Abstract Submitted
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Magnetospheric Reconnection in Modified Current-Sheet Equilibria[1] D.L. NEWMAN, M.V. GOLDMAN, University of Colorado at Boulder, G. LAPENTA, Katholieke Universiteit Leuven, Belgium, S. MARKIDIS, Royal Institute of Technology, Stockholm, Sweden — Particle simulations of magnetic reconnection in Earth's magnetosphere are frequently initialized with a current-carrying Harris equilibrium superposed on a current-free uniform background plasma. The Harris equilibrium satisfies local charge neutrality, but requires that the sheet current be dominated by the *hotter* species – often the *ions* in Earth's magnetosphere. This constraint is not necessarily consistent with observations. A *modified* kinetic equilibrium that relaxes this constraint on the currents was proposed by Yamada et al. [*Phys. Plasmas.*, **7**, 1781 (2000)] with no background population. These modified equilibria were characterized by an asymptotic converging or diverging *electrostatic* field normal to the current sheet. By reintroducing the background plasma, we have developed new families of equilibria where the asymptotic fields are suppressed by Debye shielding. Because the electrostatic potential profiles of these new equilibria contain wells and/or barriers capable of spatially isolating different populations of electrons and/or ions, these solutions can be further generalized to include classes of *asymmetric* kinetic equilibria. Examples of both symmetric and asymmetric equilibria will be presented. The dynamical evolution of these equilibria, when perturbed, will be further explored by means of implicit 2D PIC reconnection simulations, including comparisons with simulations employing standard Harris-equilibrium initializations.

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David L. Newman
University of Colorado at Boulder

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