Abstract Submitted
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Initial Thomson Scattering Survey of Local Helicity Injection and Ohmic Plasmas at the Pegasus Toroidal Experiment[1] D.J. SCHLOSSBERG, G.M. BODNER, M.W. BONGARD, R.J. FONCK, G.R. WINZ, University of Wisconsin-Madison — A multipoint Thomson scattering diagnostic has recently been installed on the Pegasus ST. The system utilizes a frequency-doubled Nd:YAG laser ($\lambda_0 \sim 532$ nm), spectrometers with volume phase holographic gratings, and a gated, intensified CCD camera. It provides measurements of T_e and n_e at 8 spatial locations for each spectrometer once per discharge. A new multiple aperture and beam dump system has been implemented to mitigate interference from stray light. This system has provided initial measurements in the core region of plasmas initiated by local helicity injection (LHI), as well as conventional Ohmic L- and H-mode discharges. Multi-shot averages of low-density ($n_e \sim 3 \times 10^{18}$ m^{-3}), $I_p \sim 0.1$ MA LHI discharges show central $T_e \sim 75$ eV at the end of the helicity injection phase. $I_p \sim 0.13$ MA Ohmic plasmas at moderate densities ($n_e \sim 2 \times 10^{19}$ m^{-3}) have core $T_e \sim 150$ eV in L-mode. Generally, these plasmas do not reach transport equilibrium in the short 25 ms pulse length available. After an L-H transition, strong spectral broadening indicates increasing T_e, to values above the range of the present spectrometer system with a high-dispersion VPH grating. Near-term system upgrades will focus on deploying a second spectrometer, with a lower-dispersion grating capable of measuring the 0.1–1.0 keV range. The second spectrometer system will also increase the available number of spatial channels, enabling study of H-mode pedestal structure.

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