

PEM022-10

Room: 201A

Time: May 23 14:30-14:45

High-speed EMCCD imaging of auroral microstructures

Ryuhō Kataoka^{1*}, Yoshizumi Miyoshi², Ayumi Yaegashi³, Takeshi Sakanoi³, Kazuo Shiokawa², Yusuke Ebihara²

¹Tokyo Tech, ²Nagoya University, ³Tohoku University

It has been known that auroral microstructures sometimes show very rapid variations beyond Pc1 ULF range, possibly associated with electromagnetic ion gyrotron waves or dispersive Alfvén waves. In order to resolve the key optical features of the electron acceleration mechanisms, it may be essential to realize the high-speed imaging with sampling rate beyond the Video frame rate of 30 Hz.

We have conducted a coordinated observation of 110 Hz high-speed imaging of auroral microstructure at Poker Flat Research Range since late January 2010. Two wavelengths of 845 and 670 nm are observed by two different EMCCD cameras to estimate the characteristic energy of precipitating electrons. Many types of interesting features were found associated with substorms, although we are now in the very initial stage of basic data analysis. We will report the initial results, comparing the optical data with ground-based search-coil magnetometer data from the ULF to ELF ranges. Future planning of high-speed imaging system will also be discussed.