

Abstract Submitted  
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**Oscillating Field Current Drive in MST<sup>1</sup>** K.J. MCCOLLAM, A.P. BLAIR, F. EBRAHIMI, P.D. NONN, J.S. SARFF, A.F. ALMAGRI, J.K. ANDERSON, D. CRAIG, D.J. DEN HARTOG, G. FIKSEL, S. GANGADHARA, R. O'CONNELL, S.C. PRAGER, UW - Madison, B.H. DENG, W.X. DING, D.L. BROWER, UCLA — Oscillating field current drive (OFCD) is a proposed method of efficient, steady-state toroidal plasma current sustainment using AC poloidal and toroidal loop voltages. In MST, OFCD is applied to a baseline, standard RFP plasma, adding about 10% to the current with Ohmic efficiency. The evolution of current and pressure profiles during OFCD, including a 50% modulation in central pressure, is obtained using internal magnetic field and electron density and temperature data, from which resistivity and confinement characteristics are also inferred. The added current is maximal for positive, but not maximal, helicity injection, which is likely due in part to OFCD's modulating effect on magnetic fluctuations, which are smallest at maximal added current. OFCD also modulates the ion temperature and anomalous ion heating. The experimental results are generally consistent with detailed 3D resistive-MHD computation and 1D relaxed-state modeling. MST's OFCD system is being upgraded for a longer pulse at higher power.

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Karsten McCollam  
University of Wisconsin - Madison

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