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## the study of magnetotail fluctuation during substorms

Kaoru Satoh<sup>1\*</sup>, Shinobu Machida<sup>1</sup>, Yukinaga Miyashita<sup>2</sup>, Akimasa Ieda<sup>2</sup>, Masahito Nose<sup>1</sup>, Satoko Nakamura<sup>1</sup>, Vassilis Angelopoulos<sup>3</sup>

<sup>1</sup>Kyoto University, <sup>2</sup>Nagoya University, <sup>3</sup>University of California, Berkeley

The Earth's magnetosphere takes energy from the solar wind and stores it as a form of magnetic fields in the magnetotail. However, when it progresses excessively, the energy release takes place suddenly converting the magnetic field energy to the kinetic energy of particles. This phenomenon is called a substorm, but the physical mechanism of the substorm triggering is still remains unsolved.

In this study, we investigate the plasma density, plasma temperature, three components of velocity and magnetic field vectors in the central plasma sheet using the data from the THEMIS probes in order to obtain some clues to understand the substorm triggering. We found earthward flows which accompany the increase of northward magnetic field in the region beyond  $X \sim -12 R_e$  about several minute before the auroral breakup, i.e., the substorm onset. However, the occurrence of such flows decreases around  $X \sim -11 R_e$ . The occurrence of earthward flows increases again inside the region of  $X \sim -10 R_e$ , but the flow becomes more oscillatory and it is also characterized by the increase of the northward magnetic field.

In this presentation, we will discuss on similarities and differences between those two earthward flows.

Keywords: substorm, dipolarization