DEELS 21- Diagnostics Experts of European Light Sources 2021

Report of Contributions

https://indico.cern.ch/e/1027295

Contribution ID: **34** Type: **not specified**

DEELS2021 WELCOME

Wednesday 7 July 2021 10:00 (15 minutes)

Presenter: AL-MOHAMMAD, Hussein (SESAME)

Contribution ID: **36** Type: **not specified**

Computer vision application for real-time beam tracking in pinhole image systems at Alba

Wednesday 7 July 2021 10:15 (20 minutes)

During the last year we have installed and commissioned a second x-ray pinhole at ALBA for redundant and alternative beam size measurements. Here we report the issues we encountered and compare the ultimate PSF of both pinholes at ALBA. We also report on the first steps of a computer vision and machine learning application for pinhole beam diagnostics.
We have trained an artificial neural network to simultaneously detect, track and measure one or more beam images coming from the pinhole camera feed.

Primary authors: IRISO, Ubaldo; NOSYCH, Andriy (ALBA CELLS (ES))

Presenter: NOSYCH, Andriy (ALBA CELLS (ES))

Track Classification: Photon beam diagnostic

Contribution ID: **38** Type: **not specified**

Photon Beam Diagnostics at SESAME

Wednesday 7 July 2021 10:45 (20 minutes)

Multiple systems of photon diagnostics are adapted at SESAME, in order to measure beam size and to observe the beam profile in various positions. One of the systems is the In-Air X-ray Detector (IAXD), which primarily depends on high-exposure imaging of the residual high energy x-rays that escaped after the photon absorber on the ends of the bending magnet ports. In addition to that, the Synchrotron Radiation Monitor (SRM) has been implemented in two techniques, the first is simply direct imaging of the monitor, the second is to adapt the interferometry technique to acquire beam size measurement. Other than that, Pinhole imaging system is currently being designed to be installed at cell 15, to provide precise measurement of both vertical and horizontal beam sizes through fitting formula of the obtained images.

Primary authors: AL KAILANI, Omar (SESAME); AL-MOHAMMAD, Hussein (SESAME)

Presenter: AL KAILANI, Omar (SESAME)

Track Classification: Photon beam diagnostic

Contribution ID: **40** Type: **not specified**

Results with the Visible Light diagnostics with EBS now in full User-service mode

Wednesday 7 July 2021 11:40 (20 minutes)

Several Visible Light diagnostics have put in operation, more than 1 year after the start of the EBS commissioning. The Visible Light extraction system, with its first mirror in UHV and a chicaned transfer line, has been completely and optimally aligned to obtain distortion-free light in a dedicated laboratory at 9m from source point. This allowed to characterize this light in different means, and to then use it for bunch-length measurements with a Streak Camera. This for both the stored bunches in the Storage Ring and for the injected bunches, with the latter showing both their bunch-length and the longitudinally behaviour of that injected beam under different injection conditions.

Primary authors: SCHEIDT, Bertus Kees (ESRF); BURATIN, Elena (ESRF - European Synchrotron Radiation Facility); EWALD, Friederike (ESRF); PONS, Jean-Luc (ESRF); Dr CARMIGNANI, Nicola (ESRF); BENOIST, Nicolas (ESRF)

Presenter: BURATIN, Elena (ESRF - European Synchrotron Radiation Facility)

Track Classification: Photon beam diagnostic

Contribution ID: **41** Type: **not specified**

About XBPMs for SOLEIL upgrade

Wednesday 7 July 2021 14:55 (20 minutes)

SOLEIL Synchrotron has an upgrade plan to replace its storage ring by a new one based on multi-bend (7/4BA) achromat lattice. To fulfil the new tight requirements, most beam diagnostics will have to be replaced, or at least refurbished and improved. Among them are the X-ray Beam Position Monitors (XBPMs). Located on each beamline front-end, they enable to measure the position of the photon beams before their delivery to downstream users. The present XBPMs rely on four tungsten or copper blades operated in photo-emission mode. We will present a brief state-of-the-art of the existing or under-study XBPM systems, summarize the limitations our systems are presently facing, and introduce our strategy for the upgrade.

Primary author: LABAT, Marie

Presenter: LABAT, Marie

Track Classification: Upgrade projets

Contribution ID: **42** Type: **not specified**

Improvements of the bunch purity measurement at PETRA III

Wednesday 7 July 2021 14:25 (20 minutes)

In this presentation the actual work on the bunch purity measurement at PETRA III will be reported. The system is based on small area XAPDs used as detector in a time correlated single photon counting measurement scheme. At first improvements of the analog electronics of the detector head will be shown. An introduction to the test setup and placement at the PETRA III storage ring and the specific characteristics will be given, too. At least we will have a look on the actual results and ideas for future improvements.

Primary author: DEMMLER, Kai-Oliver (DESY)

Presenter: DEMMLER, Kai-Oliver (DESY)

Track Classification: Others

Contribution ID: **43** Type: **not specified**

SESAME in a Nutshell

Wednesday 7 July 2021 14:05 (15 minutes)

A pre-recorded video for SESAME facility illustrating the main components and some of diagnostics instruments.

Primary author: AL-MOHAMMAD, Hussein (SESAME)

Presenter: AL-MOHAMMAD, Hussein (SESAME)

Contribution ID: **44** Type: **not specified**

XBPM temperature interlocks for DLS-II

Wednesday 7 July 2021 15:25 (20 minutes)

Synchrotron upgrades at Diamond Light Source and elsewhere are being undertaken to increase the X-ray brightness. A side effect of this is an increase in power that may be intercepted by X-ray beam diagnostics. Of particular concern are front end XBPMs, often the first component along the beam path. Diamond currently uses a temperature interlock to prevent damage to XBPMs in the event of a missteer. A PT100 monitors the temperature of a water-cooled copper aperture within the XBPM, and beam is dumped if the temperature exceeds a threshold value. However, it is well understood that using this single temperature sensor as a critical MPS component is unsatisfactory. Presented in this talk are our findings on the effectiveness and limitations of our existing front end XBPM interlocks. Diamond is aiming to re-use as much of the front end as possible after our machine upgrade, and entirely replacing our XBPM apertures and fitting additional temperature sensors is undesirable. We will also present our concepts for potential future interlock triggers, and will welcome input from DEELS on their experiences with similar problems.

Primary author: BLOOMER, Chris (Diamond Light Source Ltd.)

Co-authors: BOBB, Lorraine (Diamond Light Source); HOUGHTON, Claire (Diamond Light Source)

Presenter: BLOOMER, Chris (Diamond Light Source Ltd.)

Track Classification: Photon beam diagnostic

Contribution ID: **45** Type: **not specified**

Conclusions

Wednesday 7 July 2021 15:55 (10 minutes)

Primary author: AL-MOHAMMAD, Hussein (SESAME)

Presenter: AL-MOHAMMAD, Hussein (SESAME)

Contribution ID: **46** Type: **not specified**

Experience with Pilot-tone+Libera Spark at ALBA

Wednesday 7 July 2021 12:10 (20 minutes)

A BPM calibration-readout system composed by a Libera Spark and a Pilot-tone generator has been installed at ALBA. In this talk, results on stability and position measurement will be reported. A comparison of performances between this readout system and other Libera Elettronics, will also be presented.

Primary author: TORINO, Laura

Track Classification: BPM electronics development