Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Continued Development and Validation of Methods for Spheromak Simulation THOMAS BENEDETT, Univ of Washington — The HIT-SI experiment has demonstrated stable sustainment of spheromaks; determining how the underlying physics extrapolate to larger, higher-temperature regimes is of prime importance in determining the viability of the inductively-driven spheromak. It is thus prudent to develop and validate a computational model that can be used to study current results and provide an intermediate step between theory and future experiments. A zero-beta Hall-MHD model has shown good agreement with experimental data at 14.5 kHz injector operation. Experimental observations at higher frequency, where the best performance is achieved, indicate pressure effects are important and likely required to attain quantitative agreement with simulations. Efforts to extend the existing validation to high frequency ($\sim$ 36-68 kHz) using an extended MHD model implemented in the PSI-TET arbitrary-geometry 3D MHD code will be presented. Results from verification of the PSI-TET extended MHD model using the GEM magnetic reconnection challenge will also be presented along with investigation of injector configurations for future SIHI experiments using Taylor state equilibrium calculations. Work supported by DoE.

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Date submitted: 24 Jul 2015 Electronic form version 1.4