

STUDIES OF OI 630.0 nm NIGHT AIRGLOW AND GPS-TEC OBSERVATIONS DURING THE GEOMAGNETIC STORM AT LOW LATITUDE

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Ground based photometric observations of OI 630.0 nm emission line have been carried out from Kolhapur station (Geog. Lat.16.8°N , Geo. Long 74.2°E) and GPS data processed by UNB Ionospheric Modeling Technique and RD_RINEX software used to get both TEC and variation in TEC i.e d(TEC)/dT from Hyderabad (17.41°N, 78.55°E) and Bangalore (13.02°N, 77.57°E) station, India during the period of the largest geomagnetic storm of the solar cycle 23 which occurred on 20 November 2003, with minimum Dst index -472 nT occurring around mid-night hours. We observed that on 19 November 2003 which was geomagnetically quiet day, the airglow activity of OI 630 nm emission and d(TEC)/dT were subdued and it was decreasing monotonically. However, on the night of November 20, 2003 the enhancement is observed during geomagnetic storm due to the increased electron density at the altitude of the F region which is related to the downward transport of electrons from the plasmasphere to the F-region. Airglow intensity at OI 630.0 nm and d(TEC)/dt showed increase around midnight on November 21, 2003 but comparatively on a smaller scale. On this night the Dst index was about -100 nT. This implies that the effect of the geomagnetic storm persisted on that night also. These observations have been explained by the penetration of magnetospheric electric field to the low latitude region and the subsequent modulation of meridional wind during the magnetic disturbance at night.

Ionosphere, Low latitude Ionosphere, Geomagnetic storm, Night Airglow, Total Electron Content (TEC)

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