

Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

FRC Rotation in Extended MHD Modeling¹ MICHAEL H. FRESE, SHERRY D. FRESE, NumerEx, EDWARD L. RUDEN, JAMES H. DEGNAN, NORMAN F. RODERICK, U.S. Air Force Research Laboratory — Field reversed configurations (FRCs) are observed to develop bulk rotation. The explanation for this behavior from a particle point of view is the preferential diffusion of one sense of angular momentum through the separatrix. We demonstrate that bulk angular momentum is developed in computational simulation of FRCs with extended MHD using the Generalized Ohm's Law and without finite Larmor radius effects and explain how. We analyze the relationship of the fluid model to the hybrid particle model. These simulations are performed in geometries and with fields driven by self-consistent circuits that reflect experiments performed as part of the DoE OFES Magneto-Inertial Fusion program. The fluid point of view clarifies the cause of the rotation and allows development of applied fields to counteract the rotation.

¹Work Supported by U.S. Department of Energy Office of Fusion Energy Science

Michael H. Frese
NumerEx

Date submitted: 20 Jul 2007

Electronic form version 1.4