

Abstract Submitted
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Spectral Diagnostics of Plasma Confined within a Field Reversed Configuration J.M. LITTLE, W.W. HEIDBRINK, E.P. GARATE, R. MCWILLIAMS, E. TRASK, W.S. HARRIS, University of California, Irvine — A field reversed configuration (FRC) consists of a toroidal plasma current confined by closed magnetic field lines within a cylindrical chamber. The FRC at the University of California Irvine is estimated to operate in a temperature range of 1eV-5eV at a density of approximately $5 \times 10^{13} \text{ cm}^{-3}$. An impurity ion survey and temperature measurement are to be performed by analyzing the visible light emitted by the plasma. In order to determine the different species of ions confined within the field, a spectrometer with a resolution of one nanometer will be used. Light from the chamber will be collected using a collimating probe and transmitted to the spectrometer via fiber optic cable. Software will be used to analyze the data, which will then be compared to the NIST Atomic Spectra Database. Expected impurities include oxygen and carbon ions from the plasma injectors. Measurements of the ion temperature will be performed by an observation of the Doppler broadening of the H-alpha emission line. Assuming an ion temperature of 5eV, a resolution of approximately one angstrom is needed to observe this effect. Due to limitations of the spectrometer, the light from the fiber optic cable will instead be sent through a high resolution spectrometer and imaged using a gated intensifier. By observing the H-alpha line shape the ion temperature can be determined.

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