

PEM025-P32

Room: Convention Hall

Time: May 26 17:15-18:45

Statistical analysis of night-time MSTIDs based on airglow imaging observations in the equatorial thermosphere

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We study night-time medium-scale traveling ionospheric disturbances (MSTIDs) observed at Kototabang (0.2S, 100.3E, geomagnetic latitude (MLAT): 10.6S), Indonesia during 7 years from 26 October 2002 to 25 October 2009. We took 630-nm night airglow images with exposure times of 105-165 s and time resolutions of 4.5-5.5 min by using a highly-sensitive all-sky airglow imager. In this observation during 7 years from solar maximum to minimum, the airglow emission became weaker and the observation rate of MSTIDs decreased year by year. This fact may suggest a correlation relation between the decrease of the observation rate of MSTIDs and the solar activity. However the decrease of the signal-to-noise ratio and the decline of the imager sensitivity must also affect this positive correlation. The average and standard deviation of the horizontal phase velocity and period of the MSTIDs were 316.7, 166.0 m/s and 42.1, 10.5 min, respectively. Most of the MSTIDs propagated geomagnetically poleward, while some propagated geomagnetically equatorward. In the presentation, we discuss detailed characteristics of the MSTIDs observed over 7 years in the context of dynamics of the equatorial thermosphere.

Keywords: MSTID, airglow, equatorial thermosphere