

Abstract Submitted  
for the SHOCK05 Meeting of  
The American Physical Society

**Proton Radiography Observations of the Failure of a Detonation Wave to Propagate to the End of a Conical Explosive Charge** ERIC N. FERM, FESSEHA G. MARIAM, Los Alamos National Laboratory, LANSCE PROTON RADIOGRAPHY TEAM — Failure diameter is a well-known property of explosive materials, being the critical diameter below which a steady detonation wave will not be able to support itself and ultimately fails to propagate. A detonation wave traveling down a uniform cylindrical charge larger than its critical diameter will reach a steady detonation velocity which is a function of the diameter of the explosive as well as other material properties, notably density and temperature. In this work, we use proton radiography to study the propagation of detonations down conical PBX 9502 charges beginning at diameters larger than failure diameter and ending at diameters much smaller than failure diameter. Experiments show cases where complete detonation of the cone occurs as well as cases where failure is observed significantly before the end of the cone and significant portions of the charge remain unreacted. Wave velocities and densities are obtained from the multiple image proton radiography experiments and compared with failure diameter effect curves for PBX 9502.

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Date submitted: 08 Apr 2005

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