Abstract Submitted
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Magnetic Relaxation with Oscillating Field Current Drive on MST D.R. STONE, A.F. ALMAGRI, G. FIKSEL, K.J. MCCOLLAM, R.M. MAGEE, S.T.A. KUMAR, J.S. SARFF, UW-Madison, D.C. BROWER, W.X. DING, UCLA, UW-MADISON TEAM, UCLA TEAM — 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 dynamo mechanisms associated with magnetic relaxation are conducted during OFCD both to better understand the relaxation dynamics and to aid in optimizing OFCD performance. The full $[< \tilde{E} \cdot \tilde{B} >]$ and Hall $[\frac{<\tilde{j} \times \tilde{B}>}{ne}]$ dynamo and the fluctuation-induced magnetic helicity flux $[< \tilde{\phi}\tilde{B}_r >]$ associated with magnetic relaxation are measured in the edge using insertable probes. They are enhanced during OFCD by $\sim$100% relative to standard RFP operation and, as expected, exhibit the opposite radial direction of induced transport of helicity. Probes used include a secondary-emission capacitive probe developed to measure electric fields and compared to Langmuir probe measurements. Measurements of the MHD $[< \tilde{v} \times \tilde{B} >]$ and Hall $[\frac{<\tilde{j} \times \tilde{B}>}{ne}]$ dynamo in the core using charge exchange recombination spectroscopy and far-infrared interferometry-polarimetry are in progress as well. This work is supported by the US DOE.

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