Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Collective Dynamics and Slow Relaxation of Charge/Spin Density Wave domains in Antiferromagnetic Chromium OLEG SHPYRKO, University of California San Diego, ERIC ISAACS, Argonne National Laboratory and University of Chicago, JONATHAN LOGAN, HYEKYUNG KIM, University of Chicago, MARTIN HOLT, MICHAEL SPRUNG, ZHONGHOU CAI, ALEC SANDY, Argonne National Laboratory — We present coherent x-ray diffraction and x-ray microscopy measurements of slow fluctuations and relaxation of charge- and spin-density wave domains in antiferromagnetic Chromium. Intensity fluctuations of the coherent x-ray speckle of incomensurate charge density wave satellite, combined with time-resolved x-ray microscopy measurements, reveal the collective nature of the uncharacteristically slow domain wall and phase defect fluctuation as well as non-equilibrium charge- and spin-density wavevector relaxation. The observed dynamics of pinned charge- and spin-density wave condensate in Chromium is similar to other examples of elastic media in presence of quenched disorder, ranging from dynamics of vortex lattices in disordered superconductors and sliding friction to snow avalanches and earthquakes. A particularly interesting analogy is dynamics of soft matter undergoing jamming transition, which show similar compressed exponential relaxation behavior.

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Date submitted: 26 Nov 2007 Electronic form version 1.4