

Abstract Submitted  
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**Visualizing Perturbation Decay in Shocked Granular Materials**

MARCIA COOPER, TRACY VOGLER, Sandia National Laboratories — A new experiment continuously visualizing shock wave perturbation decay through an increasing thickness of granular material has been tested with a gas gun. The experiment confines powders of either tungsten carbide or cerium oxide into a wedge geometry formed by tilting the downstream observation window, plated with a reflective aluminum film, at a shallow angle from the driver plate. The driver is machined with a sinusoidal wavy pattern for incident shock wave perturbation. After projectile impact, the perturbed shock wave passes through the granular material, first emerging at the wedge toe. Image sequences collected at 5 MHz of reflectivity loss at the plated window-granular material interface capture the spatial variation in wave propagation with increasing sample thickness. Extracting the evolving wavy pattern from the images determines the temporal perturbation amplitude. The data are compared to continuum and mesoscale simulations in normalized terms of perturbation amplitude and wavelength. Sandia National Laboratories is a multi-mission laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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