Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

**Ion Heating During Reconnection Events in the MST Reversed Field Pinch**[1] G. FIKSEL, D. CRAIG, D.J. DEN HARTOG, D.A. ENNIS, S. GANGADHARA, V.V. MIRNOV, S.C. PRAGER, V.A. SVIDZINSKI, Department of Physics, University of Wisconsin-Madison and Center for Magnetic Self-Organization in Laboratory and Astrophysical Plasmas, USA — Sudden ion heating occurs during reconnection events in the Madison Symmetric Torus (MST) reversed field pinch. This phenomenon shares some common underlying features with a number of astrophysical and other laboratory plasmas. The reconnection events are characterized by quasi-periodic bursts of magnetic fluctuations accompanied by self-generation and redistribution of magnetic flux. The ion temperature typically doubles a very powerful source of energy deposition and a very efficient thermalization mechanism. The spatial profile of the rise in the ion temperature suggests that the heating mechanism is broad and active throughout the plasma volume. We observe that the impurity ions are heated more strongly than the bulk plasma ions. In addition, the impurities ion distribution function stays Maxwellian throughout the sawtooth cycle while the bulk ion distribution function exhibits deviation from the Maxwellian distribution. A number of theories are being examined to explain the full set of results. These include viscous damping of fluctuation induced ion flows and ion acceleration in the electric field induced by the reconnections.

[1]Work supported by the US Department of Energy and National Science Foundation

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Date submitted: 25 Jul 2005 Electronic form version 1.4