

First nadir imaging of medium-scale traveling ionospheric disturbances by the spectrographic imager on International Space Station

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Medium-scale traveling ionospheric disturbances (MSTIDs) at mid-latitudes are wave-like structures of the ionosphere, which has been mainly observed by ground-based instruments. It is more challenging to observe MSTIDs from the space while it can clarify spatiotemporal characteristics of MSTIDs. In this presentation, we show the first result of nadir imaging of MSTIDs by the Visible and near-Infrared Spectral Imager (VISI). VISI is one of the instruments of the ISS-IMAP (International Space Station-Ionosphere, Mesosphere, upper Atmosphere, and Plasmasphere mapping) mission, which is designed to measure three nightglow emissions; O (630nm), OH Meinel band (730 nm), and O₂ atmospheric band (762 nm), with two field of views (+/-45 deg. to nadir). Using 630-nm airglow data of an ionospheric observation mode, MSTIDs structures were successfully detected on May 22, 2014. Horizontal wavelengths of the MSTIDs were 200-500km, which agreed with those observed by ground-based instruments. The peak-to-peak amplitude of MSTIDs observed by the forward (backward) field of views were about 40% (60%) of the background. The difference of the ratios indicates the geomagnetic field-aligned structure of the MSTIDs.

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