

Abstract Submitted  
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**Characterization of medium-range order in disordered materials by fluctuation x-ray microscopy** LIXIN FAN, D.J. PATERSON, I. MCNULTY, 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.

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