SOME FEATURES OF THE TEC BEHAVIOR OBSERVED UNDER DISTURBED CONDITIONS

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To understand and eventually model the ionospheric Vertical Total Electron Content (VTEC) behavior under quiet and disturbed conditions is of great importance for communications and navigation. In this work, Global Position System (GPS) data from the Continuously Operating Reference Stations (CORS) network have been used to obtain the ionospheric Vertical Total Electron Content values over the continental USA, corresponding to a series of 10-day storm periods with good seasonal coverage. The VTEC values have been extracted using the Data Assimilation Algorithm for Ionospheric Imaging package, a Kalman filter based code that is the basis of SECs US-TEC model. The storm response of the VTEC was extracted from the data as a ratio to the quiet periods preceding the storms, and sorted as a function of latitude and a storm index defined as the integral, or filtered, ap over the previous 33 hours. When studying the 10-day periods we found consistent features from storm to storm, but these features are more apparent when separating the data between the driven phase of the storm, when the integral of ap is rising, and the recovery to the storm, when the integral of ap is declining. The driven phase shows, for these storms, a positive phase for the mid latitude region when CONUS is in the right time sector, while the recovery shows a negative phase. The existence of the positive phase over CONUS at the beginning of the storm period seems to be related to the timing of the peak of the perturbation; a positive phase will be observed when the peak of the perturbation occurs near midnight UT.

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