

Abstract Submitted  
for the DPP15 Meeting of  
The American Physical Society

**NIMROD simulations of the IPA FRC experiment** RICHARD MILROY, PSI-Center, University of Washington — The IPA experiment [John Slough, George Votroubek and Chris Pihl, Nucl. Fusion **51**, 053008 (2011)] created a high temperature plasma by merging and compressing supersonic  $\theta$ -pinch formed FRCs. The NIMROD code has been used to simulate this process. These calculations include the  $\theta$ -pinch formation and acceleration of two FRC's using the dynamic formation methodology, and their translation to a central compression chamber where they merge and are magnetically compressed. Transport coefficients have been tuned so simulation results agree well with experimental observation. The inclusion of the Hall term is essential for the FRCs merge quickly, as observed experimentally through the excluded flux profiles. The inclusion of a significant anisotropic viscosity is required for the excluded flux profiles to agree well with the experiment. We plan to extend this validation work using the new ARPA-E funded Venti experiment at Helion Energy in Redmond WA. This will be a very well diagnosed experiment where two FRCs merge (like the IPA experiment) and are then compressed to near-fusion conditions. Preliminary calculations with parameters relevant to this experiment have been made, and some numerical issues identified.

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Date submitted: 22 Jul 2015

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