Abstract Submitted
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Investigation of electron gyroscale fluctuations in NSTX plasmas D.R. SMITH, R.E. BELL, J.C. HOSEA, S.M. KAYE, B.P. LEBLANC, E. MAZZUCATO, H.K. PARK, PPPL, W. LEE, POSTECH, C.W. DOMIER, N.C. LUHMANN, UC-Davis, F.M. LEVINTON, H. YUH, Nova Photonics — Electron gyroscale fluctuations are studied to reveal the existence and nature of electron temperature gradient (ETG) turbulence in NSTX plasmas. The role of parameters relevant to ETG turbulence, such as ∇T_e, $\hat{s}$, and T_e/T_i, are highlighted. Fluctuation spectra are obtained using a multi-channel, microwave scattering system that measures fluctuations with $k_\perp \leq 20$ cm^{-1} and $k_\perp \rho_e \leq 0.6$. The system can measure up to five distinct wavenumbers simultaneously, and the k-space resolution is $\Delta k_\perp \approx 0.7$ cm^{-1}. The probe and receiving beams are positioned nearly on the equatorial midplane and configured for tangential scattering, so measured fluctuations are primarily radial. Steerable optics can position the scattering volume throughout the outer half-plasma from the magnetic axis to the edge. In addition to fluctuation spectra, transport calculations using `TRANSP` and linear gyrokinetic calculations using `GS2` are also presented. This work is supported by the U.S. Department of Energy under Contract Nos. DE-AC02-76CH03073, DE- FG03-95ER54295, and DE-FG03-99ER54531.

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