Abstract Submitted
for the SHOCK17 Meeting of
The American Physical Society

Configuring and Characterizing X-Rays for Laser-Driven Compression Experiments at the Dynamic Compression Sector[1] Y. LI, Washington State University, D. CAPATINA, K. D'AMICO, Argonne National Laboratory, P. ENG, University of Chicago, J. HAWRELIAK, T. GRABER, D. RICKERSON, J. KLUG, P. A. RIGG, Y. M. GUPTA, Washington State University — Coupling laser-driven compression experiments to the x-ray beam at the Dynamic Compression Sector (DCS) at the Advanced Photon Source (APS) of Argonne National Laboratory requires state-of-the-art x-ray focusing, pulse isolation, and diagnostics capabilities. The 100J UV pulsed laser system can be fired once every 20 minutes so precise alignment and focusing of the x-rays on each new sample must be fast and reproducible. Multiple Kirkpatrick-Baez (KB) mirrors are used to achieve a focal spot size as small as 50μm at the target, while the strategic placement of scintillating screens, cameras, and detectors allows for fast diagnosis of the beam shape, intensity, and alignment of the sample to the x-ray beam. In addition, a series of x-ray choppers and shutters are used to ensure that the sample is exposed to only a single x-ray pulse ($\sim$80ps) during the dynamic compression event and require highly precise synchronization. Details of the technical requirements, layout, and performance of these instruments will be presented.

[1]Work supported by DOE/NNSA

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Date submitted: 24 Feb 2017 Electronic form version 1.4