

APS invited talk:

Electron gyro-scale fluctuations in NSTX plasmas

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- motivation
  - neoclassical ion thermal transport
  - large  $E \times B$  flow shear w/ NBI
  - confinement scaling
  - ETG linearly unstable
- high-k scattering system
  - multi-channel
  - tangential
  - steerable optics
- fluctuations in high- $T_e$  L-mode discharges w/ HHFW
  - linear GS2 analysis
  - enhanced fluctuations when  $\text{grad } T_e$  above ETG critical gradient
  - cite PRL & IAEA papers

- fluctuations in H-mode discharges w/ NBI
  - TRANSP & linear GS2 analysis
  - inboard measurements
    - enhanced fluctuation when grad  $T_e$  above ETG critical gradient
  - outboard measurements
    - ETG marginally stable
    - reduced fluctuations when ExB shear above ETG growth rate
  - confinement scaling
    - amplitudes decrease at higher TF for similar conditions
- fluctuation amplitudes
  - general, order-of-magnitude agreement with GYRO
- future work & unique capabilities
  - k-space isotropy
  - ETG-ITG-ZF interaction w/ upcoming BES
- summary