

Abstract Submitted
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Solution of the Helical Grad-Shafranov Equation for Magnetic Fields with Islands¹ DANIEL RABURN, RAVI SAMTANEY, DONALD MONTICELLO, ALLAN REIMAN, Princeton Plasma Physics Laboratory — We have developed a new solver for the helical Grad-Shafranov equation that can handle magnetic islands. Three applications are being pursued: 1) to serve as a testbed for new algorithms to be used in a fully 3D equilibrium code; 2) for benchmarking the PIES 3D equilibrium code for helical equilibria that have magnetic islands; 3) for testing and verification of a new capability being incorporated in the PIES code to handle neoclassical effects on magnetic islands. A Jacobian-Free Newton-Krylov method, including a linesearch algorithm and physics-based preconditioning, is currently being tested as a potential method for speeding the calculation of 3D equilibria with magnetic islands.

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