



Correlation Between Ionospheric Electron Density Parameters and Geomagnetic Index Dst From Observations of FORMOSAT-3/COSMIC

K. Wang (1) and S. W. Y. Tam (2)

(1) Plasma and Space Science Center, National Cheng Kung University, Tainan, Taiwan (ktwang@pssc.ncku.edu.tw / 886-6-275-3519), (2) Institute of Space, Astrophysical and Plasma Sciences, National Cheng Kung University, Tainan, Taiwan (sunwytam@pssc.ncku.edu.tw / 886-6-275-3519)

The FORMOSAT-3/COSMIC mission is composed of six identical micro-satellites launched on April 14, 2006 under a joint project between NSPO of Taiwan and NCAR of USA. This mission has provided the first satellite constellation for monitoring global weather using the Global Positioning System (GPS) radio occultation (RO) technique. Currently, there can be more than 2000 electron density profiles acquired per day covering a global range of the ionosphere from the altitude of 90km to 800km. Therefore, we adopt this advantage to statistically investigate the correlation between the ionospheric electron density parameters and geomagnetic disturbances based on analyzing the RO data from FS-3/COSMIC. NmF2 and TEC are the primary electron parameters studied; the geomagnetic index Dst at both quiet and storm time is the geomagnetic disturbance factor chosen to be compared with. We will present our statistical results on how NmF2 and TEC at different regions (by magnetic latitudes) and different time (by magnetic local time MLT) respond to the values of Dst and the temporal trend of Dst for both quiet and storm times. We have found that, in general, NmF2 and TEC increase as Dst decreases. These results can be applied to ionospheric and space weather forecasting in the future.