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New Milestones in Comparing Experimental and Simulated Reconnection: Results from TREX and Cylindrical VPIC[1] SAMUEL GREESS, JAN EGEDAL, UW-Madison, ADAM STANIER, LANL, JOE OLSON, UW-Madison, BILL DAUGHTON, ARI LE, LANL, ALEX MILLET-AYALA, RACHEL MYERS, JOHN WALLACE, MIKE CLARK, CARY FOREST, UW-Madison — Magnetic reconnection is studied in the Terrestrial Reconnection Experiment (TREX) under collisionless conditions relevant to the Earth's magnetosphere [1]. The thickness of the reconnection current layer normalized to electron kinetic length scales is one of the features most commonly used to identify different sets of reconnection dynamics. Previous studies suggest that experimental layer widths are larger by a factor of four compared to those in kinetic simulations [2]. However, results from TREX closely match the current width scaling and geometry seen in both prior 2D laminar kinetic reconnection simulations and new 3D VPIC models that have been developed specifically to reflect the TREX geometry. These findings will be presented along with results of the newest TREX run, with an adjustable guide field and a pressure anisotropy probe, and the associated VPIC simulation outputs. 1. Olson, J. et al. Experimental Demonstration of the Collisionless Plasmoid Instability below the Ion Kinetic Scale during Magnetic Reconnection. Phys. Rev. Lett. (2016). 2. Ji, H. et al. New insights into dissipation in the electron layer during magnetic reconnection. Geophys. Res. Lett. 35, L13106 (2008).

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