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Investigation of the evolution of modulated radiative blast waves created by high intensity laser - cluster interaction H.J. QUEVEDO, I.T. KIM, W. BANG, D.R. SYMES, J. OSTERHOFF, R. FAUSTLIN, M. MAURER, A.C. BERNSTEIN, TCHILS - The University of Texas at Austin, A.S. MOORE, E.T. GUMBRELL, AWE pcl, A.D. EDENS, Sandia National Laboratories, R.A. SMITH, T. DITMIRE, TCHILS - The University of Texas at Austin — Radiative blast waves exhibiting instabilities are common and play an important role in astrophysics. Certain aspects of these astrophysical waves can be reproduced in suitably designed laboratory experiments. Previous laboratory experiments have shown that blast waves can be created from intense laser-cluster interactions and the evolution of these waves in high Z cluster gases is radiative, with trajectories that deviate from an adiabatic Sedov-Taylor expansion. With this approach, we have been studying the evolution of hydrodynamic perturbations on cylindrical blast waves in the radiative regime. In our experiment, cylindrical blast waves are generated by high intensity irradiation of an argon cluster jet. The blast waves' spatial profile is modified by initially destroying clusters in specific locations using another laser pulse. This modulation then becomes the seed to study the variation in the perturbations' amplitude. We observe some initial evidence for the oscillatory behavior predicted by the Vishniac model of perturbations on thin shell blast waves.

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