Time variations of electron density surfaces at the nighttime lower-ionosphere in the low-middle latitudes by using tweeks

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The purpose of this study is the investigation of the correlation between the reflection height of tweek atmospherics and Dst indicies. Therefore, we estimated the equal electron density surfaces at nighttime lower-ionosphere (< 110 km) in the low-middle latitudes by using tweek atmospherics. Tweek atmospherics are VLF/ELF electromagnetic waves which occurs from lightning discharges and propagate in the earth-ionosphere waveguide in long distances. We estimated the reflection surfaces (the electron density; 18-37 cm-3) by using the curve fitting method. As a result, it was confirmed that the reflection surfaces covering wide area in the low-middle latitudes went down in recovery phase of geomagnetic storms.