Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Advances in NIMROD Modeling of the HIT-SI Experiment KYLE MORGAN, T.R. JARBOE, C. AKCAY, University of Washington — Previous two-fluid simulations of the HIT-SI experiment using the NIMROD code at low injector frequencies have served as a launching point for modeling of both pressure effects related to Steady Inductive Helicity Injection (SIHI) and the new HIT-SI3 injector configuration. Results from the end of HIT-SI operation have encouraged the inclusion of pressure effects in NIMROD modeling. Previous calculations using NIMROD assumed uniform temperature and density profiles, producing good agreement with low injector frequency operations ($f_{inj} < \frac{v_{th}}{a}$) but poor agreement at high injector frequencies ($f_{inj} > \frac{v_{th}}{a}$). Experimental observations at these higher frequencies give evidence of pressure driven activity, as well as a higher volume averaged β. The full anisotropic Braginskii thermal conduction model has been applied in NIMROD calculations of HIT-SI and shows improvement in qualitative agreement at high injector frequencies, while maintaining results at low frequencies. In addition, modeling of the new 3-injector configuration of HIT-SI3 will serve as a source of validation of the model.

Kyle Morgan
University of Washington

Date submitted: 11 Jul 2014 Electronic form version 1.4