

Abstract Submitted
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Extending V3FIT with New Equilibrium Solvers¹ M.R. CIANCIOSA, J.D. HANSON, N. ROBERDS, Auburn University — Due to the non-axisymmetric magnetic field geometry of stellarators, symmetry breaking modes in reverse field pinches and tokamaks with radial magnetic perturbation (RMP) fields applied for edge localized mode (ELM) control, a fully three dimensional equilibrium reconstruction is an important tool for understanding plasma response. V3FIT [1] is a three dimensional equilibrium reconstruction code that uses the VMEC [2] equilibrium solver. While VMEC can model a wide array of devices, it is fundamentally limited to the assumption of closed, nested flux surfaces, thus unable to resolve magnetic islands. Through the use of object oriented programming techniques, the equilibrium model of V3FIT has been abstracted into a generic equilibrium interface. Using this interface, new equilibrium solvers may be added in addition to VMEC, thus extending the regimes V3FIT can reconstruct. This work will discuss the process by which a new equilibrium solver can be included.

[1] J. D. Hanson, S. P. Hirshman, S. F. Knowlton, L. L. Lao, E. A. Lazarus, J. M. Shields, Nucl. Fusion, **49** (2009) 075031.

[2] S. P. Hirshman and Whitson J. C., Phys. Fluids, **26** (1983) 3553

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Mark Cianciosa
Auburn University

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