

Nighttime Medium-Scale Traveling Ionospheric Disturbances From Airglow Imager and Global Navigation Satellite Systems Observations

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In this study, coordinated airglow imager, GPS total electron content (TEC), and Beidou geostationary orbit (GEO) TEC observations for the first time are used to investigate the characteristics of nighttime medium-scale traveling ionospheric disturbances (MSTIDs) over central China. The results indicated that the features of nighttime MSTIDs from three types of observations are generally consistent, whereas the nighttime MSTID features from the Beidou GEO TEC are in better agreement with those from airglow images as compared with the GPS TEC, given that the nighttime MSTID characteristics from GPS TEC are significantly affected by Doppler effect due to satellite movement. It is also found that there are three peaks in the seasonal variations of the occurrence rate of nighttime MSTIDs in 2016. Our study revealed that the Beidou GEO satellites provided fidelity TEC observations to study the ionospheric variability.

Keywords: Beidou GEO TEC, GPS TEC, Airglow imager, MSTIDs