Long-Wavelength Turbulence Scaling Properties in DIII-D\textsuperscript{1} G.R. MCKEE, D.J. SCHLOSSBERG, M.W. SHAFER, University of Wisconsin-Madison, C.H. HOLLAND, University of California-San Diego, P. GOHIL, General Atomics — The scaling properties of long-wavelength density fluctuations are investigated in DIII-D L-mode and H-mode plasmas utilizing the expanded high-sensitivity 2D Beam Emission Spectroscopy (BES) system. BES employs a 64-channel system that utilizes a radially-scannable 8x8 array sampling multiple radial and poloidal correlation lengths, allowing for full sampling of the 2D wavenumber spectrum. Measurements of turbulence as a function of several important dimensionless parameters ($\kappa$, $T_e/T_i$, ion mass, $\rho_*$) are obtained, showing that fluctuation intensity increases strongly with decreasing plasma elongation (at constant $q$), consistent with increased thermal transport and reduced energy confinement. In contrast, increasing $T_e/T_i$ increases momentum and thermal transport with little change in low-$k$ density fluctuations. Measurements obtained during a $\rho_*$ ($\rho_i/a$) scan in hydrogen will also be presented. Together, these measurements will be crucial for comparing with transport simulations, such as GYRO and TGLF.

\textsuperscript{1}Work supported by the US DOE under DE-FG02-89ER53296, DE-FG02-97ER54917, and DE-FC02-04ER54698.

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Date submitted: 18 Jul 2008

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