

## Disturbances in the polar cap region of the upper thermosphere simulated by a GCM

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Recent radar and satellite observations have shown various disturbances in the polar cap region of the upper thermosphere. In particular, European incoherent scatter (EISCAT) radar and Super Dual Auroral Radar Network (SuperDARN) observations have revealed ionospheric variations, which would be caused by the magnetic reconnections at the dayside magnetosphere, and significant thermospheric heating due to the electromagnetic energy injection from the magnetosphere. Previous GCM simulations have also shown that traveling atmospheric disturbances (TADs) are generated by auroral particle precipitation, ion drag, and Joule heating in the thermosphere, while localized disturbances are generated in association with atmospheric waves propagating from the lower atmosphere. In the present study, we focus our attention on disturbances in the polar cap region of the upper thermosphere. Using a GCM, which covers all the atmospheric regions, we investigate thermospheric heating and generations of TADs in the polar cap region. We will describe one of typical examples of the magnetosphere-ionosphere-thermosphere coupling.