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Abstract Submitted
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Simulations and experiments of ejecta generation in twice-shocked metals[1] VARAD KARKHANIS, PRAVEEN RAMAPRABHU, University of North Carolina, Charlotte, WILLIAM BUTTLER, JAMES HAMMERBERG, FRANK CHERNE, MALCOLM ANDREWS, Los Alamos National Laboratory, New Mexico — Using continuum hydrodynamics embedded in the FLASH code, we model ejecta generation in recent target experiments [1], where a metallic surface was loaded by two successive shock waves. The experimental data were obtained from a two-shockwave, high-explosive tool at Los Alamos National Laboratory, capable of generating ejecta from a shocked tin surface in to a vacuum. In both simulations and experiment, linear growth is observed following the first shock event, while the second shock strikes a finite-amplitude interface leading to nonlinear growth. The timing of the second incident shock was varied systematically in our simulations to realize a finite-amplitude re-initialization of the RM instability driving the ejecta. We find the shape of the interface at the event of second shock is critical in determining the amount of ejecta, and thus must be used as an initial condition to evaluate subsequent ejected mass using a source model[2]. In particular, the agreement between simulations, experiments and the mass model is improved when shape effects associated with the interface at second shock are incorporated. [1] W. T. Buttler et al., J. Appl. Phys., 116 (2014). [2] F.J. Cherne et al., J. Appl. Phys., 118, 185901 (2015).

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Varad Karkhanis
University of North Carolina, Charlotte

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