[구SO-03] Magnetospheric and thermospheric responses to interplanetary magnetic field sector polarity changes.

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Many near-Earth space (magnetosphere, ionosphere, and thermosphere) phenomena strongly depend on the orientation and/or strength of the interplanetary magnetic field (IMF). During 2003, the ACE spacecraft in the solar wind observed well-defined two quasi-stationary corotating structures in the IMF. One is directed predominantly away from the Sun ("away-IMF") and the other is directed toward the Sun ("toward-IMF"). These sector structures are associated with high-speed solar wind streams originating from corona hole. In our study, we examine how near-Earth space environment changes when the magnetosphere is surrounded by different IMF sectors (i.e., "away-IMF" or "toward-IMF"), using thermosphere total mass density data from the CHAMP satellite, geosynchronous magnetic field data, and low-latitude ground magnetic field data.

[구SO-04] Statistics of substorm occurrences during northward IMF conditions

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Substorms are considered to occur mainly under southward IMF conditions, but they also occur even under northward IMF conditions. This work aims to estimate the statistical significance of substorms which occur during northward IMF conditions in two ways. First, we used the Frey-Mende onset list and ACE satellite data. For the onsets for the interval May 16, 2000 to Dec 31, 2001, we have checked the IMF Bz condition of the ACE satellite. A total of 1495 substorms were studied and we found that 1051(70.3%) substorms are associated with a preceding southward IMF condition and the other 444(29.7%) substorms are associated with a preceding northward IMF condition. For the substorms under northward IMF conditions, we have decided duration times of northward IMF condition preceding each onset after a previous onset. Second, we have searched for an interval during which the IMF Bz is northward continuously for 3 hrs or longer based on the IMF Bz data from ACE. For the selected northward IMF intervals, we have checked the occurrence of substorms based on ground magnetometer data of the image, 210MM chain and CARISMA network. We have identified a total of 173 independent intervals, and found 74 substorms that occurred during northward IMF conditions. Based on the results obtained by these two approaches, we will discuss implications of the substorms that occurred during northward IMF conditions.