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Non-Ideal ELM Stability and Non-Axisymmetric Field Penetration Calculations with M3D-C1[1] N.M. FERRARO, M.S. CHU, P.B. SNYDER, General Atomics, S.C. JARDIN, PPPL, X. LUO, Rensselaer Polytechnic — Numerical studies of ELM stability and non-axisymmetric field penetration in diverted DIII-D and NSTX equilibria are presented, with resistive and finite Larmor radius effects included. These results are obtained with the nonlinear two-fluid code M3D-C1, which has recently been extended to allow linear non-axisymmetric calculations. Benchmarks of M3D-C1 with ideal codes ELITE and GATO show good agreement for the linear stability of peeling-ballooning modes in the ideal limit. New calculations of the resistive stability of ideally stable DIII-D equilibria are presented. M3D-C1 has also been used to calculate the linear response to non-axisymmetric external fields; these calculations are benchmarked with Surfmn and MARS-F. New numerical methods implemented in M3D-C1 are presented, including the treatment of boundary conditions with C^1 elements in a non-rectangular mesh.

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