New capabilities for structural analysis using high-energy X-rays at the APS

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The Structure Science group at the APS is operating 4 beamlines using high-energy X-rays (27 keV to 106 keV) for in situ and operando structural analysis. The methods are high-resolution powder diffraction at 11-BM operating at 30 keV, rapid powder diffraction at 17-BM using 27 keV to 51 keV, total scattering for PDF analysis at 11-ID-B operating at 58 keV or 87 keV, and using 106 keV photon energy at 11-ID-C for diffraction under extreme conditions, and at single crystals.

The latest development of the expansion of the capabilities and improvements of the instrumentations of the beamlines are presented here, including sample environments, multi-modal approaches, microfocusing for studying layered materials, and total scattering under grazing incidence on surfaces and interfaces.