

EXPERIMENTAL END STATION OF NON-CRYSTALLINE DIFFRACTION BEAM LINE AT ALBA.

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The NCD beam line at Alba will cater for a host of different communities and therefore will require a flexible and versatile experimental station capable of accommodating a variety of conditions. The main techniques, i.e Small Angle X-ray Scattering (SAXS) and Wide Angle X-ray Scattering (WAXS), either separately or combined will serve experiments that aim to study semi-ordered systems, long-range structures, diffuse systems, solution scattering and bulk scattering.

This beam line will be installed at Port 11 of the Alba storage ring and will use an in-vacuum, U21, undulator as an x-ray source. It is expected that in the standard configuration the optical setup will deliver on the sample ca. 2×10^{12} photons/sec when the storage ring is running with 400 mA. The focal spot after considering likely optical errors and aberrations is estimated to be $\sigma_{\text{horizontal}} \times \sigma_{\text{vertical}} \sim 65 \times 30 \mu\text{m}^2$, the beam dimensions at the sample will change with the sample position along the optical bench.

The experimental hutch dimensions will be $\sim 12\text{m}$ in length, 3m in width with the internal ceiling height at 2.6m . The x-ray beam height above the floor level is about 1376mm . There will be outlets/inlets for gases and cooling water as well as exhaust system distributed around the inside perimeter of the hutch. The internal experimental hutch temperature will be maintained at $23 \pm 1^\circ\text{C}$.

The preliminary experimental station layout comprises an optical bench that will serve as a common girder holding the detection system, the SAXS camera assembly, the sample environment platform and the x-ray conditioning system components.

Briefly, the experimental setup will consist of a $\sim 10\text{ m}$ long granite slab (synthetic or natural) that will serve as an optical bench. A common translation system consisting of profile rail guides with carriages will hold the different components such as beam defining slits, sample stage as well as camera setup to enable linear translation along the x-ray beam axis. Specifically, the configuration of the sample stage and the properties of two-dimensional detector systems under consideration will be addressed.

For further information see [<http://www.cells.es/Beamlines/NCD>].