Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Electron Energization During m=0 Magnetic Bursts in MST plasmas[1] W.C. YOUNG, D.J. DEN HARTOG, L.A. MORTON, University of Wisconsin-Madison, CMSO, MST TEAM — MST reversed-field pinch plasmas develop magnetic modes with both a core-resonant poloidal mode m=1 structure and edge-resonant m=0 structure on the reversal surface. The impact of the m=0 modes on electron energization has been observed with Thomson scattering under plasma conditions with suppressed m=1 modes. Under such conditions, the m=0 modes undergo brief ($\sim$100 μs) bursts of localized magnetic activity. These bursts show a localized 4% heating of electrons above a 600-900 eV background temperature, associated with a reduction of magnetic energy. An inward propagating cold pulse follows after the heating as a result of reduced confinement. Ensembles of hundreds of bursts are required to measure small relative heating, however single-shot results from MST's high repetition Thomson scattering diagnostic support the ensemble results. Analysis of Thomson scattering data also provides constraints on non-Maxwellian distributions and upcoming upgrades will improve the ability to resolve electron currents associated with the magnetic bursts.

[1]This work is supported by the US DOE and NSF.

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Date submitted: 24 Jul 2015 Electronic form version 1.4