Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Investigation of core electron gyroscale fluctuations in reverse shear and monotonic-q discharges on NSTX[1] D.R. SMITH, E. MAZZUCATO, H.K. PARK, M.G. BELL, R.E. BELL, S. KAYE, B.P. LEBLANC, J.E. MENARD, D.R. MIKKELSEN, G. REWOLDT, PPPL, C.W. DOMIER, M. JOHNSON, N.C. LUHMANN, JR., UC-Davis, F. LEVINTON, H. YUH, Nova Photonics — Electron thermal transport is the dominant loss mechanism across NSTX profiles and within tokamak internal transport barriers. Reverse shear discharges can exhibit improved electron thermal confinement compared to similar monotonic-q discharges. The improved electron confinement may be associated with reduced electron gyroscale fluctuations. With this motivation, a five-channel scattering system is employed to study core electron gyroscale fluctuations in reverse shear and monotonic-q discharges on NSTX. Scattering measurements and the subsequent density fluctuation spectra are localized in both real space and k-space. The NSTX scattering system can measure fluctuations with $k_\perp \leq 20$ cm^{-1} and $k_\perp \rho_e \leq 0.7$ at five discrete wavenumbers. The k- space resolution is $\Delta k_\perp \approx 0.7$ cm^{-1}. Steerable optics can position the scattering volume at any location throughout the plasma minor radius. In addition to fluctuation spectra, MSE q-profiles, `TRANSP` transport calculations and gyrokinetic simulations are also presented.

[1]This work was supported by the U.S. Department of Energy under Contract Nos. DE-AC02-76CH03073, DE-FG03-95ER54295, and DE-FG03-99ER54531.

David Smith
PPPL

Date submitted: 21 Jul 2006 Electronic form version 1.4