

Abstract Submitted
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Density and Temperature Diagnostics of the Pulsed High Density (PHD) FRC Experiment¹ H. GOTA, S.P. ANDREASON, G.R. VOTROUBEK, C.J. PIHL, J.T. SLOUGH, Plasma Dynamics Laboratory, University of Washington, Seattle, WA 98195 — The High Flux Source (HFS) of the Pulsed High Density Experiment (PHDX) has been constructed, and field-reversed configuration (FRC) plasmas are being produced. To obtain the electron density and temperature of the FRC plasma we set up a $\lambda=632.8$ nm He-Ne laser interferometer system near the midplane of the HFS, and to estimate the ion density and temperature a 16 channel spectrometer has been installed for end-on viewing. For more detailed density and temperature analyses a soft x-ray measurement system is being developed on the end flange of the HFS; this system consists of 5 AXUV100 photodiodes with directly deposited filters which have approximately 0.1-0.3 μm thick thin films (Al, Zr/C, Sn/Ge, Cr/Al, and Ti/Pd) on each diode. The electron density and temperature are approximately determined by comparing the response of the detectors to computed responses using the emissivity from an atomic model of the plasma. We will present both computational and experimental results from the soft x-ray measurement system and the comparison of all density and temperature diagnostics of FRC plasmas.

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