

Statistical study of occurrence characteristics of TIDs using the GPS network in North-American and European during solar maximum

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The traveling ionospheric disturbances (TIDs) in North-America and Europe were statistically studied using GPS TEC data from the IGS network during the solar maximum of the year 2001 with about 15 geomagnetic storms ($Dst \leq -100$ nT). The propagation parameters of TIDs are deduced from the multichannel maximum entropy spectral analysis of the optimized filters on GPS TEC time series. The propagational characteristics and seasonal variations of TIDs are presented based on the statistical results of around 15 storms: the analysis results show that there is a peak in the large number of the large-scale TIDs (LSTIDs) and medium scale TIDs (MSTIDs) during the winter independently of solar activity. One exhibits a dominant period of about 50 ± 10 min, a mean horizontal phase speed of about 500 ± 100 m/s. The other MSTIDs of 30-40 min for the dominant period propagated in the equatorward direction with a mean horizontal phase velocity of about 300 ± 50 m/s. There are somewhat shifted clockwise or anticlockwise from the south in the propagation directions of the TIDs.