

Abstract Submitted
for the SHOCK15 Meeting of
The American Physical Society

Synchrotron hard X-ray imaging of shock-compressed metal powders¹ MICHAEL E. RUTHERFORD, DAVID J. CHAPMAN, MARK A. COLLINSON, DAVID R. JONES, JASMINA MUSIC, SAMUEL J.P. STAFFORD, GARETH R. TEAR, THOMAS G. WHITE, JOHN B.R. WINTERS, Institute of Shock Physics, Blackett Laboratory, Imperial College London, London, UK SW7 2BW, MICHAEL DRAKOPOULOS, Diamond Light Source, Beamline I12 (JEEP), Didcot, Oxfordshire, UK OX11 0DE, DANIEL E. EAKINS, Institute of Shock Physics, Blackett Laboratory, Imperial College London, London, UK SW7 2BW — This poster will present the application of a new, high-energy (50 to 250 keV) synchrotron X-ray radiography technique [1] to the study of shock-compressed granular materials. Following plate-impact loading, transmission radiography was used to quantitatively observe the compaction and release processes in a range of high-Z metal powders (e.g. Fe, Ni, Cu). By comparing the predictions of 3D numerical models initialized from X-ray tomograms—captured prior to loading—with experimental results, this research represents a new approach to refining mesoscopic compaction models.

[1] D. E. Eakins and D. J. Chapman, Review of Scientific Instruments 85, 123708 (2014).

¹The authors gratefully acknowledge the ongoing support of Imperial College London, EPSRC, STFC and the Diamond Light Source, and AWE Plc.

Michael Rutherford
Imperial College London

Date submitted: 27 Jan 2015

Electronic form version 1.4