

## Relativistic electron precipitations associated with the pulsating aurora

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We investigate the wide energy electron precipitations from keV to MeV associated with the pulsating aurora. The EISCAT observations indicated that a few hundred keV electrons often precipitate into the middle atmosphere during the pulsating aurora. The satellite at the magnetosphere observes that intense rising tone emissions of chorus waves were observed in the magnetosphere. The chorus waves that propagate to the higher latitudes can modulate electrons for the wide energy range, and resultant precipitations take place. Our computer simulation confirmed this process; chorus waves propagating along the field line cause the wide energy electron precipitations. These precipitations have a great impact on the ion chemistry at the mesosphere. In fact, the computer simulation showed that significant enhancement of NO<sub>x</sub> and decrease of O<sub>3</sub> occurs associated with the precipitation of pulsating aurora electrons.

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