

Poster Presentation

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PF BL-15A for semi-microbeam XAFS/XRF and high-brilliance SAXS/GI-SAXS

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New beamline, BL-15A, was completed at the BL-15 section of the PF-ring in 2014. This new beamline has a short gap undulator which produces high brilliance X-rays ranging from 2.1 keV to 15 keV. The beamline will be dedicated to both activities, XAFS/XRF/XRD studies using semi-micro focus beams (A1 station) and SAXS experiments using collimated softer and hard X-rays (A2 station). In the XAFS/XRF studies, the semi-micro beam available in a wide range of photon energies allows analyzing the local structures of the elements and valence on inhomogeneous samples in the fields of environmental science and new energy source science. The softer X-rays up to 2.1 keV will provide access to absorption edges of phosphor and sulfur, which are very important targets for those fields. The SAXS scientific programs include structural studies of functional membranes, time-resolved X-ray scattering and large hierarchical structure analysis. All of these three programs require a high-brilliance light source. In particular, grazing incidence SAXS (GI-SAXS) using vertically small-size softer beam ranging between 2.1-3.0 keV will help to control the depth of the membrane structure analysis and reduce the roughness defects of an imperfect membrane. The combination of XAFS/XRF and SAXS experiments gives wide structural information from fine atomic structure to low and medium resolution. It can be beneficial to build these instruments as two stations on the same beamline. BL-15A is oriented toward joint advanced studies by the two techniques. Old BL-15 beamlines were scrapped and new construction work started in 2013. The construction was completed in the summer shutdown of 2013 and the first beams was delivered on Oct 17, 2013. We are pursuing the beamline commissioning and the A1 and A2 stations will be opened to users in May, 2014. Here, the beamline design and performance, and the preliminary results will be reported.

Keywords: beamline, XAFS, SAXS