

Abstract Submitted
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Progress in Oscillating Field Current Drive Experiments in the MST RFP¹ A.P. BLAIR, F. EBRAHIMI, K.J. MCCOLLAM, P.D. NONN, S.C. PRAGER, J.S. SARFF, University of Wisconsin Madison — To test Oscillating Field Current Drive, two 280Hz 1 MVA oscillators are installed in the toroidal and poloidal magnetic field circuits of the MST reversed field pinch. Current drive of about 10% has been demonstrated, comparable to theoretical predictions. However, maximum current drive does not coincide with maximum helicity injection - possibly due to an observed dependence of both core and edge tearing modes on the relative phase of the oscillators. An entrainment of the natural sawtooth frequency to our applied oscillation was observed. Varying the natural sawtooth frequency via the nominal plasma current yields a controllable number of sawteeth per cycle while sustaining the entrainment effect - albeit less consistently at low current levels. A significant dependence of wall interactions on phase was observed, the largest interaction coinciding with negative current drive. A relaxed state model using measured gap voltages was used to study the effects of voltage amplitudes, frequencies, and waveforms on current drive and magnetic field profiles. Predicted current drive was comparable to experimental values. Phase dependence was not, due to the models sensitivity to noise and sawteeth.

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