Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Single-shot measurements of > 1 keV electron temperature and first Lundquist number profile scalings in the MST Reversed-Field-Pinch. ROB O'CONNELL, DANIEL DEN HARTOG, JAY ANDERSON, BRETT CHAPMAN, DARREN CRAIG, HILLARY CUMMINGS, DAVID ENNIS, STEWART PRAGER, JOSH REUSCH, JOHN SARFF, University of Wisconsin - Madison — Electron temperatures greater than 1 keV are routinely observed during 550 kA improved confinement plasmas. Single-shot, time-evolved profile measurements using a new multipoint Thomson scattering diagnostic have confirmed previous profile data based on measurements at one spatial and temporal point per shot, averaging over many shots. However, the new measurements have revealed a substantial shot to shot profile variance. Typical best discharges have approximately a 25% larger temperature than measured previously with shot averaging. For example, electron temperatures approaching 1 keV have been measured during 400 kA plasmas for the first time. These temperature variations are found over a range of plasma currents for both standard and improved-confinement plasmas. Other improved profile measurements, in particular Zeff, current density and the parallel electric field now allow for measurement of the radial dependence of the plasma conductivity. This allows the first measurements of the Lundquist number (S) profile in the MST. First results on the S-scaling of radial magnetic field and velocity fluctuations will be presented.
*This work is supported by the USDOE.

Rob O'Connell

Date submitted: 20 Jul 2006 Electronic form version 1.4