Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Study of the links between surface perturbation parameters and shock-induced mass ejection SHABNAM MONFARED, WILLIAM BUTTLER, Los Alamos National Laboratory, LALONE BRANDON, Special Technologies Laboratory, DAVID ORO, CORA PACK, MARTIN SCHAUER, Los Alamos National Laboratory, GERALD STEVENS, Special Technologies Laboratory, JOSEPH STONE, Los Alamos National Laboratory, LOS ALAMOS NATIONAL LABORATORY TEAM, SPECIAL TECHNOLOGIES LABORATORY COLLABORATION
— Los Alamos National Laboratory is actively engaged in the study of material failure physics to support development of the hydrodynamic models. Our supporting experiments focus on the failure mechanisms of explosively shocked metals that causes mass ejection from the backside of a shocked surface with perturbations. Ejecta models are in development for this situation. Our past work has clearly shown that the total ejected mass and mass-velocity distribution sensitively links to the wavelength and amplitude of these perturbations. In our most recent efforts, we studied the link between amount of tin ejecta and surface perturbation parameters. Our ejecta measurements utilized soft x-radiography and piezoelectric pins to quantitatively determine the amount of ejected mass. Results from these analysis techniques were in remarkably good agreement. In addition, optical shadowgraphy and laser Doppler velocimetry were used to identify any symmetry imperfections as well as fast ejecta and free surface velocities. We also compared our recent results with some earlier measurements. Within each set, amount of ejecta is predictable based on surface parameters. We relate minor differences between the results of our previous and current experiments partially to different surface cuts used.

Shabnam Monfared
Los Alamos National Laboratory

Date submitted: 13 Nov 2013 Electronic form version 1.4