Abstract Submitted
for the SHOCK17 Meeting of
The American Physical Society

Simulations of the DAXUMM and DAX Experiments GERRIT SUTHERLAND, U.S. Army Research Laboratory, MATTHEW BISS, Los Alamos National Laboratory — The U.S. Army Research Laboratory uses small-scale experiments to determine explosive properties (detonation pressure and velocity) using a minimal amount of material. The disk acceleration experiment (DAX) [1] uses an end detonated cylindrical explosive charge in which a velocity of a thin metal plate affixed to the opposing end is measured with a photonic Doppler velocimeter. In contrast, the disk acceleration experiment utilizing minimal material (DAXUMM) [2] uses a centrally detonated mostly spherical charge with a flat region formed on the sphere. Like the DAX, a thin metal plate is affixed to the flat region. From methods of Lorenz [1] and Biss [3] features of the velocity records can be used to determine detonation pressure and velocities. Simulations are presented that show the following. First, simulations predict the differences in the plate velocity histories between the two configurations and will be compared to experiments. Second, the simulations predict the response of each test if a non-ideal explosive (large reaction zone) is used. The presence of a large reaction zone is speculated to affect the velocity histories. Finally, the simulations will predict the effect of unfilled or filled voids (mineral oil) adjacent to the metal plate. Such voids are speculated to be present during some experiments and to have altered results. [1] Lorenz, K. T, et al. Propellants, Explosives, Pyrotechnics 40.1 (2015): 95-108. [2] Biss, M. et al. APS Shock Compression of Condensed Matter Meeting Abstracts. Vol. 1. 2015. [3] Biss, M. " Propellants, Explosives, Pyrotechnics 38.4 (2013)

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Date submitted: 23 Feb 2017 Electronic form version 1.4