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Characterization of intermittent divertor filaments in L-mode discharges in NSTX and NSTX-U[1] F. SCOTTI, LLNL, R.J. MAQUEDA, X-Science LLC, V.A. SOUKHANOVSKII, LLNL, S. ZWEBEN, PPPL — Divertor filaments due to intermittent fluctuations are studied in L-mode discharges in NSTX and NSTX-U to understand transport due to edge blobs and their role in the divertor particle fluxes. In diverted Ohmic L-mode NSTX discharges, intermittent filaments on the divertor target were imaged via neutral lithium emission with frame rates up to 200 kHz and ≤ 1 cm resolution. Broadband fluctuations up to 20-50% in RMS/mean are observed between $\Psi_N \sim 1.02$ and 1.3. Spiral-shaped divertor correlation regions are observed up to $\Psi_N \sim 1.02$ and extend for over a toroidal turn. The spiral motion of the filaments at the target is consistent with a radial and poloidal downward motion upstream as previously observed in NSTX H-mode discharges. Divertor filaments are correlated with midplane blobs measured by the gas puff imaging diagnostic. The cross-correlation with midplane blobs is observed to peak at zero delay at every radius, with values up to 0.8 in the far SOL and decreasing to 0.4 at $\Psi_N \sim 1.05$. In NSTX-U, a more sensitive camera with optimized throughput allowed divertor turbulence imaging using C III emission at up to f= 100 kHz, enabling the study of filament dynamics along the inner and outer divertor legs in NBI-heated L-mode discharges.

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F. Scotti
LLNL

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