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Cross-diagnostic comparison of fluctuation measurements in a cylindrical argon plasma ADAM LIGHT, Swarthmore College, SAIKAT CHAKRABORTY THAKUR, GEORGE TYNAN, 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 is difficult to map onto a single physical variable for use in a theoretical model. This work continues our exploration of the relationship between visible-light imaging and other diagnostics in the Controlled Shear Decorrelation Experiment (CSDX). CSDX is a well-characterized linear machine producing dense plasmas relevant to the tokamak edge ($T_e \sim 5$ 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, and average profiles of ion temperature and velocity are obtained using laser-induced fluorescence (LIF). We present a detailed comparison between these measurements, including temporal, spatial, and spectral properties in various operational regimes.

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