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Reconstruction of full electron energy distributions by Poisson-regularized spectral inversion of x-ray Bremsstrahlung emissions in the PFRC device[1] CHARLES SWANSON, PETER JANDOVITZ, Princeton Plasma Physics Laboratory, ALEXANDRA BOSH, Virginia Polytechnic Institute and State University, SAMUEL COHEN, Princeton Plasma Physics Laboratory — The PFRC is an odd-parity Rotating Magnetic Field (RMF) driven Field-Reversed Configuration plasma confinement experiment equipped with Si-PIN and SDD x-ray detectors. It is predicted that the electron energy distribution is non-thermal when the RMF is active. Using a novel inversion technique, we present full electron distribution functions as reconstructed ("spectrally inverted") from the x-ray Bremsstrahlung emissions. This method regularizes the inverse treating the measurement as a Poisson random variable, as opposed to state-of-the-art methods which assume a Normal random variable. The method maximizes the log-likelihood of the solution, determined from Bayes' Theorem.

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