Abstract Submitted
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Observation of toroidal variation of density gradients and turbulence in DIII-D with 3D fields during ELM suppression[1] R.S. WILCOX, M.W. SCHAFER, J.M. CANIK, E.A. UNTERBERG, A. WINGEN, ORNL, N.M. FERRARO, PPPL, G.R. MCKEE, UW-MADISON, L. ZENG, T.L. RHODES, UCLA — Significant 3D variation in broadband density fluctuations is observed using beam emission spectroscopy and Doppler backscattering near the boundary of weakly 3D plasmas in DIII-D when non-axisymmetric fields are applied to suppress ELMs. The increase in fluctuations is concomitant with an increase in the density gradient measured using profile reflectometry, suggesting that this toroidally localized density gradient could be a mechanism for turbulence destabilization in localized flux tubes. Although changes to magnetic surface topology are shown to be too small to affect turbulence stability directly, two-fluid M3D-C1 simulations find that there is a significant 3D variation of density within flux surfaces in the pedestal. These modeled local density changes modify the local pressure- and density- gradient scale lengths, and measured turbulence is shown to increase on flux tubes with larger gradients.

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