

Abstract Submitted
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Incorporation of Soft X-Ray Chordal Diagnostics into Equilibrium Reconstruction on the Compact Toroidal Hybrid Experiment¹ G.J. HARTWELL, J.D. HANSON, S.F. KNOWLTON, B.A. STEVENSON, Auburn University — Signals from Soft X-Ray (SXR) chords normally used for tomographic reconstruction on the Compact Toroidal Hybrid (CTH) torsatron experiment ($R = 0.75$ m, $a \sim 0.2$ m, $B \leq 0.7$ T, $n_e \leq 10^{19}$ m⁻³, $T_e \leq 250$ eV) have been incorporated into the V3FIT[1] equilibrium reconstruction code. Four cameras, each consisting of a 20-channel AXUV-20EL photo-diode array view the plasma through $2\mu\text{m}$ Be foil. Three cameras view the plasma in one symmetry plane ($\varphi = 36^\circ$) while the fourth views the plasma at another symmetry plane ($\varphi = 0^\circ$), one-half field period away. Under the assumption of uniform SXR emissivity on a flux surface, the signals provide additional constraints to V3FIT, which primarily uses magnetic data to fit the equilibrium. A description of the V3FIT code additions and capabilities will be given. Use of the signal effectiveness to optimize the placement SXR cameras will be discussed. Equilibrium reconstruction results will be presented.

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

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