

Abstract Submitted  
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**Steady-State Flows in Two-Fluid Models of NSTX and DIII-D Plasmas**<sup>1</sup> N.M. FERRARO, ORISE-GA, S.C. JARDIN, J. CHEN, PPPL — Accurate axisymmetric steady-states of a comprehensive two-fluid model are calculated for plasmas in diverted NSTX and DIII-D geometries using the M3D-C<sup>1</sup> code [1]. It is found that gyroviscosity may have a significant effect on the flows in steady-state when a localized density source is present. The model implemented in M3D-C<sup>1</sup> self-consistently includes the effects of flows, anisotropic viscosity, anisotropic thermal conductivity, and resistivity. Results for ohmically driven plasmas are presented. New capabilities of M3D-C<sup>1</sup> allow the three-dimensional linear stability of axisymmetric equilibria to be calculated; these capabilities and preliminary stability results are discussed. Also discussed are recent and future extensions to M3D-C<sup>1</sup>, including heuristic bootstrap current models, coupling to a physics-based transport model, and nonlinear non-axisymmetric capability.

[1] S. C. Jardin, J. Breslau, N. Ferraro, J. Comput. Phys, 226 (2007) 2146

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