

## April 2011 Alba mini newsletter

### Beamlines:

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

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

- The main cabling campaign for the optics hutch is ongoing.
- The mirror bakeout is complete.

\* BL09-MISTRAL: X-Ray Microscopy.

- BL09-MISTRAL's front end (FE) was opened for the first time on March 18<sup>th</sup> 2011. The x-ray beam was seen on the fluorescent screen of the white beam diagnostic which is the first item of the beamline. The FE has been opened three more times since this historic day and we have been setting up basic measurement tools such as electrometers and CCD readings. During the commissioning of the machine we will have the possibility to use the beam a few hours per week until May 13<sup>th</sup> although the electron orbit is not the theoretical one.
- The official commissioning of the BL optics is planned from May 13<sup>th</sup> to June 3<sup>rd</sup> and during the month of September as there is a machine shutdown to install the last 3 insertion devices (IDs) from June to August. The transmission x-ray microscope will be commissioned in October.
- The control hutch of the beamline is currently being built.

\* BL11-NCD: Non-Crystalline Diffraction.

- Two shadow shields, 20 mm thick lead plates measuring 470 x 470 mm<sup>2</sup> in height and width, centered around the direct beam, have been assembled in the past few days and are ready to be inserted into the beamline layout in the next days.
- The beamline awarded Rayonix L. L. C. (US) to deliver a two-dimensional WAXS camera on the 25<sup>th</sup> of March this year. The expected delivery of this detector will be in little over one year from today. On the 1<sup>st</sup> of April imXPAD, France, was contracted to deliver the two-dimensional SAXS detector early summer 2012.
- The linear floor rail system is being installed in the Experimental hutch as of 5<sup>th</sup> of April that is to guide the sample table, x-ray flight tube, and peripheral equipment along the floor over a distance of about 7 m. Works are expecting to take ca. one week of efforts and will require support from engineering and survey & alignment group.
- The last vacuum station of the beamline defining the location of the air to vacuum interface was installed last week and is currently undergoing bakeout in order to vacuum conditioning the parts such that they are UHV compatible.

\* BL13-XALOC: Macromolecular Crystallography.

- The detector table is currently being installed.
- The beam-conditioning elements have been installed in the end station.
- The white beam and monochromatic fluorescence screens have been installed in the optics hutch.
- The white beam attenuator has been installed in the optics hutch.

- The equipment protection system (EPS) for the optics hutch is being implemented. The EPS of the experimental station is in the design phase.
- Vibrational tests of the monochromator in cryogenic conditions have been carried out successfully.
- The third cabling campaign covering mostly several elements of the end station has just started.
- The design of the control hutch is underway.

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

- The last optical elements have been installed: one white beam attenuator and four fluorescent screens.
- The cabling of the optics hutch has been finished.
- Lines and reducers have been installed for standard and user-specific gases.

\* BL24-CIRCE: Photoemission Spectroscopy and Microscopy.

- Factory acceptance tests of the PEEM have started.
- Water cooling system has been installed.
- Laser pre-alignment has started.

\* BL29-BOREAS: Resonant Absorption and Scattering.

- The signal testing of the EPS of the optics is finalized.
- Motion tests with the final cabling are in progress.
- The vacuum control system for the beamline optics has been set up.
- The final cabling for the last optics section (including the Kirk-Patrick (KB) system,  $I_0$  and BRFM) is being purchased.
- The chiller for the water cooling system of the beamline is about to arrive at Alba and will be installed during the month of April.
- The medium and high energy gratings for the monochromator have been accepted and shipped to Alba.
- The bakeout of the front-end movable masks and the beamline DiagOn is under progress. With this bakeout, in a couple of weeks the whole beamline excluding the monochromator and the KB system will be under UHV and ready to take the first photon beam at the end of May.

#### **IDs:**

[http://www.cells.es/Divisions/Accelerators/Insertion\\_Devices/Ids/](http://www.cells.es/Divisions/Accelerators/Insertion_Devices/Ids/)

- Control and protection systems of the in-vacuum undulators (IVU) have been completed. IVU-1's bakeout will start in a few days (Figure 1) and will take one month. IVU-2's bakeout will start by mid April.

#### **Accelerators:**

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

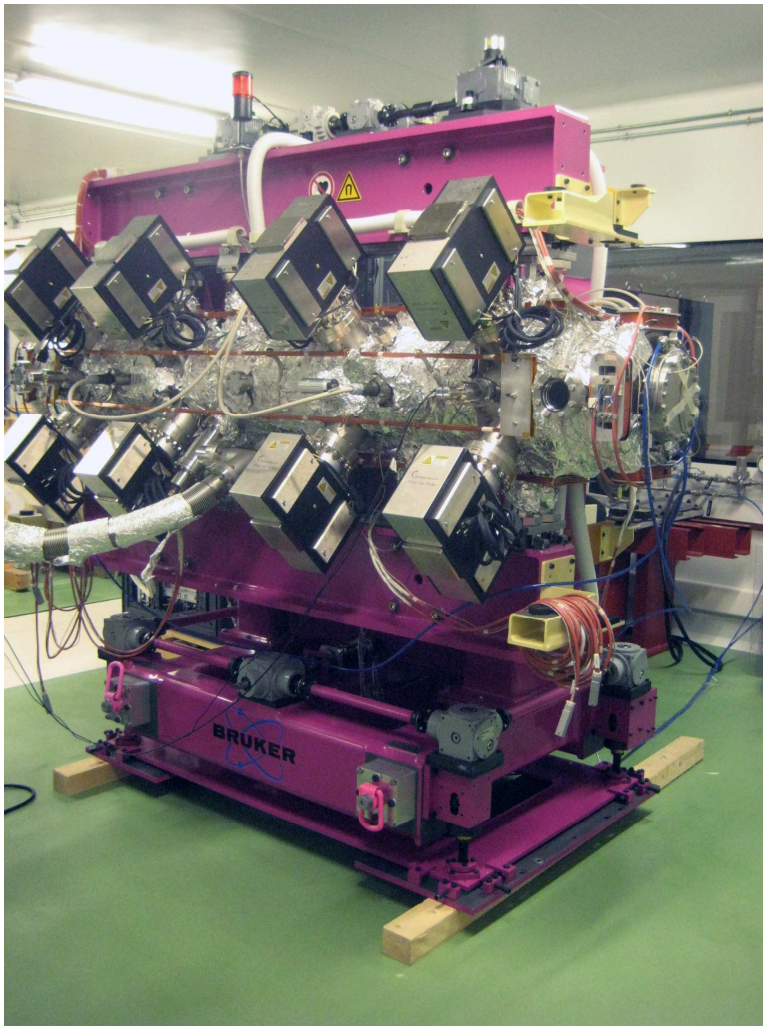
- Finally the commissioning of the storage ring (SR) started on the 8<sup>th</sup> of March. Within one day the beam made a turn around the machine and one week later the beam was accumulated up to 10 mA. Before going to higher currents the interlocks related to temperature and vacuum had all to be

checked. Also, the beam orbit interlock that will protect the vacuum chamber from synchrotron radiation in case the beam is badly mis-steered has been checked.

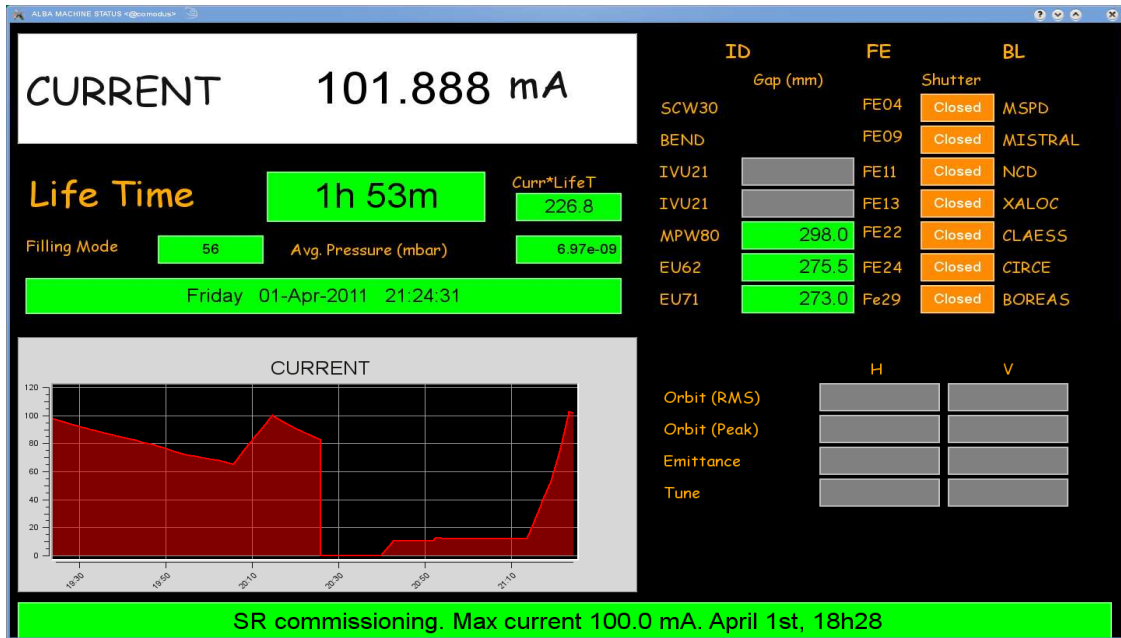
- Having done that, the current was gradually increased while checking the vacuum, the temperatures of the vacuum chamber, and for any instabilities, until on Friday 01.04.11, 100 mA were stored in the machine with a lifetime of 2 h (Figure 2).

- The coming weeks will be dedicated to reach stable and reproducible settings, to measure the parameters of the accelerators in order to obtain the nominal settings, to correct the orbit, to increase the current, and to clean the vacuum chamber with synchrotron radiation.

- In May, it is expected to test the first 3 Insertion Devices, two APPLE-II undulators and a normal conducting wiggler, which are already installed on the machine.



**Figure 1.** IVU-1 getting ready for bakeout.



**Figure 2.** A picture taken on Friday April 1<sup>st</sup> 2011 of the status of the storage ring and the accumulated current.