

MAXPD: COMPRES Multi-Anvil Facility at Beamline XPD-D at NSLS-II

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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 commissioning phase. This presentation will focus the multi-anvil techniques and capabilities that will be available at the new MAXPD (Multi-Anvil X-ray Powder Diffraction) facility at NSLS-II.

MAXPD is the downstream endstation of an insertion device beamline at Sector 28 (28-ID-2-D) of NSLS-II with a 1.8 T damping wiggler source. This beamline has an 1100-ton hydraulic press (Three-B) installed which is equipped with a DT-25 pressure module (differential Kawai geometry). This module can be swapped out for a D-DIA module as desired. MAXPD 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 is used to collect both angular dispersive X-ray diffraction data and X-radiographic imaging. A Perkin-Elmer area detector with a 200um pixel size is used for the collection of X-ray diffraction data, while a Point Grey CCD camera focused on a scintillating YAG crystal provides us with direct imaging of the samples in our experiments. Work planning, radiation surveys, and equipment installation is complete. Motorization, controls development, and data acquisition interface for this new facility will be completed in August of 2018. The first General User experiments took place in March, 2018. Final Science Commissioning beamtime is scheduled for the week after the COMPRES meeting, and the opening of the full General User program begins with the 2018-3 cycle.