

High-resolution simulation of the polar thermosphere associated with auroral activities

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It is now well recognized that complicated local wind systems and temperature structures are generated in the auroral thermosphere. In many cases, behavior of the auroral thermosphere cannot be explained simply by Joule heating, heating through particle precipitation, or ion-neutral drag. It is expected that interaction between local auroral-related wind system and background dynamics leads to complicated dynamics and energetics. In order to quantitatively study the thermospheric dynamics and energetics in the polar region, a high-resolution nonhydrostatic thermospheric model has been developed. Using the model, we investigate the interaction between local wind and large-scale background flow in the polar thermosphere. Some typical cases for thermospheric disturbances will be presented and compared with the observational results obtained by the DELTA campaign