



Observations of Double Layers in Earth's Central Plasma Sheet

R. E. Ergun (1,2), L. Andersson (1), J. Tao (1), V. Angelopoulos (3), J. Bonnell (4), J. P. McFadden (4), D. E. Larson (4), A. Roux (5), O. LeContel (5), and K.-H. Glassmeier (6)

(1) University of Colorado, LASP, Boulder, CO, USA (ree@lasp.colorado.edu), (2) Department of Astrophysical and Planetary Sciences, University of Colorado, Boulder, Colorado 80309, USA, (3) Institute of Geophysics and Planetary Physics, University of California, Los Angeles, California 90055, USA, (4) Space Sciences Laboratory, University of California, Berkeley, California, 94720, USA, (5) Centre d'étude des Environnements Terrestre et Planétaires, Velizy, France, (6) TUBS, Braunschweig, D-38106, Germany

We report the first direct observations of parallel electric fields carried by double layers (DLs) in the central plasma sheet of the Earth's magnetosphere. The observations are made by the THEMIS spacecraft. The DLs have a parallel electric field signal that is analogous to that reported by the FAST satellite in the auroral acceleration region which has been verified by numerical simulations. The most interesting of the observations is a series of five or more DLs made by the THEMIS D spacecraft at $\tilde{1}0$ earth radii (RE) during a bursty bulk flow event. DLs also are observed in the current sheet and plasma sheet boundary layer, all during magnetically active times. These observations imply that strongly nonlinear and kinetic behavior is intrinsic to the Earth's plasma sheet.