

## First successful XPCS experiments with proteins

X-ray photon correlation spectroscopy (XPCS) is a technique to investigate dynamics at atomic length scales and ms to several seconds time scales. Measurements of hard condensed matter samples are successfully performed for several decades. XPCS measurements require a high coherent flux, which result in large x-ray radiation doses deposited in the sample. Soft condensed matter, especially biological samples, are very sensitive to radiation damage. To overcome this limiting factor of radiation damage we developed two different approaches.

In the first approach we used a USAXS setup to reduce the photon density at the sample. This is achieved by using a large beam size, resulting in a reduced local dose, and a large sample detector distance. A second approach is based on X-ray speckle visibility (XSVS) and photon probability analysis. In this approach the exposure time is reduced to a minimum which leads to extremely sparse speckle patterns. By analyzing the probability of certain photon events dynamic information of the sample can be extracted.

First results of protein (casein and lysozyme) measurements at DESY and ESRF in October 2017 will be presented in my talk.