



EFW analysis of boundary layer structures and FTEs observed by Cluster

H. Khan, H. Laakso, C. Escoubet, H. Opgenoorth, A. Masson

ESA/ESTEC, Solar and Solar Terrestrial Mission Division, Noordwijk ZH, The Netherlands
(hkhan@rssd.esa.int / Fax: +31 71 565 4627 / Tel: +31 71 565 3251)

We present observations from the Electric Field and Waves (EFW) instrument on Cluster during an outbound pass on 6th April 2004, as the satellite traverses the exterior cusp and magnetopause boundary. Here we concentrate on the substructures and plasma drifts in the thin magnetospheric boundaries adjacent to the exterior cusp and as the satellites cross the magnetopause. The EFW experiment provides very high time resolution data and as a result we are able to investigate the boundary layer structures in far greater detail than with any other instrument. The time interval used for this study is one of steady southward and dawnward IMF conditions, allowing a direct source of energy into the magnetosphere via reconnection at the dayside magnetopause. Several flux transfer events resulting from reconnection are observed on either side of the magnetopause boundary, and we present an analysis of these events with reference to electric field and density variations. We also indicate the differences observed between the Cluster satellites, separated at this time by ~ 300 km, thus allowing us to gain an understanding of the spatial and temporal evolution of the structures encountered in these regions.