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Fully Kinetic Simulations of Driven Magnetic Reconnection with Boundary Conditions Relevant to MRX S. DORFMAN, Center for Magnetic Self-Organization, Princeton Plasma Physics Laboratory, W. DAUGHTON, V. ROYTERSHTEYN, University of Iowa, H. JI, M. YAMADA, W. TANG, CMSO, PPPL — Many simulations of magnetic reconnection use periodic boundary conditions which limit the physical relevance of the results when comparing with large open systems that occur in nature or with laboratory reconnection experiments. To address this issue, more realistic boundary conditions are employed to model the Magnetic Reconnection Experiment (MRX) using a fully kinetic, two-dimensional code. The simulation is made up of a box with conducting boundary conditions and two current-carrying wires. As the current is ramped down over the time scale of the simulation, a current sheet forms and elongates. Scaling comparisons for the the length and width of the electron layer as well as the reconnection rate are presented. In both the experiment and simulation the thickness of the electron layer scales linearly with the electron skin depth. However, in the experiment, the layer is four to five times thicker [1]. Magnetic islands similar to previous undriven, open-boundary simulations [2] are sometimes observed in the present work but have not been conclusively identified in the experiment. [1] Y. Ren, Princeton PhD Thesis (2007). [2] W. Daughton, et all., Phys. Plasmas. **13**, 072101 (2006). This work was supported by DOE FES Fellowship, DOE, NASA, and NSF.

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