

Abstract Submitted
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Multi-energy Soft X-ray diagnostic for NSTX¹ KEVIN TRITZ, DAN STUTMAN, MICHAEL FINKENTHAL, DEEPAK KUMAR, DANIEL CLAYTON, Johns Hopkins University — A high resolution, “multi-energy” soft X-ray (ME-SXR) diagnostic is being developed for the NSTX edge plasma. The system will measure with spatial resolution of ≤ 1 cm and with ~ 10 kHz bandwidth the XUV and SXR emission from the outer NSTX regions, including the pedestal, and will serve for studies of edge particle and electron transport, of ELM dynamics, and other edge phenomena. The system comprises five tangential AXUV diode arrays, viewing the plasma between $0.5 < r/a < 1.1$ through filters of varying composition and thicknesses, including a bare diode array. The filters provide a coarse sub-sampling of the XUV-SXR spectrum and will enable measuring changes in the electron temperature, density, and impurity concentration, on fast time scales. To obtain the electron temperature and the particle density the emissivity profiles are modeled using a coronal atomic model and a look-up table algorithm. In addition, a Transmission Grating imaging spectrometer is used to constrain the impurity fractions in this model.

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