

## A STATISTICS STUDY OF MAGNETOSPHERIC RESPONSE TIMES DURING QUASI-PERIODIC SOLAR WIND VARIATIONS

Kei Kamikawa[1], # Kiyohumi Yumoto[2], Kentarou Kitamura[2], Circum-pan Pacific Magnetometer Network Group

[1] Earth and Planetary Sci., Kyushu Univ., [2] Space Environ. Res. Center, Kyushu Univ.

In May 1996, two types of DP 2 magnetic variations were observed at the Circum-pan Pacific Magnetometer Network (CPMN) stations. One correlates with quasi-periodic variations of the IMF-Bz component, and the other correlates with changes of the solar wind Dynamic Pressure (SW Pd). The ionospheric equivalent current patterns are obtained by using the ground magnetometer data from the CPMN and WDC stations. The ionospheric equivalent current patterns show almost the same in the both cases of DP 2, that is, at high latitudes, clockwise and counter-clockwise current vortices appear in the morning and afternoon sector, respectively. Furthermore, we examined cross-correlation of the ground magnetic variations with the IMF and plasma changes at the WIND satellite, in order to determine time delays of the variations between the satellite and ground (magnetospheric response time). It is found that DP 2 caused by the IMF-Bz was about 15 minutes, and that by SW Pd was about 4 minutes.

The magnetospheric response times must be an important clue to understand the global response of the magnetosphere for the quasi-periodic solar wind variations. In the present study, we statistically analyze magnetospheric response times of 61 DP 2 events during the period of April, 1999 - March, 2000.

The following results are obtained.

(1) DP 2s observed at the ground stations can be categorized into three types: one is correlated only with the IMF-Bz [Type A: 7 events], the second is correlated both Z-component of the IMF and solar wind velocity [Type B: 45 events], and the third is correlated with SW Pd [Type C: 6 events].

(2) The Magnetospheric response times are 25 (+/-) 6 minutes for Type A, 19 (+/-) 2 minutes for Type B, and 11 (+/-) 7 minutes for Type C.