

Relationship between phase variation of LF signals and GPS-TEC variations related with MSTIDs at mid-low latitudes

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It is known that phase of LF transmitter signals largely varies in nighttime rather than in daytime, because uniform solar ionization in daytime makes the D-region ionosphere smoother. However, the cause of the nighttime phase variations has not been revealed. In this study, we focus on the periods of the phase variations of the nighttime LF transmitter signals observed in Japan and South-east Asia. As for Japanese data, we investigated the periods of LF signals observed in 16 April, and 6 May, 2007 by wavelet analysis. The propagation path (40 kHz) of the LF signals was located at Fukushima to Kagoshima. Both on 16 April and 6 May, 2007, phase variations with a period of about 50 minute was seen at around 11:00 UT and 15:00 UT, respectively. An occurrence of medium-scale traveling ionospheric disturbances (MSTIDs) was confirmed at 15:00 UT on 6 May, 2007 from GPS Total Electron Content (TEC) data, while the MSTIDs did not occur on 16 April, 2007. In the presentation, we will discuss the periods of LF phase variations and GPS-TEC variations in more detail.