

XP-Double-D: Planned COMPRES Multi-Anvil Facility at Beamline XPD-D at NSLS-II

Whitaker, Matthew L.; Baldwin, Kenneth J.; Huebsch, William B.; Vaughan, Michael T.; Weidner, Donald J.

In September, 2014, the long-running high-pressure facilities at the National Synchrotron Light Source were shut down as the synchrotron was decommissioned. In response to this loss of experimental capabilities, the COMPRES-funded multi-anvil program was split into two to take advantage of new opportunities at the Advanced Photon Source and NSLS-II. While the facility at APS (beamline 6-BM-B) has already come online and is available to users, the new facility at NSLS-II is still in the process of being built out. This presentation will focus the multi-anvil techniques and capabilities that will be available at the new XPD-D facility at NSLS-II.

XP-Double-D is an insertion device beamline at Sector 28 (28-ID-1-D) of NSLS-II with a 1.8 T damping wiggler source. This beamline has a 1000-ton hydraulic press (Three-B) installed which will be equipped with a DT-25 pressure module (differential Kawai geometry). This module can be swapped out for a D-DIA module as desired. XP-Double-D operates in monochromatic beam mode with a Laue-Laue Si(111) monochromator that can tune the beam energy from 30-70keV. The mono X-ray beam will be used to collect both angular dispersive X-ray diffraction data and X-radiographic imaging. A Perkin-Elmer area detector with a 200um pixel size will be used for the collection of X-ray diffraction data, while a Prosilica CCD camera will be focused on a scintillating YAG crystal that will provide us with direct imaging of the samples in our experiments. Work planning, controls development, and equipment installation for this new facility are already underway, and the first commissioning of the press is expected to begin in late 2016.