

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Single Crystal Diffuse X-ray Scattering Using Continuous Rotation¹ MATTHEW KROGSTAD, OMAR CHMAISSEM, KEITH TADDEI, Northern Illinois University, Argonne National Laboratory, JARED ALLRED, RAYMOND OSBORN, STEPHAN ROSENKRANZ, JUSTIN WOZNIAK, Argonne National Laboratory — Single crystal diffuse scattering provides a measure of the 3D pair distribution function and is thus useful for investigating short-range order in materials. Using very bright synchrotron x-ray sources and fast area detectors, large volumes of reciprocal space can be mapped quickly with a dynamic range large enough to measure both Bragg peaks and the much weaker diffuse scattering. With the appropriate tools for processing and analyzing large data sets (10 to 30GB), this technique can be used to track changes in the defect structures of a material as a function of different parameters, providing a sensitive and efficient method for investigating phenomena associated with disorder. We have been developing methods of measuring diffuse scattering using continuous sample rotations (shutterless mode) at the Advanced Photon Source, and will show data from several systems, including iron pnictides, for a range of temperatures and doping levels.

¹Supported by the U.S. Department of Energy, Office of Science, Basic Energy Sciences, Materials Sciences and Engineering Division.

Matthew Krogstad
Northern Illinois Univ

Date submitted: 06 Jan 2015

Electronic form version 1.4