



Substorm and magnetic storm effects on the cross-tail current sheet

Elizabeth Davey, Mark Lester, Steven Milan, and Robert Fear

Department of Physics and Astronomy, University of Leicester, Leicester, LE1 7RH, United Kingdom (ead13@ion.le.ac.uk)

We present a study of the dynamics of the mid-tail region of the current sheet. We have employed data from the Cluster spacecraft from 2001 to 2007. Specifically, we have taken fluctuations of the x component of the magnetic field (B_x) measured by Cluster 3 around $B_x=0$ to indicate that the current sheet is in motion. The effects of substorm and magnetic storm activity on current sheet motion were investigated using the AE index and SYM-H data. The crossings of the current sheet made by the spacecraft for each orbit were studied as a whole, allowing a comparison of orbits and the intrinsic geomagnetic conditions. Results indicate that the current sheet is more dynamic during orbits with greater than average magnetic activity, as evidenced by the AE index, although there is also some evidence of a stabilisation of the current sheet due to an enhanced ring current during magnetic storms.