

Abstract Submitted
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Single Hit Energy-resolved Laue Diffraction SHAMIM PATEL, MATTHEW SUGGIT, PAUL STUBLEY, University of Oxford, JAMES HAWRELIAK, Lawrence Livermore National Laboratory, ORLANDO CIRICOSTA, University of Oxford, ANDREW COMLEY, AWE, GILBERT COLLINS, JON EGGERT, Lawrence Livermore National Laboratory, JOHN FOSTER, AWE, JUSTIN WARK, University of Oxford, ANDREW HIGGINBOTHAM, University of York — In-situ white light Laue diffraction is a technique to interrogate the structure of materials undergoing dynamic compression up to megabar pressures. We present an extension to the existing Laue diffraction platform in which CCD cameras are used in single photon mode enabling a measurement of the energy of a subset of diffraction peaks. Careful choice of which diffraction peaks are observed allows for a measurement of the longitudinal and transverse strains. This allows for the measurement of absolute volume of the unit cell in addition to its aspect ratio. We present results for silicon, where only longitudinal elastic strain has been observed. VISAR measurements show the presence of a two wave structure and measurements made from the diffraction patterns on the CCD show that material downstream of the second wave does not contribute to the observed diffraction peaks, suggesting that this material may be highly disordered, or has undergone large scale rotation.

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