

Abstract Submitted
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Electron Density Profile Measurements of a Translated Field-Reversed Configuration¹ J.F. CAMACHO, NumerEx, D.J. BROWN, SAIC, E.L. RUDEN, AFRL — A four-chord HeNe laser interferometer operating at 632.8 nm is being used to measure the electron density of a field-reversed configuration (FRC) for the magnetized target fusion experiment at the Air Force Research Laboratory. The design of the interferometer has been previously described [*Bull. Am. Phys. Soc.* **52**, 84 (2007)]. We are focusing our efforts on measuring the radial density profile of an axially translated FRC as a function of time as it emerges from the bore of the conical theta coil in which it is formed. The goal is to perform these measurements where the FRC is moving and then is captured by a magnetic mirror that will serve to trap it inside a cylindrical aluminum liner. The liner will be imploded by the Shiva Star capacitor bank to heat the plasma compressively to a fusion-relevant regime [*Bull. Am. Phys. Soc.* **52**, 257 (2007)]. Data will be presented showing the density evolution of the FRC while it is in the formation, translation, and compression regions. We also plan to divert one of the four probe beams into a single-mode optical fiber whose collimated output can be used to sample a diameter of the plasma at different axial locations. Progress on obtaining density information as a function of axial position with this technique will also be reported.

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