Geophysical Research Abstracts
Vol. 13, EGU2011-6418, 2011
EGU General Assembly 2011
© Author(s) 2011

Magnetic reconnection associated fluctuations in the deep magnetotail: ARTEMIS results

Zoltan Voros (1), Martin Volwerk (2), Manfred Leubner (1), Wolfgang Baumjohann (2), Tielong Zhang (2), and Andrei Runov (3)

(1) University of Innsbruck, Institute of Astro- and Particle Physics, Innsbruck, Austria (zoltan.voeroes@uibk.ac.at), (2) Space Research Institute, Austrian Academy of Sciences, Graz, Austria, (3) Institute of Geophysics and Planetary Physics, University of California, Los Angeles, USA

The multi-probe CLUSTER and THEMIS missions revealed local and system wide aspects of collisionless fast magnetic reconnection separating spatial and temporal structures in the key regions of the inner and outer magnetosphere: at the magnetopause, in the cusp regions, in the near-Earth and mid-tail. The distant tail was studied by single spacecraft missions or occasionally during fortuitous rare alignment of two spacecraft constellations. For example, Geotail and IMP-8 observations in the deep-tail revealed, that the tailward progression and retreat of magnetic reconnection associated activity is highly dynamic, turbulent, characterized by complex 3D structures, multiple X-lines, appearance and dynamical evolution of acceleration centers. The first two-probe mission with comprehensive field and particle instrumentation is represented by ARTEMIS spacecraft P1 and P2 (Angelopoulos and Sibeck, 2008; Angelopoulos, 2010). These probes were sent to the lunar orbits ($\sim -60R_E$) allowing an unprecedented study of magnetic reconnection, turbulence and magnetotail dynamics in the deep-tail. Since the physical conditions are rather different in the mid- and distant-tail regions comparative in-situ studies can reveal the alteration of different regimes of magnetic reconnection under changing conditions in the solar wind. Here we present the first ARTEMIS observations of magnetic reconnection associated processes observed by ARTEMIS probes in the deep-tail.