Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Measurements and Simulations of Electric Field Modified Flows in the Compact Toroidal Hybrid Stellarator MARK CIANCIOSA, GREG HARTWELL, JIM HANSON, STEPHEN KNOWLTON, EDWARD THOMAS, Auburn University — Sheared flows arising from spatially inhomogeneous, transverse electric fields are common phenomena found in space, laboratory, and fusion plasmas. These flows are a source of free energy that can drive or suppress instabilities. In fusion plasmas, edge localized sheared flows provide a barrier against cross field particle transport and the presence of these flows are associated with enhanced confinement regimes (H-mode). The Compact Toroidal Hybrid (CTH) is five field period continuously wound stellarator ($R_0 = 0.75m$, $a \sim 0.2m$, $B_0 \leq 0.7T$, $\bar{n}_e = 0.2 - 1.5 \times 10^{19} m^{-3}$) run with $100ms$ long plasmas. Primary plasma generation and heating is provided through Electron Cyclotron Resonance Heating (ECRH) with a secondary Ohmic heating system. Flow experiments are performed by modifying the radial electric field by inserting an biasing electrode probe past the last closed flux surface. Plasma parameters are measured using a triple probe. Initial measurements of flows from a newly constructed Gundestrup probe will be presented. This presentation will also discuss the interpretation of probe measurements in a flux coordinate system.

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Date submitted: 15 Jul 2011 Electronic form version 1.4