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Constraining ejecta particle size distributions with light scattering MARTIN SCHAUER, WILLIAM BUTTLER, Los Alamos Natl Laboratory, DANIEL FRAYER, National Security Technologies-LAO, MICHAEL GROVER, BRANDON LALONE, National Security Technologies-STL, SHABNAM MONFARED, DANIEL SORENSON, Los Alamos Natl Laboratory, GERALD STEVENS, WILLIAM TURLEY, National Security Technologies-STL — The angular distribution of the intensity of light scattered from a particle is strongly dependent on the particle size and can be calculated using the Mie solution to Maxwell's equations. For a collection of particles with a range of sizes, the angular intensity distribution will be the sum of the contributions from each particle size weighted by the number of particles in that size bin. The set of equations describing this pattern is not uniquely invertible, i.e. a number of different distributions can lead to the same scattering pattern, but with reasonable assumptions about the distribution it is possible to constrain the problem and extract estimates of the particle sizes from a measured scattering pattern. We report here on experiments using particles ejected by shockwaves incident on strips of triangular perturbations machined into the surface of tin targets. These measurements indicate a bimodal distribution of ejected particle sizes with relatively large particles (median radius 2-4 μm) evolved from the edges of the perturbation strip and smaller particles (median radius 200-600 nm) from the perturbations. We will briefly discuss the implications of these results and outline future plans.

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