

Geomagnetic Activities and Sector Boundary Crossings

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There are periods of interplanetary magnetic fields (IMFs) outwards from or inwards towards the sun. The patterns of IMFs are called sector structures. Two or four sectors are often observed during a solar rotation period. Boundaries of the sectors of opposite IMF polarities are called sector boundaries. Previous studies suggested that a relation between sector boundary crossings and geomagnetic activities [1-2]. Forecast of geomagnetic activities is a subject of space weather. It is possible to forecast sector boundary crossings from solar magnetic field observations [3]. We statistically studied a relation between sector boundary crossings and geomagnetic activities using in-situ solar wind observation by the ACE spacecraft. According to our result, it is not easy to forecast enhancement of geomagnetic activities only by the information of the sector boundary crossings. Quiet periods of geomagnetic activities occur before the sector boundary crossing.

Keywords: sector boundary; solar wind; geomagnetic activity; space weather.

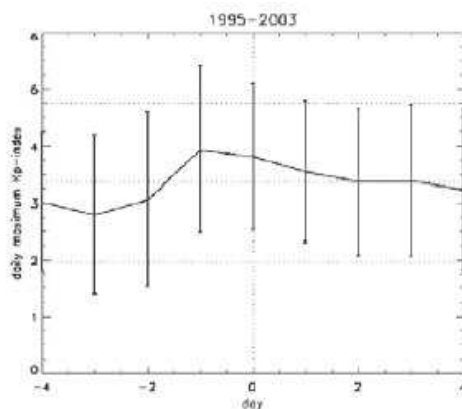


Figure 1. Superposed epoch analysis of geomagnetic activities associated with sector boundary crossings

References

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