

Abstract Submitted
for the DPP10 Meeting of
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Results of inductive helicity-injected current drive on the HIT-SI spheromak at 15 kHz¹ BRIAN VICTOR, University of Washington, THOMAS JARBOE, BRIAN NELSON, GEORGE MARKLIN, DAVID ENNIS, ROGER SMITH, CHRIS HANSEN, HIT-SI TEAM — The Helicity Injected Torus-Steady Inductive (HIT-SI) uses two semi-toroidal injectors to inductively inject helicity into a confinement volume with a bowtie cross-section. Improved spheromak formation and sustainment on HIT-SI has been achieved by increasing the oscillating frequency of the injectors to 15 kHz from 5.8 kHz. Higher frequency operations form higher spheromak currents at lower plasma density and are less disruptive to the equilibrium spheromak. Oscillations in electron density at the injector frequency, as measured by an FIR interferometer, are smaller during higher frequency operations. A three-pronged probe containing arrays of 3D pickup coils, inserted to the magnetic axis, measures the internal magnetic field profiles. Comparisons of the internal magnetic field profiles to the calculated minimum energy Taylor state show agreement for longer periods of time during high frequency operations. Time-resolved spectroscopy, observing discrete wavelengths from the VUV to visible spectrum, will also be presented.

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