

Abstract Submitted
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Sustained spheromaks with ideal $n = 1$ kink stability and pressure confinement¹ B.S. VICTOR, C. AKCAY, C.J. HANSEN, A.C. HOSSACK, T.R. JARBOE, K.D. MORGAN, B.A. NELSON, D.A. SUTHERLAND, University of Washington — Increasing the injector frequency up to 68.5 kHz on the HIT-SI experiment produced, for the first time, sustained spheromaks with pressure confinement and current gains of nearly 4. During sustainment only imposed $n = 1$ activity is observed indicating $n = 1$ kink stability at injector frequencies of 14.5, 36.8, 53.5 and 68.5 kHz. The injectors drive the edge of the plasma to a high λ ($= \mu_0 j/B$) with a low λ region forming in the center. Imposed fluctuations cause the current penetration that maintains the kink-stable profile. A Shafranov shift is consistently seen at frequencies of 53.5 and 68.5 kHz, which is above the estimated sound transit frequency, v_i/a , of HIT-SI. The PSI-TRI equilibrium solver is used to estimate the plasma pressure. In addition the magnetic profiles have improved toroidal symmetry at higher injector frequencies. Initial analysis of the density evolution and the internal magnetic fields of HIT-SI3 will also be presented.

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