November 2011 Alba mini newsletter

Accelerators

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

Now the beamlines are using most of the beam time available for their commissioning. During the time available for the machine the x-ray beam position monitors of the Front Ends have been calibrated and the Accelerators Division is doing further studies in order to reduce the orbit distortion introduced when changing the magnetic field and the gap in the superconducting and the normal conducting wigglers respectively.

Beamlines

http://www.cells.es/Beamlines

*** BL04-MSPD: Materials Science and Powder Diffraction.**

The commissioning of the beamline optics is progressing well. It should be noted that the storage ring current has been for the whole commissioning time of about 20 mA.

*We have lead the beam up to the last diagnostics inside the optics hutch.

*We are optimizing the optics elements positions and orientation.

The High pressure towers for the 2d detector and the diamond anvil cells have been installed (see Fig. 1).

Figure 1. BL04-MSPD: High pressure towers of BL04-MSPD's high pressure End Station.

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*** BL09-MISTRAL: X-Ray Microscopy.**

The focusing of the beamline's optics of Mistral has been achieved and is in agreement with the theoretical expected values. The energy calibration was started last week but unfortunately there has been a problem with the motion axis of the grating pitch monochromator and this will need to be repaired before continuing the commissioning.

*** BL11-NCD: Non-Crystalline Diffraction.**

During the month of November 2011 a station scientist for BL11-NCD has been hired and is due to take up the position in 2012.

During the month of November 2011 a Post Doc has been hired to work on BL11-NCD and will start early Spring 2012.

Installation of the X-ray flight tube is in progress. The nose cone support and therefore the most upstream section of the support has been inserted onto the rail system. This support can be seen in Fig. 1, where it is also possible to see the sample table in the background.

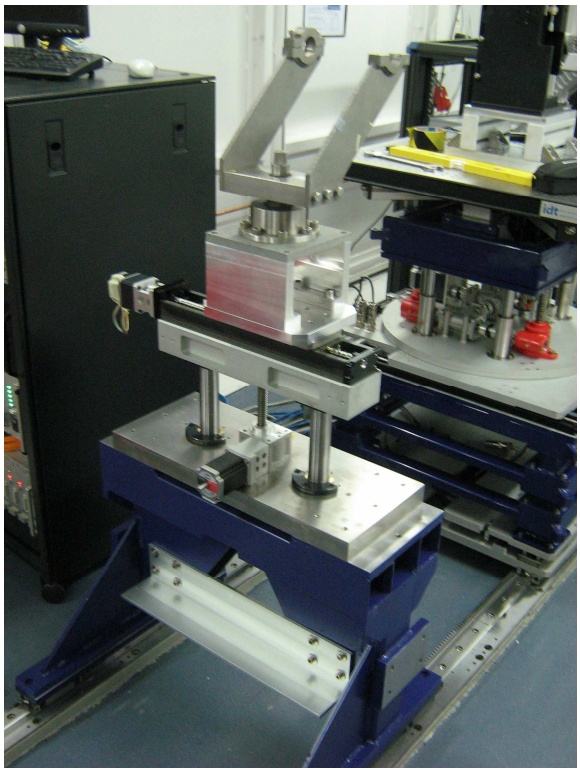

Figure 1. BL11-NCD: The most upstream section of the support inserted onto the rail system.

A scan of the direct beam from the in-vacuum undulator, IVU, of BL11-NCD was carried out by recording the monochromatic photon beam output from the double crystal monochromator. During this scan the IVU was kept at a fixed gap and the result is shown in Fig. 2. As can be seen the 5th harmonic is intense and well defined in energy. Again, as previous results these are very good news for the beam line.

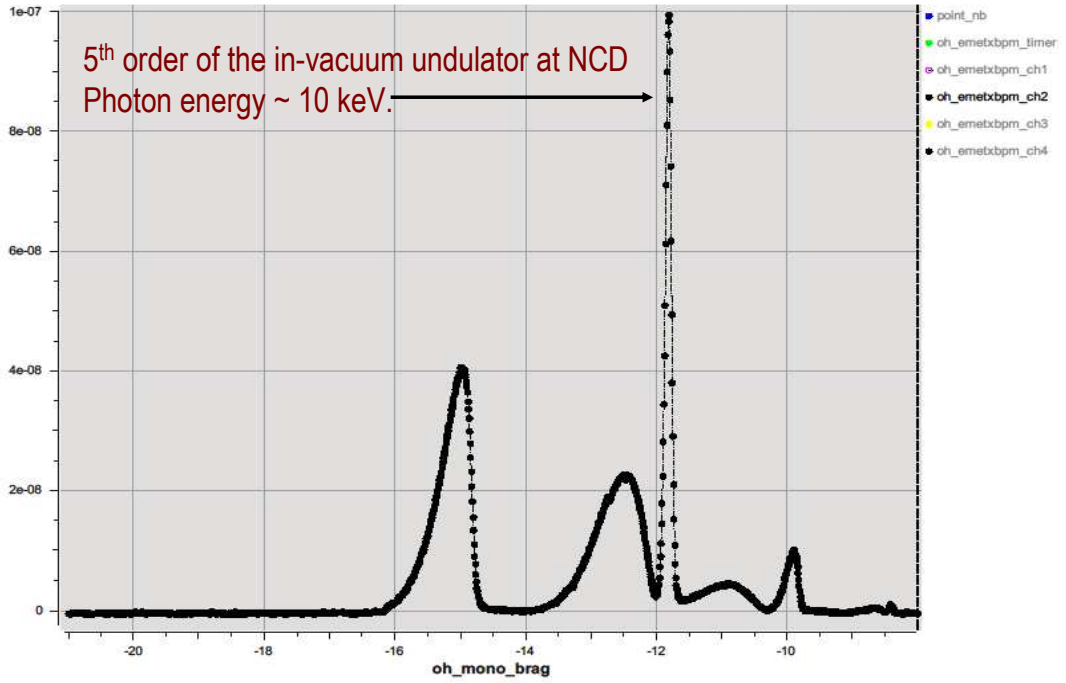

Figure 2. BL11-NCD: The 5th harmonic of the in-vacuum undulator.

The accelerator group has scanned the gap of the IVU of BL11-NCD and have determined that in the gap range of interest to the users of the beamline no problems have been identified neither from the point of view of the function of the undulator nor from the performance of the storage ring. Again, for the BL11-NCD users these are very promising findings.

*** BL13-XALOC: Macromolecular Crystallography.**

We have managed to deflect the x-ray beam with both the vertical focusing mirror and the horizontal focusing mirror. We can see the beam in the four nominal configurations (VFM in/out and HFM in/out) on the second fluorescence screen in the optics hutch.

On Dec 2nd we were able to see the first x-ray beam in the End Station (Fig. 1). More precisely, on the second diamond x-ray beam monitor ~250 mm from the sample position.

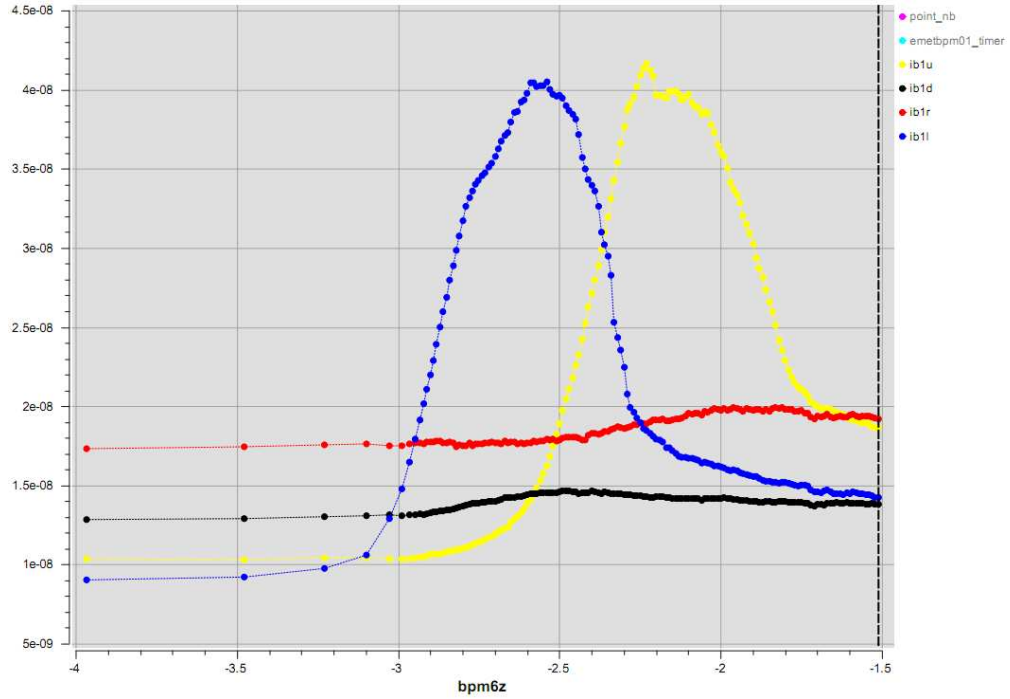

Figure 1. BL13-XALOC: A scan showing the first x-ray beam detected on the monitor 250 mm from the sample position.

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

The functioning of all optical elements is well understood and tested. We have measured absorption spectra using Si111 and Si311 crystals. The switching between the crystal pairs and/or between different mirror modes can be accomplished within a few minutes.

In the week of 12/12/2011 we should be able to measure first absorption spectra at the experimental station.

*** BL24-CIRCE: Photoemission Spectroscopy and Microscopy.**

*** BL29-BOREAS: Resonant Absorption and Scattering.**

After a preliminary optimization of the beamline optics, first N1s absorption edges have been measured using a gas cell in order to check the photon energy resolution and energy calibration of the grating monochromator using the low-energy grating.

The N1s absorption edge given below (Fig. 1) indicates a photon energy resolution E/ΔE of better than 7000 at about 400 eV photon energy which shows that the monochromator is up to performance in that respect. Further tests using the other two gratings are under way.

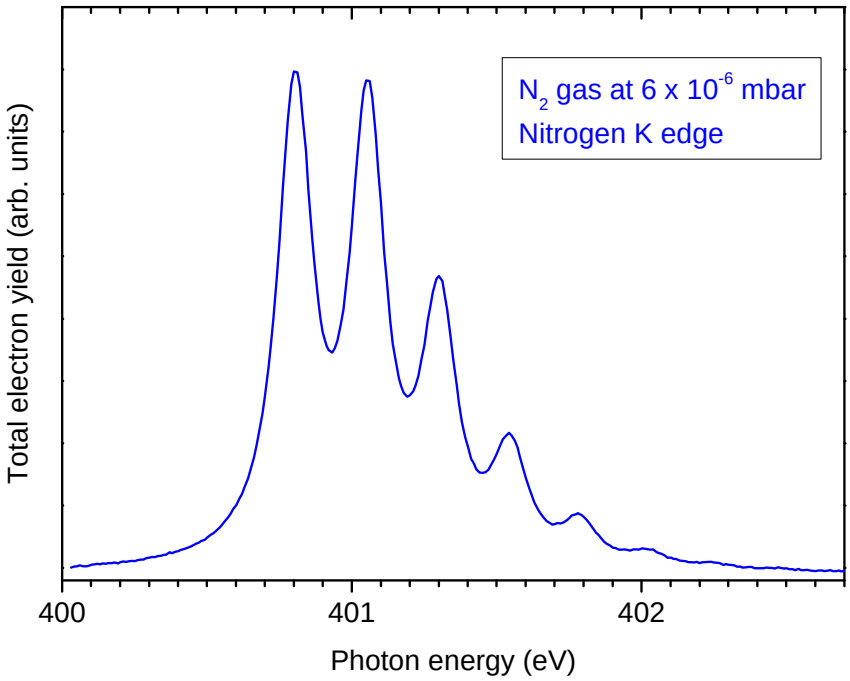

Figure 1. BL29-BOREAS: The N1s absorption edge.