

Implementation of a Thomson Scattering Diagnostic on Pegasus¹ D.J. SCHLOSSBERG, A.S. DOWD, R.J. FONCK, J.I. MORITZ, N.L. SCHOENBECK, G.R. WINZ, University of Wisconsin-Madison — The multipoint Thomson scattering system on PEGASUS will diagnose point-source helicity-driven plasmas, including dominant particle transport mechanisms and sources of helicity dissipation. Helicity-driven plasmas are estimated to have $\langle T_e \rangle \sim 50$ eV for stochastic field line confinement and ~ 200 eV for standard Ohmic closed flux surface confinement. To accurately characterize these regimes, a novel system is being designed, installed, and calibrated. A Nd:YAG laser is frequency doubled to provide a 9 ns, 2 J pulse radially across the plasma. Remote alignment of steering mirrors can be performed between shots along the 6 m length of the external laser beam-line. The 532 nm laser beam is focused to a ≤ 3 mm diameter beam within the plasma. Plasma background measurements are made simultaneously with data collection. A custom optical system collects signal from $>70\%$ of the plasma cross-section with 1.4 cm radial resolution. Optical fibers relay light to a high-efficiency volume phase holographic grating spectrometer coupled to a high quantum efficiency image intensified CCD camera, gated at ≥ 2 ns. Signal levels for plasmas with $n_e > 10^{18} \text{ m}^{-3}$ and $10 \text{ eV} < T_e < 1 \text{ keV}$ are predicted at 10^3 photons/pulse before background subtraction.

¹Work supported by US DOE Grant DE-FG02-96ER54375.

- Prefer Oral Session
 Prefer Poster Session

M.W. Bongard
mbongard@wisc.edu
University of Wisconsin-Madison

Special instructions: Please place as poster 7/7 with the other Pegasus presentations.