Abstract Submitted
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Studies of impurity transport in NSTX with the edge multi-energy SXR diagnostic[1] D.J. CLAYTON, K. TRITZ, M. FINKENTHAL, D. KUMAR, D. STUTMAN, Johns Hopkins University, R.E. BELL, B.P. LEBLANC, Princeton Plasma Physics Laboratory — A high-resolution multi-energy soft-x-ray (ME-SXR) diagnostic is utilized for transport measurements in the NSTX plasma edge. In particular, it is well suited for measuring impurity particle transport from trace impurity injections. Four 20-channel photodiode arrays, each with a different x-ray filter, measure emission from different charge states of the injected impurity. A fifth, unfiltered array acts as a bolometer. It measures emission primarily from the lowest charge states, thus providing the source term when modeling transport of the higher charge states. The ME-SXR arrays have a mid-plane tangential view of the plasma edge from $\rho/a \sim 0.6$ to the SOL, with a spatial resolution of 1 cm. Variable-gain preamplifiers provide a good signal-to-noise ratio with a time resolution > 10 kHz. The STRAHL 1D radial impurity transport code, in conjunction with a synthetic x-ray diagnostic, is used to obtain the radial diffusive and convective transport coefficient profiles from measurement. Results will be presented from impurity injection experiments in various plasma edge conditions, including the application of 3D fields.

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