

Abstract Submitted
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NIMROD Simulations of Reconnection in MRX and SSX

NICHOLAS MURPHY, CARL SOVINEC, University of Wisconsin — Two-fluid effects are known to influence magnetic reconnection rates through non-MHD communication between the reconnection layer and the surrounding magnetic geometry [1]. To examine the interrelationship between local and global magnetic geometry, we perform NIMROD simulations of the Magnetic Reconnection Experiment (MRX) and the Swarthmore Spheromak Experiment (SSX). The geometry of MRX is non-trivial due to the presence of two flux cores, and it is necessary to depart from a logically rectangular finite element grid. The required steps to do this in NIMROD are outlined. We first consider reconnection rates in MRX using the resistive MHD model. Progress on 2-D two fluid simulations of MRX, taking advantage of a recently improved implementation [2], is reported. We also show preliminary resistive MHD simulations of spheromak merging in SSX and consider astrophysically relevant reconnection tests.

1. D. Biskamp, E. Schwarz, and J.F. Drake, Phys. Plasmas 4, 1002 (1997).
2. C.R. Sovinec, H. Tian, D.D. Schnack, A.Y. Pankin, D.C. Barnes, this conference.

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