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Microturbulence, shear and burstiness in basic experimental plasmas S.H. MULLER, C. HOLLAND, G.R. TYNAN, M. XU, Z. YAN, J.H. YU, UCSD Center for Energy Research, La Jolla, CA 92093, A. FASOLI, I. FURNO, B. LABIT, M. PODESTA, CRPP EPFL, 1015 Lausanne, Switzerland — We present basic experimental studies of the interplay between microturbulence, shear flow and plasma bursts. On the linear devices CSDX and LAPD, a shear layer (SL) is found to develop in the transition region between the core and edge plasma. Multi-tip Langmuir-probe (LP) measurements on CSDX support the idea that the effective Reynolds stress (RS) of microscopic fluctuations acts as a momentum transport mechanism, which sustains the shear layer. On LAPD, wall biasing is used to study the response of the RS-SL system to an external momentum source. Both on CSDX and on the toroidal device TORPEX, radial plasma bursts are observed to occur intermittently. In both cases, the bursts are found to originate from large wave crests of a dominant coherent mode that is subject to a background sheared flow. On TORPEX, the distortion of wave crests leading to the detachment of blobs is directly visualized using an 86-tip LP array. The dynamical and transport properties of these blobs are characterized quantitatively and striking similarities with tokamak observations are reported. These results suggest that gradient-driven drift turbulence can drive large-scale shear flows which, in turn, mediate the birth of bursty events.

[ ] Prefer Oral Session
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