

Abstract Submitted
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X-ray diagnostic for monitoring the charge state distribution in an ECR ion source¹ BRIAN CLUGGISH, IOAN-NICULAE BOGATU, LIANGJI ZHAO, JIN SOO KIM, FAR-TECH, Inc. — FAR-TECH, Inc. is developing a non-invasive X-ray spectral diagnostic to monitor the charge state distribution (CSD) in an electron cyclotron resonance ion source (ECRIS). The ECRIS is magnetic mirror confined plasma device in which electrons undergo ECR heating. Consequently the electron distribution function (EDF) develops a non-Maxwellian “tail” with energies over 10 keV. This in turn results in an ion CSD dominated by multiply charged ions. FAR-TECH, Inc. will determine the EDF by measuring the bremsstrahlung X-ray spectrum between 3 and 100 keV. The CSD can then be determined using our Generalized ECRIS Model (GEM) which calculates the rate of ionization to each charge state using the EDF. Measurements of the X-ray spectrum and the resulting EDF’s will be presented. The simulations will be compared to Faraday cup measurements of the CSD of ions extracted from an ECRIS.

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