

Modeling of the thermospheric heating by auroral electrons and protons

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The energy originated from the solar wind deposits into the thermosphere through the processes of auroral particle precipitation and Joule heating. The heating rates due to these processes and their spatial variations are strongly dependent on geomagnetic conditions. Recent observations of auroral particle precipitation by satellites and ionospheric parameters by IS radars enable us to estimate the spatial and temporal variations of the thermospheric heating rates.

A model of auroral particle precipitation has been developed for use in a thermospheric general circulation model. Using this model, we can evaluate the ionization and heating rates due to the precipitation of auroral electrons and protons. This model will become a powerful tool for analysing data from satellites and IS radars.