

Abstract Submitted
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Overview of the Helicity Injected Torus Program A.J. REDD, T.R. JARBOE, W.T. HAMP, B.A. NELSON, R.G. O'NEILL, R. RAMAN, P.E. SIECK, R.J. SMITH, G.L. SUTPHIN, J.S. WROBEL, University of Washington, Seattle, WA — The Helicity Injected Torus with Steady Inductive Helicity Injection (SIHI) spheromak experiment (HIT-SI)[Jarboe, Fus. Tech., v. 36, p. 85 (1999)] addresses critical issues for spheromaks, including current drive, high-beta operation, and confinement quality. HIT-SI features an optimized high-beta plasma shape and current profile, minimal plasma-wall interaction, and the long-term goal of steady-state operation. HIT-SI has a “bow-tie” shaped axisymmetric confinement region (major radius $R=0.33\text{m}$, axial extent of 0.57m) and two half-torus helicity injectors, one mounted on each end of the flux conserver. The flux and loop voltage in each helicity injector are varied sinusoidally and in phase, while the two injectors are 90 degrees out of phase with each other, producing a constant rate of helicity injection. The physical principles of SIHI and the HIT-SI device will be presented, along with descriptions of key experimental and computational results.

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