

## Thomson scattering beamline installation on the Compact Toroidal Hybrid Experiment

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Requested Type: Poster Only

Submitted: 2016-01-05 11:13:54

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### Abstract Text:

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. 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 has been designed with a  $\sim 8$  m propagation distance to the mid-plane of the CTH device with the beam diameter kept less than 3 mm inside the plasma volume. The beam exits the vacuum system through another Brewster window and enters a beam dump, again to minimize the stray light in the vacuum chamber. An Andor iStar DH740-18U-C3 image intensified CCD camera will be 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  $5 \times 10^{18}$  to  $5 \times 10^{19} \text{ m}^{-3}$ .

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