Abstract Submitted
for the SHOCK17 Meeting of
The American Physical Society

Probing Dynamic Processes in Explosives and Propellants – Science Issues DAVID MOORE, Los Alamos National Laboratory — Recent experiments on advanced light sources have started to unravel some of the micromechanical behavior of single crystal energetic materials, including void collapse under shock loading and inter-granular failure. These examples just scratch the surface of many extant explosives science issues, which could be elucidated with advanced XFEL-type resources. These include such diverse questions as: How do powders actually compact and what are the spatially and temporally resolved temperature and flow fields generated (especially two-phase flows)? Are there polymorphic effects (if so, how are they spatially distributed)? What are the strain fields during compaction? What happens near surfaces, especially for composite explosives? How is mechanics coupled to chemistry? What are hot spots really? I will provide some history behind these and other questions and point towards how future experiments might be designed to provide some answers.

David Moore
Los Alamos National Laboratory

Date submitted: 31 Jan 2017 Electronic form version 1.4