Storm-time signatures of ionospheric ion outflow observed by IMAGE/LENA

\# Takahiro Kunori[1]; Masahito Nose[2]; Satoshi Taguchi[3]; Keisuke Hosokawa[3]; Michael R. Collier[4]; Thomas E. Moore[4]

[1] Geophysics., Kyoto Univ.; [2] DACGSM, Kyoto Univ.; [3] Univ. of Electro-Communications; [4] NASA GSFC

A number of studies have shown that the ionospheric ion outflow is one of the important sources of magnetospheric plasma. In particular, oxygen ions, which originated from the ionosphere, can be sometimes observed in large amounts in the magnetosphere. It is important to reveal the mechanism of ionospheric ion outflow and its effect on various phenomena in the magnetosphere.

The Low Energy Neutral Atom (LENA) imager on the IMAGE spacecraft can observe ENA which was generated by the charge exchange between upflowing ions and geocorona. The LENA imager provides an image of ENA around the Earth at a sampling rate of 2 minutes.

In this study, we have statistically examined IMAGE/LENA data and SYM-H index to identify characteristics of the ion outflow with a time-scale of several minutes. Results of analyses for the data from May to November 2000 show that both the ENA count and observation frequency of the count enhancement in the direction of Earth tend to have larger values with the decrease of SYM-H index. This implies that the ion outflow can be triggered by CME shocks, substorms and precipitation of the ring current particles in the course of magnetic storms. Detailed characteristics of the ion outflow for the main and recovery phases of the magnetic storms will be presented.