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Comparison of imaging and probe measurements in a linear plasma column[1] A.D. LIGHT, Earlham College, S.C. THAKUR, C. BRANDT, University of California, San Diego, Y. SECHREST, University of Colorado Boulder, G.R. TYNAN, T. MUNSAT, University of California, San Diego — The advent of fast imaging diagnostics, which provide two-dimensional measurements on relevant plasma time scales, has proven invaluable for interpreting plasma dynamics in laboratory devices. Despite its success, imaging remains a qualitative aid for many studies, because intensity cannot often be mapped onto a single physical variable for use in a theoretical model. This study explores the relationship between visible-light and electrostatic probe measurements in the Controlled Shear Decorrelation Experiment (CSDX). CSDX is a well-characterized linear machine producing dense plasmas relevant to the tokamak edge ($T_e \sim 3$ eV, $n_e \sim 10^{13}$/cc). Visible light from ArI and ArII line emission is collected at high frame rates using a fast digital camera. Floating potential and ion-saturation current are measured by an array of electrostatic probe tips. We construct a detailed comparison between imaging and probe measurements of fluctuations, including temporal, spatial, and spectral properties. In addition, we combine probe and imaging techniques to identify modes in a multi-instability regime.

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