Abstract Submitted
for the SHOCK11 Meeting of
The American Physical Society

A Study of Energy Partitioning Using A Set of Related Explosive Formulations MARK LIEBER, JOSEPH C. FOSTER, JR., University of Illinois/Urbana-Champaign, D. SCOTT STEWART, University of illinois/Urbaan-Champaign — Condensed phase high explosives convert potential energy stored in the electro-magnetic field structure of complex molecules to kinetic energy during the detonation process. This energy is manifest in the internal thermodynamic energy and the translational flow of the products. Historically, the explosive design problem has focused on intramolecular stoichiometry providing prompt reactions based on transport physics at the molecular scale. Modern material design has evolved to approaches that employee intermolecular ingredients to alter the spatial and temporal distribution of energy release. CHEETA has been used to produce data for a set of fictitious explosive formulations based on C-4 to study the partitioning of the available energy between internal and flow energy in the detonation. The equation of state information from CHEETA has been used in ALE3D to develop an understanding of the relationship between variations in the formulation parameters and the internal energy cycle in the products.

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Date submitted: 23 Mar 2011 Electronic form version 1.4