Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Magnetic Relaxation with Oscillating Field Current Drive on MST D.R. STONE, A.F. ALMAGRI, G. FIKSEL, K.J. MCCOLLAM, M.C. MILLER, R.M. MAGEE, S.T.A. KUMAR, J.S. SARFF, UW-Madison, D.C. BROWER, W.X. DING, W.F. BERGERSON, UCLA — In oscillating field current drive (OFCD), poloidal and toroidal frequency-matched ac magnetic fields are inductively applied to the plasma to drive dc plasma current through magnetic relaxation. Measurements of the MHD [$< \tilde{v} \times \tilde{B} > = < \tilde{E}_\perp \times \tilde{B}_\perp >$] and Hall [$\frac{<\tilde{j} \times \tilde{B}>}{ne}$] dynamo mechanisms associated with magnetic relaxation are conducted during OFCD both to better understand the relaxation dynamics and to aid in optimizing OFCD performance. Initial measurements of the MHD and Hall dynamo in the core and edge are reported. Charge exchange recombination spectroscopy and far-infrared interferometry-polarimetry are used in the core. Insertable probes are used in the edge, including a secondary emission capacitive probe developed to measure the electric fields. The fluctuation-induced magnetic helicity flux [$< \tilde{\phi} \tilde{B}_r >$] associated with magnetic relaxation is also measured in the edge. This flux is enhanced during OFCD by $\sim$100% relative to standard RFP operation. This work is supported by the US DOE.

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Date submitted: 21 Jul 2009 Electronic form version 1.4