

New opportunities for time-resolved SAXS with the EBS

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In this presentation, I will give a short overview of new possibilities offered by the combination of EBS with advanced pixel array detectors for the investigation of structural dynamics in soft matter and related biological systems. Small-angle X-ray scattering (SAXS) and X-ray photon correlation spectroscopy (XPCS) methods are expected to greatly benefit from these developments. Until now real-time SAXS experiments were primarily limited by the count rate as well as the frame rate of photon counting detectors. On the other hand, fast multispeckle XPCS experiments have been hampered not only by the frame rate of photon counting detectors but also due to the available coherent photon flux. With the EBS, the coherent photon flux is expected to increase by a factor 30 or so. High frame rate photon counting pixel detectors such as Eiger-500k (from PSI) and Ultra high speed sensor (UHSS-500 from Rigaku) offer great promise for microsecond range measurements. As a result, it will become feasible to probe microsecond range kinetic processes and equilibrium dynamics over a broad size scale from nanometer to micron range by real-time scattering methods.