

Abstract Submitted
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3D Equilibrium Reconstruction with Improved Magnetic Diagnostics on the Compact Toroidal Hybrid¹ X. MA, J.D. HANSON, G.J. HARTWELL, S.F. KNOWLTON, D.A. MAURER, Auburn University — Three-dimensional reconstruction of plasma equilibria is important for understanding the physics of both intrinsic 3D confinement in stellarators as well as axisymmetric plasmas in tokamaks. Equilibrium reconstructions using the V3FIT code [1] will be presented for current carrying plasma on the Compact Toroidal Hybrid (CTH) torsatron experiment. The CTH is a heliotron-type device, in which the magnetic configuration can be strongly modified by an ohmically-driven plasma current. These reconstructions use sets of recently upgraded magnetic diagnostics (44 channels), including segment and full Rogowski coils and new saddle coils. Reconstruction results with these new diagnostics, especially the time evolution of the reconstructed current density profile for a series of plasma conditions, will be presented and compared to previous ones using a smaller set of input magnetic signals. New modelling of the effects of eddy currents in the helical coil frame and vacuum vessel will also be discussed.

[1] J. D. Hanson, S. P. Hirshman, S. F. Knowlton, L. L. Lao, E. A. Lazarus, J. M. Shields, Nucl, Fusion49, 075031 (2009)

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