

Abstract Submitted  
for the SHOCK05 Meeting of  
The American Physical Society

**The Shock Response and Microstructural Determination of an Inert Simulant** S.A. MACDONALD, N.K. BOURNE, P.J. WITHERS, University of Manchester, J.C.F. MILLETT, Cranfield University, A.M. MILNE — The resolution of details of the microstructure in a polymer matrix composite has important applications in addressing safety issues in energetic materials. The generation of three-dimensional microstructure, using a non-invasive method of high resolution will advance knowledge in a range of fields. A series of inert composites have been studied with microstructure analogous to that of plastic bonded explosives (PBXs). The experimental aims of this study lay in several areas. Firstly, adequately defining the bulk morphology. Secondly in determining the geometry of defects that might lead to sites for accidental ignition within the material. Finally in demonstrating a direct linkage into the finite element prediction of mechanical response. The study included investigation of materials selected to firstly test the resolution limits of the X-ray microtomography equipment, but also since a parallel series of shock experiments (with associated modelling) was conducted. This work is the first step in providing a coordinated capability to understand accidental ignition within insensitive high explosives (IHEs).

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Date submitted: 08 Apr 2005

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