Longitude variations of medium-scale traveling ionospheric disturbances from GPS observations

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More than ten small Global Position System (GPS) networks located at middle latitude of both hemisphere with different longitude selected from International GNSS Service (IGS) were used to investigate the global longitude variations of medium-scale traveling ionospheric disturbances (MSTIDs). These networks can provide the total electron content (TEC) over the global major sectors (Asia-Australia, Europe-Africa, and America). To detect MSTIDs, the cross-spectral method is used to obtain the nighttime MSTID parameters from small GPS network TEC series. The parameters of MSTIDs in different longitude are first compared, and their similarities and differences are discussed. On other hand, we focus on the seasonal variation of MSTID occurrence rate, especially their comparison in different longitude. Further, the features of MSTIDs in inter-hemisphere are also discussed. In addition, the characteristics of the MSTIDs during nighttime and daytime are compared, especially their similarities and differences in different longitude.

Keywords: Longitude variation, MSTIDs, GPS TEC

