Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Initial Characterization of L-mode and H-mode Edge Turbulence in NSTX-U using Beam Emission Spectroscopy[1] DAVID KRIETE, RAYMOND FONCK, GEORGE MCKEE, DAVID SMITH, University of Wisconsin-Madison — Turbulence in L-mode and H-mode plasmas in NSTX-U has been measured using the upgraded 2D BES system. Plasma discharges exhibit a broadband turbulence spectrum up to ∼150 kHz. In addition, a broadband feature centered at 100 kHz is observed in the early, low density L-mode phase of a discharge with high neutral beam heating, but not in the late, high density L-mode phase of a discharge with low neutral beam heating. Normalized density fluctuation power reduces after the L-H transition by a factor of ∼10 in the outer edge region, and ∼5 in the inner edge region. More detailed characterization results, including correlation lengths, decorrelation times, and flow dynamics across the L-H transition, will be presented. Due to discontinuation of the photodiode currently used in BES detectors, the capacitances of several modern, PIN photodiodes have been measured to assess their suitability for BES measurements. The BES preamplifier board layout has been redesigned to test each of the potential replacement diodes. The redesign also enables automated fabrication and assembly of the preamplifiers, simplifying future expansions to the BES system. Finally, the design specifications of a survey spectrometer for impurity measurements with BES detectors will be discussed.

[1]This work is supported by US DOE Award Numbers DE-SC0001288 and DE-AC02-09CH11466.

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Date submitted: 15 Jul 2016 Electronic form version 1.4