

Abstract Submitted
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Edge Magnetic Activity in the HIT-SI Experiment J.S. WROBEL, D.A. ENNIS, T.R. JARBOE, G.J. MARKLIN, B.A. NELSON, R.J. SMITH, University of Washington — Arrays of surface magnetic probes embedded in the HIT-SI flux conserver have resolved plasma dynamics in the 10Hz-200kHz frequency range. Four separate Amperian loops formed by the surface magnetic arrays measured the toroidal plasma current with rise times as well as reversals in the current direction on a $100\mu\text{s}$ time scale. Studies of the reversal process will be presented. Global magnetic field oscillations at the 5.8kHz injector driving frequency are also observed and the distribution of oscillations suggests twisted injector prominences in the confinement region. Data from surface probe arrays along the midplane gap together with external flux loops have shown substantial spheromak flux is driven out the gap characterized by toroidal mode numbers $n = 1$ and $n = 2$. The new magnetic data is providing guidance for eliminating the loss of flux at the gap and for future injector designs. A comparison to Taylor models will also be presented. Work supported by USDoE.

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