Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Dipolarization fronts as a distinctive feature of transient reconnection in the magnetotail: Particle simulations with open boundaries and THEMIS observations M. SITNOV, JHU/APL, A. RUNOV, V. ANGELOPOULOS, UCLA/IGPP, M. SWISDAK, P. GUZDAR, UMD/IREAP, A. DIVIN, KUL, Belgium, V. SERGEEV, SPbU, S. OHTANI, B. MAUK, JHU/APL, J. BONNELL, J. MCFADDEN, D. LARSON, UCB/SSL, K.-H. GLASSMEIER, U. AUSTER, TUBS/IGEP — Particle simulations with open boundary conditions revealed an interesting new phenomenon in the outflow regions of the collisionless reconnection pattern. It was found that transient reconnection may result in the formation of dipolarization fronts (DFs), regions of the strong magnetic flux pileup propagating with the speed of the order of the Alfven speed in the reconnection exhausts. The flux pileup is accompanied by a drop of the plasma density making the front similar to a plasma bubble. Similar phenomena have been observed in the tail of the Earth's magnetosphere by Geotail, Cluster and other missions. Here we present the results of simulations of DFs using the explicit massively parallelized full-particle code P3D [Zeiler et al., JGR, 107, 1230, 2002] with open boundaries [Divin et al., GRL, 34, L09109, 2007] and compare them with observations of DFs in the magnetosphere using five-satellite THEMIS mission. DFs are found to be microscopic shock-like boundaries with the thickness of the order of the ion inertial length that propagate over a macroscopic distance up to ten Earth radii.

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Date submitted: 13 Jul 2009 Electronic form version 1.4