

Abstract Submitted  
for the DPP05 Meeting of  
The American Physical Society

**A Microwave Interferometer and Polarimeter for the HIT-SI Device** J.S. WROBEL, R.J. SMITH, T.R. JARBOE, R.G. O'NEILL, University of Washington — Polarimetry has been proposed on HIT-SI as a non-perturbative internal field measurement system. HIT-SI studies the use of inductive helicity injection for sustainment of a toroidal current in a spheromak. The existing 185  $\mu\text{m}$  FIR interferometer on HIT-SI [1] is capable of multi-chord density measurements but has an unsuitable wavelength for polarimetry. A 2mm heterodyne system based on an IMPATT diode source is being considered. The sources will be stabilized by a phase locked loop and differential quadrature detection is proposed to minimize non-ideal behavior of mixers. The microwave interferometry and polarimetry system will provide chord averaged density and magnetic field measurements to complement the density profile measurements from the FIR interferometer. The design and modeling of the microwave system will be presented for various HIT-SI spheromak equilibria.

[1] Jewell, Patrick D. *et al.*, Rev. Sci. Instr. **74**, 80 (2003).

Jonathan Wrobel  
University of Washington

Date submitted: 13 Sep 2005

Electronic form version 1.4