

Relationship between dissipation of electromagnetic energy and energy deposition by precipitating particle in the polar ionosphere

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We have determined statistically the relationship between the electromagnetic energy and the kinetic energy of precipitating particles, which flow from magnetosphere into the ionosphere and thermosphere. Using EISCAT CP-1 data obtained between 1987 and 2005, we have estimated the electromagnetic energy flux and the energy deposition from precipitating electrons. The present study has shown that these two energies tend to be anti-correlated to each other, when the ionosphere is dark.

At the presentation, we will further provide more detailed results, for example, regional differences and magnetic local time (MLT) and invariant latitude (INV) dependence of the relationship between the two energies. These differences and dependence should be important, because the characteristics of field-aligned currents, precipitation particles and others highly depend on the region such as morning/dayside/afternoon/nightside, and CPS/BPS/Polar cap.