

Abstract Submitted  
for the SHOCK05 Meeting of  
The American Physical Society

**Measurements of the DDT Process in Laser and Exploding Bridgewire Detonators** ERIC MARTIN, KEITH THOMAS, STEVEN CLARKE, Los Alamos National Laboratory, D. SCOTT STEWART, University of Illinois, HEATHER MALLETT, JAMES KENNEDY, ALAN MUNGER, Los Alamos National Laboratory — The deflagration-to-detonation transition of low density (0.88 g/cc) PETN during initiation by both an exploding bridgewire and laser driven source is being studied using both laser interferometry and streak photography. Cutback experiments using VISAR have confirmed a 1.0 mm run-distance to detonation in low density PETN powder. In a detonation system using a combination of low and high density powders, an apparent center of initiation (COI) analysis of streak data has yielded a surprisingly similar result. This data suggests that a compaction of low density powder to near theoretical maximum density (TMD) occurs before the onset of detonation, which is consistent with work done previously.<sup>1</sup> Additionally, data analysis shows that although function time increases significantly with decreasing firing voltage, the apparent COI changes very little. This indicates that the detonation criteria is not dependant upon the rate of deflagration, but on a volume of material that must be burned in a confined space to create the critical pressure needed at the compaction front. 1. M.J. Gifford, K. Tsembeles, & J.E. Field, *J. Appl. Phys.* 91, 4995 (2002).

Keith Thomas  
Los Alamos National Laboratory

Date submitted: 08 Apr 2005

Electronic form version 1.4