Abstract Submitted
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Study of ion and electron scale turbulence in an NSTX H-mode plasma using a synthetic high-k diagnostic and gyrokinetic simuation.[1] J. RUIZ RUIZ, A. WHITE, MIT-PSFC, W. GUTTENFELDER, Y. REN, F. POLI, S. KAYE, B. P. LEBLANC, E. MAZZUCATO, PPPL, K. C. LEE, NFRI, Korea, C. W. DOMIER, UC-Davis, D. R. SMITH, U. Wisconsin-Madison, H. YUH, Nova Photonics, Inc. — Electron scale turbulence is studied on NSTX with a combination of experimental measurements from a high-k scattering system and gyrokinetic simulations. Recent work has shown that electron scale turbulence can be stabilized by the equilibrium electron density gradient after a controlled current ramp down experiment in an NSTX H-mode [1]. Nonlinear electron scale gyrokinetic simulation has shown to underpredict the experimental level of electron heat flux, both before and after the current ramp down. These results suggest ion scale turbulence might not be completely suppressed by ExB shear. Recent nonlinear gyrokinetic simulation results of ion-scale turbulence and its contributions to electron thermal transport for this NSTX plasma will be presented. In addition, a novel synthetic diagnostic for the high-k scattering system is under development to provide quantitative comparisons and constraints between experiments and simulations of electron-scale turbulence. Progress on the development of the synthetic diagnostic along with recent results applied to NSTX and NSTX-U plasmas will be presented. [1] Ruiz Ruiz et al., PoP 22, 122501 (2015).

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