Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Detection and Analysis of X Ray Emission from the Princeton-Field-Reversed Configuration (PFRC-2)[1] ALEXANDRA BOSH, Virginia Polytechnic Institution and State University, CHARLES SWANSON, PETER JANDOVITZ, SAMUEL COHEN, Princeton Plasma Physics Laboratory — The PFRC is an odd-parity rotating-magnetic-field-driven field-reversed-configuration magnetic confinement experiment. Studying X rays produced via electron Bremsstrahlung with neutral particles is crucial to the further understanding of the energy and particle confinement of the PFRC. The data on the x rays are collected using a detector system comprised of two, spatially scannable Amptek XR-100 CR detectors and a Amptek XR-100 SDD detector that view the plasma column at two axial locations, one in the divertor and one near the axial midplane. These provide X-ray energy and arrival-time information. (Data analysis requires measurement of each detectors efficiency, a parameter that is modified by window transmission. Detector calibrations were performed with a custom-made X-ray tube that impinged 1-microamp 1-5 kV electron beams onto a carbon target.) From the analyzed data, the average electron energy, effective temperature, and electron density can be extracted. Spatial scans then allow the FRCs internal energy to be measured. We present recent measurements of the Bremsstrahlung spectrum from 0.8 to 6 keV and the inferred electron temperature in the PFRC device as functions of heating power, magnetic field and fill gas pressure.

[1]This work was supported, in part, by DOE Contract Number DE-AC02-09CH11466

Alexandra Bosh
Virginia Polytechnic Institution and State University

Date submitted: 15 Jul 2016 Electronic form version 1.4