

# Motions of flux transfer events: Two-point observations by ISEE 1 and ISEE 2

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Flux transfer events (FTEs) are transient phenomena (duration: a few to several minutes) observed near the magnetopause, characterized by bipolar perturbations in the magnetic field component perpendicular to the magnetopause (BN). FTEs are generally thought to be the results of transient reconnections at the magnetopause.

There exist many reports in literature on FTEs. However, so far there exist only limited number of reports doing statistical analyses on the directions of motions of FTEs, because one satellite is not sufficient to clarify the spatial structures and the directions of motions of FTEs.

To address the directions of motions of FTEs, in this paper we present a statistical analysis of FTEs simultaneously observed by two satellites ISEE 1 and ISEE 2, which made observations for continuous ten years (1978-1987). Two-point observation does not completely resolve the direction of motion; we cover it by large-scale statistics (634 events) of the ten-years data of ISEE.

For each FTE we have determined the time lag from ISEE 1 to ISEE 2 as that which maximizes the correlation function between BN's at ISEE 1 and ISEE 2. This time lag has a significant correlation with the longitudinal distance between the two satellites, consistent with east-west motions away from the subsolar point. The time lag shows a weaker correlation with the latitudinal distance. The significant east-west motion suggests that FTEs in nature are likely to have a structure whose longitudinal scale is shorter than its latitudinal scale. In other words, flux rope structure is more consistent with the observations than a long-X-line type structure.