

Abstract Submitted  
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**0.5-5 keV X-ray Spectroscopy as a  $T_e$  Diagnostic of PFRC Plasma**<sup>1</sup> A. STEPANOV, S.A. COHEN, PPPL — A commercial Si-PIN X-ray detector has been adapted for the non-invasive measurement of the RMF-heated PFRC's electron temperature. The energy scale of the detector was calibrated using X-ray fluorescence, and detector efficiency is being measured using the Bremsstrahlung spectrum of a thick carbon target. The expected plasma emission spectrum was obtained by numerically integrating the Elwert approximation to the exact QM Gaunt factor. The measured X-ray pulse-height distribution, with the detector viewing along a diameter 8 cm from the midplane, often shows an exponential behavior, consistent with a single temperature. Comparing the calculated to the measured spectra yielded electron temperatures between 100 and 300eV. It was observed that a -100 kHz frequency shift (FS) of the RMF from its initial 14 MHz value during a pulse results in a 20% increase in  $T_e$  and 4-fold increase in X-ray count rate, despite decreases in plasma density and power coupled to the plasma. Time-of-arrival histograms of the X-ray pulses were obtained confirming the existence of a "dead zone" before the application of the FS and the subsequent increase in emission after application of the FS.

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