

RELATIONSHIPS BETWEEN MAGNETOSPHERIC DISTURBANCES AND SOLAR ACTIVITIES OBSERVED FROM APRIL 30 TO MAY 5, 1998

Haruka Adachi[1], Tohru Sakurai[2], Katsuhide Marubashi[3]

[1] Aeronautics and Astronautics, Tokai Univ., [2] Dept. Aero. & Astro. Tokai Univ., [3] Comm. Res. Lab.

Three magnetic disturbances occurred successively during 6 days from April 30 to May 5, 1998, in which the Dst index grew greatly to the minimum value of about

-200 nT. These strong magnetospheric disturbances were brought by attacks of three successively shocked solar winds observed during this period. In this paper we examined the storm and substorm signatures, and their related magnetic disturbances including ULF wave activities observed on the ground and in the magnetosphere by the Geotail satellite and the Geosynchronous satellite, Goes 8 and 9. The storm activities appeared in the development of the Dst index. The first SSC was observed at 0930 UT on 30 April, which was not so strong. However, clear Psc ULF waves were observed on the ground from high to low latitude ground stations, and simultaneously very interesting excitation of Pc 5 ULF waves was observed by Geotail in the morning side outer magnetosphere. The second SSC was observed at 2200 UT on 1 May, which brought the first clear negative excursion of the Dst index to -100 nT. This magnetic disturbance was caused by the second high speed solar stream in excess of about 600 km/s. Magnetic disturbances observed on the ground were very severe with strong substorm activities. ULF waves observed on the ground were also enhanced. The third SSC was observed at 0330 UT on 4 May, which appeared with a very steep decrease of the Dst without any clear initial phase, but with strong substorm activities with large amplitude Pc 3 and 5 ULF waves. The speed of the third shocked solar stream was in excess of 800 km/s, highest among the three solar streams. The travel time was estimated as being very short only with about 45 hours. We also examined the relationship of the magnetic structure between the magnetic cloud observed on 2 May and the CME on 29 April, and found that the orientation of the flux rope was in good agreement with the orientation of the filament disappearance. Magnetospheric disturbances associated with these interplanetary disturbances are discussed in more detail.