

## **Fine-Auroral Structure Obtained from Simultaneous Image and Particle Observations by REIMEI**

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Japanese micro-satellite REIMEI was launched successfully in the last August, and started auroral observations using a multi-spectral monochromatic auroral CCD camera (MAC) at three wavelengths and electron/ion energy-spectrum analyzers (ESA and ISA) from late in October. Three emissions of N<sub>2</sub><sup>+</sup> first negative band (427.8 nm), OI (557.7 nm) and N<sub>2</sub> first positive band (670 nm) are independently obtained by the MAC with typical spatial and time resolutions of 2 km and 120 ms, respectively. Three-axis bias momentum attitude control system adopted in REIMEI enables us to direct the field-of-view of MAC toward the magnetic footprint or the limb of the earth. Consequently, simultaneous measurements between in-situ particles and auroral images at the magnetic footprint have been carried out so far. Further, we have tried to obtain auroral height distributions by pointing the field-of-view of MAC toward the limb of the earth. In this paper we will report the recent results of REIMEI image and particle observations shown as follows. 1) Spatial and time variations of fine-auroral structures obtained when the field-of-view of MAC were pointed toward the magnetic footprint. Particularly, we found the 'narrow pulsating aurora event' whose widths are about 5 km in magnetic latitude and several tens km in magnetic longitude, respectively. In addition, simultaneous image-particle observations of disturbed discrete aurora and black aurora will be presented. 2) Altitude profile of aurora observed in the limb direction in association with the enhanced auroral event and/or a ray-structure. Further, resonant fluorescence of molecular nitrogen ions occurred in the sunlit region will be discussed.