

January-February 2012 ALBA newsletter

Accelerators

<http://www.cells.es/Divisions/Accelerators>

- The Storage Ring was restarted in week 3 after the shutdown. A 100 mA electron beam with an orbit stability within the micron has been available to the beamlines during weeks 4 and 5 with an 82% uptime. Snow has been the main reason for the downtime. Not that snow itself has a bad impact on the beam but because a couple of shifts were cancelled because the bad weather conditions.
- There are still some issues regarding the movement of the photon beam observed at the Front Ends and Beamlines which does not compare with the movement of the electron beam as measured at the electron beam-position monitors (BPMs). Accelerators is looking into this, and in parallel we are doing lifetime studies in order to understand the measured lifetime.

Beamlines

<http://www.cells.es/Beamlines>

* BL04-MSPD: Materials Science and Powder Diffraction.

- During January the optics elements commissioning was achieved at 100 mA ring current. We have observed a very stable beam.
- The control hutch has been erected and already furnished.
- The beam arrived to the first diagnostics of the EH on the week of Feb 13th (Fig. 1).

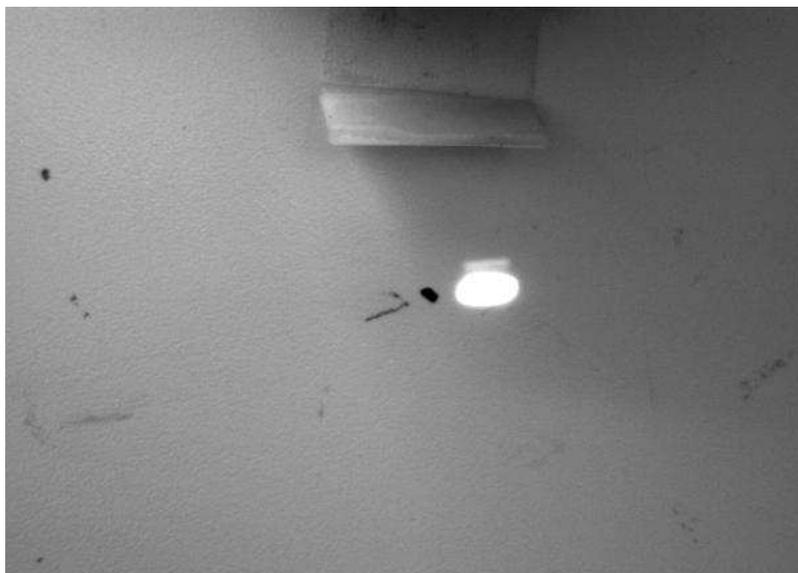


Figure 1. BL04-MSPD: First x-ray beam at the experimental hutch of BL04-MSPD.

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* BL09-MISTRAL: X-Ray Microscopy.

- Andrea Sorrentino has joined the Mistral team as a post-doc and started on February 1st.
- The BL commissioning is progressing. Flux measurements at the end-station have shown that a re-alignment of the monochromator was necessary. This was completed last week. More measurements will be done during next run (starting February 15th) to confirm that the re-alignment is satisfactory.

* BL11-NCD: Non-Crystalline Diffraction.

- The new Post doc of the beam line, Dr. Chong Zhang, took up her position on January 16th, 2012. She will be responsible for the control and maintenance of the two-dimensional x-ray detectors on the beamline. She will also be the expert on data analyses packages available on the beamline as of Summer 2012.
- A repair of a limit switch of the bender for the collimating mirror was carried out early January 2012. This repair work involved venting the vacuum chamber of the mirror systems.
- A temporary x-ray flight tube has been installed and will be used for pre-commissioning until the material of the beam line is delivered.

* BL13-XALOC: Macromolecular Crystallography.

- Right before the Christmas shutdown we were able to get the first X-rays at sample position (Fig. 1).

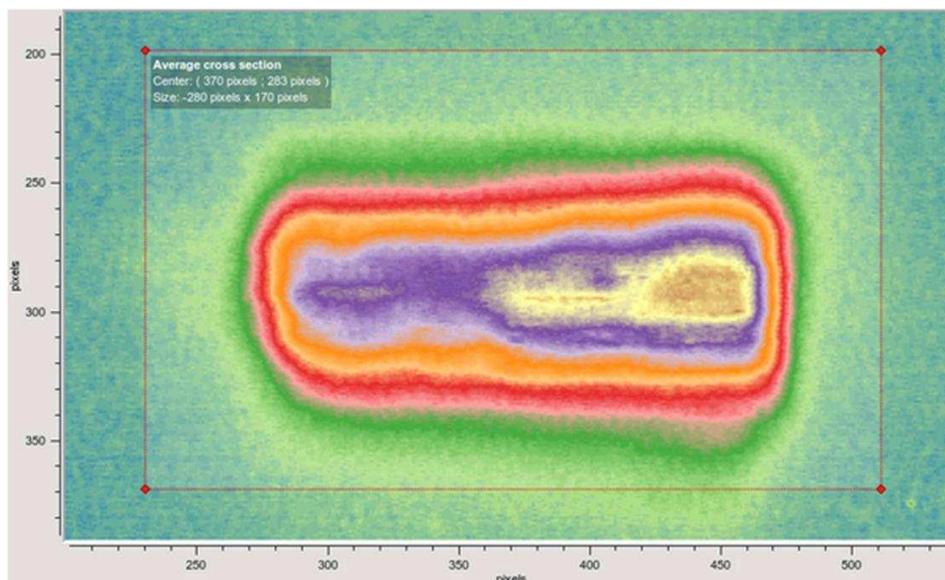


Figure 1. BL13-XALOC: Picture of a partly focused x-ray beam at sample position (YAG) as seen with the diffractometer's on-axis viewing system.

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- During the shutdown we have been able to: (1) fix some problems with the diffractometer table and the monochromatic attenuators, (2) install the second diamond XBPM in the EH, (3) advance in the design of the movable XYZ beamstop, (4) advance in the control of the phi/omega air-bearing axis system, (5) advance in the design/manufacturing of the diagnostics unit at the detector, (6) start the control of the mirror benders to focus the beam.
- In early January, XALOC received ~50 beamtime applications that are currently being reviewed.
- We are now able to have the X-ray beam at sample position in two different modes: unfocused (no mirror present) and focused (both mirrors present). We have restarted commissioning with X-rays of the beamline on Feb 15th.

* BL22-CLÆSS: Core Level Absorption & Emission Spectroscopies.

- The first absorption spectra were measured at the sample position. You can follow the illustrated beamline commissioning milestones [here](#).
- The main source of the noise seen on the above mentioned spectra was due to the software (not hardware) synchronization among various beamline electrometers. A new high precision timing hardware has been installed and integrated into the beamline control system.
- A new generation of Sardana control system has been installed at the beamline by the Computing & Controls Division and tested during several weeks. It offers several important upgrades for the convenience of users' operation.

* BL24-CIRCE: Photoemission Spectroscopy and Microscopy.

- The CIRCE PEEM had a first "friendly user" during November/December 2011, Dr. Miguel Ángel Niño from the IMDEA Nanoscience Institute in Madrid. With his help, the experimental station was equipped with an ion sputter gun, gas dosing leak valves, and two evaporator exchange systems. He performed first test experiments on the microscope without x-ray beam (in PEEM, LEEM and LEED modes).

* BL29-BOREAS: Resonant Absorption and Scattering.

- The soft x-ray magnetic circular dichroism spectra on the Fe2p, Mn2p, and Cr2p absorption edges of remanently-magnetized SS 304 steel have been recorded in order to determine the lower limit of the dichroic effect that can presently be measured in a given amount of time at the BOREAS beamline.
- Scanning speed issues regarding the combined monochromator and undulator gap/phase scan have been addressed in view of optimizing and minimizing the scan time of a typical XCMCD spectrum.
- Tests for the optimization of the circular polarization rate vs. flux in the > 3rd harmonics of the EU71 undulator have started.

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- The KB mirrors and mechanics have been installed, and the corresponding bakeout of the complete KB system is finished.
- The KB mirror, Izero and Beam Reference Monitor have been connected to the beamline pipe, and are ready for commissioning with beam.

HECTOR end station:

- Commissioning activities regarding the performance of the superconducting coils and the sample cryostat have been started and are still ongoing.
- Strategies for the minimization of noise in the sample drain current signal (total electron yield) are being tested.

MARES end station:

- The order for the procurement of the UHV vessel of the scattering end station has been launched.
- A call for tender for an in-situ CCD soft x-ray camera for the scattering end station has been issued.