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Thomson scattering diagnostic on the Compact Toroidal Hybrid Experiment[1] PETER TRAVERSO, D.A. MAURER, D.A. ENNIS, G.J. HARTWELL, Auburn University — 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 system takes a single point measurement at the magnetic axis to both calibrate the two color soft x-ray T_e system and serve as an additional diagnostic for the V3FIT 3D equilibrium reconstruction 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 propagates 8 m to the CTH device mid-plane with the beam diameter ¡ 3 mm inside the plasma volume. Thomson scattered light is collected by two adjacent f/2 plano-convex condenser lenses and focused onto a custom fiber bundle. The fiber is then re-bundled and routed to a Holospec f/1.8 spectrograph to collect the red-shifted scattered light from 535-565 nm. The system has been designed to measure plasmas with core T_e of 100 to 200 eV and densities of 5×10^{18} to 5×10^{19} m^{-3}.

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