Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Simulating Magnetic Reconnection Experiment (MRX) with a Guide Field using Fluid Code, HiFi TAMAS BUDNER, Ursinus College, YANGAO CHEN, Peking University, ERIC MEIER, College of William and Mary, HANTAO JI, Princeton University, MRX TEAM — Magnetic reconnection is a phenomenon that occurs in plasmas when magnetic field lines effectively "break" and reconnect resulting in a different topological configuration. In this process, energy that was once stored in the magnetic field is transfered into the thermal velocity of the particles, effectively heating the plasma. MRX at the Princeton Plasma Physics Laboratory creates the conditions under which reconnection can occur by initially ramping the current in two adjacent coils and then rapidly decreasing with and without a guide magnetic field along the reconnecting current. We simulate this experiment using a fluid code called HiFi, an implicit and adaptive high order spectral element modeling framework, and compare our results to experimental data from MRX. The purpose is to identify physics behind the observed reconnection process for the field line break and the resultant plasma heating.

Tamas Budner
Ursinus Coll

Date submitted: 19 Aug 2015 Electronic form version 1.4