Abstract Submitted
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High-resolution imaging of a shock front in plastic by phase contrast imaging at LCLS[1] M. BECKWITH, S. JIANG, Y. ZHAO, Lawrence Livermore National Lab, A. SCHROPP, Deutsches Elektronen-Synchrotron DESY, A. FERNANDEZ-PANELLA, H. G. RINDERKNECHT, S. WILKS, K. FOURNIER, Lawrence Livermore National Lab, E. GALTIER, Z. XING, E. GRANADOS, E. GAMBOA, S. H. GLENZER, P. HEIMANN, SLAC National Accelerator Laboratory, U. ZASTRAU, European XFEL, B. I. CHO, Gwangju Institute of Science and Technology, J. H. EGGERT, G. W. COLLINS, Y. PING, Lawrence Livermore National Lab — Understanding the propagation of shock waves is important for many areas of high energy density physics, including inertial confinement fusion (ICF) and shock compression science. In order to probe the shock front structures in detail, a diagnostic capable of detecting both the small spatial and temporal changes in the material is required. Here we show the experiment using hard X-ray phase contrast imaging (PCI)[1] to probe the shock wave propagation in polyimide with submicron spatial resolution. The experiment was performed at the Matter in Extreme Conditions (MEC) endstation of the Linac Coherent Lightsource (LCLS). PCI together with the femtosecond time scales of x-ray free electron lasers enables the imaging of optically opaque materials that undergo rapid temporal and spatial changes. The result reveals the evolution of the density profile with time. 1. M. A. Beckwith, S. Jiang, A. Schropp et al, Rev. Sci. Instrum. 88, 053501 (2017)

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