39th COSPAR Scientific Assembly 2012

Space Studies of the Upper Atmospheres of the Earth and Planets including Reference Atmospheres (C)
Recent Advances in Equatorial, Low- and Mid-Latitude Mesosphere, Thermosphere and Ionosphere Studies (C1.1)
Either poster or oral presentation (no preference).

EMPIRICAL MODEL OF THE TEC STORM-TIME RESPONSE IN EUROPE FOR USE IN REGIONAL IONOSPHERIC SPECIFICATION AND FORECAST

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An operational system for Total Electron Content (TEC) nowcast and forecast is being developed to assist in monitoring the ionospheric effects on Global Navigation Satellite System (GNSS) applications. In the forecast procedure, the TEC temporal behaviour is considered as composed of a periodic component (representing the average, non-disturbed ionospheric conditions) and a random component (describing the disturbed, storm-time ionospheric conditions). While the average behaviour can be predicted from past measurements or a climatological model, the key challenge is to estimate in advance the storm-time component. This estimation is performed here by using the modelled storm-response pattern and the predicted values of geomagnetic indices (Dst and K/Kp). For this purpose, an empirical model of the storm-time variations in TEC is needed. TEC measurements from local (Dourbes, 50.1°N, 04.6°E) and other European regional IGS (International GNSS Service) stations have been used to obtain the TEC changes during the geomagnetic storms of the last solar activity cycle. It has been found that during storms, the TEC relative deviation from the "quiet" average/median behaviour depends heavily on the storm time elapsed (i.e. the time passed from the geomagnetic storm onset) and also on season, local time, and latitude. Therefore, for modelling purposes, the average response pattern is suitably expressed as a function of the storm intensity and time, season and latitude. The model and the operational forecast performance will be evaluated with instantaneous measurements from recent storm events.