

Abstract Submitted  
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**Oscillating Field Current Drive Experiments on MST** K.J. MCCOLLAM, F. EBRAHIMI, J.S. SARFF, D.R. STONE, D.J. DEN HARTOG, G. FIKSEL, UW-Madison, R. O'CONNELL, S.C. PRAGER, UW-Madison, D.L. BROWER, UCLA, B.H. DENG, W.X. DING, UCLA, D. CRAIG, Wheaton College — Oscillating field current drive (OFCD) is a proposed method for efficient, steady-state toroidal plasma current sustainment using AC poloidal and toroidal loop voltages. OFCD is added to a standard RFP in the MST device, increasing the net plasma current by about 10%. In recent experiments the OFCD input power and frequency and MST baseline current have been varied to test their effects on the OFCD-added current, but it has not yet been improved beyond previously improved levels. The amount of added current is likely to be strongly affected by magnetic fluctuation activity, which is modulated significantly by OFCD. The added current computed by a 3D resistive-MHD code using experimental voltage parameters closely matches the measured current. OFCD's effect on confinement is a key issue in evaluating its feasibility for full sustainment. In these partial-sustainment tests the cycle averages for both the energy confinement time and total beta are about the same as in the standard RFP without OFCD. Helicity balance studies are ongoing which include contributions from potential and magnetic fluctuations as measured in the plasma edge. This work is supported by the US DOE.

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