

Nighttime MSTIDs propagating northward observed by the Hokkaido HF radar and GEONET

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The SuperDARN Hokkaido radar is a useful tool for studying medium-scale traveling ionospheric disturbances (MSTIDs) that appear between the northern edge of Japan and Kamchatka. By combining radar data with GEONET-TEC data, we can obtain new knowledge of MSTIDs over and to the north of Japan.

We performed statistical analysis of nighttime MSTIDs (8 - 22 UT; 17 - 7 JST) propagating northward and examined seasonal and local time dependence of occurrence characteristics. We found that these MSTIDs have relatively high occurrence rate at pre-night in May and at sunset in May and August. The statistical analysis of MSTIDs over Japan with GEONET-TEC data during 2002 [Kotake, 2007] also showed high occurrence rate at sunset in May and August. However, MSTIDs occurrence rate at nighttime was lower than that observed by the Hokkaido radar. Furthermore, we used the dataset of simultaneous observation by the Hokkaido radar and GEONET to examine whether nighttime MSTIDs propagating northward were observed by the Hokkaido radar and GEONET simultaneously. The results show that propagating direction of MSTIDs observed by the Hokkaido radar do not necessarily coincide with that observed by the GEONET. From this, it is considered that the HF radar may be observing MSTID that is beyond the field of view of the GEONET and has different characteristics. It is likely that we have new knowledge of MSTIDs propagating northward using the Hokkaido radar, whose field of view was not covered by the GEONET.

The result of statistical analysis and, event studies of northward-propagating MSTIDs, together with the discussion of their characteristics will be presented.

Keywords: ionosphere-thermosphere coupling, MSTID, SuperDARN, GEONET, gravity waves, Perkins instability