Abstract Submitted
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Electron Layer Dissipation Mechanisms in Driven Magnetic Reconnection S. DORFMAN, H. JI, M. YAMADA, B. MCGEEHAN, E. OZ, J. SCHROEDER, CMSO, PPPL, W. DAUGHTON, V. ROYTERSHTEYN, LANL, Y. REN, University of Wisconsin — An open question in magnetic reconnection is the nature of the dissipation mechanism(s) responsible for fast reconnection rates in laboratory and astrophysical plasmas. In 2-D collisionless particle in cell simulations, the off-diagonal terms in the electron pressure tensor provide the necessary force balance at the electron diffusion layer center [1]. Recent comparisons between the Magnetic Reconnection Experiment (MRX) and a well-matched PIC code have shown that this mechanism is insufficient to balance the reconnecting electric field in MRX [2,3]. Candidate mechanisms not present in the simulation are under investigation, including electromagnetic fluctuations and other 3-D effects such as layer distortions. The relationship between fluctuations and equilibrium parameters such as the outflow current and layer width is examined, and first investigations into the 3-D symmetry of the layer are presented. On the simulation side, analysis is underway to gain further insight into the nature of the off-diagonal pressure tensor terms, especially effects due to the driven nature of the simulation. [1] M. Hesse, et al., Phys. Plasmas, **6**:1781 (1999). [2] S. Dorfman, et al., submitted to Phys. Plasmas (2008). [3] H. Ji, et al., Geophys. Res. Lett., **35**, L13106 (2008). This work was supported by NDSEG, DOE, NASA, and NSF.

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