Abstract Submitted
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Installation of a Thomson scattering diagnostic on the Compact Toroidal Hybrid Experiment[1] P.J. TRAVERSO, D.A. MAURER, D.A. ENNIS, G.J. HARTWELL, Auburn University, M.R. CIANCIOSA, Oak Ridge National Laboratory — A Thomson scattering system is being commissioned for the non-axisymmetric plasmas of the Compact Toroidal Hybrid (CTH), a five-field period current-carrying torsatron. The initial system takes a single point measurement on the magnetic axis and will be used to assess options for an expansion to a multi-point system to enable better 3D equilibrium reconstructions using the V3FIT code. A single point measurement will reduce the uncertainty in the reconstructed peak pressure by an order of magnitude for both current-carrying plasmas and future gyrotron-heated stellarator plasmas. The beam, generated by a frequency doubled Continuum 2 J, Nd:YaG laser, is passed vertically through an entrance Brewster window and a two-aperture optical baffle system to minimize stray light. The beam line is designed to propagate ~ 8 m to the mid-plane of the CTH device with the beam diameter < 3 mm inside the plasma volume. An Andor iStar DH740-18U-C3 image intensified CCD camera is used in conjunction with a Holospec f/1.8 spectrograph to collect the red-shifted scattered light from 532-580 nm. A single point system will initially measure plasmas with core electron temperatures of 100 to 200 eV and densities of 5×10^{18} to 5×10^{19} m^{-3}.

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