

Problems on Chapter 9: Equatorial Circulation

Q 9.1: A ring of air initially with no west-east component of motion is moved from the equator in such a way that there is no longitudinal variation. What west-east velocity does it acquire at latitudes 10°N , 20°N , 30°N , 40°N , 50°N ?

Q 9.2: Air which is initially at rest at 20°N is moved in a longitudinally symmetric manner from that latitude. What would be the west-east component of motion at latitudes 10°S , the equator, 10°N , 30°N ?

Q 9.3: Consider a ring of air raised zonally symmetrically from the surface to a height of 16 km (the height of the tropopause in the tropics). By not neglecting the height in comparison with the radius of the earth, find the zonal component of motion induced at the tropopause?

(The zonal direction is along the lines of constant latitude)