Periods of the lower ionosphere disturbances observed in the phase variations of LF transmitter signal

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It is known that phase of LF transmitter signals largely varies in nighttime rather than daytime. The daytime phase is stable due to strong solar ionization. On the other hand, 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. The propagation path (40 kHz) was located from Fukushima to Kagoshima for the Japanese data. We investigated the periods of LF signals observed in 16 April, and 6 May, 2007 by using a wavelet analysis. For both nights, a period of ~50 minutes was seen at around 11:00 UT (20:00 LT) and 15:00 UT (00:00 LT). Medium-scale traveling ionospheric disturbances (MSTIDs) were observed in the map of GPS Total Electron Content (TEC) at 15:00 UT on 6 May, 2007, which such MSTIDs were not observed on 16 April, 2007. In the presentation, we will discuss the cause of the periods of LF phase in detail.