

Troposphere – ionosphere interaction at equatorial latitude, Tirunelveli, India

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We have made an attempt to study the troposphere – ionosphere interaction at equatorial latitude station. The tropospheric variability has been studied by using surface pressure variation. The stratospheric variability has been studied by using ozone variability from the TOMS satellite. The mesopause temperature has been measured by Tiwari et al. (2002) and has been used in the present study. The magnetic activity index (aa-index) has been used as an input variability from the solar atmosphere. The gravity wave amplitude shows increasing trend from winter to summer season. The ozone column density shows decreasing trend from winter to summer of 2001. The tropospheric gravity wave amplitude found to be in similar phase to the mesopause temperature with a time lag of about 7 days. The aa-index shows some similarity with the tropospheric gravity wave amplitude at the time lag of about 15 days. The stratospheric – mesospheric – and thermospheric parameter shows the prominent presence of planetary waves of period 25 days, 14 days, 7 days etc. On the other hand, tropospheric power spectrum shows the presence of 27 days, 16 days, and 9 days etc. The tropospheric power spectral peak shows a time lag of two days with upper atmosphere power spectral peaks. This study shows that the disturbances takes about 15 days to reach from thermosphere to tropospheric altitude, and it takes about 7 days from the mesospheric to tropospheric altitude. Thus there might be a movement of disturbances from thermosphere to troposphere and the time lag is found to be varying from one to two week period.