Abstract Submitted
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Design of the Thomson Scattering Diagnostic on the Pegasus Toroidal Experiment[1] D.J. SCHLOSSBERG, R.J. FONCK, B.A. KUJAKFORD, B.T. LEWICKI, J.I. MORITZ, University of Wisconsin-Madison — A critical question concerning use of point-source helicity injection for non-inductive startup is whether, as I_p increases, energy confinement is dominated by cross-field transport or by parallel losses due to field line stochasticity. Furthermore, resistively-driven helicity dissipation during plasma formation must be characterized. Both of these topics are important for predictive scaling to larger tokamaks. In addition, T_e and n_e profiles are needed for accurate magnetic equilibrium reconstructions at high β_T and I_N. To resolve these issues, a Thomson scattering diagnostic is being developed for the PEGASUS Toroidal experiment. The design is guided by systems on MST[2] and HSX.[3] Scattered light from an incident Nd-YAG laser ($\lambda = 1064$ nm) will be detected by a polychromator system. Implementation on PEGASUS will measure n_e and T_e at ≥ 10 radial locations for plasmas with $n_e \geq 10^{19}$ m^{-3} and $T_e \sim$ 10 eV – 1 keV, with radial resolutions of $\sim$1.75 cm and 5 cm for fine and coarse configurations, respectively.

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[2]J.A. Reusch, et al. RSI **79**, 10E733 (2008)
[3]K. Zhai, et al. RSI **75**, 10 (2004)

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