



Investigation of why certain flux transfer events appear as isolated events

Anita Kullen, Simon Thor, Tomas Karlsson, and Lei Cai

KTH Royal Institute of Technology, EECS, Space and Plasma Physics, Stockholm, Sweden (kullen@kth.se)

This flux transfer event (FTE) study is based on 989 FTEs, originally identified by Wang et al. (2005) in Cluster data. Due to Cluster's orbit the FTE list exclusively contains events detected at the high-latitude dayside magnetopause and low-latitude flanks. The focus of the present study is on FTE separation time. Our results show significant differences between FTE cascades and isolated FTE events regarding IMF conditions and distribution along the magnetopause. Most FTE cascades are observed during strongly negative IMF By. They appear mainly in the northern dusk and southern dawn region of the magnetopause, which in agreement with the expected rapid azimuthal motion of FTEs that form during dominant IMF By. In contrast, isolated FTEs appear typically during IMF conditions with average IMF By close to zero. As could be expected for near zero IMF By conditions, isolated FTEs are nearly uniformly spread over the entire magnetopause region that is covered by Cluster crossings. A subset of isolated FTEs appears during IMF conditions with low cone angles suggesting that these may form as a result of magnetosheath jets impacting on the magnetopause. A detailed examination of Cluster magnetic field and particle data reveals further differences between isolated and FTE cascades that may explain why certain FTEs to appear only as isolated events. This is discussed in detail in the present work.