Abstract Submitted
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Spatial-mode Analysis of Blast-wave-driven Hydrodynamic-instability Growth[1] M. KLONOWSKI, College of Wooster, M. MANUEL, General Atomics, B. ALBERTAZZI, M. KOENIG, P. MABEY, T. PIKUZ, G. RIGON, Laboratoire Pour Lutilisation Des Lasers Intenses, A. CASNER, V. BOUFFETIER, Centre Lasers Intenses Et Applications — Hydrodynamic instabilities in fluids are a heavily studied phenomenon, and in plasmas this topic remains a comparatively lighter research area due to its additional complexity. Hydrodynamic instabilities can cause energy cascades to smaller spatial scales via turbulent behavior. The transition to turbulent behavior in plasmas is important in many astrophysical objects, such as supernova remnants (SNRs). While SNRs provide beautiful illustrations of plasma turbulence, laser-driven shock-tube experiments enable a more practical approach due to their controlled manner. Experiments using the X-ray Free Electron Microscope (XFEL) at the Spring-8 Angstrom Compact free electron LAser (SACLA) in Japan allow for significant resolution enhancement of high energy density (HED) plasma images compared to previous radiographic techniques. These high resolution images allow for a more precise analysis of plasma motion down to an approximately 1um spatial scale. Spatial-mode analysis of experimental data will be shown and discussed as it relates to classical turbulence theory.

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