

Abstract Submitted
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Electron Density Measurements of a Field-Reversed Configuration Using Fiber Probe Interferometry¹ J.F. CAMACHO, NumerEx, LLC, A.G. LYNN, University of New Mexico, E.L. RUDEN, Air Force Research Laboratory, Directed Energy Directorate — A HeNe laser interferometer operating at 632.8 nm with two single-mode optical fiber probe beams has been assembled to measure time history of the line-integrated electron density of a field-reversed configuration (FRC) for a magnetized target fusion (MTF) experiment. Our system features probe path lengths many times longer than the reference paths. We have performed simultaneous measurements along two diameters at different axial locations. During plasma formation, translation, and capture tests, the lower probe monitored the formation region, while the upper probe monitored the capture region corresponding to the location of an imploding cylindrical aluminum liner driven by the Shiva Star capacitor bank to compress and heat the FRC plasma. For the actual imploding liner experiment, the upper chord was moved to monitor the translating FRC at the entrance to the liner region. Results from the formation, translation, and capture tests as well as an actual imploding liner experiment will be presented. In addition, interferometer visibility measurements and other factors establishing the viability of our design will be discussed.

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J. F. Camacho
NumerEx, LLC

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