



Multi-point perspectives of reconnection induced boundary layers

Malcolm Dunlop (1,2,3) and the ISSI Themis-Cluster Team

(1) Space Science and Technology Department, RAL, Chilton, Didcot, Oxfordshire, OX11 0QX, UK (M.W.Dunlop@rl.ac.uk, +44 1235 44-5848), (2) Center for Space Science and Applied Research, CAS, Beijing 100080, China, (3) The Blackett Laboratory, Imperial College London, London SW7 2AZ, UK

Cluster, Double Star and THEMIS close conjunctions at the magnetopause allow exploration of the conjugate response of the dayside magnetopause on the dawn/dusk flanks. In particular, during the April to July 2007 epoch, the array of four Cluster spacecraft, separated at large distances (10,000 km), were traversing the dawn-side magnetopause at high and low latitudes; the five THEMIS spacecraft were often in a 4+1 configuration, traversing the low latitude, dusk-side magnetosphere, and the Double star, TC-1 spacecraft was in an equatorial orbit between the local times of the THEMIS and Cluster orbits. This combination of 10 spacecraft provided simultaneous monitoring across a wide range of local times. The distribution and grouping of spacecraft allow multi-scale analysis of local phenomena operating on both flanks of the magnetopause, such as the occurrence and location of reconnection sites; extent and orientation of the X-line, and associated boundary layer properties. These near simultaneous encounters with reconnection sites are consistent with both a tilted X-line in the LLBL, together with anti-parallel sites extending to flank locations. Smaller scale configurations of Cluster and TC-1 have shown evidence (centering on repeated multi-point sampling of the ion diffusion region and associated null magnetic field) for high-latitude reconnection at a dayside location where the magnetic field orientations inside and outside the magnetopause lie close to anti-parallel, which is closely following a period of low latitude reconnection.