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Blast-Wave Generation and Propagation in Rapidly Heated Laser-Irradiated Targets S.T. IVANCIC, C.R. STILLMAN, P.M. NILSON, A.A. SOLODOV, D.H. FROULA, Laboratory for Laser Energetics, U. of Rochester — Time-resolved extreme ultraviolet (XUV) spectroscopy was used to study the creation and propagation of a >100-Mbar blast wave in a target irradiated by an intense ($> 10^{18}$ W/cm^2) laser pulse. Blast waves provide a platform to generate immense pressures in the laboratory. A temporal double flash of XUV radiation was observed when viewing the rear side of the target, which is attributed to the emergence of a blast wave following rapid heating by a fast-electron beam generated from the laser pulse. The time-history of XUV emission in the photon energy range of 50 to 200 eV was recorded with an x-ray streak camera with 7-ps temporal resolution. The heating and expansion of the target was simulated with an electron transport code coupled to 1-D radiation–hydrodynamics simulations. The temporal delay between the two flashes measured in a systematic study of target thickness and composition was found to evolve in good agreement with a Sedov–Taylor blast-wave solution.
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