

Abstract Submitted  
for the DPP08 Meeting of  
The American Physical Society

**The in-plane electric field and its role in the ion dynamics in collisionless magnetic reconnection**<sup>1</sup> RUSSELL KULSRUD, Princeton University and PPPL/CMSO, DMITRI UZDENSKY, Princeton University/CMSO, MASA AKI YAMADA, PPPL/CMSO — A potential in-plane electric field, observed in numerical simulations and detected by spacecraft in the Earth magnetosphere, plays an important role in the dynamics of collisionless magnetic reconnection. In particular, it pulls the ions into the layer, effectively resulting in ion heating. Building on our previous work,<sup>2</sup> we discuss the physics of the in-plane electric field and its relation to the quadrupole magnetic field. We also present a formalism (within the electron-MHD approach) for calculating it analytically for a given structure of the in-plane magnetic field. We emphasize the role of this electric field on the ion dynamics and heating.

<sup>1</sup>Work supported by the NSF Center for Magnetic Self-Organization in Laboratory and Astrophysical Plasmas (CMSO).

<sup>2</sup>D. Uzdensky & R. Kulsrud, Phys. Plasmas, 13, 062305 (2006).

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Date submitted: 20 Jul 2008

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