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Identification of a localized core mode in a helicon plasma DANIEL A. GREEN, Swarthmore College, Swarthmore, PA 19081, USA, SAIKAT CHAKRABORTY THAKUR, Center for Energy Research, University of California San Diego, La Jolla, CA 92093, USA, GEORGE R. TYNAN, Department of Mechanical and Aerospace Engineering and Center for Energy Research, University of California San Diego, La Jolla, CA 92093, USA, ADAM D. LIGHT, Swarthmore College, Swarthmore, PA 19081, USA — We present imaging measurements of a newly observed mode in the core of the Controlled Shear Decorrelation Experiment - Upgrade (CSDX-U). CSDX-U is a well-characterized linear machine producing dense plasmas relevant to the tokamak edge ($T_e \sim 3 \text{ eV}, n_e \sim 10^{13}/\text{cc}$). Typical fluctuations are dominated by electron drift waves, with evidence for Kelvin-Helmholtz vortices appearing near the plasma edge. A new mode has been observed using high-speed imaging that appears at high magnetic field strengths and is confined to the inner third of the plasma column. A cross-spectral phase technique allows direct visualization of dominant spatial structures as a function of frequency. Experimental dispersion curve estimates are constructed from imaging data alone, and allow direct comparison of theoretical dispersion relations to the observed mode. We present preliminary identification of the mode based on its dispersion curve, and compare the results with electrostatic probe measurements.

> Adam Light Swarthmore College

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