Statistical analysis of activity of medium-scale traveling ionospheric disturbances using IGS network

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Using GPS data taken from Geographical Survey Institute of Japan and International GPS Service, we investigate TEC perturbations associated with Medium-Scale Traveling Ionospheric Disturbances (MSTIDs). We use TEC data taken from five GPS receivers in each of six regions (Japan, South-California, East-America, South-America, Australia, and Europe). To reveal seasonal and local time variations of MSTID activity, ratio of standard deviation of TEC perturbation within one hour to background TEC is investigated. Statistical analysis using the TEC data in 1998, 2000, and 2001 shows that MSTID is most active in winter in the three years in the all regions. This result can be explained by a theory of Bristow et al. [1996] which tells that the lower probability of MSTID in summer may result from gravity wave reflection due to a steep temperature gradient with altitude below the cold summer mesopause.