

Abstract Submitted
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Whole Shot 3-D MHD Equilibrium Reconstruction using V3FIT¹

M.C. CIANCIOSA, J.D. HANSON, D.A. MAURER, S.F. KNOWLTON, G.J. HARTWELL, M.C. ARCHMILLER, X. MA, Auburn University — Equilibrium reconstruction is the process by which diagnostic signals are used to determine parameters of a MHD model. As modern stellarators are designed to achieve larger values of β with higher bootstrap currents, the deviation between vacuum magnetic fields and plasma magnetic fields becomes significant. Coupled with the intricately shaped magnetic field structures, a fully three dimensional equilibrium reconstruction becomes an important tool for understanding plasma response. On the Compact Toroidal Hybrid (CTH) device, the V3FIT code plays an important role in the operations and interpretation of experiments. To facilitate this, a client-server system has been developed to allow remote, parallel execution of the V3FIT [1] code. This, coupled with client software, allows integration of V3FIT with diagnostic systems for automated (shot to shot) and whole shot reconstructions. This presentation will discuss the structure and development of this system. An example of whole shot reconstructions from CTH diagnostics using this system will be presented. The future direction of this system and the V3FIT code will also be discussed.

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

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