Abstract Submitted
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Coherent boundary density fluctuations in DIII-D advanced tokamak hybrid plasmas[1] RONGJIE HONG, TERRY RHODES, WILLIAM PEEBLES, KSHITISH BARADA, University of California, Los Angeles, HUIQIAN WANG, General Atomics, DIII-D TEAM — Turbulent transport into the scrape-off layer (SOL) results in enhanced plasma-wall interactions which could impact the performance of advanced tokamak fusion plasmas. Coherent density fluctuations have been observed by Doppler backscattering systems in the scrape-off layer (SOL) region of advanced tokamak (AT) hybrid plasmas in the DIII-D tokamak. These coherent fluctuations occur between ELMs, and are associated with a step-like density profile at the separatrix, as well as high pedestal temperature, i.e. $T_e^{\rm ped} > 1000$ eV. The coherent fluctuations have a mean frequency of $f_0 \sim 2000$ kHz and wavenumbers of $k_\perp \sim 4 - 5$ rad/cm. As these SOL density modes burst, fluctuations of pedestal density and divertor ion saturation currents increase correspondingly. This suggests that these coherent SOL fluctuations play a role in the boundary transport and power deposition in high-β AT-class plasmas, thus strongly motivating further work.

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