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## A study of medium-scale traveling ionospheric disturbances observed with a GPS network in Europe

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Medium-Scale Traveling Ionospheric Disturbances (MSTIDs) were studied using the Total Electron Content (TEC) data taken from the data of GPS receiver networks in Europe. We found that the observed MSTIDs can be categorized into two types. One type is daytime MSTIDs, which frequently occur in winter. Since most of the daytime MSTIDs propagate southeastward, we speculate that the daytime MSTIDs could be caused by atmospheric gravity waves in the thermosphere. Second type is nighttime MSTIDs, which also frequently occur in winter. Nighttime MSTIDs propagate southwestward. This propagation direction is consistent with the idea that polarization electric fields could play an important role in generating nighttime MSTIDs.

Keywords: ionosphere, ionospheric disturbance, mid-latitude ionosphere, GPS, TEC