

Abstract Submitted  
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**Results of the first same-sided successive-shock HED instability experiments**<sup>1</sup> E.C. MERRITT, C.A. DI STEFANO, F.W. DOSS, K.A. FLIPPO, H. ROBEY, R. SACKS, D.W. SCHMIDT, L. KOT, T. PERRY, Los Alamos Natl Lab — The presence of multiple shocks interacting with multiple material interfaces is ubiquitous in ICF, but is often poorly validated in these complex systems. The LANL NIF MShock campaign is developing a capability to study RM/RT growth in the multiple layer, multiple-shock regime. We recently demonstrated the novel ability to generate two successive shocks from the same direction in a planar target. Successive shock interaction with an interface has unique outcomes, compared to traditional reshock, which have never been experimentally isolated. The relative direction of the shock to the interface density gradient affects the direction of vorticity deposition and controls the possibility of interface phase inversion. Across all parameters, successive shocks span from the simplest physics of multiple shocks (no phase inversions and co-directional vorticity addition) to the most complicated dynamics (two phase inversions and counter-acting vorticity deposition). We present results of the first experiments studying successive shock interaction with a single perturbed interface. Initial experiments with two cases of different  $A/\lambda$  show observed perturbation growth matches predictions that post-2nd shock the smaller  $A/\lambda$  case re-inverts and the larger  $A/\lambda$  case continues to grow.

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Elizabeth Merritt  
Los Alamos Natl Lab

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