

Total Electron Content variations over Korean peninsula during Geomagnetic Storms: the initial results

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We have studied the variations of the total electron content(TEC) over Korea during 2003 solar and geomagnetic activities. We adopted the regional ionospheric model of Korea Astronomy and Space Science Institute (KASI) to determine the ionospheric characteristics, and also used vertical TEC (VTEC) data with 30s interval and GOES X-ray data to examine the solar flare-ionosphere relationship. To classify the TEC responses in terms of magnetic storms, we used the hourly relative deviation TEC (RTEC) data by removing diurnal, seasonal and solar rotation-induced variations. During solar flares, it is shown that the sudden increment of TEC is about 10 TECU(1 TECU = 10^{16} m⁻²). We also found that the variation of VTEC is similar to that of solar activity index (f10.7 flux). During storm times, most of RTEC values increase more than 50%. In addition, we compared changes of positive and negative deviations of RTEC with the Dst and Kp indices, which indicated that the positive deviations were highly associated with strong geomagnetic activity. These results suggest that the solar and geomagnetic activities can be an important factor modulating the TEC variations.