0.5
950	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.1	0.2	0.2	0.4
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
MEAN	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.2	0.2	0.3	0.6

TABLE D3b.—*Interannual standard deviation of the vertical transport of sensible heat by mean meridional circulation $\sigma([\bar{\omega}]''' \, [\bar{T}]''')$, 10^{-3}mb/s · °C*

$\sigma([\bar{\omega}]''' \, [\bar{T}]''')$								60 MONTHS										
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
100	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.4	0.4	0.5	0 6
200	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.4
300	0.9	0.7	0.7	0.6	0.4	0.4	0.5	0.3	0.2	0.1	0.2	0.3	0.4	0.5	0.5	0.7	1.1	1.2
400	1.3	1.0	0.9	0.7	0.5	0.5	0.6	0.4	0.3	0.1	0.3	0.4	0.5	0.7	0.7	0.9	1.4	1.7
500	1.3	0.9	0.8	0.6	0.5	0.5	0.5	0.4	0.3	0.1	0.2	0.4	0.5	0.7	0.7	0.9	1.4	1.6
700	1.0	0.8	0.7	0.6	0.5	0.4	0.5	0.4	0.2	0.1	0.2	0.3	0.4	0.6	0.6	0.6	1.0	1.3
850	0.6	0.6	0.5	0.6	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.5	0.7	1.1
900	0.4	0.5	0.4	0.5	0.3	0.2	0.2	0.2	0.1	0.0	0.1	0.2	0.2	0.3	0.4	0.5	0.7	1.0
950	0.3	0.4	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.5	0.7
1000	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
MEAN	0.8	0.6	0.6	0.5	0.4	0.3	0.4	0.3	0.2	0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.9	1.1
								JANUARY										
50	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.4
100	0.4	0.6	0.7	0.4	0.1	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.3	0.5	0.4	0.4	0.4	0.2
200	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.4	0.5	0.7
300	1.3	0.4	0.6	1.0	0.5	0.4	0.7	0.3	0.1	0.1	0.2	0.3	0.6	1.0	0.9	1.5	1.8	1.3
400	1.9	0.7	0.9	1.5	0.5	0.6	0.8	0.3	0.1	0.1	0.4	0.6	0.8	1.4	1.3	1.8	2.3	1.3
500	1.9	0.9	1.1	1.3	0.5	0.5	0.7	0.3	0.1	0.1	0.5	0.7	0.8	1.5	1.2	1.6	2.2	1.1
700	1.6	1.2	0.7	1.4	0.6	0.5	0.7	0.4	0.1	0.1	0.4	0.6	0.7	1.1	0.9	1.0	1.1	1.0
850	1.0	1.1	0.4	1.2	0.6	0.4	0.5	0.3	0.1	0.0	0.3	0.3	0.4	0.7	0.7	0.6	0.8	1.5
900	0.8	0.9	0.3	1.0	0.5	0.3	0.4	0.2	0.1	0.0	0.2	0.2	0.3	0.6	0.6	0.5	0.5	1.5
950	0.5	0.6	0.2	0.7	0.4	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.3	0.4	0.4	0.4	0.3	1.0
1000	0.1	0.2	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.3
MEAN	1.2	0.7	0.6	1.0	0.4	0.4	0.5	0.2	0.1	0.1	0.3	0.4	0.5	0.9	0.8	1.0	1.2	1.0
								JULY										
50	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2
100	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.1	0.2	0.2	0.3	0.4
200	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
300	0.3	0.1	0.1	0.1	0.1	0.2	0.1	0.4	0.4	0.1	0.0	0.1	0.2	0.1	0.3	0.3	0.3	0.5
400	0.5	0.2	0.2	0.1	0.1	0.3	0.1	0.5	0.5	0.1	0.0	0.2	0.2	0.1	0.4	0.6	0.6	0.8
500	0.4	0.2	0.2	0.1	0.1	0.3	0.1	0.5	0.5	0.1	0.0	0.1	0.2	0.1	0.4	0.5	0.6	0.8
700	0.1	0.1	0.2	0.0	0.1	0.2	0.1	0.3	0.4	0.1	0.1	0.1	0.2	0.1	0.3	0.2	0.5	0.7
850	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.0	0.1	0.2	0.1	0.2	0.1	0.4	0.6
900	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.3	0.5
950	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.3
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
MEAN	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.3	0.1	0.0	0.1	0.2	0.1	0.3	0.2	0.4	0.5
								YEAR										
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1
100	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.3	0.3
200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
300	0.3	0.3	0.3	0.3	0.1	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.3	0.5	0.4
400	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.4	0.6	0.6
500	0.5	0.4	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.6	0.5
700	0.5	0.4	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.3
850	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3
900	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3
950	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
MEAN	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.2	0.3	0.3

TABLE D4a.—*Interannual standard deviation of the vertical transport of potential energy (gZ) by stationary eddies $\sigma([\bar{\omega}^*\bar{Z}^*])$, 10^{-3}mb/s · gpm*

$\sigma([\bar{\omega}^* \bar{Z}^*])$																		
60 MONTHS																		
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.6	0.7	1.1	1.3	1.5	1.4	1.6	1.9	2.4
100	0.3	0.2	0.3	0.4	0.6	0.6	0.7	0.9	1.0	1.4	1.6	2.1	2.7	3.4	4.5	3.8	3.8	5.5
200	0.3	0.3	0.4	0.6	1.0	1.1	1.4	1.9	2.7	3.9	4.4	4.6	4.7	5.6	7.2	6.8	6.2	7.4
300	0.3	0.4	0.5	0.6	0.9	1.1	1.4	2.2	4.4	5.9	6.2	6.5	7.3	7.5	8.6	7.6	7.0	8.4
400	0.3	0.3	0.5	0.6	0.8	1.3	1.8	2.3	4.7	5.7	5.5	6.3	7.5	7.2	7.8	7.1	7.7	10.0
500	0.3	0.3	0.4	0.5	0.6	1.0	1.7	2.2	4.0	4.6	4.7	5.6	6.5	6.0	6.1	6.0	7.3	9.0
700	0.3	0.3	0.4	0.4	0.7	0.7	1.7	1.9	1.8	2.5	2.9	3.2	3.6	3.5	3.5	3.4	3.6	4.5
850	0.2	0.2	0.2	0.3	0.5	0.6	1.4	1.6	1.0	1.3	1.5	1.7	2.1	2.4	2.2	2.2	2.4	2.6
900	0.2	0.2	0.2	0.3	0.5	0.5	1.1	1.4	0.9	1.0	1.2	1.4	1.8	2.2	1.8	1.8	1.9	2.6
950	0.1	0.1	0.1	0.2	0.3	0.3	0.6	0.9	0.6	0.6	0.7	0.9	1.2	1.6	1.3	1.2	1.2	1.3
1000	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.4	0.6	0.4	0.5	0.5	0.3
MEAN	0.2	0.2	0.3	0.4	0.6	0.8	1.4	1.7	2.5	3.2	3.4	3.8	4.3	4.5	4.9	4.6	4.8	5.9
JANUARY																		
50	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.8	0.9	1.4	1.9	2.3	1.8	2.2	2.4	3.0
100	0.1	0.3	0.4	0.3	0.3	0.3	0.5	0.6	0.2	1.2	1.7	3.9	6.4	7.4	7.1	3.2	5.9	7.5
200	0.3	0.4	0.3	0.3	0.4	0.5	2.0	3.3	3.0	5.1	6.3	8.7	10.2	7.8	8.2	3.5	6.7	7.0
300	0.2	0.5	0.5	0.3	0.3	0.6	2.1	3.8	7.0	10.2	10.6	11.2	12.1	8.1	9.1	5.0	5.4	4.4
400	0.2	0.6	0.6	0.5	0.6	0.8	1.6	3.4	8.8	10.4	7.6	10.1	9.5	7.0	8.0	4.6	4.0	5.4
500	0.2	0.6	0.6	0.5	0.8	1.4	1.8	2.9	7.7	8.6	5.4	8.9	7.7	6.0	5.2	3.0	4.5	5.8
700	0.2	0.4	0.4	0.4	0.7	0.9	0.9	1.4	3.3	3.4	1.1	4.4	4.5	4.2	2.3	2.4	3.6	4.1
850	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	1.1	1.1	1.5	2.4	2.3	1.8	0.8	2.6	2.5	1.4
900	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.7	0.6	1.2	1.8	1.9	1.5	0.8	2.0	1.8	0.6
950	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.3	0.7	1.0	1.2	1.0	0.6	1.3	1.1	0.7
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.4	0.4	0.4	0.2	0.5	0.4	0.3
MEAN	0.2	0.4	0.4	0.4	0.5	0.7	1.2	2.0	4.0	5.0	4.0	6.1	6.4	5.1	4.6	3.0	4.0	4.3
JULY																		
50	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.6	0.6	0.3	0.2	0.2	0.3	0.3	0.7
100	0.4	0.4	0.4	0.6	0.9	1.0	0.7	0.9	0.8	1.3	1.9	0.9	0.3	0.6	0.7	0.6	0.5	1.5
200	0.3	0.3	0.5	1.1	1.7	1.1	0.6	1.0	1.4	1.6	3.0	1.9	0.7	1.7	2.0	1.1	1.2	1.8
300	0.3	0.5	0.7	0.9	1.4	1.1	1.0	0.7	0.8	1.2	2.7	2.4	1.2	2.0	3.3	1.5	2.2	2.4
400	0.3	0.4	0.5	0.6	0.8	1.0	1.2	1.0	0.5	1.2	2.1	2.4	2.2	2.3	3.3	1.4	2.6	2.4
500	0.4	0.4	0.4	0.5	0.4	0.5	1.0	0.9	1.1	1.4	2.0	2.6	3.3	2.5	2.7	2.1	2.9	1.9
700	0.4	0.3	0.4	0.5	0.6	0.6	1.7	1.4	1.9	1.8	1.3	1.8	2.7	2.0	1.5	1.6	1.1	0.6
850	0.3	0.2	0.2	0.3	0.8	0.6	1.1	0.9	1.5	1.2	0.6	1.4	1.7	1.1	0.7	0.6	0.1	0.4
900	0.2	0.1	0.2	0.3	0.7	0.6	0.7	0.6	1.2	1.0	0.5	1.2	1.4	0.8	0.4	0.4	0.3	0.8
950	0.1	0.1	0.1	0.2	0.5	0.4	0.3	0.3	0.7	0.7	0.3	0.8	0.9	0.5	0.2	0.2	0.2	0.4
1000	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.3	0.2	0.1	0.1	0.1	0.1
MEAN	0.3	0.3	0.4	0.6	0.8	0.7	1.0	0.9	1.1	1.3	1.7	1.8	1.8	1.7	1.8	1.2	1.4	1.3
YEAR																		
50	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.4
100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.4	0.4	0.4	0.6	0.4	0.3	0.5	0.5	0.4
200	0.1	0.0	0.1	0.2	0.4	0.3	0.4	0.5	0.5	0.9	1.0	0.8	0.6	0.6	0.7	1.0	0.9	0.6
300	0.1	0.1	0.2	0.2	0.3	0.3	0.5	0.5	0.4	1.3	1.4	1.0	1.4	1.6	0.8	1.1	0.8	1.4
400	0.1	0.1	0.2	0.2	0.2	0.3	0.6	0.5	0.3	1.4	1.4	1.3	2.2	1.9	1.0	1.3	1.1	2.4
500	0.1	0.1	0.2	0.2	0.1	0.3	0.3	0.2	0.2	0.8	1.0	1.4	2.1	1.5	1.0	1.1	1.3	2.6
700	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.3	0.6	0.5	0.9	1.1	0.7	0.6	0.6	0.6	1.1
850	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.5	0.4	0.4	0.4	0.4
900	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.4	0.6
950	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3
1000	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
MEAN	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.7	0.7	0.8	1.1	0.9	0.6	0.7	0.7	1.2

TABLE D4b.—*Interannual standard deviation of the vertical transport of potential energy by mean meridional circulation* $\sigma([\bar{\omega}]''' \, [\bar{Z}]''')$, 10^{-2}*mb/s · gpm*

$\sigma([\bar{\omega}]''' \; [\bar{Z}]''')$

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
60 MONTHS																		
50	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.3	0.7	1.2	1.9
100	0.6	0.8	1.1	0.8	0.5	0.6	0.6	0.4	0.2	0.1	0.2	0.4	0.8	1.2	1.3	2.0	3.2	4.3
200	2.6	1.9	2.4	1.9	1.3	1.5	1.8	1.1	0.7	0.3	0.4	1.0	1.6	2.3	2.0	3.5	5.3	6.3
300	3.8	2.6	2.8	2.3	1.7	1.8	2.3	1.5	0.9	0.4	0.6	1.2	1.8	2.5	2.2	3.7	5.5	6.6
400	3.5	2.5	2.4	1.9	1.5	1.5	1.8	1.3	0.8	0.4	0.5	1.0	1.5	2.1	2.1	2.9	4.5	5.4
500	2.6	1.9	1.7	1.3	1.1	1.0	1.2	1.0	0.6	0.3	0.4	0.8	1.2	1.6	1.7	2.0	3.2	3.8
700	1.0	0.9	0.7	0.6	0.5	0.4	0.5	0.5	0.3	0.2	0.2	0.3	0.5	0.8	0.8	0.8	1.3	1.7
850	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.5	0.7
900	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4
950	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAN	1.7	1.3	1.3	1.1	0.8	0.8	1.0	0.7	0.5	0.2	0.3	0.6	0.9	1.3	1.2	1.7	2.7	3.3
JANUARY																		
50	0.2	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.3	0.6	0.6	1.6	1.6	4.7
100	1.0	1.6	2.0	1.5	0.5	0.8	0.9	0.5	0.3	0.1	0.3	0.2	0.9	2.0	2.2	4.4	4.5	8.5
200	3.8	1.7	2.6	3.3	1.4	1.4	2.1	1.0	0.5	0.1	0.2	1.0	1.8	3.2	4.2	7.5	8.0	8.4
300	5.5	1.6	2.4	4.2	2.0	2.0	3.0	1.1	0.6	0.2	0.7	1.4	2.6	4.6	4.5	7.2	8.6	6.5
400	5.3	2.0	2.4	3.8	1.5	1.6	2.4	1.0	0.6	0.2	1.0	1.5	2.2	4.3	4.0	5.4	6.9	4.4
500	4.1	1.9	2.1	2.7	1.0	1.2	1.6	0.8	0.4	0.2	0.9	1.4	1.9	3.5	3.1	3.6	4.8	2.7
700	1.5	1.1	0.7	1.4	0.6	0.6	0.8	0.6	0.2	0.1	0.4	0.6	0.9	1.6	1.3	1.2	1.3	1.3
850	0.4	0.4	0.1	0.4	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.2	0.3	0.6	0.6	0.3	0.3	0.7
900	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.4	0.4	0.1	0.1	0.4
950	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.0	0.0	0.1
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
MEAN	2.6	1.2	1.4	2.0	0.9	0.9	1.3	0.6	0.3	0.1	0.4	0.8	1.3	2.4	2.3	3.3	3.9	3.5
JULY																		
50	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
100	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.3
200	0.8	0.3	0.3	0.2	0.3	0.6	0.4	0.9	1.0	0.3	0.1	0.2	0.5	0.4	0.7	0.7	1.1	1.3
300	1.5	0.5	0.4	0.4	0.4	1.0	0.6	1.3	1.4	0.4	0.2	0.3	0.6	0.5	1.1	1.4	1.3	2.1
400	1.3	0.5	0.6	0.3	0.4	0.9	0.4	1.2	1.3	0.5	0.2	0.3	0.6	0.3	1.2	1.6	1.7	2.3
500	0.9	0.4	0.5	0.2	0.3	0.6	0.2	0.9	1.0	0.4	0.2	0.2	0.4	0.2	0.9	1.1	1.5	2.0
700	0.3	0.1	0.2	0.1	0.2	0.2	0.1	0.3	0.4	0.2	0.1	0.1	0.3	0.1	0.5	0.3	0.7	1.0
850	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.3	0.3
900	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2
950	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAN	0.6	0.2	0.3	0.2	0.2	0.4	0.2	0.6	0.7	0.3	0.1	0.2	0.3	0.2	0.6	0.6	0.9	1.2
YEAR																		
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.4
100	0.2	0.1	0.2	0.3	0.2	0.2	0.3	0.1	0.1	0.0	0.0	0.1	0.3	0.6	0.5	0.3	0.9	1.2
200	0.5	0.5	0.9	0.8	0.5	0.6	0.7	0.4	0.2	0.0	0.1	0.3	0.6	1.0	0.6	1.0	2.1	1.7
300	1.2	0.9	1.2	1.0	0.6	0.9	0.8	0.5	0.2	0.1	0.1	0.3	0.6	0.9	0.4	1.5	2.4	2.0
400	1.2	1.0	1.1	0.8	0.4	0.6	0.5	0.4	0.2	0.1	0.1	0.3	0.4	0.7	0.4	1.3	2.0	1.7
500	1.1	0.8	0.8	0.5	0.3	0.4	0.4	0.3	0.2	0.1	0.1	0.2	0.3	0.6	0.4	0.8	1.4	1.1
700	0.5	0.4	0.3	0.3	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.3	0.2	0.3	0.5	0.4
850	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2
900	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
950	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAN	0.6	0.5	0.5	0.4	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.3	0.5	0.3	0.6	1.1	0.9

TABLE D5a.—*Interannual standard deviation of the vertical transport of water vapor by stationary eddies $\sigma([\bar{\omega}^*\bar{q}^*])$, 10^{-4}mb/s · g/kg*

$\sigma([\bar{\omega}^* \bar{q}^*])$

60 MONTHS

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
400	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1
500	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.2
700	0.3	0.2	0.3	0.4	0.5	0.5	0.8	0.7	0.5	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2
850	0.2	0.2	0.1	0.3	0.5	0.6	0.7	0.5	0.6	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
900	0.2	0.1	0.1	0.2	0.4	0.4	0.6	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
950	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2
1000	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
MEAN	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1

JANUARY

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
500	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1
700	0.3	0.4	0.5	0.6	0.4	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2
850	0.2	0.2	0.1	0.2	0.3	0.3	0.5	0.1	0.4	0.4	0.3	0.4	0.4	0.2	0.3	0.4	0.4	0.3
900	0.2	0.2	0.1	0.2	0.3	0.3	0.5	0.2	0.4	0.4	0.3	0.4	0.4	0.2	0.3	0.4	0.4	0.3
950	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.1	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2
1000	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
MEAN	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

JULY

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
500	0.1	0.1	0.1	0.2	0.4	0.5	0.1	0.7	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
700	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.8	0.7	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2
850	0.2	0.1	0.1	0.2	0.2	0.2	0.6	0.7	0.9	1.0	0.3	0.3	0.4	0.2	0.2	0.2	0.1	0.1
900	0.2	0.1	0.1	0.2	0.3	0.2	0.4	0.5	0.7	0.8	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.1
950	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0
MEAN	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1

YEAR

P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
700	0.1	0.1	0.1	0.3	0.3	0.2	0.3	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1
850	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1
900	0.1	0.1	0.0	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1
950	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MEAN	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

TABLE D5b.—*Interannual standard deviation of the vertical transport of water vapor by mean meridional circulation $\sigma([\bar{\omega}]''' \; [\bar{q}])$, 10^{-4}mb/s · g/kg*

$\sigma([\bar{\omega}]''' \; [\bar{q}])$									60 MONTHS									
P (MB)	10°S	5°S	EQ	5°N	10°N	15°N	20°N	25°N	30°N	35°N	40°N	45°N	50°N	55°N	60°N	65°N	70°N	75°N
50																		
100																		
200																		
300	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2
400	1.3	0.9	0.9	0.7	0.5	0.5	0.5	0.6	0.5	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3
500	2.7	2.1	2.1	1.4	1.2	1.0	1.0	1.2	1.1	0.6	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3
700	5.7	5.2	4.8	3.6	2.8	2.2	2.2	2.3	2.0	1.4	1.3	1.1	1.1	0.8	0.8	0.6	0.6	0.7
850	5.6	6.0	5.2	4.9	3.6	2.6	2.6	2.5	2.1	1.9	1.7	1.3	1.3	0.9	1.0	0.8	0.7	0.8
900	4.5	5.5	4.5	4.6	3.1	2.2	2.2	2.2	1.9	1.7	1.7	1.2	1.1	0.9	0.9	0.7	0.6	0.6
950	3.1	4.1	3.1	3.5	2.3	1.5	1.5	1.6	1.3	1.2	1.2	0.9	0.8	0.7	0.6	0.5	0.4	0.4
1000	0.8	1.2	0.9	1.2	0.8	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1
MEAN	2.6	2.5	2.3	1.9	1.4	1.1	1.1	1.2	1.0	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.3	0.4
									JANUARY									
50																		
100																		
200																		
300	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1
400	1.3	0.7	0.6	0.9	0.3	0.2	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1
500	3.0	1.7	1.9	2.1	0.5	0.5	0.7	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.1
700	5.8	4.3	3.8	5.9	2.1	1.3	2.0	1.4	0.7	0.7	1.2	0.8	0.6	0.7	0.4	0.4	0.3	0.2
850	7.2	7.3	2.9	8.7	4.3	2.0	2.8	2.2	1.4	0.9	1.5	0.7	0.6	0.7	0.5	0.3	0.2	0.4
900	6.4	7.2	2.4	8.2	4.1	1.8	2.3	1.8	1.4	0.8	1.5	0.7	0.5	0.6	0.5	0.3	0.2	0.4
950	4.6	5.4	1.7	6.2	3.2	1.3	1.6	1.3	1.0	0.6	1.1	0.5	0.5	0.5	0.3	0.2	0.1	0.2
1000	1.2	1.5	0.5	2.1	1.1	0.4	0.5	0.4	0.4	0.2	0.4	0.2	0.2	0.2	0.1	0.1	0.0	0.0
MEAN	3.1	2.5	1.7	3.2	1.4	0.7	1.1	0.8	0.5	0.4	0.6	0.4	0.3	0.4	0.2	0.2	0.2	0.2
									JULY									
50																		
100																		
200																		
300	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.3	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1
400	0.8	0.4	0.5	0.4	0.6	0.9	0.4	1.2	1.1	0.5	0.4	0.4	0.3	0.1	0.2	0.2	0.2	0.2
500	1.8	0.8	1.5	0.8	1.5	1.8	0.7	2.5	2.4	0.9	0.8	1.0	0.6	0.2	0.6	0.5	0.5	0.5
700	3.0	2.0	3.0	1.3	2.6	3.4	1.3	4.2	4.2	1.6	1.8	2.4	1.9	0.7	1.5	0.7	1.2	1.3
850	2.5	2.8	2.5	1.3	3.0	3.5	2.5	4.0	3.9	2.4	1.6	2.6	2.4	1.1	1.6	0.6	1.3	1.4
900	1.6	3.5	2.6	1.4	2.3	2.8	2.1	3.2	3.2	2.1	1.2	2.2	2.1	1.1	1.4	0.6	1.1	1.2
950	0.9	3.1	2.0	1.1	1.2	1.6	1.4	2.2	1.9	1.3	0.8	1.5	1.4	0.9	0.9	0.5	0.7	0.8
1000	0.2	1.0	0.7	0.3	0.3	0.5	0.4	0.8	0.6	0.4	0.3	0.5	0.4	0.4	0.3	0.2	0.3	0.2
MEAN	1.4	1.2	1.4	0.7	1.3	1.6	0.8	2.1	2.1	1.0	0.8	1.2	0.9	0.4	0.7	0.4	0.6	0.6
									YEAR									
50																		
100																		
200																		
300	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
400	0.5	0.3	0.4	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
500	1.2	0.7	1.0	0.6	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1
700	2.9	2.0	2.3	1.8	0.6	0.9	1.1	0.7	0.4	0.5	0.6	0.3	0.3	0.4	0.2	0.2	0.2	0.1
850	3.0	2.9	2.2	2.9	1.1	1.0	1.1	0.9	0.6	0.6	0.7	0.4	0.2	0.4	0.3	0.3	0.2	0.2
900	2.6	2.8	2.0	2.7	1.0	0.7	0.7	0.8	0.6	0.6	0.7	0.4	0.2	0.4	0.3	0.2	0.2	0.2
950	1.8	2.2	1.4	2.0	0.8	0.5	0.4	0.5	0.5	0.5	0.6	0.3	0.1	0.3	0.2	0.2	0.1	0.1
1000	0.5	0.6	0.4	0.6	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.1	0.1	0.0	0.0
MEAN	1.3	1.1	1.0	1.0	0.4	0.4	0.5	0.4	0.2	0.3	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1

Appendix B

A Test of the Importance of Spatial Gaps in the Rawinsonde Network, using General Circulation Model Output

The measures of uncertainty presented earlier in this paper are not due only to real year-to-year variability, but also contain the effects of data deficiencies (see subsection 4.1). These deficiencies include errors in the basic reports, gaps in the time series at each station, and the spatial gaps in the hemispheric station coverage. In this appendix the problem of the spatial gaps, probably the most serious data deficiency, will be investigated further.

It seems that the credibility of the present interannual statistics depends to a large extent on how much the gaps in the Northern Hemisphere rawinsonde network actually affect these statistics. In other words, the important question arises as to how different the statistics would be if the rawinsonde stations were not concentrated over the continents but rather were distributed uniformly over the hemisphere with, for example, a horizontal resolution of 500 km. One simple and fairly realistic method to investigate this question is through the use of meteorological fields generated by a full general circulation model. In this case, the network is probably ideal since "data" are available at each point of a regular grid and for each time step of the model. If one now assumes that the particular numerical model used generates a model atmosphere that sufficiently closely resembles the real atmosphere, one may perform certain relevant tests (see also Oort 1977). For example, by first deleting the meteorological information at grid points far enough removed from any "rawinsonde grid point" and then simply interpolating at these grid points from the still-available information at the rawinsonde grid points, one may compute a certain set of model general circulation statistics. This set then can be compared with a control set of similar statistics computed by using the basic information at all grid points of the full model. The comparison should clearly show the influence of the data gaps on the model statistics and, by inference, also on the real atmospheric statistics. Such a procedure will actually be followed here using the daily output for 5 winter months from a 2-yr run of the so-called ZODIAC model developed at GFDL by S. Manabe and his coworkers. The ZODIAC model is a global, general circulation model with a seasonal cycle. It has 11 levels in the vertical and a horizontal resolution of about 250 km (see, e.g., Holloway and Manabe 1971, and later references in this appendix).

In a first experiment all model grid point data were used to compute, for each winter month, zonal- and vertical-mean statistics of the kind presented in subsections 5.2 and 5.3. Similarly as before for the real atmosphere (see figs. 10 through 21), the results for the 5 individual months are plotted as a function of latitude, and dashed lines are added showing the 5-month average plus and minus the inter-monthly standard deviation. Because there were only 2 years of "data" available for the model run, 5 winter months[3] are used here instead of 5 January months as before. However, this difference in procedure is probably insignificant. The results of this first experiment are shown in the top graphs of figures 22 through 26 for various meteorological parameters. They will serve as the control data for the second experiment to be described below. No transient eddy terms are included because their calculation would require very extensive additional data processing.

[3]January, February, and December from the first year and January, February from the second year of integration were used. It should be mentioned that the first year of integration was still a test period for the ZODIAC model during which various corrections were made in the computer code. Therefore, the values of the "month-to-month" spread in figures 22 through 26 may be larger (and perhaps more realistic!) than they should be for this type of model. To make meaningful comparisons between the model and the real atmospheric interannual variations as shown in the main body of this paper, the ZODIAC model should be run for at least 5 yr. However, very large amounts of computer time would be required.

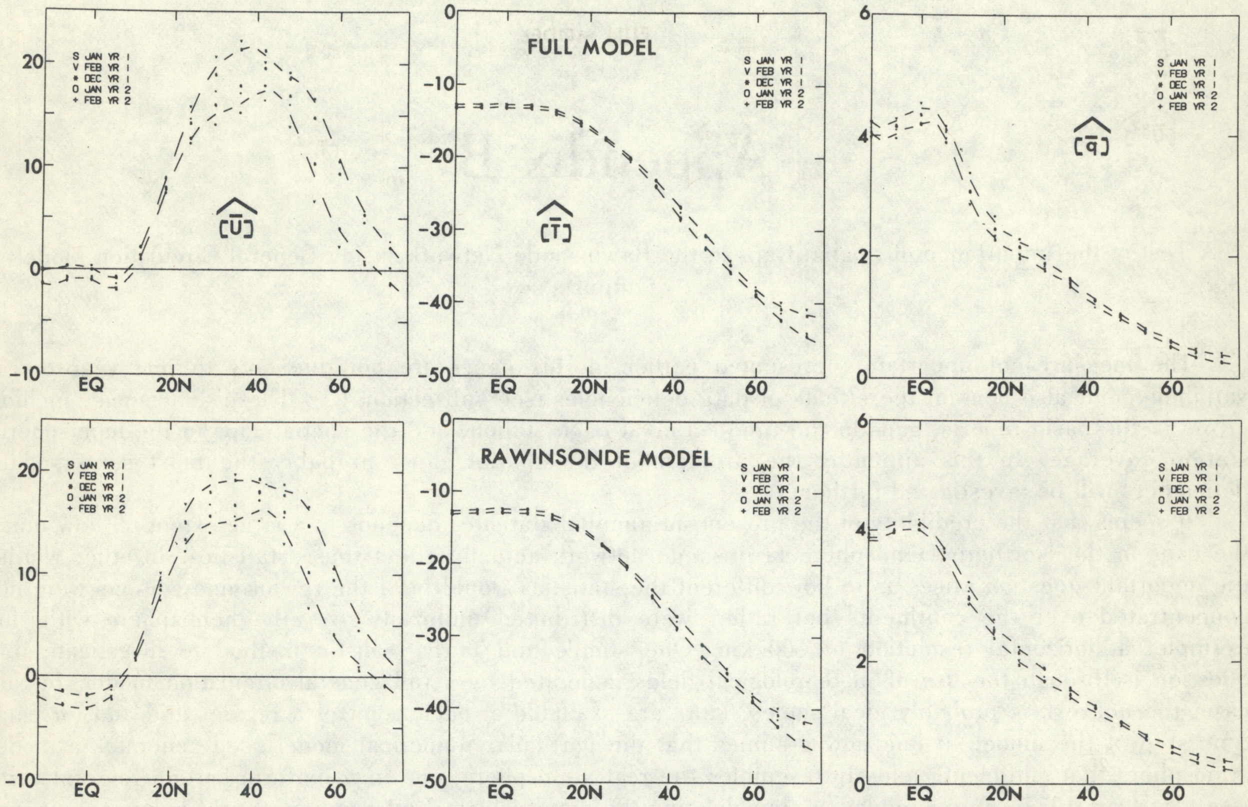

FIGURE 22.—Meridional profiles of the zonal and vertical mean values for the model zonal wind in units of m/s, the model temperature in °C, and the model specific humidity in g/kg. The top graphs are for the "full model" and the bottom graphs for the "rawinsonde model" results. Shown are data points for 5 winter months from a 2-yr integration of the ZODIAC model. The two dashed curves indicate the 5-month mean value plus and minus the intermonthly standard deviation.

In a second experiment the information at grid points more than 200 km away from a rawinsonde station (see station map in figure 3) was deleted. Next the same analysis scheme as was used before for the analysis of real data (see Section 3) was employed to interpolate between rawinsonde gridpoints to again obtain a complete gridpoint field. For these new "analyzed" fields the same zonal and vertical mean statistics were then evaluated as for the control data. The results are shown in the bottom graphs of figures 22 through 26.

From the comparison of the top ("full grid-point version") and bottom ("rawinsonde-network version"), graphs one can now estimate the effect of the spatial gaps in the rawinsonde network on the evaluation of different meteorological fields. One may argue that the objective analysis method used by us is probably not the best possible one, but in our opinion the use of a different analysis scheme would not materially change the plots. Because the evaluation of the ZODIAC model is not the object of the present paper, the model results will not be compared here with the real atmospheric results presented earlier in the main body of this paper. It should be mentioned, however, that the model results seem sufficiently realistic to warrant an interpretation in terms of the real atmosphere (see Manabe, Hahn, and Holloway 1974, Manabe and Holloway 1975, Manabe and Mahlman 1976, and Hayashi and Golder 1977).

The plots for mean quantities like the zonal wind, temperature, and specific humidity in figure 22 are very similar, especially in terms of the interannual spread. One apparently unsatisfactory feature is the appearance of too-strong easterlies in the equatorial regions in the rawinsonde-network version of the model. The stationary variances in figures 23 and 24 are also very well simulated by the rawinsonde network except for the magnitude of the variance of the zonal wind component. The fluxes of momentum, sensible heat, latent heat, and total energy due to stationary eddies in figures 24 and 25 again show a fairly good

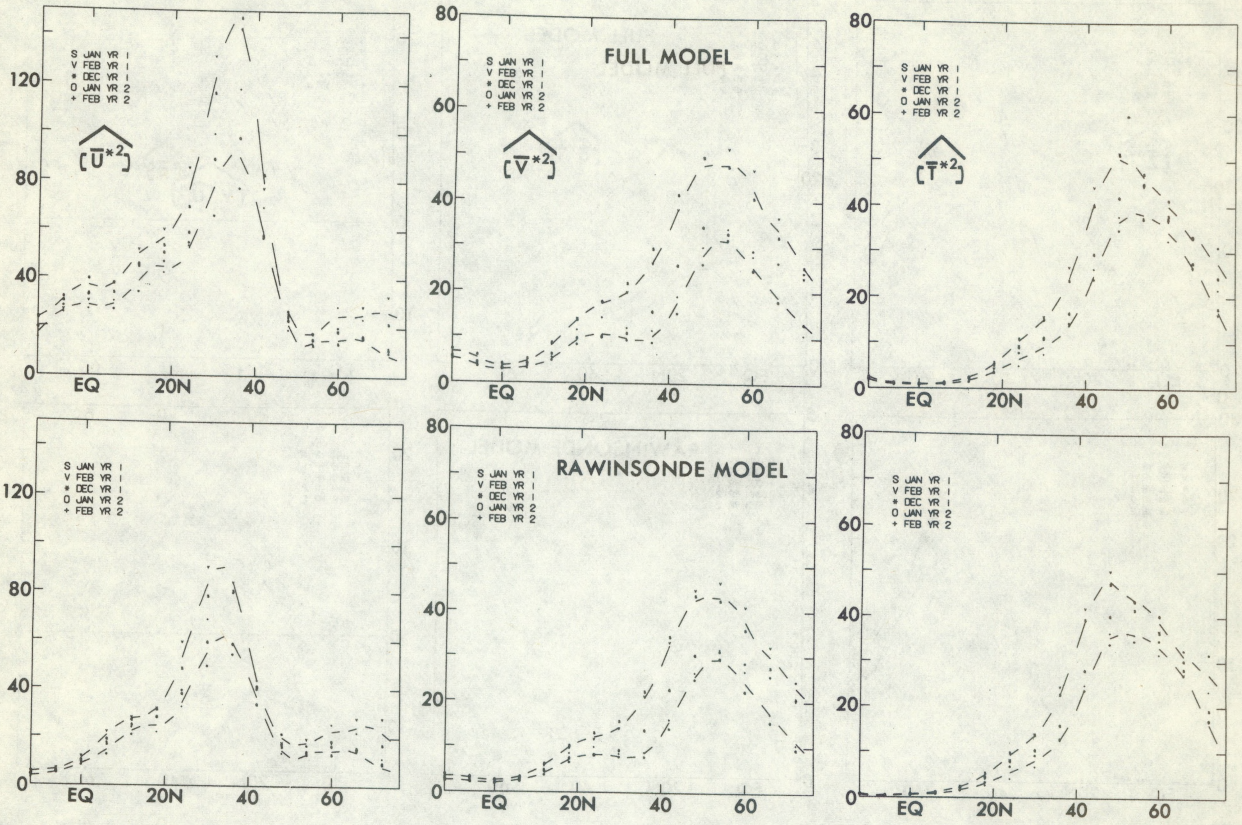

FIGURE 23.—Same as figure 22 but shows the stationary eddy variance of the model zonal wind in units of $m^2 \cdot s^{-2}$, of the model meridional wind in $m^2 \cdot s^{-2}$, and the model temperature in $°C^2$.

agreement between full and simulated model results. Only south of the Equator are significant discrepancies found. They must be caused by analysis problems close to the borders of the analysis grid. As mentioned before, transient eddy statistics were not evaluated for the ZODIAC model. However, one would expect that they would be simulated quite well, in fact much better than the stationary statistics, because of their more zonal distribution (at least on a monthly basis). In the case of the fluxes by the mean meridional circulations in figure 26, the simulated model results deviate somewhat more from the full model results than in the case of the stationary eddy fluxes. However, in summary one can say on the basis of these intercomparisons that the gaps in the rawinsonde network do not materially affect the model results. Therefore, one may also have some confidence that the results for the real atmosphere given earlier in the paper represent a true measure of the year-to-year variability.

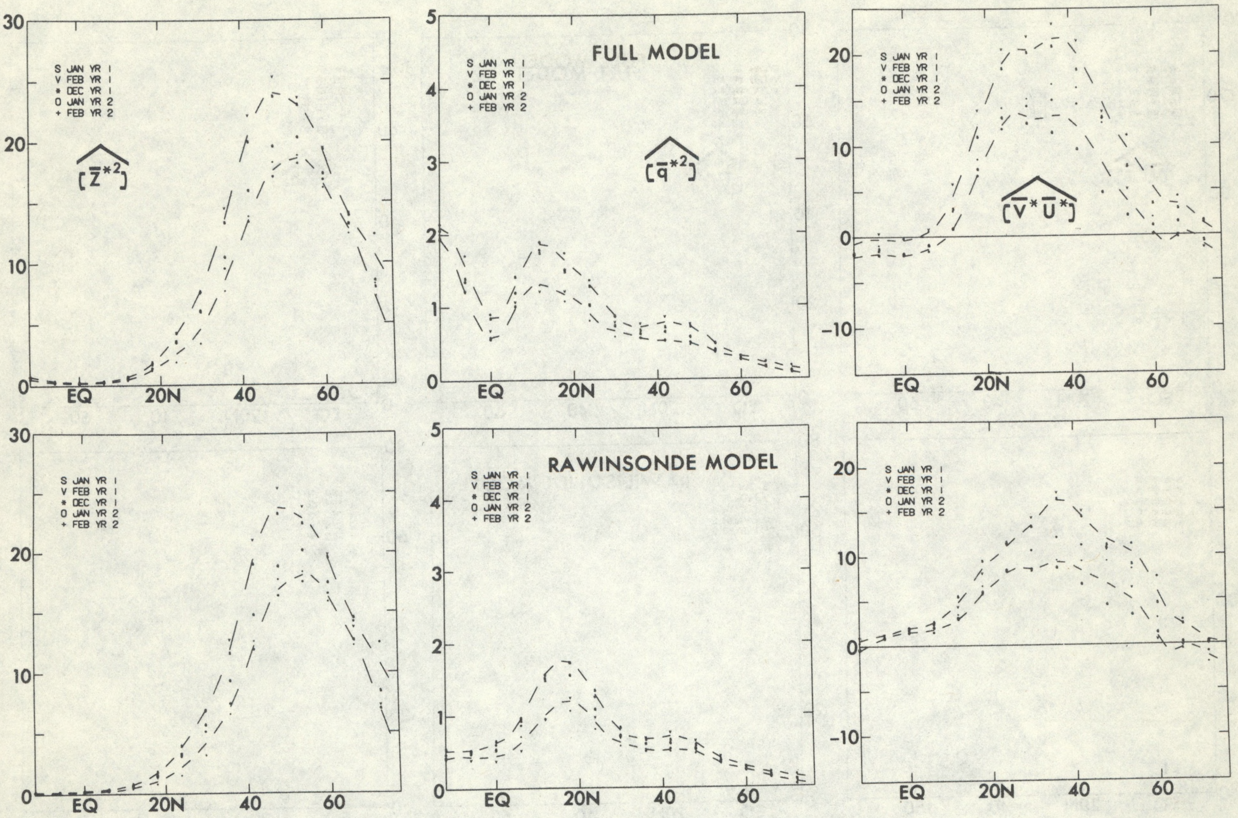

FIGURE 24.—Same as figure 22 but shows the stationary eddy variance of the model geopotential height in units of 1000 gpm^2, of the model specific humidity in $g^2 \cdot kg^{-2}$, and the model stationary eddy momentum flux in $m^2 \cdot s^{-2}$.

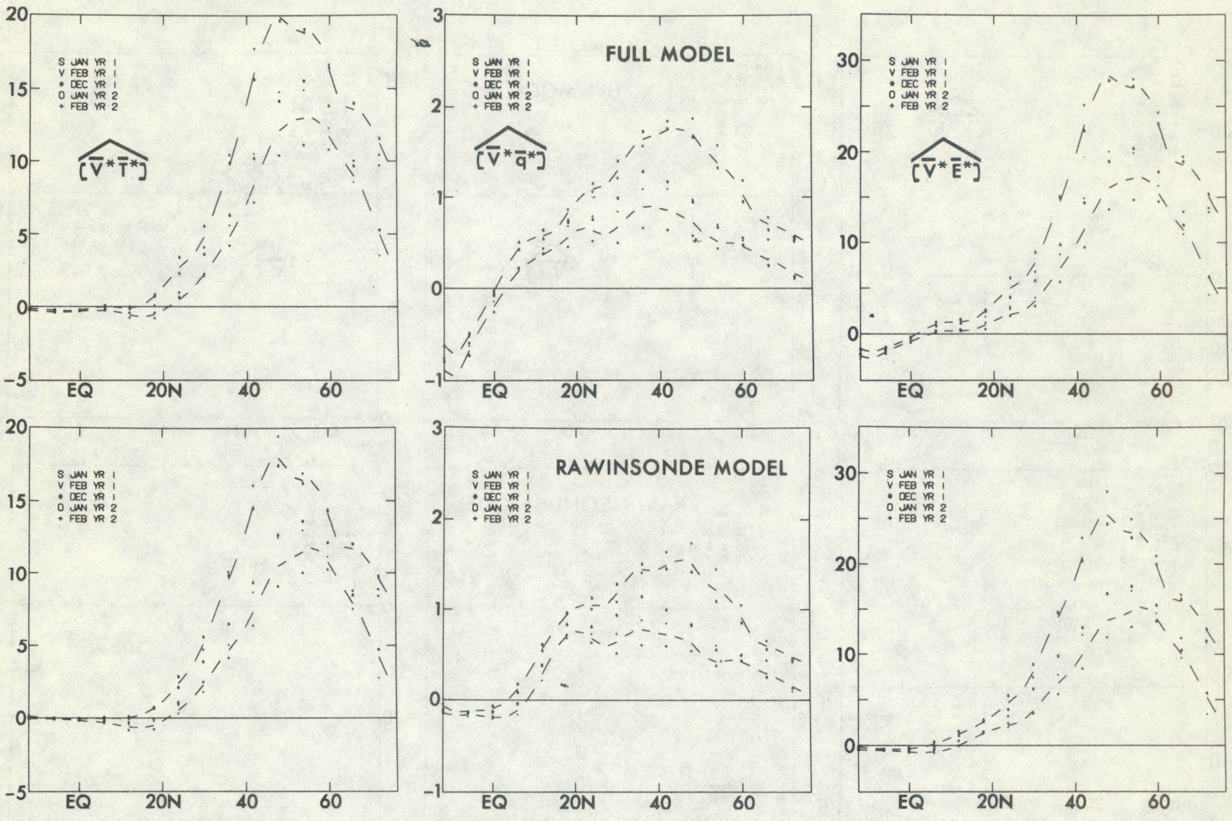

FIGURE 25.—Same as figure 22 but shows the model stationary eddy flux of sensible heat in units of m/s · °C, of latent heat in m/s · g/kg, and of total energy in m/s · °C.

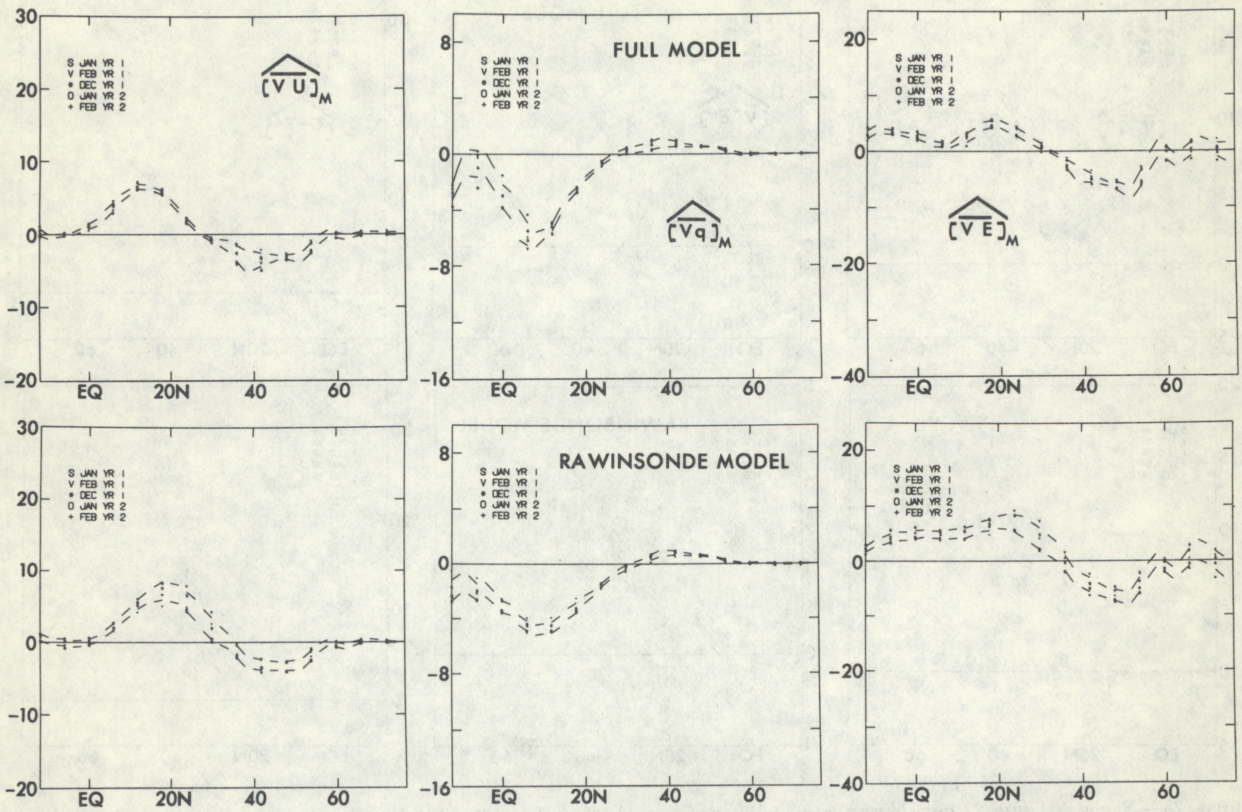

FIGURE 26.—Same as figure 22 but shows the model mean meridional flux of momentum in $m^2 \cdot s^{-2}$, of latent heat in m/s · g/kg, and of total energy in m/s · °C.

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