

Abstract Submitted  
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**Equilibrium Reconstruction using Soft X-Ray Chordal Diagnostics on the Compact Toroidal Hybrid Experiment**<sup>1</sup> G.J. HARTWELL, J.D. HANSON, J.L. HERFINDAL, S.F. KNOWLTON, M.C. MILLER, B.A. STEVENSON, Auburn University — Equilibrium reconstructions using the V3FIT [1] code will be presented for current carrying plasmas 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<sup>-3</sup>,  $T_e \leq 250$  eV). The reconstruction input data set includes the Soft X-Ray (SXR) chord signals normally used for tomographic reconstructions. Four cameras, each consisting of a 20-channel AXUV-20EL photo-diode array view the CTH plasma through  $2\mu\text{m}$  Be foil. Three cameras view the plasma at one symmetry plane ( $\varphi = 36^\circ$ ) while the fourth views the plasma at another symmetry plane ( $\varphi = 0^\circ$ ), one-half field period away. When observed, sawtoothing provides additional constraints to reconstructions. The reconstructions assume uniform SXR emissivity on a flux surface. The SXR signals provide additional data inputs to V3FIT, which has primarily used magnetic data to fit the equilibrium.

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

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