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Initial density fluctuation measurements from the NSTX Beam Emission Spectroscopy diagnostic system* D.R. SMITH, R.J. FONCK, G.R. MCKEE, N.L. SCHOENBECK, D. THOMPSON, I.U. UZUN-KAYMAK, UW-Madison, B.C. STRATTON, PPPL — Density fluctuation measurements on the ion gyroscale have been obtained on NSTX with a newly commissioned beam emission spectroscopy (BES) diagnostic system. The BES system measures red-shifted D_α emission near 660 nm from deuterium neutral beams with high throughput optics and high efficiency detectors. The system presently employs 16 detection channels arranged in radial and poloidal arrays, and an expansion to 32 channels is planned. Radial arrays can measure fluctuations from $r/a \approx 0.1$ to beyond the last closed flux surface and resolve fluctuations with $k_\perp \rho_i \leq 1.5$. Initial BES measurements reveal broadband turbulence and coherent modes below 300 kHz for $r/a \geq 0.4$. The broadband turbulence appears in high gradient regions and increases at H-L transitions. The frequency characteristics of the coherent modes correlate with Alfvén/energetic particle modes in Mirnov probe measurements, but some coherent modes appear in BES measurements only. *Supported by the U.S. Department of Energy under Contract Nos. DE-FG02-89ER53296, DE-AC02-09CH11466 and DE-SC0001288.

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