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Real time x-ray diffraction measurements in shocked solids at the Advanced Photon Source Y.M. GUPTA, S.J. TURNEAURE, K. PERKINS, K. ZIMMERMAN, Washington State University, C.S. YOO, G.W. COLLINS, Lawrence Livermore National Laboratory, G. SHEN, Carnegie Institute of Washington — The Advanced Photon Source provides a number of benefits (high photon numbers, pulsed time structure, and flexible beam properties) to examine the real time x-ray diffraction response of shocked crystals. However, shock wave experiments at a synchrotron facility pose a number of operational challenges, including the coupling of a shock wave driver to the beam line, and appropriate synchronization/gating of detectors. This talk will describe experimental plans and developments underway to utilize either a monochromatic or white beam for x-ray measurements in shocked solids. A compact launcher to achieve impact velocities of ∼1km/s will be presented. Results of ambient measurements, in preparation for the shock experiments planned this summer, will be presented. Work supported by DOE.

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