Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

The Simultaneous Combination of Phase Contrast Imaging with In Situ X-ray diffraction from Shock Compressed Matter EMMA ELIZABETH MCBRIDE, FRANK SEIBOTH, SLAC National Accelerator Laboratory, LEORA COOPER, MIT, MUNGO FROST, SLAC National Accelerator Laboratory, SEBASTIAN GOEDE, European XFEL, MARION HARMAND, IMPMC, ABE LEVITAN, SLAC National Accelerator Laboratory, DAVID MCGONEGLE, University of Oxford, KOHEI MIYANISHI, NORIMASA OZAKI, Osaka University, MELANIE ROEDEL, HZDR, PEIHAO SUN, SLAC National Accelerator Laboratory, JUSTIN WARK, University of Oxford, JERRY HASTINGS, SIEGFRIED GLENZER, LUKE FLETCHER, SLAC National Accelerator Laboratory — Here, we present the simultaneous combination of phase contrast imaging (PCI) techniques with in situ X-ray diffraction to investigate multiple-wave features in laser-driven shock-compressed germanium. Experiments were conducted at the Matter at Extreme Conditions end station at the LCLS, and measurements were made perpendicular to the shock propagation direction. PCI allows one to take femtosecond snapshots of magnified real-space images of shock waves as they progress though matter. X-ray diffraction perpendicular to the shock propagation direction provides the opportunity to isolate and identify different waves and determine the crystal structure unambiguously. Here, we combine these two powerful techniques simultaneously, by using the same Be lens setup to focus the fundamental beam at 8.2 keV to a size of 1.5 mm on target for PCI and the 3rd harmonic at 24.6 keV to a spot size of 2 um on target for diffraction.

Emma Elizabeth McBride
SLAC National Accelerator Laboratory

Date submitted: 17 Jul 2017 Electronic form version 1.4