

Planetary waves in the equatorial mesosphere and ionosphere

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Meteor radar wind observations from two sites in the equatorial region, one at Cariri (7.4°S, 36.5°W) and the other at Ascension Island (7.9°S, 14.4°W), with a distance of 2400 km in longitude, revealed that there are common period oscillations with 3-4-day, 6-8-day and ~16-days in the zonal winds and 2-day period in the meridional wind, suggesting that these are longitudinally propagating planetary waves. The day to day variability of the minimum ionospheric virtual height, h'F, measured at Fortaleza (3.9°S, 38.4°W) also showed similar oscillation period. Among these the 6-day wave was prominent during a period from August to November 2004. From the phase difference between the two meteor radar sites it is found that the wave has a horizontal wavelength of about 12,000 km, phase velocity of ~21 m/s propagating eastwards, with a vertical wavelength of 60-80 km. Although the wave should not penetrate directly to F-region heights it could affect the post-sunset ExB uplifting of the base of the F-layer. Possible coupling processes between the upper mesosphere to ionosphere will be presented and discussed.