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Using Laser Deflection Diagnostics to Profile Densities of Accelerated SCTs on CTIX<sup>1</sup> SAMUEL BROCKINGTON, UC Davis Department of Electrical Engineering, DAVID HWANG, ROBERT HORTON, RUSSELL EVANS, STEPHEN HOWARD, UC Davis Department of Applied Science — Having demonstrated laser deflection as a valid technique for obtaining plasma density profiles of Spheromak-like Compact Toroids (SCTs) [1], we have made modifications to increase the reliability and repeatability of the deflection diagnostic so larger data sets can be obtained to produce good statistics. Primarily, improvements to the photodiode preamplifier design were made to make laser photon statistics the limiting source of noise. A deflection assembly was used to measure plasma density profiles of SCTs of different peak densities created by CTIX. By assuming a density profile for a SCT, plasma peak densities proportional to laser deflection angles were calculated and compared to heterodyne interferometer measurements at the same location. Values from interferometry and deflectometry for different density SCTs will be compared, as a well as peak densities from both axial and radial deflection. By measuring both the radial and axial defection, the assumed SCT density profile can be checked. [1] Brockington, S. et al, "Plasma Density Gradient Measurement Using Laser Deflection," Review of Scientific Instruments 76, 1 (2005)

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