Abstract Submitted
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Evolution of High-Frequency Turbulence During Limit-Cycle Oscillations on DIII-D[1] J.C. ROST, A. MARINONI, E.M. DAVIS, M. PORKOLAB, MIT, K.H. BURRELL, GA — Limit-cycle oscillations (LCO) can provide insight into the interplay between shear and turbulence in triggering the H-mode transition. The Phase Contrast Imaging (PCI) diagnostic on DIII-D is particularly sensitive to density fluctuations in the highly sheared flow in the H-mode/LCO edge due to sensitivity to finite radial wave number ($k_r \sim k_\theta$) and large bandwidth (10 kHz $<$ f $<$ 2 MHz). Each roughly 1 ms oscillation in the LCO (10s of ms) exhibits a period of highly Doppler shifted, highly sheared turbulence which terminates at a burst of low-f turbulence. As the Doppler backscattering (DBS) diagnostic records a gradual increase in fluctuation amplitude rather than a burst [1], the PCI signal can be explained by a sudden decrease in radial correlation length caused by a burst in zonal flows. Both diagnostics are consistent with results of 1D models [2]. Comparison of LCOs of different durations reveals a threshold-like behavior in mean flow.

[1] L. Schmitz et al., Phy. Rev. Lett. **108**, 155002 (2012).
[2] K. Miki et al, Phys. Plasmas **19**, 092306 (2012)

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