Cluster-MAGDAS/CPMN conjunction study of Pi2 wave propagation in the inner magnetosphere

Hideaki Kawano[1]; Shinichi Ohtani[2]; Teiji Uozumi[3]; Shuji Abe[4]; Kentarou Kitamura[5]; Yoshimasa Tanaka[6]; Kiyohumi Yumoto[4]; Elizabeth A. Lucek[7]; Yumoto Kiyohumi MAGDAS/CPMN Group[8]

[1] Earth and Planetary Sci., Kyushu Univ.; [2] JHU/APL; [3] SERC; [4] Space Environ. Res. Center, Kyushu Univ.; [5] NICT; [6] ROIS; [7] Imperial Coll.; [8] -

http://denji102.geo.kyushu-u.ac.jp/denji/staff/kawano/kawano.html

In this paper we study Pi2 events simultaneously monitored by the Cluster spacecraft and ground magnetometers that belong to MAGDAS/CPMN (MAGnetometer Data Acquisition System/Circum-pan Pacific Magnetometer Network). In particular, we focus on cases in which Cluster was located in the inner magnetosphere.

So that Cluster and MAGDAS/CPMN are located close in longitude, we have selected Pi2 events for which Cluster was located within the magnetic-longitude range of 180-240 deg, because the distribution of MAGDAS/CPMN magnetometers is dense around the 210 deg magnetic meridian. Among thus found events, we have further selected Pi2 events for which Cluster was located in the nightside inner magnetosphere.

We examine thus found Pi2 events. The features seen in the data include the following. The latitude coverage of Cluster is wider than past satellites, and the amplitudes of the waves (within the frequency range of Pi2) observed by Cluster appear to show a strong latitude dependence. This is consistent with the latitude dependence of ground Pi2 waves. We also address the propagation of the Pi2 signal across the plasmapause, using cases in which a few of the Cluster satellites were located within the plasmasphere while the rest were outside, with the ground Pi2 signal as a key reference. The events thus far found include a case in which the amplitude of the transverse component of Pi2 appears to have decreased as the signal propagated earthward across the plasmapause.