

## Magnetic local time dependence of disturbances during magnetic storms observed by the IMAGE satellite and ground observatories

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It is well known that the decrease of magnetic field measured on the ground during magnetic storms is longitudinally asymmetric, and centered around the dusk side. It has been thought that this longitudinal asymmetry is generated by the partial ring current. But it is necessary to discuss further because there is contradiction that some previous studies using satellite data statistically indicate the center of partial ring current around the midnight. All these studies are based on statistical survey, and very few attempts have been made for short time scale.

We compared the longitudinal profile of ground magnetic field disturbances to the longitudinal distribution of the energetic neutral atom (ENA) flux measured by the HENA imager on board the IMAGE satellite.

IMAGE is the polar orbital satellite which has a perigee of 1000km, apogee of 8.2RE and an orbital period of 14.2hr. ENAs generated from ring current ions by charge-exchange process can be detected by the HENA imager. We examined the high energy hydrogen (61-119keV) data when the IMAGE satellite made an observation more than 2 hours at geomagnetic latitude (GMLAT) higher than 80 degrees. We found 476 such intervals from 2000-2002, and then further selected intervals during geomagnetic storms.

We also used one-minute digital data of ground magnetic field measured at the observatories with  $|GMLAT|=10-50$  degrees.

The 18 September 2000 event was observed at the recovery phase of geomagnetic storm, and neither geomagnetic disturbance nor ENA flux has clear longitudinal asymmetry. On the other hand, the 24 November 2001 event was observed at the main phase, and both had clear longitudinal asymmetry. The peak of ground magnetic field is at the dusk-midnight sector, while the peak of ENA flux distribution is at midnight. These results indicate that the geomagnetic decrease is not generated by only partial ring current, and that there seems to be apparently storm phase dependence in longitudinal asymmetry. In the presentation we will also show statistical results on comparison of longitudinal asymmetry.