

Title: Structure and dynamics of MF radar scatterers over Tirunelveli and Kolhapur

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Abstract:

Medium frequency (MF) radars working on spaced antenna technique possess tremendous potential to probe and study dynamics of the mesosphere and lower thermosphere (MLT) region. Indian Institute of Geomagnetism operates two identical radar units at Tirunelveli (8.7°N, 77.8°E) and Kolhapur (16.7°N, 74.24°E), one located very close to the geomagnetic equator and under the influence of equatorial electrojet (EEJ) and the other away from the equator and outside the EEJ belt. Studies have been initiated to understand the latitudinal variations in MLT winds as well as any differences in the dynamics of the atmosphere over these regions. In this work, we investigate the nature of the atmospheric scatterers of radio waves over these sites by analysing the geometrical parameters retrieved from the full correlation analysis applied to the radar returns for a selected time duration. Earlier studies from Tirunelveli had demonstrated that the same electric field that drives the EEJ plays an important role in structuring of the radar scatterers and the behaviour of the geometrical parameters. Simultaneous observations from Tirunelveli and Kolhapur now provide us an opportunity to examine the competing roles played by neutral atmospheric and plasma electrodynamical processes in governing the behaviour of the radar scatterers and the signal returns over the two sites.

References-

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