

New Developments of X-ray diffraction and pair distribution function beamlines 11-ID and 17-BM at Advanced Photon Source

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X-ray beamlines, 11-ID-B/C and 17-BM, operated by the Structural Science (SRS) group of the X-ray Science Division at the Advanced Photon Source, offer a wide range of *in situ* and *operando* powder X-ray diffraction (XRD) and total scattering (e.g., PDF) measurement capabilities with sub-second temporal resolution. Most recent developments include an *in situ* Raman system at 17-BM that allows simultaneous measurement of XRD/PDF and Raman spectroscopy data under controlled temperature and gas environment and an upgrade to the sample stage assembly through the installation of a heavy-load hexapod stage at 11-ID-C that allows high-accuracy control of specimen orientation and enables new type of measurements, such as surface and interface scattering. Testing and installation of compound refractive lens (CRLs) optics, enabling sub-10 μm 1-D focusing, is currently underway at 11-ID-B with the goal of delivering focusing capabilities to users in the 2018-2 cycle. Additionally, new mail-in programs and hardware are being developed at 17-BM and 11-ID-B, aiming at serving users with request of 2D data ambient measurements on standard capillary samples. Details of the setups and first experiment results will be shown in the poster presentation.