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**Measuring the Dependence of Turbulence Characteristics and Transport Behavior on $\rho$* Through Dimensionless Scaling Experiment in HL-2A**[1] XIJIE QIN, GEORGE MCKEE, LUCAS MORTON, RAYMOND FONCK, ZHENG YAN, University of Wisconsin-Madison, RUI KE, MIN XU, TING WU, Southwest Institute of Physics, China — The variation of local long wavelength density fluctuation characteristics with $\rho$* are measured with beam emission spectroscopy (BES) in HL-2A plasmas while other dimensionless quantities are held nearly fixed, to examine how turbulence and transport depend on $\rho$*, the dimensionless size parameter. The ion gyroradius is varied while holding other dimensionless parameters ($\beta$, q, $\kappa$, $\nu$, R/a, M_A, T_i/T_e) nearly fixed by varying the toroidal field and plasma current and adjusting input power and density accordingly to match profiles. The normalized density fluctuation amplitude ($\tilde{n}$/n), poloidal and radial correlation lengths, decorrelation time, and poloidal velocity are calculated from a 16 (radial) by 2 (poloidal) channel array of BES density fluctuation measurement over the minor radial range, $\rho$ =0.2-0.8s. Initial results demonstrate localized poloidal velocity flow reversals and variation in correlation properties with $\rho$*. The analysis of turbulence and transport dependence on $\rho$* is aimed at predicting confinement in ITER-like large scale plasmas.

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