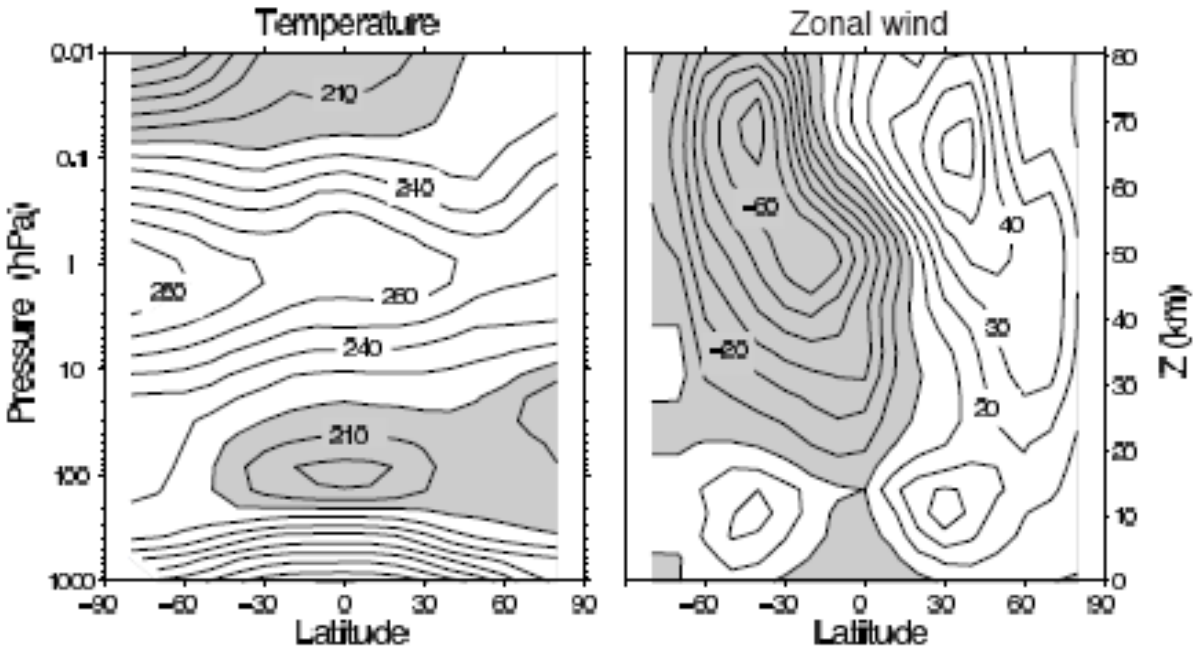
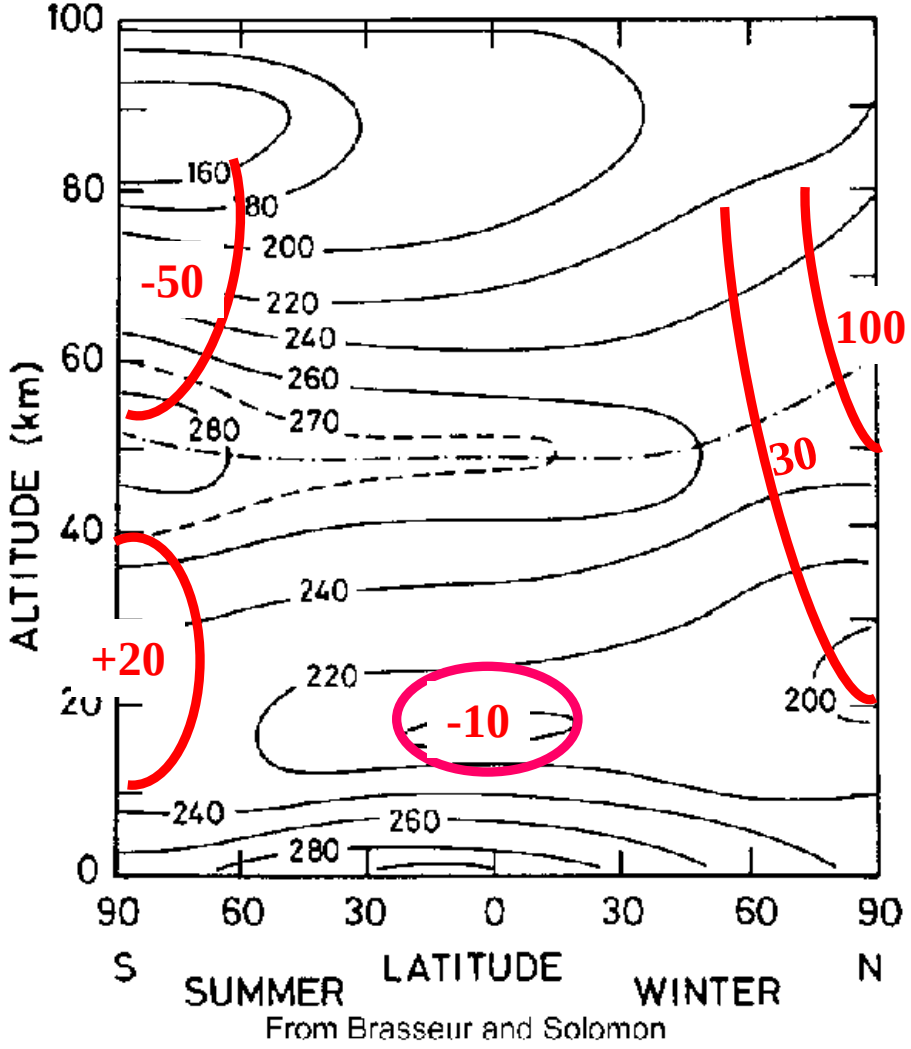
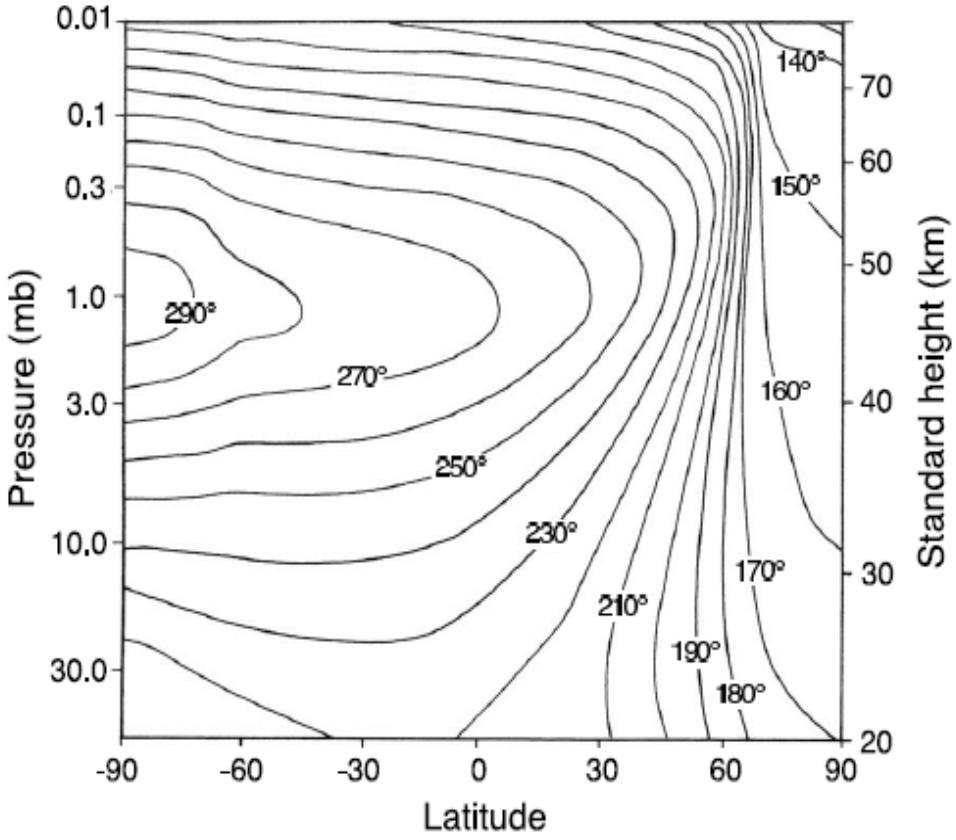


Fig. 13.12 The zonally averaged temperature and zonal wind in January. The temperature countour interval is 10 K, and values less than 220 K are shaded. Zonal wind contours are 10 m s^{-1} and negative (westward) values are shaded.[7]



From Brasseur and Solomon



From Vallis (2006) Adapted from Fels (1985), with the help of K. Hamilton.

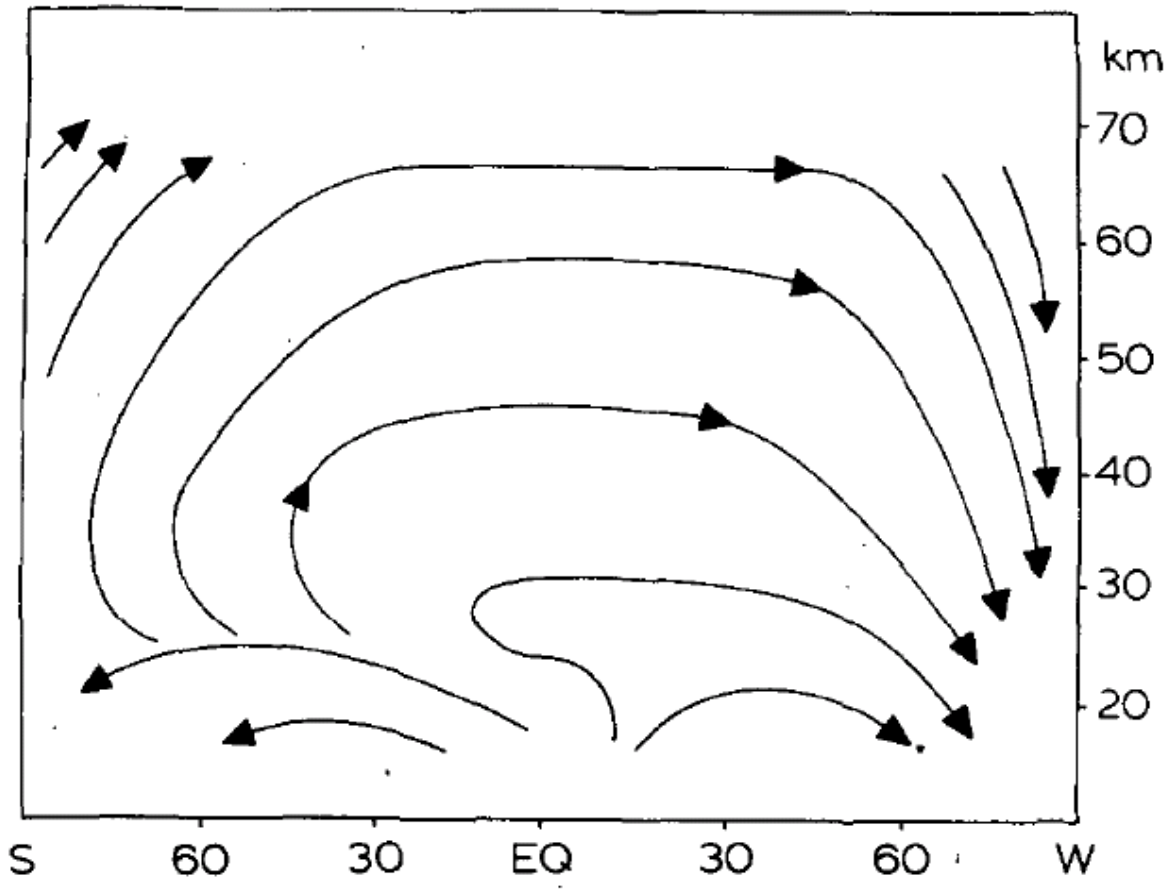


FIG. 4. Streamlines associated with Lagrangian-mean velocities.

Dunkerton (1978)

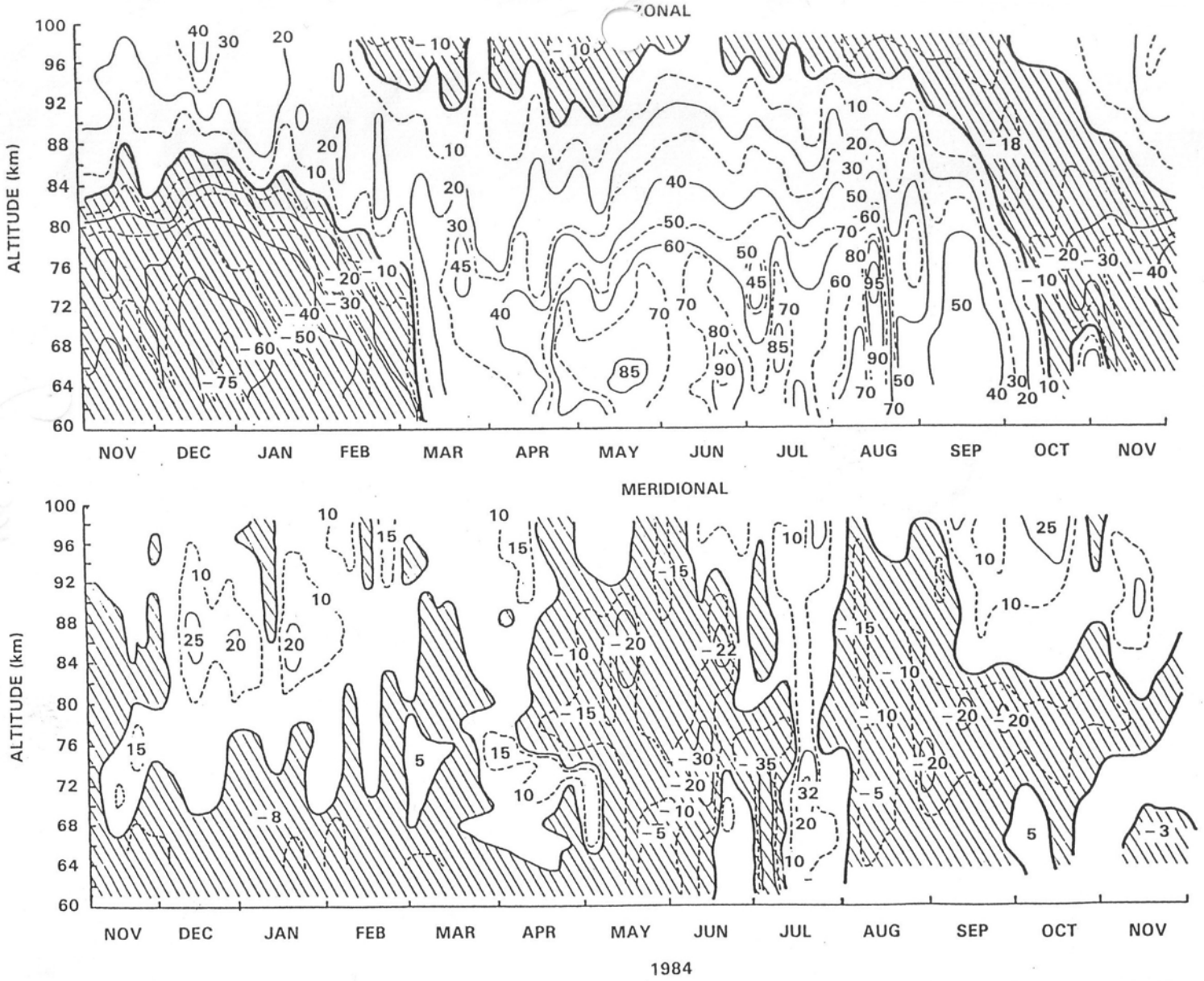


Figure 6-3. Zonal and meridional winds (ms^{-1}) in the mesosphere measured with a PR radar at Adelaide (35°S, 128°E). Shaded areas indicate regions of westward and southward flow.

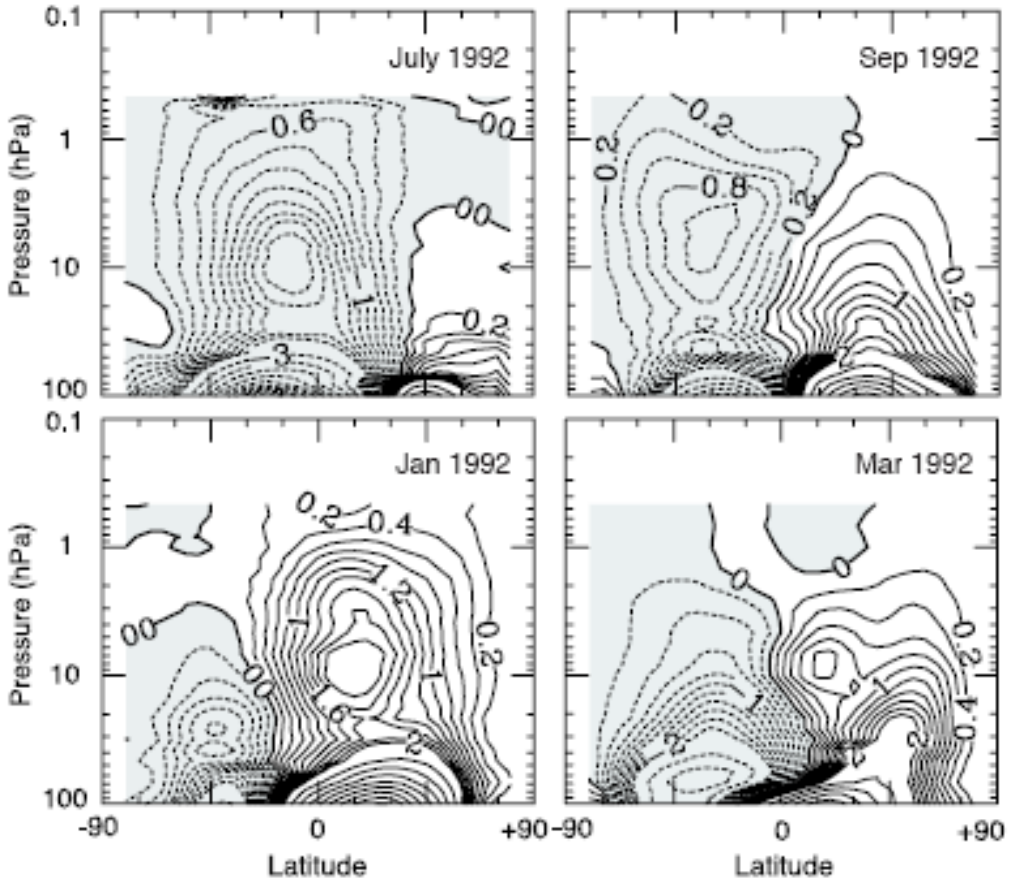
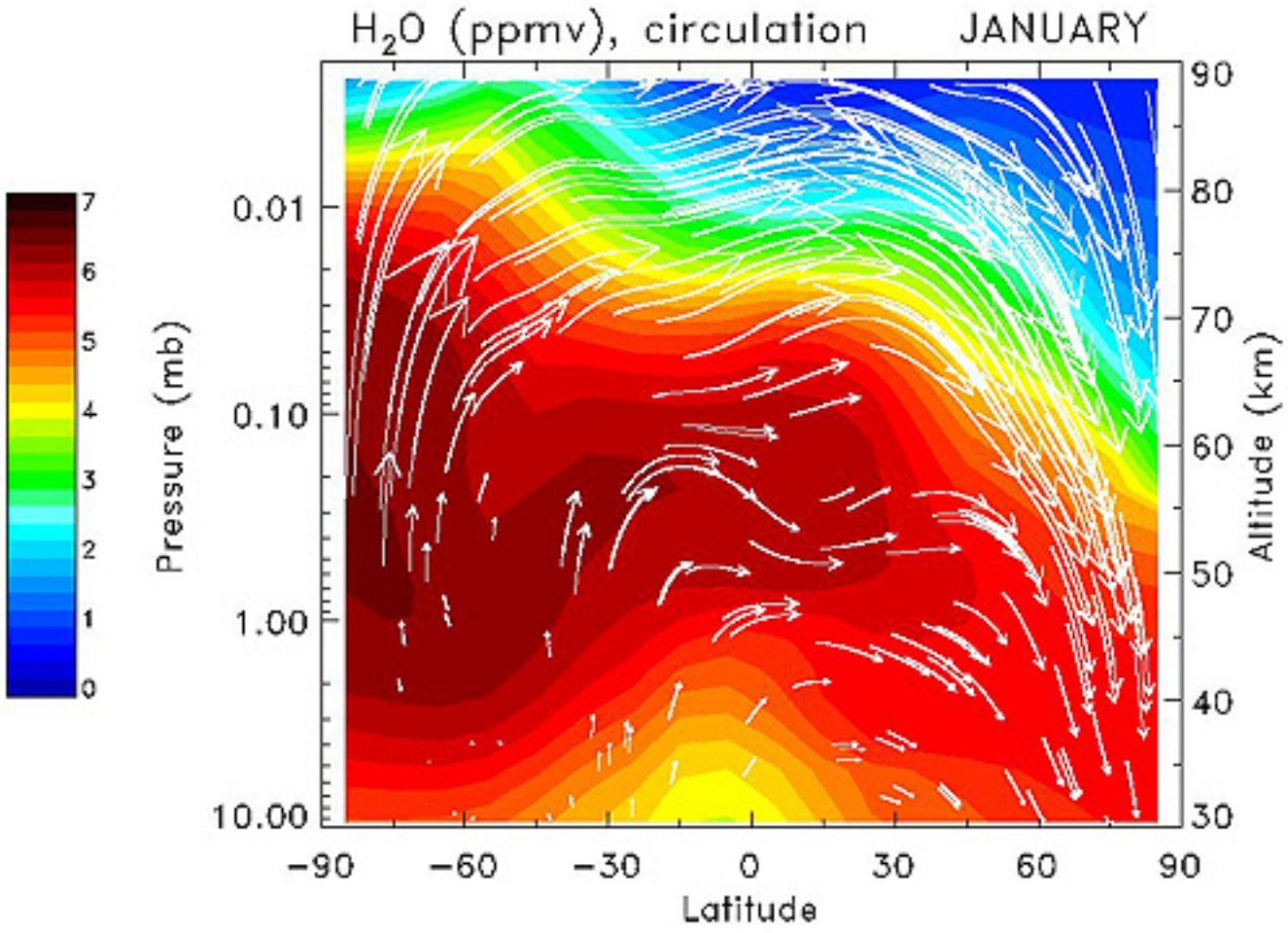
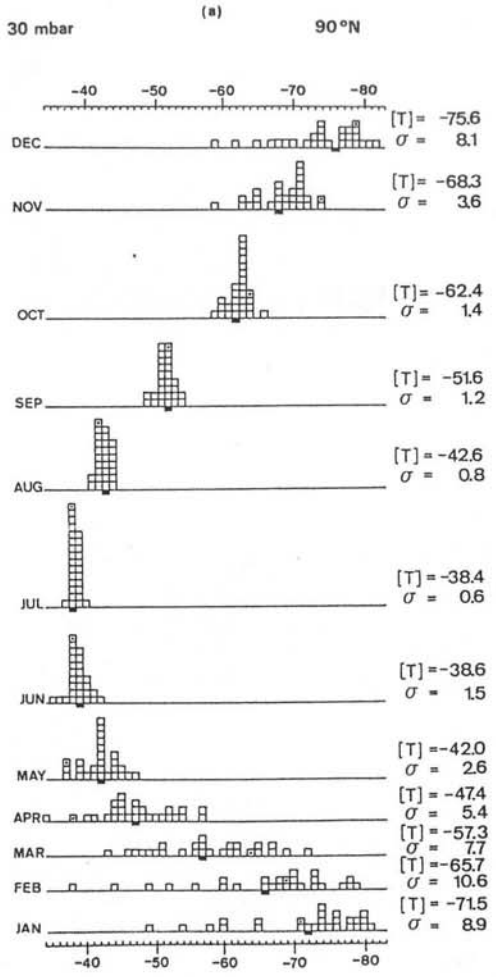


Fig. 13.13 The observed thickness-weighted (residual) streamfunction in the stratosphere, in Sverdrups (10^9 kg s^{-1}). The circulation is clockwise where the contours are solid. Note the stronger circulation in the winter hemispheres, whereas the equinoctal circulations (September, March) are more inter-hemispherically symmetric.[8]


H2O (ppmv), circulation
JANUARY
7
6
5
4
3
2
1
0
Pressure (mb)
0.01
0.10
1.00
10.00
90
80
70
60
50
40
30
Altitude (km)
−90
−60
−30
0
30
60
90
Latitude



1.7(a)

Figure 6.26. Frequency distribution of the monthly mean 30 mb temperatures (°C). The interval is 1 °C. The long-term average [T] is given on the right hand side of the picture together with the standard deviation σ, and [T] is also marked as a black box in the frequency distribution. (a) is for the North Pole using radiosonde data for the period July 1955-Dec. 1982,

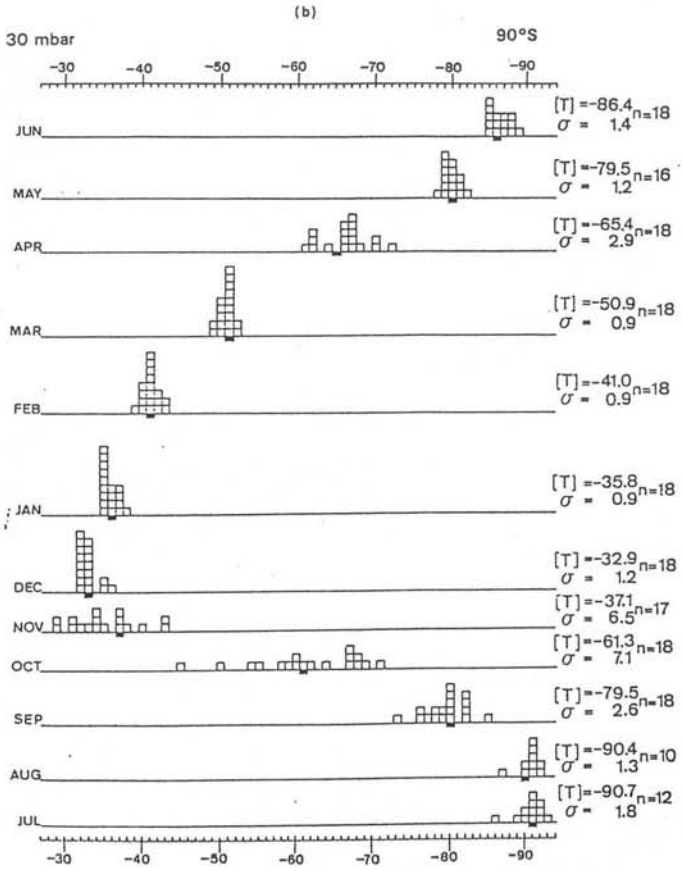


Figure 6.26. (b) is for the South Pole for the period 1961-1978 using, for each month, data for the number of years specified by n. [After Naujokat, 1981, and Labitzke and Naujokat, 1983].

1.7 (b)

Holton et al. 1995

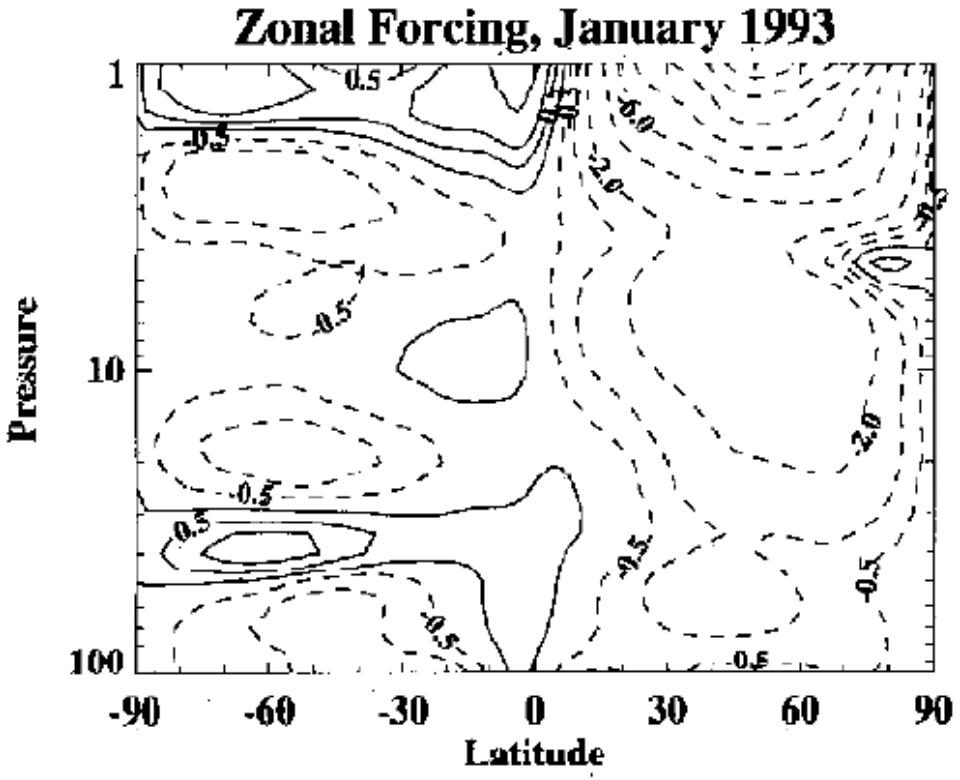
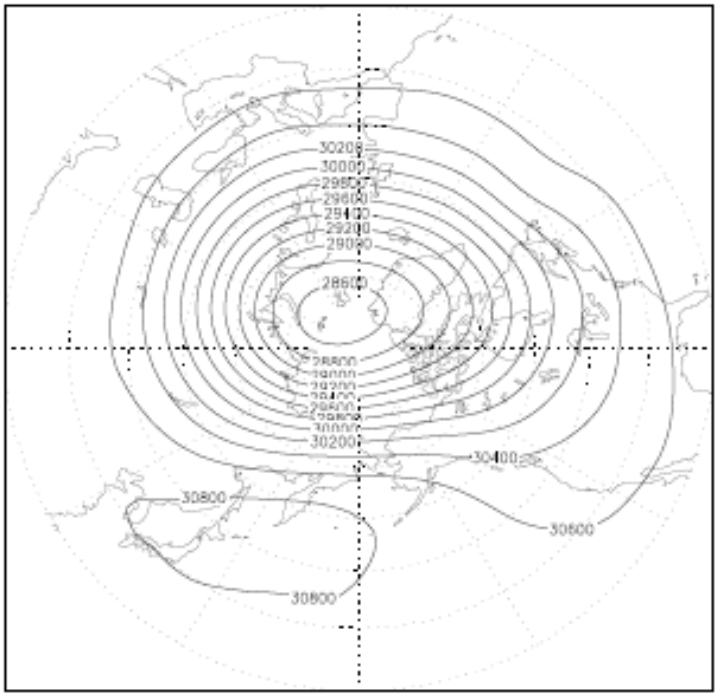
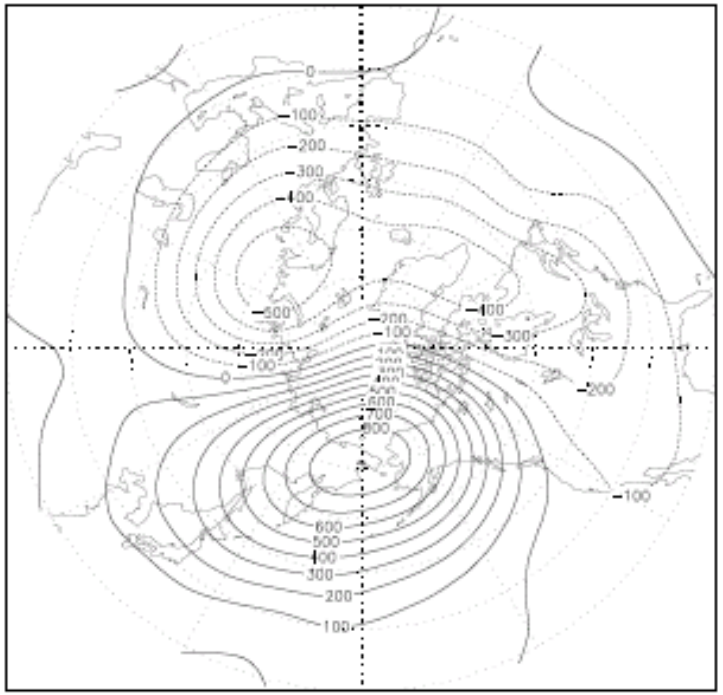


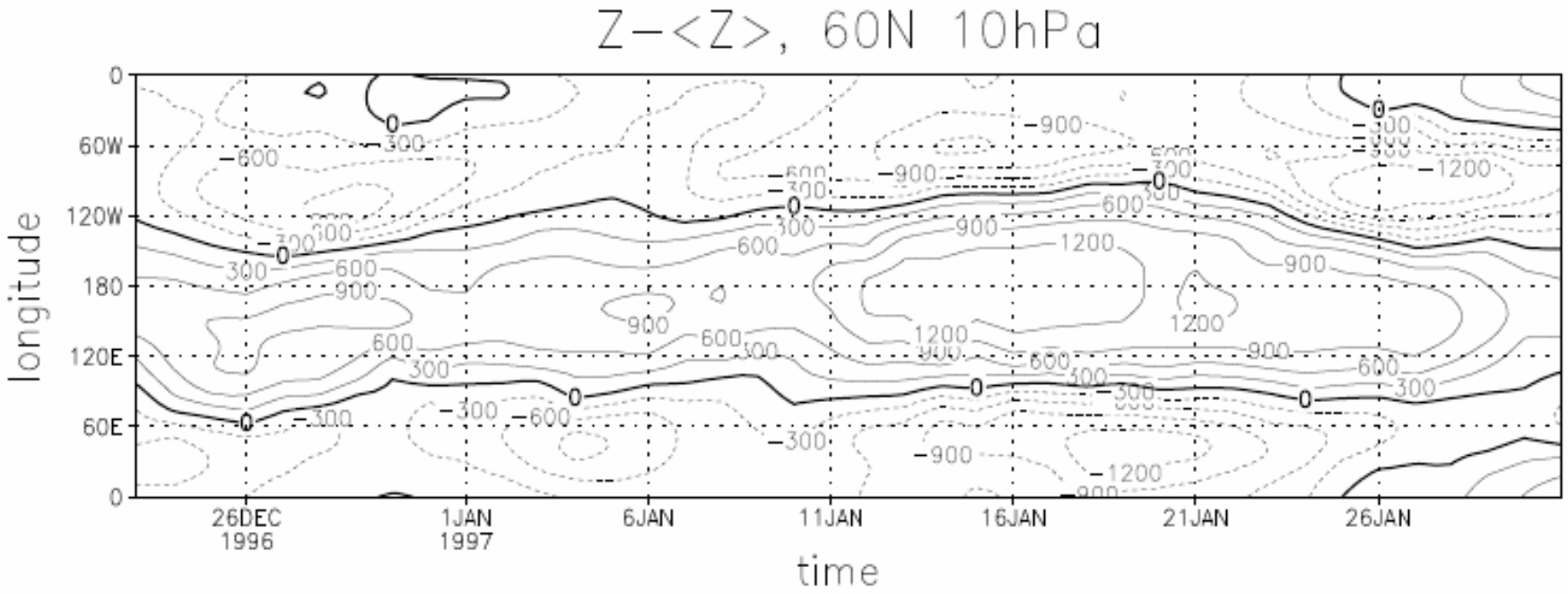
Figure 5. Wave-induced zonal force per unit mass, $\bar{G}$, in units of meters per second per day, for January 1993, deduced indirectly from the momentum balance (equation (1)) using a radiatively derived meridional circulation and the observed zonal mean wind. Contours are at 2 m s^{-1} d^{-1} intervals, with additional contours of ± 1 and ± 0.5 m s^{-1} d^{-1}. The eastward force centered near 60°S and 40 hPa may be an artifact caused by the ill-conditionedness in calculating radiative heating rates from observed temperatures, especially in the summertime lower stratosphere. (After *Rosenlof* [1995]).

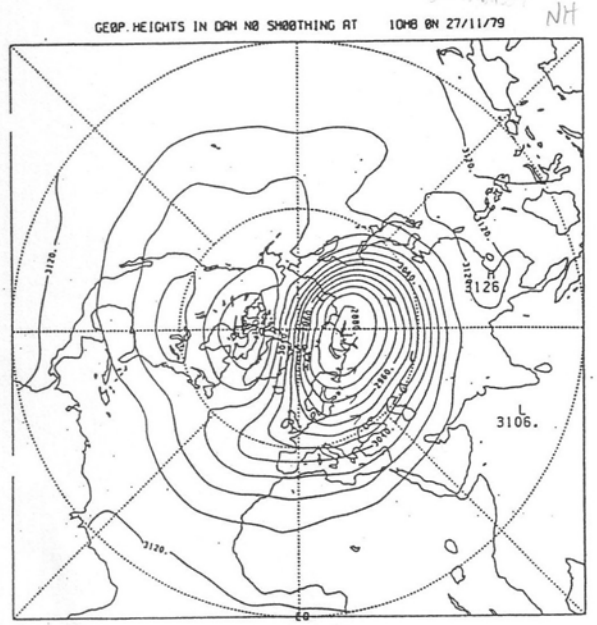
Geopotential Height 10 hPa, Dec 96 – Feb 97



Z–<Z>, 10 hPa Dec 96 – Feb 97

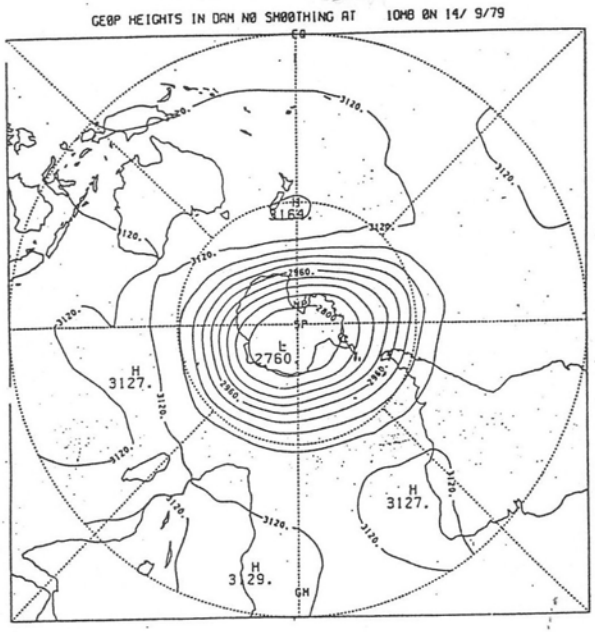



Z−<Z>, 60N 10hPa
longitude
0
60W
120W
180
120E
60E
0
26DEC
1996
1JAN
1997
6JAN
11JAN
16JAN
21JAN
26JAN
time



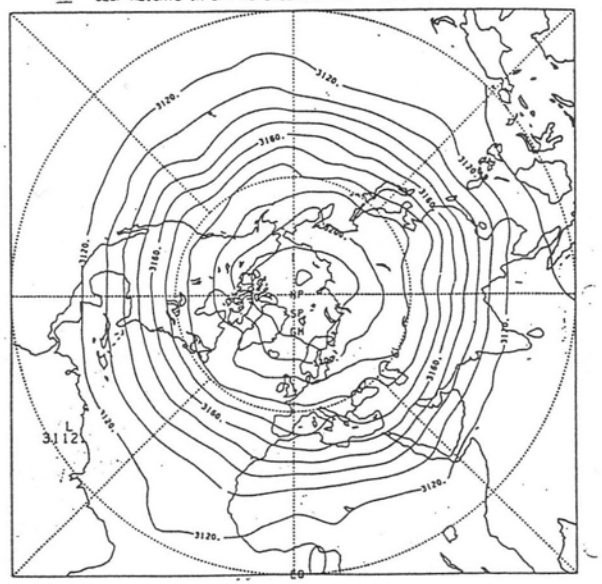
NH

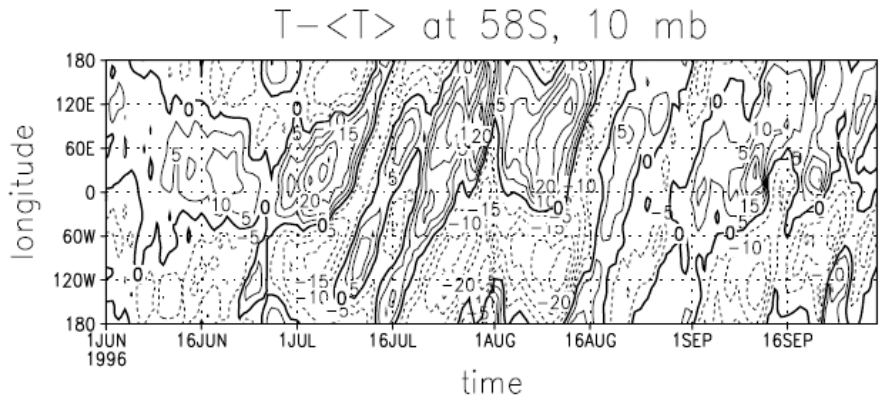
1.8(a)

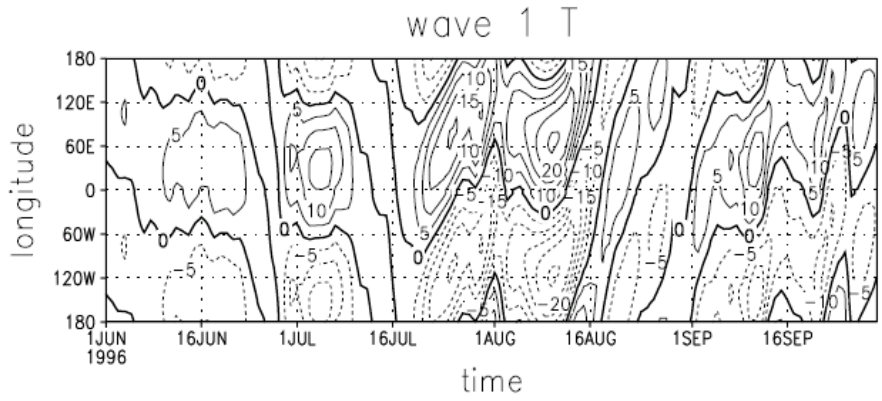


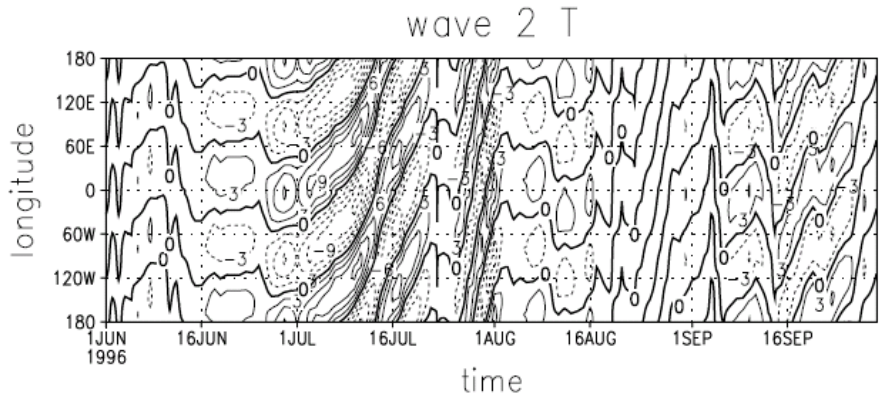
1.8(b)

summer NH

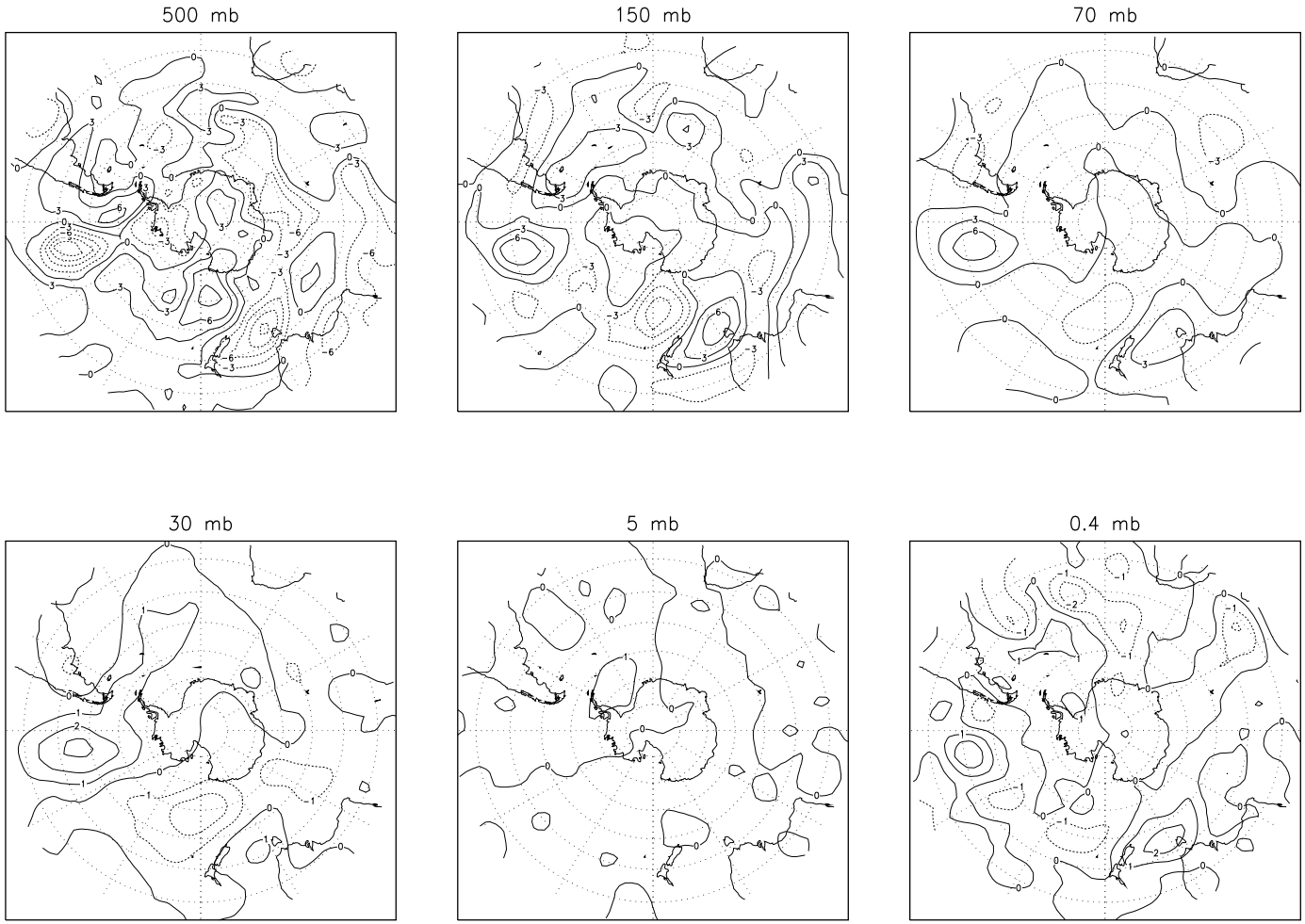


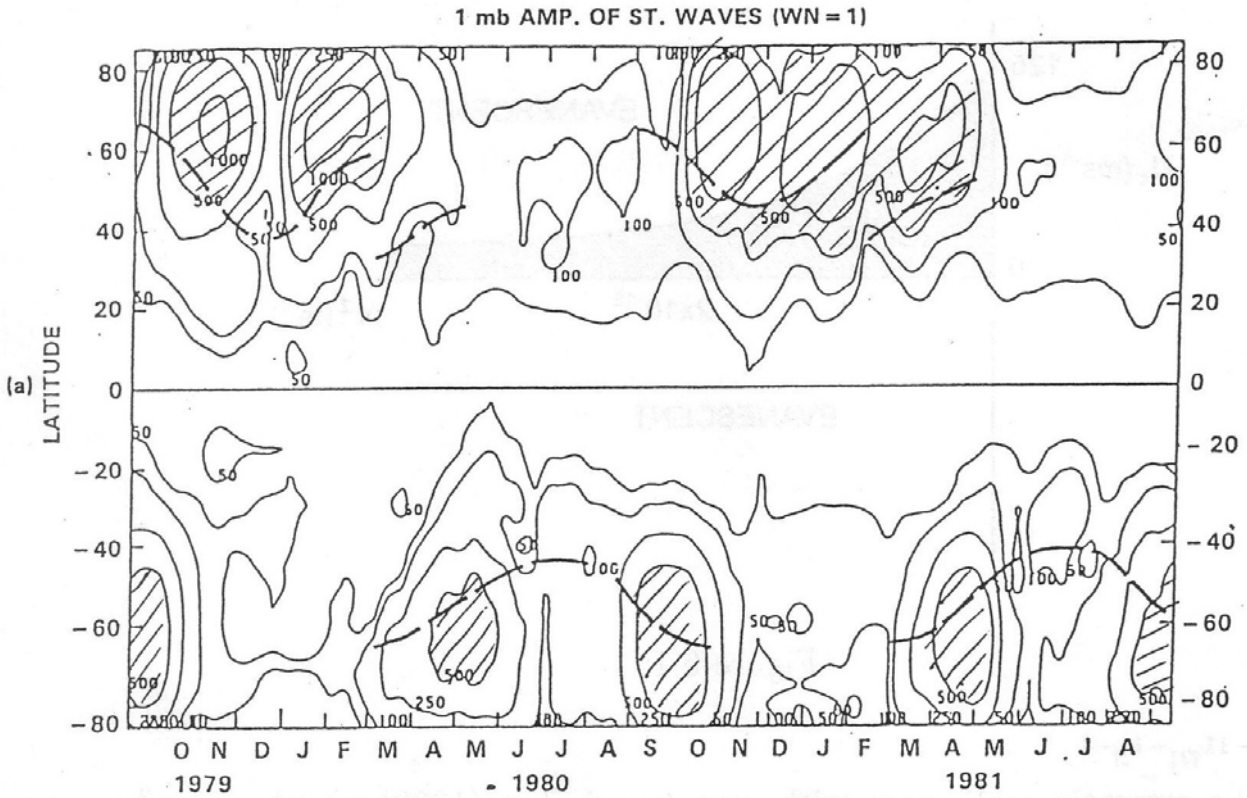

T−<T> at 58S, 10 mb
longitude
180
120E
60E
0
60W
120W
180
1JUN
1996
16JUN
1JUL
16JUL
1AUG
16AUG
1SEP
16SEP
time

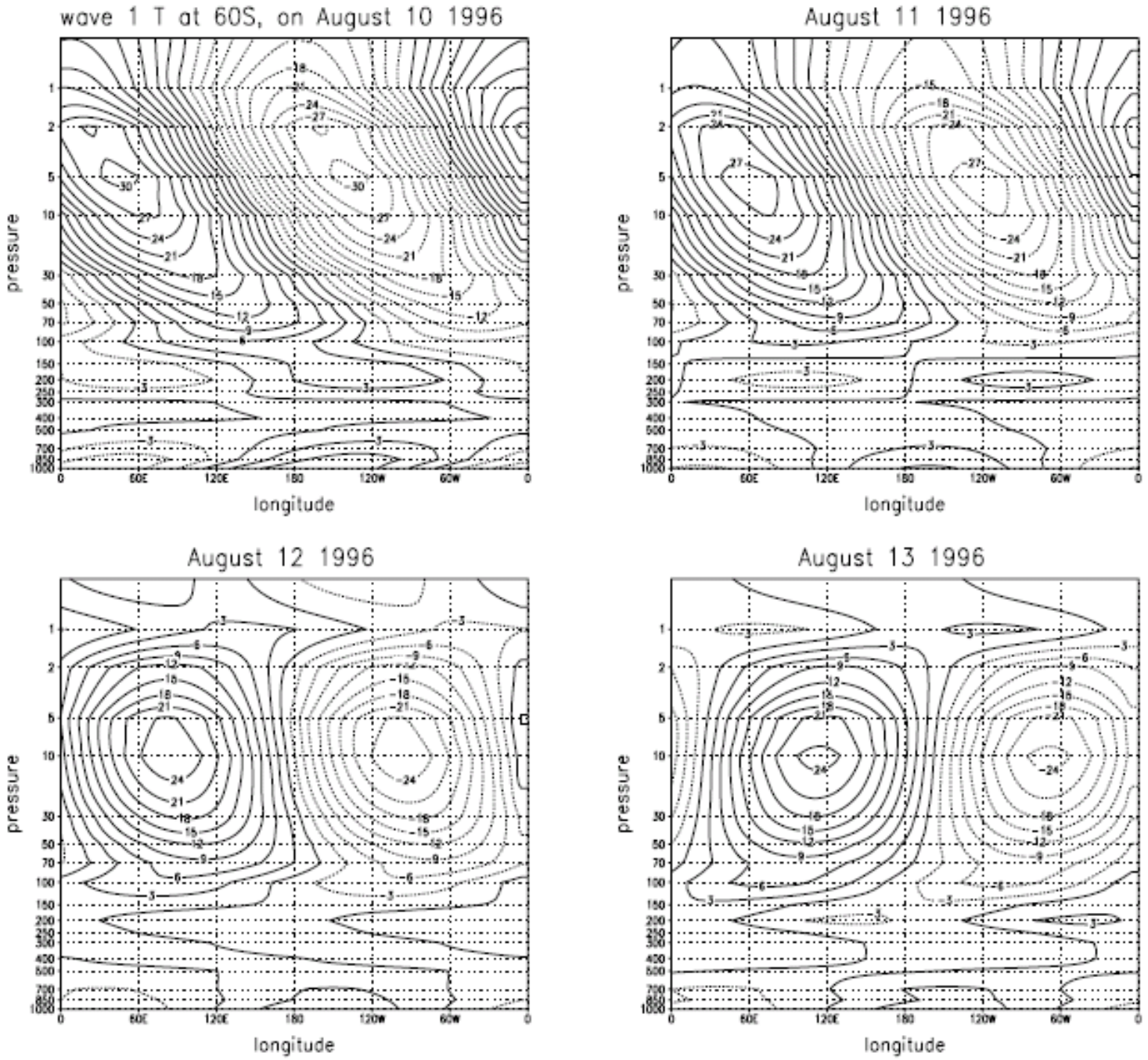

wave 1 T
longitude
180
120E
60E
0
60W
120W
180
1JUN
1996
16JUN
1JUL
16JUL
1AUG
16AUG
1SEP
16SEP
time


wave 2 T
longitude
180
120E
60E
0
60W
120W
180
1JUN
1996
16JUN
1JUL
16JUL
1AUG
16AUG
1SEP
16SEP
time

Jan 28 1996, SH




1 mb AMP. OF ST. WAVES (WN = 1)
(a)
LATITUDE
80
60
40
20
0
-20
-40
-60
-80
O N D J F M A M J J A S O N D J F M A M J J A
1979
1980
1981


wave 1 T at 60S, on August 10 1996
August 11 1996
August 12 1996
August 13 1996
pressure
longitude
1
2
5
10
30
50
70
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
0