

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°S, 48.2°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.