

Your Synchrotron Powder Diffraction Instrument: 11-BM at the Advanced Photon Source

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"I would have used a synchrotron, if I had one" (Prof. Abe Clearfield, circa 1998).

Synchrotrons have revolutionized powder diffraction. They make possible data collection with tremendous resolution and superb signal to noise. Alternately, they allow for extremely rapid (<1 second) collection of entire, high quality, powder diffraction patterns. The high penetration and data sensitivity over wide Q range from high energy sources even allows synchrotrons to make inroads into territory that previously demanded neutrons: extreme sample environments and crystallographic site occupancy studies. Despite all these advances, relatively few researchers make the trek out to use a synchrotron for powder diffraction.

To address this, the 11-BM synchrotron powder diffractometer at Argonne's Advanced Photon Source now offers rapid and easy mail-in access for routine structural analyses with truly first-quality data. This instrument offers resolution unmatched in U.S. ($\Delta Q/Q \sim 2 \times 10^{-4}$). With both vertical and horizontal focusing and a detection system with twelve perfect crystal analyzers, the diffractometer can collect a superb pattern suitable for Rietveld analysis in an hour or less. Information on the diffractometer is available at <http://11bm.xor.aps.anl.gov>.

The poster will describe the instrument, will discuss the types of measurements that can currently be performed, how we hope to improve the capabilities and widen the access offered to users. We are interested in input from potential users on the features they would like to see implemented.