Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Coherent and Turbulent Fluctuation Measurements on NSTX Using Millimeter-Wave Reflectometry[1] S. KUBOTA, W.A. PEEBLES, N.A. CROCKER, X.V. NGUYEN, PPPL, G.J. KRAMER, D.R. MIKKELSEN, B.P. LEBLANC, R.E. BELL, S.M. KAYE, J.C. HOSEA, J.R. WILSON, M. ONO, PPPL, A. EJIRI, U. of Tokyo — Recently the millimeter-wave reflectometers on NSTX were modified to allow several new measurements of both coherent and turbulent density fluctuations in the core plasma. 1) The 28-40 GHz ($0.97-2.0\times10^{13}$ cm^{-3}, O-mode) correlation reflectometer has been upgraded from homodyne to quadrature detection, which allows the dual-channel system to measure fluctuation levels and poloidal flow in addition to radial correlation lengths. 2) A fixed frequency quadrature channel at 42 GHz (2.2×10^{13} cm^{-3}, O-mode) was been modified for detection of density oscillations associated with the HHFW launched at 30 MHz. Initial measurements show strong modulation of the reflected wave by both turbulent and coherent fluctuations. 3) Improvements to the FM-CW reflectometer (13-53 GHz, $0.2-3.5\times10^{13}$ cm^{-3} for O-mode) now allow 10 μs repetition rates. Radial profile measurements of $\tilde{n}/n$ for fast ion driven modes (EPM's and possibly low-frequency TAE's) are explored.

[1]Supported by U.S. DoE Grant DE-FG03-99ER54527.

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Date submitted: 21 Jul 2006 Electronic form version 1.4