Response of the Equatorial and Low Latitude Ionosphere Thermosphere System to the Space Weather Events During the Declining Phase of the Solar Cycle 23

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The physical and dynamical state of the Equatorial and low latitude Ionosphere Thermosphere System (EITS) deviates substantially from the average quiet time behaviour during magnetospheric disturbances. The energetics/dynamics associated with the magnetospheric disturbances induce significant variability in the equato|ëal eletrodynamics and, therefore, in the large scale processes like the Equatorial Electrojet (EEJ), Equatorial Ionization Anomaly (EIA) and Equatorial Spread F (ESF). In this context, the response of the EITS to the space weather events during the declining phase of the solar cycle 23 (2004-2006) is investigated using the Vertical Total Electron Content (VTEC) measured by the Global Positioning System (GPS) receivers along the ~80°E longitude. The observed characteristics in the VTEC variations during these events revealed many interesting features like unusual depletion and enhancement in the VTEC. The observed variability in the VTEC along with the O/N₂ ratio obtained from the Global Ultraviolet Imager (GUVI) instrument onboard the TIMED satellite and the ionosonde data from the magnetic equatorial location of Trivandrum (8.5°N; 77°E; dip lat ~ 0.5° N) in India is studied in detail and the results are presented.

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