

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Characterization of medium-range order in disordered materials by fluctuation x-ray microscopy** LIXIN FAN, D.J. PATERSON, I. MC-NULTY, Advanced Photon Source, Argonne National Laboratory, Argonne, IL 60439, M.M.J. TREACY, D. KUMAR, Department of Physics and Astronomy, Arizona State University, Tempe, AZ 85287, P. DU, Materials Science & Engineering, Cornell University, Ithaca, NY 14853, U. WIESNER, Materials Science & Engineering, Cornell University, Ithaca, NY 148, J.M. GIBSON, Advanced Photon Source, Argonne National Laboratory, Argonne, IL 60439 — Measuring medium-range order is a challenging problem in the structural study of disordered materials. We have developed a technique which we call fluctuation x-ray microscopy that offers quantitative insight into medium-range correlations in disordered materials at nanometer- and larger-length scales. The technique examines spatially resolved fluctuations in the intensity of x-ray speckle patterns. To demonstrate this new technique at micron-length scales, we studied a model system comprised of polystyrene latex spheres. Using nanofocusing optics, we have further developed fluctuation x-ray microscopy for the study of nanomaterials. The medium-range order in two hybrids of *PI-b-PEO/ aluminosilicates* was quantitatively examined and compared. by fluctuation x-ray microscopy.

Lixin Fan  
Advanced Photon Source, Argonne National Laboratory, Argonne, IL 60439

Date submitted: 03 Dec 2006

Electronic form version 1.4