



High resolution measurements of electron distributions in the proximity of near Earth neutral lines by Cluster

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Recent simulation (Drake et al. 2006) and observational (Taylor et al. 2006) studies indicate that on magnetic field lines connected to a reconnection region beams of energetic electrons should be observed streaming away from the reconnection region. Based on a list of more than 10 reconnection events observed by the four Cluster spacecraft from 2001 to 2004 in the near-Earth tail, we have studied in detail the few events where the directionality of the supra-thermal electron population can be sufficiently resolved by the Research with Adaptive Particle Imaging Detector (RAPID) energetic electron instrument. Plasma Electron and Current Experiment (PEACE) observations of thermal electron plasma are studied for signatures of streaming towards the reconnection region, providing evidence for separatrix crossings. The existence and directionality of such energetic electron beams during these crossings can provide information about the structure and connectivity of the local field lines in the vicinity of an active region. On the other hand, if energetic electron beams during separatrix crossings are not commonly found, this would raise questions about the prevalence and persistence of electron acceleration in the reconnection region.