Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Thomson Scattering Measurements During Local Helicity Injection in the Pegasus Toroidal Experiment[1] G.M. BODNER, M.W. BONGARD, R.J. FONCK, J.A. REUSCH, C. RODRIGUEZ SANCHEZ, D.J. SCHLOSSBERG, University of Wisconsin-Madison — Local helicity injection (LHI) is a non-solenoidal startup technique currently being developed at the Pegasus Toroidal Experiment. In LHI, helicity is injected by compact, high-power current sources located in the plasma scrape off layer that drive bulk plasma current through magnetic reconnection. Investigations of the electron temperature and density evolution in LHI plasmas are being pursued using the multi-point Thomson scattering diagnostic on Pegasus. It has been expanded to provide a total of 24 spatial channels using a set of three high-throughput transmission gratings and intensified CCD cameras. Measurements have been made in two separate helicity injector configurations: a low-field-side (outboard midplane) configuration; and a high-field-side (lower divertor) configuration. Initial observations during injection showed $50 < T_e < 150$ eV with $0.5 \times 10^{19} < \bar{n}_e < 1.0 \times 10^{19}$ m^{-3}. Both injection methods yield peaked temperature profiles in the core; however, a more rapid rise in T_e from the edge to the core was observed in the case of outboard injection. Further analysis of electron temperature and density profiles is required to understand the electron confinement scaling associated with LHI. These initial results suggest this startup technique is scalable to MA-class devices with relatively modest injector requirements.

[1]Work supported by US DOE grant DE-FG02-96ER54375.

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Date submitted: 13 Jul 2016 Electronic form version 1.4