

Abstract Submitted
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Three-Dimensional MHD Simulations of Co- and Counter-Helicity Spheromak Merging in SSX using the HYM Code¹ CLAYTON E. MYERS, E.V. BELOVA, Princeton Plasma Physics Laboratory — The HYM (Hybrid MHD) code has been used to perform 3D MHD simulations of co- and counter-helicity spheromak merging. These simulations aim to understand relaxation and stability phenomena that have been observed in merging experiments on the Swarthmore Spheromak Experiment (SSX). In simulating a novel co-helicity merging configuration with counter-directed toroidal fields, the two spheromaks are observed to tilt prior to forming an asymmetric, three-dimensional reconnection layer and relaxing to a stable and fully tilted final state. In simulating a more conventional counter-helicity merging configuration, we are attempting to reproduce the Doublet CT (Compact Torus) configuration that has been observed in SSX experiments. The visualization of both simulated and experimental data has been improved using the 3D visualization software VisIt. The HYM code is also being modified to incorporate collisional and radiative heat loss mechanisms to more accurately characterize the evolution of the temperature and density profiles in the plasma.

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