Relationship between the variation of lower thermospheric temperature and auroral activities obtained at Syowa station

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Polar thermosphere is expected to respond to auroral activities through Joule heating and particle heating. Therefore, observation of the thermospheric dynamics in the polar regions can be a key factor for understanding the magnetosphere - ionosphere - thermosphere coupling.

Purpose of the present study is to reveal the local relation between auroral activity and the thermospheric winds and neutral temperatures using data obtained with an FPI, which has high temporal (-2 min) and spatial (-a few tens km) resolutions, and with an All-sky Imager (ASI) at Syowa station. Tadano [2004] reported the relation between auroral activity and the lower thermospheric winds and temperatures on the night of July 16, 2001, which indicated enhancements of the lower thermospheric temperature without changing of auroral emission height. Similar relation between auroral activity and the lower thermospheric temperature was found in the data obtained on July 24, 2001. In order to understand the rapid increase of temperature, simultaneous observation data from other instruments such as imaging riometer will be discussed along with the results of optical observation.