

Abstract Submitted  
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**Full Orbit PIC in NIMROD** CHARLSON KIM, University of Washington - PSI Center, PLASMA SCIENCE AND INNOVATION CENTER TEAM — The primary goal of the Plasma Science and Innovation Center (PSI Center) is to refine and optimize existing MHD codes to achieve improved predictability for emerging concept (EC) experiments. Kinetic effects have been shown to play a dominant role in some EC experiments, particularly in FRC stability<sup>1</sup>. The PSI Center will extend the hybrid kinetic-MHD implementation in NIMROD<sup>2</sup> from the drift kinetic model to the full kinetic model to include sufficient physics to accurately account for these effects, in particular large Larmor radius. The Boris push has been implemented for particles in NIMROD. However, this places a severe timestep restriction on the particle time step. We discuss several strategies for circumventing this restriction to simulate on the MHD time scale. We will show some of the preliminary results from the implementation of full orbit (Lorentz force) particles coupled to the NIMROD code.

<sup>1</sup>E. Belova et.al. “Numerical Study of tilt stability of prolate field-reversed configurations,” PoP, **7**, 4996, 2000

<sup>2</sup>C.C. Kim et.al. “Hybrid Kinetic-MHD Simulations in General Geometry,” CPC, **164**, 448, 2004

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