

## W0262

**Benefits of Coherence in SAXS at Beamline 34-ID-C at the APS.** S. Boutet, I.K. Robinson, Dept. of Physics, Univ. of Illinois at Urbana-Champaign, 1110 West Green Street, Urbana, IL, 61801.

The Coherent X-Ray Diffraction (CXD) beamline 34-ID-C at the Advanced Photon Source, Argonne National Laboratory can double as a SAXS instrument with a short turnaround period. The beamline was designed to optimally utilize the high brilliance of the beam which makes it ideally suited to the study of biological nanoparticles and nanocrystals related to protein nucleation. The SAXS setup was used to study the formation of nano-sized clusters of proteins at low temperature. The protein ferritin in solution was found to self-organize into well-ordered clusters roughly 50nm in size upon freezing of the solution. The clusters were found to possess crystalline order, however, the lattice spacing was found to be strongly dependent on temperature. Furthermore, the crystallite size was also found to be temperature dependent. Direct simulations of the SAXS pattern using the Debye formula for the spherically averaged intensity revealed that the nanocrystals, though possessing the expected FCC crystals structure displayed a non isotropic planar habit, which might be correspond to the critical nucleus. Coherence was useful in tracking the residual products of crystals that were eventually radiation damaged.