Coordinated Reimei and THEMIS ground based observatory observations of fine-scale aurora

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Fine-scale auroral dynamics have been observed by a multi-spectral auroral camera (MAC) and particle sensors (ESA/ISA) on board the Reimei satellite with a sun-synchronous orbit of 610x670 km altitude at 1250/0050 local time. In general, MAC observes three auroral emissions, 428 nm (N2+ 1N), 558 nm(OI) and 670 (N2 1P), with time and spatial resolutions of 120 ms and 1km/pix, respectively. ESA/ISA observes electron/ion energy spectrum in the range of 10eV-12keV with a time resolution of 40 ms.

On the other hand, THEMIS is a five-satellite mission to investigate the causes of the global reconfigurations of the Earth's magnetosphere. The satellite data will be combined with auroral network data obtained at THEMIS ground based observatories (GBOs) across the Arctic Circle in Canada and Alaska.

To investigate the fine-scale auroral dynamics and their relationship to the large-scale aurora, we have made coordinated Reimei-THEMIS ground based observatory observations during winter periods of 2005/2006 and 2006/2007. During the first winter of 2005/2006, there were already 10 of the THEMIS GBOs operational, and we found more than 100 passes when the Reimei footprint was less than 400 km away from any one of the THEMIS-GBOs and all three instruments (Reimei MAC, Reimei ESA/ISA, and GBO ASI) were operating simultaneously. However, there have been only a few really good conjunctions in the 2005/2006 winter since it is difficult to fulfill the conditions of clear sky and auroral appearance. This number will increase for the 2006/2007 winter with 19 operational GBOs. In the presentation, we report the recent results of coordinated Reimei and THEMIS-GBO observations in detail.