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Electron Scale Turbulence and Transport in an NSTX H-mode Plasma Using a Synthetic Diagnostic for High-k Scattering Measurements[1] JUAN RUIZ RUIZ, PSFC-MIT, WALTER GUTTENFELDER, PPPL, NUNO LOUREIRO, PSFC-MIT, YANG REN, PPPL, ANNE WHITE, PSFC-MIT, MIT/PPPL COLLABORATION — Turbulent fluctuations on the electron gyro-radius length scale are thought to cause anomalous transport of electron energy in spherical tokamaks such as NSTX and MAST [1, 2] in some parametric regimes [3]. In NSTX, electron-scale turbulence is studied through a combination of experimental measurements from a high-k scattering system [4] and gyrokinetic simulations. Until now most comparisons between experiment and simulation of electron scale turbulence have been qualitative, with recent work expanding to more quantitative comparisons via synthetic diagnostic development [5,6]. In this new work, we propose two alternate, complementary ways to perform a synthetic diagnostic using the gyrokinetic code GYRO. The first approach builds on previous work [5,6] and is based on the traditional selection of wavenumbers using a wavenumber filter, for which a new wavenumber mapping was implemented for general axisymmetric geometry. A second alternate approach selects wavenumbers in real-space to compute the power spectra. These approaches are complementary, and recent results from both synthetic diagnostic approaches applied to NSTX plasmas will be presented. [1] Kaye NF 2007, [2] Valovic NF 2011, [3] Guttenfelder PoP 2013, [4] Smith RSI 2008, [5] Poli PoP 2010, [6] Poli APS 2010.

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