Dual-satellite observations of flux transfer events: ISEE-1 and ISEE-2

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Flux transfer events (FTEs) are transient events observed near the dayside magnetopause, characterized by bipolar perturbation in the magnetic field component normal to the magnetopause. They are generally thought to be generated by transient dayside reconnection, which transports solar wind energy into the magnetosphere. We have analyzed magnetic field data from dual satellites ISEE-1 and ISEE-2 (usually separated from each other by several hundred kilometers), in an attempt to directly detect the motion of FTEs. From ten years' data of ISEE, we have identified about thousand cases in which the two satellites observed the same FTE. Then, from the positions and observation times of each FTE at the two satellites, we have estimated the direction of motion of the FTE. Unlike the four-spacecraft sets of Cluster or the planned SCOPE project, the two-satellite set of ISEE do not perfectly resolve the three-dimensional direction of motion of FTEs, but the statistical analysis of the large database of ISEE covers it. Preliminary results suggest that the FTEs tend to move tailward, mainly in the east-west direction, away from the subsolar point; this is inconsistent with an east-west elongated structure caused by a transient reconnection at the (east-west elongated) equatorial reconnection line, but consistent with a flux-tube structure which has a small cross-section in the GSM XY plane.