

Abstract Submitted
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Ejecta particle size measurements for shocked Sn targets based on the Mie scattering technique TODD HAINES, SHABNAM MONFARED, MARTIN SCHAUER, Los Alamos Natl Lab — Los Alamos National Laboratory is actively engaged in material failure research. The goal of these studies is to support development of hydrodynamic models, where an important failure mechanism of explosively shocked metals causes mass ejection from perturbations on the shocked surface. While we have had success developing ejecta mass and velocity models, better data on the size and velocity distributions of the ejected mass is needed. To support size measurements we are developing an affordable technique based on the scattering of a monochromatic light using inexpensive fiber optics and a single diode laser. In this presentation, we will discuss static test experiments on polystyrene particles of known size designed to test the precision and reproducibility of the method. We will also present results from experiments performed on the 0.99995 purity Sn targets shocked to loading pressure of about 27 GPa. Results from the fielded dynamic experiments based on the transmitted and scattered intensities from ejecta clouds are in reasonable agreement and yield estimated average particle sizes in the range of 1-5 μm .

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