

Abstract Submitted  
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**Correlated x-ray scattering, from nanoparticle solutions to proteins** DEREK MENDEZ, THOMAS JOSEPH LANE, JONGMIN SUNG, HERSCHEL WATKINS, DANIEL RATNER, SEBASTIAN DONIACH, Stanford Univ, DONIACH GROUP TEAM — Recent developments in x-ray source technology have shed new light on the Kam correlated x-ray scattering (CXS) theory, first proposed in 1977 [1]. The goal of CXS is to obtain high resolution structural information for the individual particle in a solution of disoriented, identical particles. This is achieved by exposing the solution to bright, short (shorter than the particle diffusion time) pulses of x-rays and then calculating angular intensity correlations in the plane of an area detector. The resulting correlations contain more information than standard small and wide angle x-ray scattering (SAXS and WAXS) measurements. This information can be used to place constraints on low-resolution particle models. We have demonstrated the feasibility of CXS at atomic length scales for solutions of nanoparticles (in review), where recovery of the signal involved non-linear filtering of the intensities. This eliminated dominant systematic noises in the data, which was recorded at the Stanford Synchrotron Radiation Lightsource (SSRL). We are refining analysis techniques which will be applied to CXS measurement of biomolecules at the SPring-8 angstrom compact free electron laser (SACLA) facility.

[1] Kam, Zvi 1977 *Macromolecules* 10, 927-934.

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