

Precipitating electron beams observed below auroral acceleration region

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Reimei satellite is polar orbiting satellite within altitude range of 610 to 670km, which is lower than auroral acceleration regions but higher than auroral emission regions. The satellite is three-axes stabilized, we cannot apply typical techniques of getting three-dimensional particle distribution functions with satellite spin motion. However, we can get particle energy spectra with full pitch-angle coverage, and with time resolution of 40ms, since auroral particle instruments (ESA/ISA) onboard are top-hat type analyzers, and installed into appropriate positions.

Precipitating electrons with energies of 10 to 1000eV are frequently observed in high-latitude side of auroral 'Inverted-V' structures with active aurora. These electrons are highly confined field-aligned beams which are time-dispersed. They would be cold ionospheric electrons accelerated by inertial Alfvén waves which are generated in higher altitude and traveling downward.

The ionospheric cold electrons can get only ~300eV due to the inertial Alfvén waves. Resulting auroral photon emission would be faint. Therefore, auroral emission structures would almost be determined by accelerated electrons through the inverted-Vs. We picked up events of the time-dispersed precipitating electrons without the inverted-V signatures from Reimei particle data. From auroral image data taken by MAC onboard Reimei, corresponding auroral structures are line-like (thickness of a few km) with traveling vortex.