Analysis of ionospheric electron parameters in relation to the geomagnetic index Dst from RO data of FORMOSAT-3/COSMIC

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The FORMOSAT-3/COSMIC mission launched in 2006 has provided globally-distributed radio occultation profiles for the ionosphere and atmosphere. Utilizing this advantage, we statistically analyze how the ionospheric electron parameters NmF2, hmF2, and TEC react to the geomagnetic activities at different magnetic latitudes and magnetic local time (MLT) based on these data. The responses to geomagnetic index Dst at both quiet and storm time are the primary factors to explore in this study. Data of two years from August of 2006 to July of 2008 are adopted for this statistical analysis. The results indicate that, in general, the NmF2, hmF2 and TEC decrease as Dst increases at all seasons at the low-latitude dayside regions. During the main phase of a storm, this region can expand to higher latitudes. Only during the sudden commencement phase (SSC) of storm events, NmF2 and TEC may increase as Dst increases. An application from these results toward other observations will be presented.