



Ionospheric response to the major geomagnetic storm during maximum solar activity

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The outstanding problem faced by operational Global Navigation Satellite Systems (GNSS) is that ionospheric weather variability is significantly amplified during disturbed solar maximum conditions. An appropriate study of the geomagnetic storm-driven ionospheric density disturbances development is required to estimate the possible impact that storms have on corrections for GNSS performance improvement. In this paper the ionospheric response to the major geomagnetic storm ($Dst \leq -250$ nT) during 4 years (2000–2003) of observations at high solar activity in 23th cycle is investigated using ground-based Global Positioning System (GPS) total electron content (TEC) at Nicosia. We examined the TEC patterns of storm-time disturbances as measured by the departure from the average behavior and established consistent features of TEC changes during ionospheric storms of these magnitudes at the low mid-latitude location considered in the study. They demonstrate clearly defined ionospheric space weather effect on communications over the range of frequencies.