

Simultaneous auroral imaging and particle observations of fine-scale aurora obtained by the REIMEI satellite

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In order to investigate the dynamics of fine-scale auroral structures, observations using the Multi-spectral Camera (MAC) on board the REIMEI satellite, which was launched into a polar orbit at an altitude of ~610 km in August 2005, are being carried out. Characteristics of auroral particles are simultaneously observed by the Electron Spectral Analyzer (ESA) and the Ion Spectral Analyzer (ISA) instruments also on board the REIMEI satellite. In the nightside auroral region, MAC can take monochromatic images at three wavelengths of N₂+1N band (427.8 nm), OI (557.7 nm), and N₂1P band (670 nm), with high temporal (max. 120msec) and spatial (max. 2km) resolutions.

Since the REIMEI satellite is 3-axis stabilized, we can point MAC to a footprint of the magnetic field line threading the satellite to realize simultaneous auroral particle and emission observations. However, attitude of the satellite has to be determined according to the position of satellite and geomagnetic field. A software that determines such satellite attitude for a predicted orbit was developed. Simultaneous observations of auroral particles and emissions were successfully made using the software.

Preliminary results of such simultaneous observations will be presented.