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Measurement and Analysis of Core Turbulence in NSTX[1] S. KUBOTA, W.A. PEEBLES, N.A. CROCKER, X.V. NGUYEN, UCLA, D.R. MIKKELSEN, R.E. BELL, S.M. KAYE, B.P. LEBLANC, G.J. KRAMER, E.J. VALEO, PPPL — Measurements of core turbulence using a homodyne radial correlation reflectometer (26-40 GHZ) and quadrature reflectometers (30, 42, 49 GHz) have been made in NSTX discharges (Ohmic, NB and RF heated L-modes, and Ohmic H-modes) which have peaked low density profiles for good core access. Previous measurements in NB-heated L-mode discharges indicated radial correlation lengths ($L_{\rm cr}$) increasing from $\sim$2 to 10-15 cm over a radius from $\rho\sim$0.7 to 0.4. This range of values is typical for most L-mode discharges observed. However for Ohmic H-mode discharges, a sudden decrease in $L_{\rm cr}$ in the core plasma is seen at the L-H transition. Changes in fluctuation levels and spectra will also be compared with confinement properties determined via TRANSP. Analysis of the reflectometer data will be aided by the use of a fast 2-D full-wave code [E.J. Valeo, G.J. Kramer, R. Nazikian, Plasma Phys. Control. Fusion 44, L1 (2002)]. The long-term goal is a direct comparison between experimental results and turbulence predictions using the nonlinear gyrokinetic simulation code GYRO.

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