Geophysical Research Abstracts
Vol. 15, EGU2013-2759, 2013
EGU General Assembly 2013

Multi-point observations of the near-Earth reconnection and peculiarities of particle dynamics.

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Multi-point spacecraft observations allowed detail studies of the near-Earth magnetic reconnection events and the related phenomena: Current Sheet (CS) thinning and bifurcation, plasma flows, propagation of dipolarization fronts and energetic particle bursts. Using the advantage of multi-point measurements provided by Cluster, Themis and Double Star spacecraft the spatial structure of the CS and the kinetic features of particle dynamics were studied in the vicinity of a magnetic reconnection region and the characteristic temporal scales were estimated. The large number of studies showed that reconnection in the magnetotail can usually be described in a 2D magnetic field topology. However several observations reported the existence of a background guide field in the magnetotail CS. A strong By field can shear the magnetic field of the CS, making the CS thin and causing a cross-tail field-aligned current, influencing the adiabaticity and orbits of charged particles in the CS. It also might be important for the reconnection process itself. These phenomena as well as the possible mechanisms of the generation of a strong By field in the magnetotail CS are discussed in the present talk.