MEASUREMENTS OF ELECTRON TEMPERATURE FLUCTUATIONS AND DENSITY FLUCTUATIONS IN DIII-D AND COMPARISONS TO NONLINEAR GYROKINETIC SIMULATIONS*

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Simultaneous measurements of the turbulent electron temperature and density fluctuations have been performed for the first time at DIII-D in neutral beam heated L-mode plasmas. The rms amplitude and spectra of the electron temperature fluctuations are measured at multiple radial locations using the technique of correlation electron cyclotron emission (CECE) radiometry.[1] Local density fluctuations are measured with beams emission spectroscopy. In neutral beam heated L-mode plasmas, core electron temperature fluctuations in the region $0.5 < r/a < 0.9$ increase with radius from ~0.5% to ~2%, similar to simultaneously measured density fluctuations. The fluctuations levels of these two turbulent fields have been compared with predictions for the turbulence from nonlinear gyrokinetic simulations.[2]

1. G. Cima, *et al.,* Phys. Plasmas **2**, 720, (1995); S. Sattller, *et al.,* Phys. Plasmas **72**, 653 (1994).
2. A.E. White, *et al.,* submitted to Phys. Plasmas (2007),

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