

Abstract Submitted
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Validation of improved Multi-Mode model for density, temperature and toroidal rotation profiles using PTRANSP simulations L. LUO, G. BATEMAN, A.H. KRITZ, A.Y. PANKIN, T. RAFIQ, Lehigh U., D.C. MCCUNE, R.V. BUDNY, PPPL — Advances in the Multi-Mode model include an improved Weiland model for the ITG and TEM modes [1] and a new model for the drift resistive inertial ballooning modes (DRIBM) [2]. Advances in the PTRANSP code include an improved algorithm for the particle density evolution. Validation studies are carried out for the improved Multi-Mode model using PTRANSP simulations. In order to allow tight coupling with stiff transport models, all of the transport equations for main ion and impurity density profiles as well as electron temperature, ion temperature and toroidal angular rotation profiles are advanced simultaneously by the PTRANSP solver. The Plasma State connects the new solver to the rest of PTRANSP. The solver uses several techniques to control numerical stability. Simulation results for density, temperature and rotation frequency profiles are compared with experimental data for L-mode and H-mode discharges.

[1] J.Weiland et al., Nucl. Fusion 49 (2009) 965933; F.D. Halpern et al., Phys. Plasmas 15 (2008) 065033

[2] T. Rafiq et al., to appear in Phys. Plasmas (2010)

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