Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Revised numerical wrapper for PIES code DANIEL RABURN, ALLAN REIMAN, Princeton Plasma Physics Laboratory, DONALD MONTICELLO, Retired — A revised external numerical wrapper has been developed for the Princeton Iterative Equilibrium Solver (PIES code), which is capable of calculating 3D MHD equilibria with islands. The numerical wrapper has been demonstrated to greatly improve the rate of convergence in numerous cases corresponding to equilibria in the TFTR device where magnetic islands are present. The numerical wrapper makes use of a Jacobian-free Newton-Krylov solver along with adaptive preconditioning and a sophisticated subspace-restricted Levenberg-Marquardt backtracking algorithm. The details of the numerical wrapper and several sample results are presented.

Daniel Raburn
Princeton Plasma Physics Laboratory

Date submitted: 23 Jul 2015 Electronic form version 1.4