

Statistical analysis of low-latitude boundary of polar-type medium-scale travelling ionospheric disturbances observed by a 630-nm airglow imager at Nyrola, Finland

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Medium-scale traveling ionospheric disturbances (MSTIDs) are ionospheric plasma density structures with scale sizes of 100-1000 km and are observable through 630-nm airglow imagers. Shiokawa et al. (2012; 2013) and Yadav et al. (2020) reported high-latitude MSTIDs which move associated with auroral brightening and magnetic field disturbances, based on airglow imaging observation at Tromsø (69.6°N, 19.2° E; magnetic latitude: 66.7°N), Norway. Shiokawa et al. (2003) reported MSTID observations at middle latitudes at Shigaraki (34.8°N, 136.1°E; magnetic latitude: 25.4°N), Japan. However, difference of MSTID features occurring at different latitudes, such as their occurrence probabilities, have not been well understood. In this study, we study MSTIDs observed by an airglow imager at Nyrola (62.3°N, 25.5°E; magnetic latitude: 59.4°N), Finland, which is latitudinally located between the auroral zone and middle latitudes. We found 12 cases of MSTIDs from January 23, 2017, to September 30, 2021. We compared the occurrence probability, velocity, wavelength, period, and wave front directions of MSTIDs at three latitudes, including those in previous studies in the auroral zone and middle latitudes. The results showed that the probability of occurrence was smaller at Nyrola than those at Tromsø. In the presentation, we will discuss the differences in the causes of MSTIDs occurring in the mid-latitudes and those occurring in the polar regions.

References:

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