

Observations of atmospheric gravity waves near equatorial region and its relationship with the F2-layer stratification

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Atmospheric gravity waves AGWs can be generated by different sources During geomagnetic disturbances e g Joule heating by particle precipitations at high latitudes and tropospheric disturbances e g cold fronts lightning etc When such wave-like disturbances propagate through the atmosphere either horizontally or vertically they can be observed in ionospheric sounding observations in the form of the traveling ionospheric disturbances TIDs A digital ionosonde located at Palmas 10 16 r S 48 2 r W dip 11 Brazil operates in two distinct modes in the first one frequencies between 1 and 20 MHz are swept generating the well known ionograms every 5 min in the second one ionospheric soundings are carried out at six fixed frequencies 3 4 5 6 7 and 8 MHz with high time resolution 100 sec Using the second mode it is possible to observe the temporal variations of the height changes for different sounding frequencies iso-frequency plots Such plots make possible to observe the presence or absence of the AGWs An analysis of observations on several geomagnetically quiet days in December 2003 January 2004 and February 2004 showed some evidences of the presence of AGWs possibly associated with tropospheric disturbances just before the occurrence of stratification of the F2-layer generating an additional F3-layer suggesting some relation between them In this work we present results and discuss the possibility of inter-relation between the occurrence of AGW and stratification of the F2-layer

Publication:

36th COSPAR Scientific Assembly. Held 16 - 23 July 2006, in Beijing, China.
Meeting abstract from the CDROM, #862

Pub Date:

2006

Bibcode:

2006cosp...36..862B