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Self-regulation of turbulence in low rotation DIII-D QH-mode with an oscillating transport barrier[1] KSHITISH BARADA, T. L. RHODES, UCLA, K. H. BURRELL, General Atomics, L. ZENG, UCLA, XI CHEN, General Atomics — We present observations of turbulence and flow shear limit cycle oscillations (LCOs) in wide pedestal QH-mode DIII-D tokamak plasmas (Burrell et al, PoP, 2016) that are consistent with turbulence self-regulation. In this low input torque regime, both edge harmonic oscillations (EHOs) and ELMs are absent. LCOs of ExB velocity shear and $\tilde{n}$ present predator-prey like behavior in these fully developed QH-mode plasmas. During these limit cycle oscillations, the ExB poloidal flows possess a long-range toroidal correlation consistent with turbulence generated zonal flow activity. Further, these limit cycle oscillations are observed in a broad range of edge parameters including n_e, T_e, floor Langmuir probe ion saturation current, and radial electric field E_r. TRANSP calculations of transport indicate little change between the EHO and LCO wide pedestal phases. These observations are consistent with LCO driven transport that may play a role in maintaining the profiles below ELM threshold in the EHO-free steady state wide pedestal QH-mode regime.

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Kshitish Barada
UCLA

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