FIRST RESULTS AT THE HIGH FLUX BEAMLINE FOR SMALL ANGLE SCATTERING

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A double-focusing high-flux beamline dedicated for SAXS is currently under commissioning. The instrument is mainly intended for time-resolved studies of fast structural transitions in the submillisecond time region in solutions and partly ordered systems. The primary goal is to obtain structural information during relaxations from nonequilibrium states in supramolecular assemblies, such as gels, liquid crystals, (bio-polymers and amorphous materials. The multi-purpose sample stage will include IR-laser, T-jump, p-jump, stopped-flow mixing, and flow-shear relaxation devices. Besides SAXS it will be possible to also perform simultaneously WAXS experiments between 5 and 10
The photon source is a 57-pole wiggler having a critical energy of 4.1 keV. The SAXS-Beamline is situated 1.25 mrad off wiggler-axis and accepts 1.0 x 0.3 mrad2 (horiz. x vert.). The vertically deflecting fixed-exit double-crystal monochromator contains three pairs of flat, interchangeable Si(111) crystals, which are optimised for the energies 5.4, 8 and 16 keV (2.3, 1.54, and 0.77), respectively. Downstream, a segmented toroidal mirror focuses the light both in horizontal and in vertical direction with a 1/2.5 magnification onto the SAXS-detector.
The energy resolution DE/E of the monochromator will be 2 2.5 x 10-3. The calculated spot size at the detector is about 1.1 x 0.6 mm2 with a sample size of 4.2 x 2 mm2. For 8 keV photons, the maximal SAXS-resolution will be about 400 x 1400 2 d-spacing assuming an optimal distance between detector and sample of 1.8 m. The flux at the sample will be 1012 ph/s/mm2 (for 8keV photons and 400 mA beam current).
First results obtained at this new beamline will be presented.