Abstract Submitted
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Adapting 3D Equilibrium Reconstruction to Reconstruct Weakly 3D H-mode Tokamaks[1] M.R. CIANCIOSA, S.P. HIRSHMAN, S.K. SEAL, E.A. UNTERBERG, R.S. WILCOX, A. WINGEN, ORNL, J.D. HANSON, Auburn Univ. — The application of resonant magnetic perturbations for edge localized mode (ELM) mitigation breaks the toroidal symmetry of tokamaks. In these scenarios, the axisymmetric assumptions of the Grad-Shafranov equation no longer apply. By extension, equilibrium reconstruction tools, built around these axisymmetric assumptions, are insufficient to fully reconstruct a 3D perturbed equilibrium. 3D reconstruction tools typically work on systems where the 3D components of signals are a significant component of the input signals. In nominally axisymmetric systems, applied field perturbations can be on the order of 1% of the main field or less. To reconstruct these equilibria, the 3D component of signals must be isolated from the axisymmetric portions to provide the necessary information for reconstruction. This presentation will report on the adaptation to V3FIT for application on DIII-D H-mode discharges with applied resonant magnetic perturbations (RMPs). Newly implemented motional stark effect signals and modeling of electric field effects will also be discussed.

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