

RADIO AND OPTICAL INVESTIGATIONS OF THE LOW-LATITUDE IONOSPHERE-THERMOSPHERE SYSTEM

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Coordinated experimental campaigns involving airglow and VHF radar measurements were conducted from Gadanki (13.5 N 79.2E 6.4 diplat) India during January to March from 2003 to 2007 and also during April 2006. The total electron content (TEC) measurements were also obtained using GPS observation during certain campaigns in 2007. The HF radar observations from low latitude stations were also used to understand the ionosphere-thermosphere system comprehensively. These observations revealed the presence of enhancement structures in additions to plasma depletions associated with equatorial spread F (ESF). Estimation of zonal wavelength of the bottomside ESF structure and the inference of shears in the zonal plasma drift in the presence of confined ESF structure were obtained. An evidence for “fossil bubbles” turning active was obtained. The signatures of interplanetary electric field (IEF) on the nocturnal OI630.0nm airglow intensities were obtained by the high-resolution photometer and three other independent techniques. The future plan for obtaining such signatures from satellite borne measurements will be discussed. On some occasions, the IEF was shown to trigger the generation of ESF. The development of late night plasma plume under the influence of eastward over-shielding electric field was obtained. Further, the complexities involved in equatorial electric field in the presence of sub-storm during storm time were investigated. Some of the case studies involving the above scientific issues will be highlighted in the presentation.

Airglow, Equatorial Spread F, Interplanetary Electric Field

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