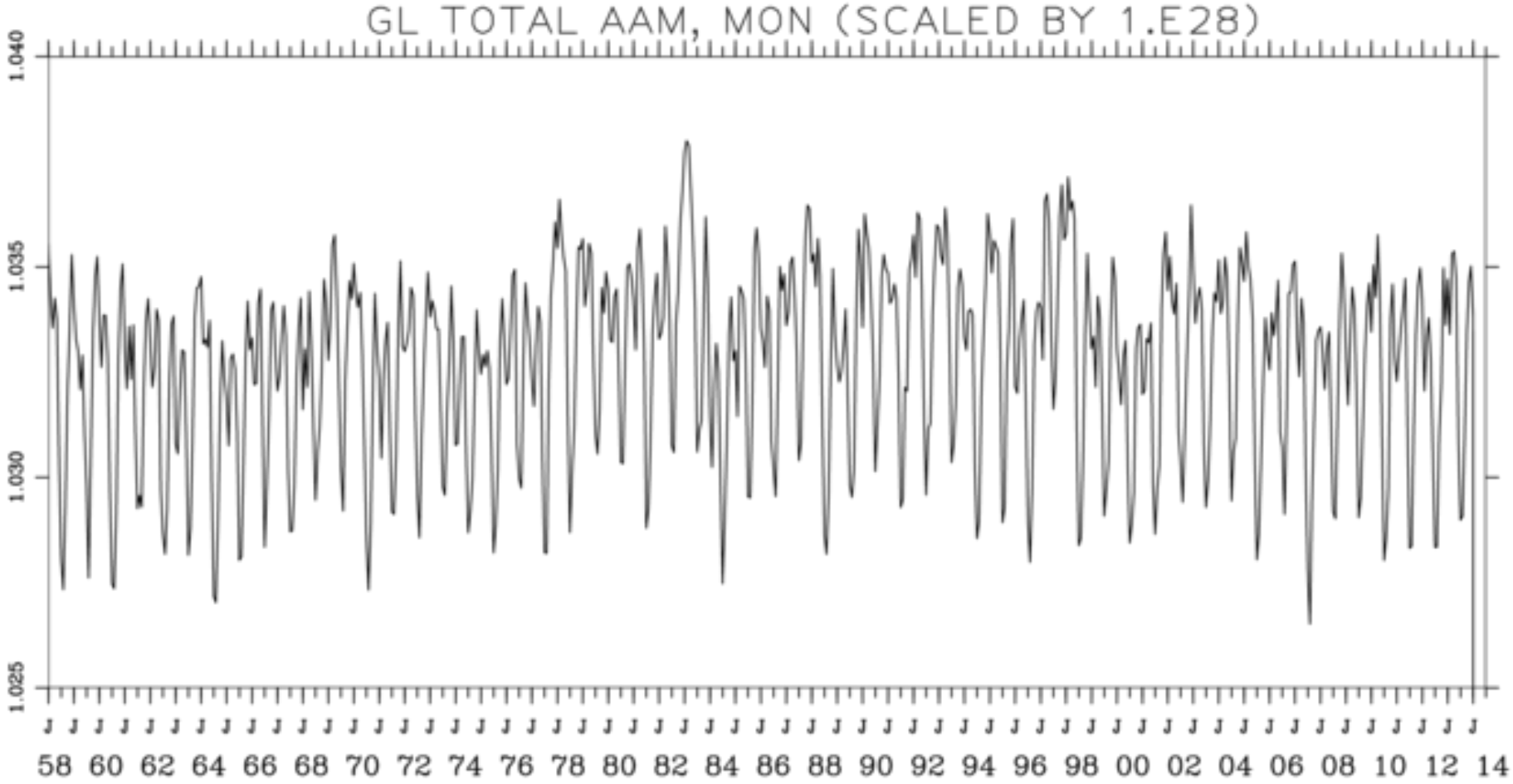
ATM 622
General Circulation

4. Angular Momentum

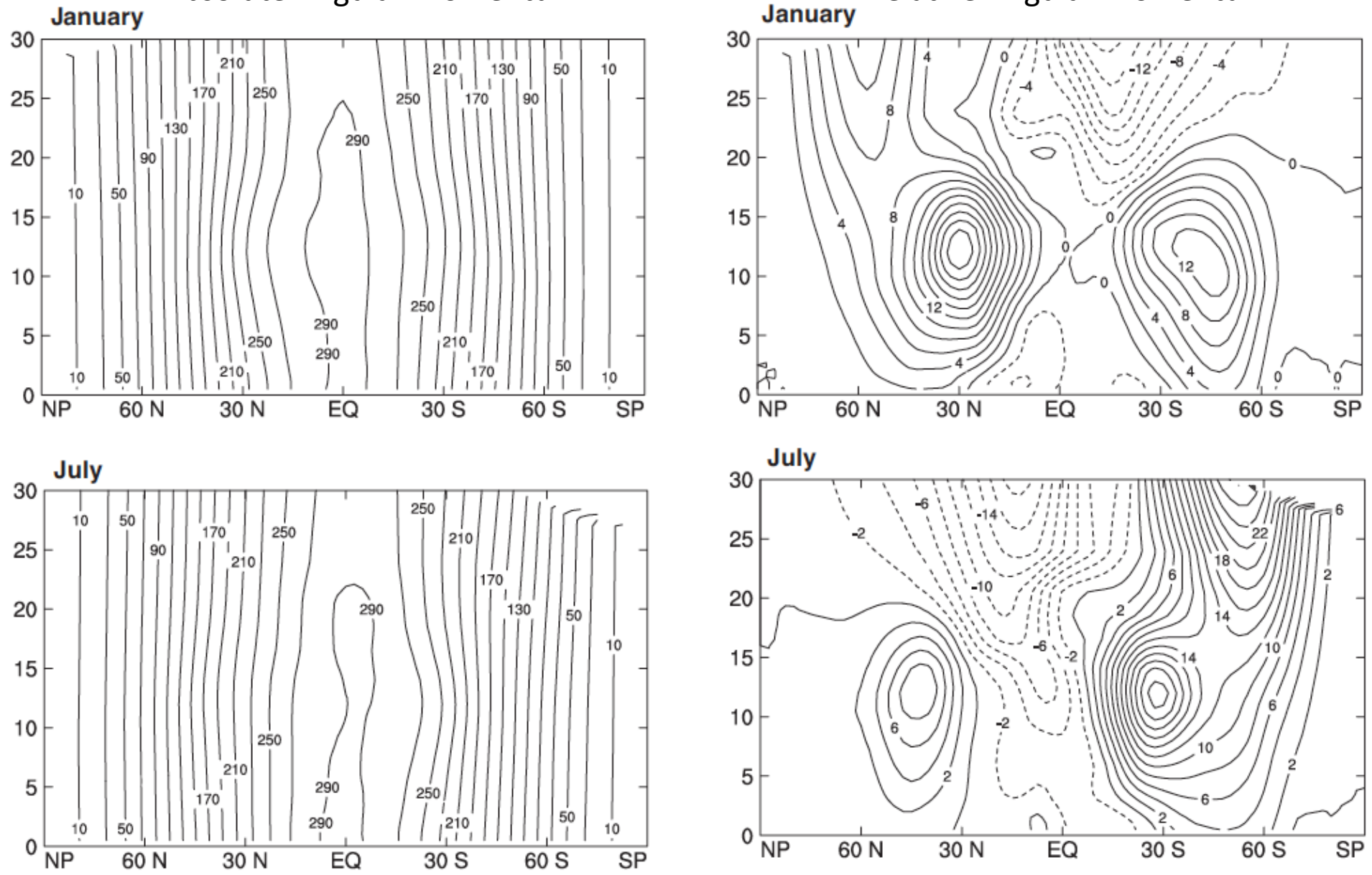

GL TOTAL AAM, MON (SCALED BY 1.E28)
1.040
1.035
1.030
1.025
58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 00 02 04 06 08 10 12 14

NOAA/ESRL

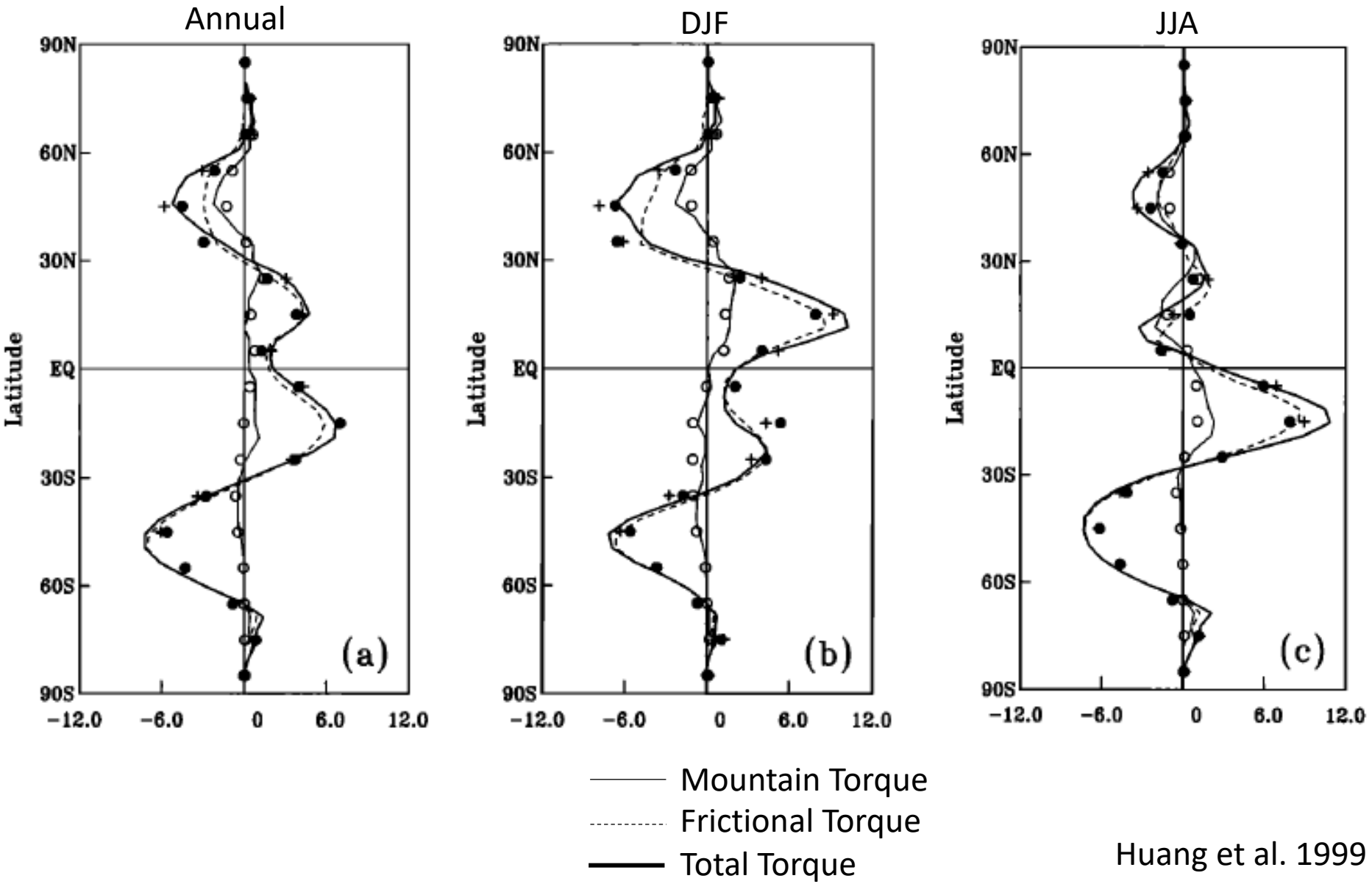
10^7 m^2 s^{-1}

Absolute Angular Momentum

Relative Angular Momentum



Randall (2004)



Huang et al. 1999

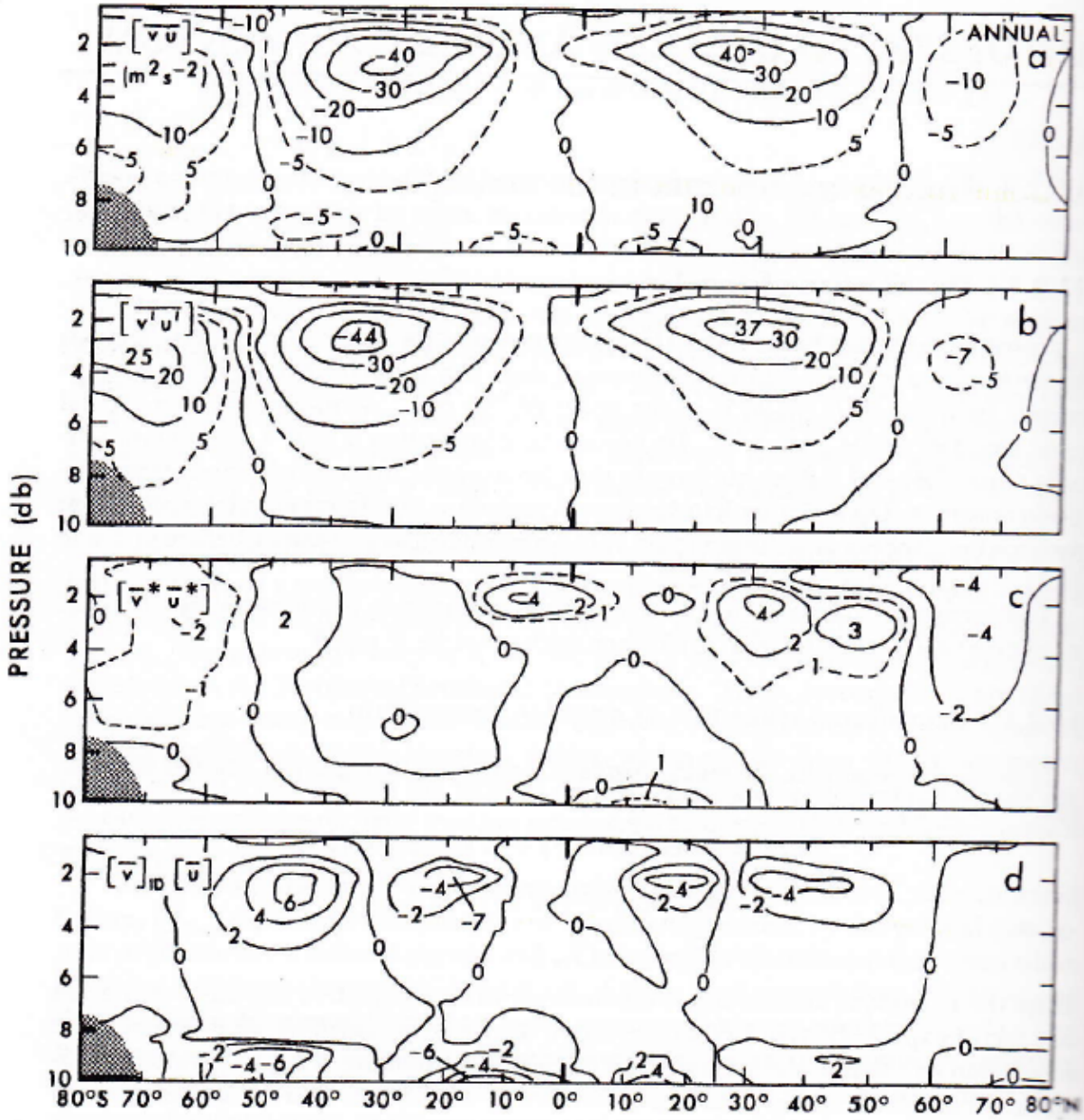


FIGURE 11.7. Zonal-mean cross sections of the northward flux of momentum by all motions (a), transient eddies (b), stationary eddies (c), and mean meridional circulations (d) in $m^2\ s^{-2}$ for annual-mean conditions (from Oort and Peixoto, 1983).

Peixoto and Oort (1992)

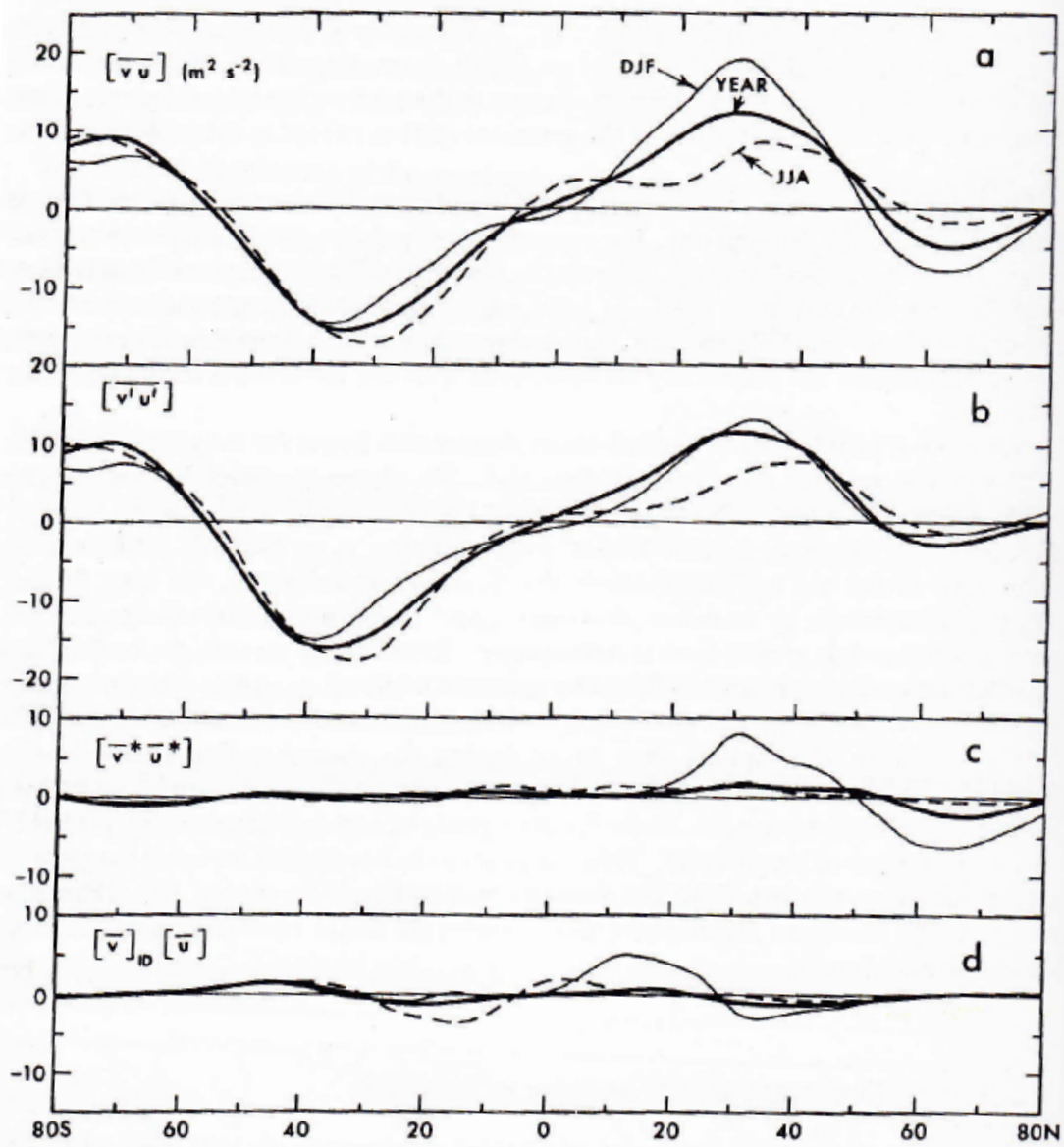


FIGURE 11.8. Meridional profiles of the vertical- and zonal-mean northward transport of momentum by all motions (a), transient eddies (b), stationary eddies (c), and mean meridional circulations (d) in units of $m^2\ s^{-2}$ for annual, DJF, and JJA mean conditions [to convert to angular momentum transport units of 10^{18} kg $m^2\ s^{-1}$ multiply values by $2\pi R^2 \cos^2\phi(p_0/g) = 2.56 \cos^2\phi$, where $2\pi R \cos\phi$ = length of latitude circle, $R\cos\phi$ = distance to rotation axis, and p_0/g = mass per unit area $\approx 10^4$ kg m^{-2}; from Oort and Peixoto, 1983].

Peixoto and Oort (1992)

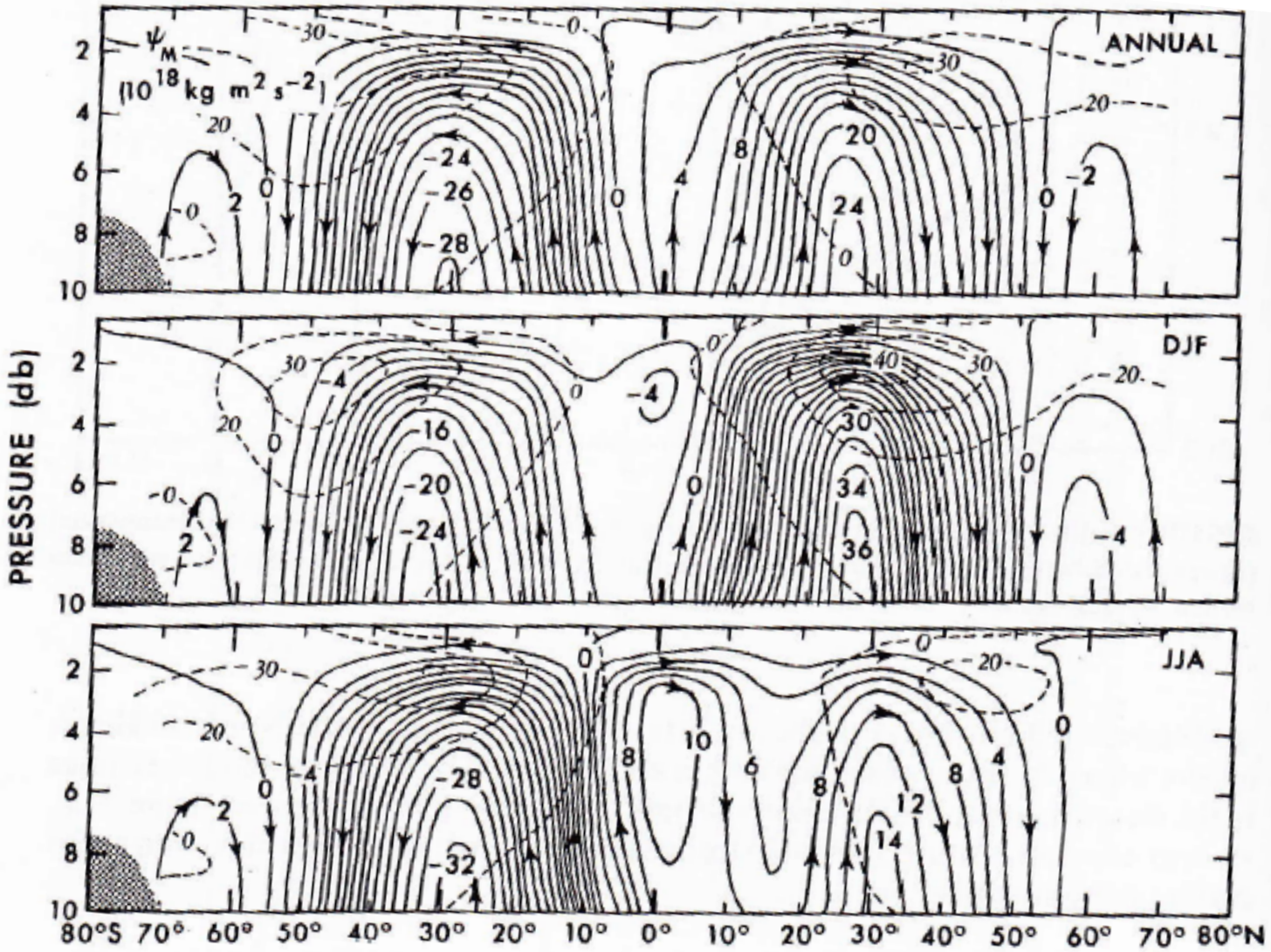


FIGURE 11.13. Streamlines of the nondivergent component of the zonal-mean transport of relative angular momentum in the atmosphere for annual, DJF, and JJA mean conditions in 10^{18} kg m^2 s^{-2}. Added are some dashed contours of $[u]/\cos\phi$ in units of m s^{-1}, which show the countergradient nature of the eddy transports (from Oort and Peixoto, 1983).

Peixoto and Oort (1992)