

多点衛星観測による磁場の双極子化と高速流の関係

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Statistical relationships between dipolarization and BBFs: Multi-spacecraft observations

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The relationship between dipolarizations and bursty bulk flows (BBFs) is one of the most important keys to understand the substorm trigger mechanism. Recent multi-spacecraft observations provide some important aspects: (1) connections between dipolarizations and BBFs depend on the initial magnetic topology in the inner magnetosphere, (2) dipolarization close to the geosynchronous orbit can be sometimes independent of the BBFs in the magnetotail. Thus, the further study should be devoted based on simultaneous observations of three key regions, i.e., geosynchronous orbit, inner magnetosphere, and near-Earth magnetotail.

We statistically study the relationship between dipolarizations and BBFs, using Geotail, Cluster, Double Star and GOES spacecraft. The intervals are selected as a dipolarization and/or BBF events during 2004-2006 where at least one spacecraft is at $R=6.6 R_E$, another in the inner magnetosphere (X is greater than $-15 R_E$), and the other in the near-Earth tail (X is greater than $-25 R_E$). Thus, the three key regions for the dipolarization occurrence and the fast flow propagation are simultaneously covered. Taking into account the existence of dipolarizations and/or BBFs at each location, the contribution of BBFs to the dipolarizations is discussed.