[P-055/SE-3] Comparison between Weak and Strong SPEs during the Solar Cycle 23

Junga Hwang[1], Kyung-Suk Cho[1], Rok-Soon Kim[1,2], Young-Jae Moon[3]
[1]*Korea Astronomy and Space Science Institute*
2Astronomy and Space Science, ChungnamNationalUniversity
3Astronomy and Space Science, Kyunghee University

We parameterize (1) CME speeds, accelerations, angular widths, locations, and earthward direction parameter, based on SOHO/LASCO catalog, (2) SPE (solar proton event) rise time, duration time, decrease time and peak intensity, (3) Solar Flare Strength (X-ray Flare intensity) and radio type II burst, (4) propagation time delay from Solar Flare and SEP and from CME to SEP during solar cycle 23 (1997-2006). We found that SPE rise time and duration time depend on CME speed and direction parameter, and the peak SPE intensity depends on CME speed and X-ray Flare intensity.

We also compare weak and strong SPEs during the same period. We found that there are positive correlations between SPE peak flux and rise time, and between that and duration time for weak SPEs. In the other hand, for strong SPEs, there are negative correlations between SPE peak flux and SPE time scales.

[P-056/SE-4] Correlations between Dst, ΔDst and interplanetary electric field.

Yoon-Kyung Park[1] and Byung-Ho Ahn[2]
[1]*Department of Science Education, Kyungpook National University*
[2]*Department of Earth Science Education, Kyungpook National University*

Burton et al,(1975) predicted the Dst index solely from a knowledge of the interplanetary electric field(Ey), in order words, VBs, where V and Bs stand for the solar wind velocity and southward component of the interplanetary magnetic field. They further argued that the decay rate is a function of the Dst index with the ring current decay constant being computed 0.13 hour-1, which corresponds to a decay time of 7.7 hours. O'Brien and McPherron(2000) argued, however, that the ring current decay parameter varies with Ey not with the Dst index. They proposed that the decay time is variable as a function of Ey and suggested it is in the range of three to 20 hours. As mentioned above, the problem on the decay parameter has not been settled yet and it remains one of the major topics to be solved in the prediction of the Dst index during magnetic storms. Contrary to the preview studies, we attempt to find the decay parameter for the main and recovery phases of magnetic storms separately and also try to figure out whether the decay parameter is a function of the Dst index or of Ey. For this purpose we examine the correlations between ΔDst and the Dst index, ΔDst and Ey, and the Dst index and Ey during the main and recovery phases of magnetic storms separately. For this research, we utilized 62 well-behaved geomagnetic storms particularly with monotonously decreasing main phase occurred during the period of 1998-2006. One hour average data of the Dst index and the ACE interplanetary electric field data are employed. The dynamic pressure effect of the solar wind has been removed from the Dst index. Based on this result, we try to predict the Dst index during magnetic storms.