

Abstract Submitted  
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**Overview of the Helicity Injected Torus Program** BRET THOMAS STEWART, A.J. REDD, T.R. JARBOE, R.Z. ABOULHOSN, C. AKCAY, W.T. HAMP, G. MARKLIN, B.A. NELSON, R.G. O'NEILL, R. RAMAN, P.E. SIECK, R.J. SMITH, J.S. WROBEL, University of Washington, Seattle, Washington — The Helicity Injected Torus with Steady Inductive Helicity Injection (HIT-SI) spheromak experiment [Jarboe, *Fus.Tech.*, v.36, p.85 (1999)] addresses critical research areas for spheromak formation and sustainment, including current drive, high-beta operation, confinement quality, and efficient steady-state operation. HIT-SI has a “bow-tie” shaped, axisymmetric confinement region with a major radius of 0.33 m, and an axial extent of 0.57 m. Attached to the confinement region are two half-torus helicity injectors, one mounted on each end of the flux conserver. HIT-SI has produced up to 30 kA of toroidal current in spheromaks generated using less than 4 MW of applied power, demonstrating that Steady Inductive Helicity Injection can create and sustain discharges with modest power requirements. HIT-SI has recently been repaired and upgraded, with an improved flux conserver, higher helicity and power injection, better diagnostic coverage, and an improved plasma-facing insulating surface. HIT-SI operational and diagnostic improvements, and corresponding physics studies, will be summarized.

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