Statistical study of large-scale traveling ionospheric disturbances using the GEONET total electron content data

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LSTIDs was studied statistically using TEC data derived from GEONET in Japan.

Seventeen LSTIDs were identified during sixteen months from April 1999 to July 2000. All of those LSTIDs traveled southward at the speed of several hundreds m/s. We believe that they were generated at the auroral region. Most of those events appeared during magnetically disturbed periods. This indicates that most LSTIDs are generated by intense heating in the auroral region, which was caused by the electrojet and the precipitations of the energitic particles.

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In addition to GEONET data, we use GPS data of International GPS Service (IGS) and Continuously Operating Reference Stations (CORS) to discuss the damping rates and the propagation mechanism of LSTIDs. The observational data of other instruments, such as magnetometers, satellites, and radars in the auroral region, were used to verify the characteristics of the LSTIDs detected by GPS data.