Abstract Submitted
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Design and implementation of a Thomson scattering diagnostic for the Compact Toroidal Hybrid Experiment[1] P.J. TRAVERSO, D.A. MAURER, D.A. ENNIS, G.J. HARTWELL, M.M. GOFORTH, S.D. LOCH, A.J. PEARCE, M.R. CIANCIOSA, Auburn University — A Thomson scattering system using standard commercially available components has been designed for the non-axisymmetric plasmas of the Compact Toroidal Hybrid (CTH). The initial system takes a single point measurement and will be used to assess options for an upgrade to a multi-point system providing electron temperature and density profiles. This single point measurement will reduce the uncertainty in the reconstructed peak pressure by an order of magnitude for both ohmically driven, current-carrying plasmas and future gyrotron-heated stellarator plasmas. A principle design goal is to minimize stray laser light, geometrically on the machine side and spectrally on the collection side, to allow measurements of both full and half Thomson scattered spectral profiles. The beam, generated by a frequency doubled Continuum 2 J Nd:YaG laser, is passed vertically through an entrance Brewster window and an aperturing baffle system to minimize stray light. Light collection, spectral processing, and signal detection are accomplished with an $f/\# \sim 1$ aspheric lens, a Holospec f/1.8 spectrometer, and an Andor iStar DH740-18U-C3 image intensified camera. The estimated number of scattered photons per channel will be of the order of 5×10^3 with a signal to noise ratio of $S/N = 19$

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