

Abstract Submitted
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Electron Density Profile Measurements of a Field-Reversed Configuration Using an Optical Interferometer¹ J.F. CAMACHO, NumerEx, E.L. RUDEN, AFRL — A laser interferometer system operating at 633 nm is being used to measure the electron density of field-reversed configurations (FRCs) produced by the magnetized target fusion (MTF) experiment at the Air Force Research Laboratory (AFRL). The design is a scaled-down version of an eight-chord system previously used to provide time-resolved information about the spatial distribution of electron density in a similar FRC experiment [E. L. Ruden *et al.*, *Rev. Sci. Instrum.* **77**, 103502 (2006)]. Here, a fanned array of laser beams probes the plasma through the FRC midplane along four different chords. In addition, our design features the option of diverting any or all of the four probe beams into single-mode optical fibers whose collimated outputs can be used to probe different axial locations simultaneously [L. M. Smith *et al.*, *Rev. Sci. Instrum.* **74**, 3324 (2003)]. This arrangement enables us to place the interferometer system's optical table at a safe distance from the MTF-FRC experiment when destructive tests involving plasma compression by a solid metal liner imploded by the Shiva Star capacitor bank are attempted. Data from the four-chord system and the system with the fiber-optic probe beam modification will be presented.

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