Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Design of a Polarimeter for Non-invasive Internal Magnetic Field Measurements on the HIT-SI Spheromak N.K. HICKS, R.J. SMITH, D.A. ENNIS, C.J. HANSEN, T.R. JARBOE, B.S. VICTOR, J.S. WROBEL, University of Washington — The Helicity Injected Torus – Steady Inductive (HIT-SI) program investigates helicity injection current drive for magnetic confinement. The installation of a non-perturbative diagnostic of the internal magnetic field in HIT-SI discharges would allow the important ability to measure current-, q- and λ-profiles. Between motional Stark effect and polarimetric methods, the latter is more feasible on HIT-SI and is being pursued. This diagnostic introduces a probe beam at millimeter wavelengths, and the beam's polarization is modified by the spheromak plasma as it propagates; measurement of this effect yields the density-weighted, line-integrated magnetic field parallel to the propagation. The diagnostic will also make an interferometric measurement of the electron density. The measurements will help to validate MHD codes running at the PSI-Center. This research is supported in part by an appointment to the U.S. Department of Energy Fusion Energy Postdoctoral Research Program administered by the Oak Ridge Institute for Science and Education.

Nathaniel Hicks
University of Washington

Date submitted: 26 Jul 2010 Electronic form version 1.4