Explosively driven two-shockwave tools with application to ejecta formation at the Los Alamos National Laboratory Proton Radiography Facility
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We present the development of an explosively driven physics tool to generate two mostly uniaxial shockwaves. The tool is being used to extend single shockwave ejecta models to a subsequent shockwave event separated by a time interval on the order of a few microseconds. We explore the possibility of varying the amplitude of both the first and second shockwaves, and we apply the tool in experimental geometries on Sn with a surface roughness of $R_a = 0.8\mu m$. We then evaluate the tool further at the Los Alamos National Laboratory Proton Radiography (pRad) Facility in an application to Sn with larger scale perturbations of wavelength 550μm, and various amplitudes that gave wave-number amplitude products of $\eta_0 2\pi/\lambda = \{3/4, 1/2, 1/4, 1/8\}$, where the perturbation amplitude is $\eta_0$, and the wave-number $k = 2\pi/\lambda$. The pRad data and velocimetry imply it should be possible to develop a second shock ejecta model based on unstable Richtmyer-Meshkov physics.

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