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Prediction of high-k electron temperature fluctuation in an NSTX H-mode plasma[1] XIANG CHEN, JUAN RUIZ RUIZ, NATHAN HOWARD, Massachusetts Institute of Technology, WALTER GUTTENFELDER, Princeton Plasma Physics Laboratory, JEFF CANDY, General Atomics, JERRY HUGHES, ROBERT GRANETZ, ANNE WHITE, Massachusetts Institute of Technology — High-k temperature fluctuations $\tilde{T}_e$ in fusion plasmas are associated with electron-scale electromagnetic drift-wave type turbulence. High-k $\tilde{T}_e$ might contribute significantly to heat loss in a fusion reactor. However, no direct measurements of high-k $\tilde{T}_e$ have ever been made in any experiments and thus no validation work involves the quantity $\tilde{T}_e$. In this work, we run electron temperature gradient(ETG)-scale nonlinear gyrokinetic simulations of an NSTX H-mode with CGYRO. We will do a synthetic projection of high-k $\tilde{T}_e$ from simulation in NSTX which has never been done before. Comparison with high-k electron density fluctuation $\tilde{n}_e$ are made to demonstrate the advantages of predicted $\tilde{T}_e$ diagnostics and how critical it is for validation of transport models. The impact of $\tilde{T}_e$ on electron thermal transport are studied to answer the question whether ETG is the dominant turbulence mechanism or not.

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