Abstract Submitted
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Flute-reduced drift-MHD model for external magnetic perturbations using the BOUT++ code[1] I. JOSEPH, M.V. UMANSKY, X.Q. XU, M.E. FENSTERMACHER, M.J. LANCTOT, LLNL, A. ALLEN, B.D. DUDSON, U. York, F.L. WAELBROECK, U. Texas, Austin — Numerical simulations of the plasma response to external magnetic perturbations are performed using a flute-reduced drift-MHD model implemented within the BOUT++ code [1]. Benchmarks against the linear ideal and resistive response are performed in slab and circular geometry. The plasma response to external magnetic perturbations is necessary to understand the mechanism for controlling edge transport and edge localized mode stability [2]. Drift-MHD models that incorporate first order gyro-radius effects generally predict that reconnection can only occur at the location where the perpendicular electron velocity vanishes [3]. An experimentally measurable prediction is that the quasilinear torque and induced particle flux should change sign across this point. The effect of hyper-resistivity/anomalous electron viscosity on the scaling of reconnection processes is explored both analytically and numerically.

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[2] I. Joseph, Contrib. Plasma Phys. **52**, 326 (2012).
[3] F. L. Waelbroeck, I. Joseph, E. Nardon, et al., Nucl. Fusion **52**, 074004 (2012).

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