

SLS 2.0 User Workshop of 28 Feb 2022

Questions and Answers

Machine overview – Andreas Streun

Anonymous 09:27 AM

How will the upgrade of the storage ring affect the time structure of the beam? How long will the X-ray pulses be?

Phil Willmott 09:50 AM

Comparable to today's time structure. Exact length will be given after webinar but will be ca. 30 - 40 ps.

Andreas Streun said later ca. 70 ps. No camshaft mode foreseen, and studies need to be made to see how much charge could be accommodated in the isolated pulse. Later slide from Andreas Streun:

Time structure SLS 2.0

450 bunches train, 2 ns spacing = 900 ns

(SLS now 430 bunches)

30 empty buckets = 60 ns

(SLS now 50 empty)

bunch length 63...86 ps FWHM (depending where in bunch train) (50...120 ps)

No cam shaft (single bunch in gap) operation foreseen.

5 mA bunch would be ~100 ps FWHM (to be investigated)

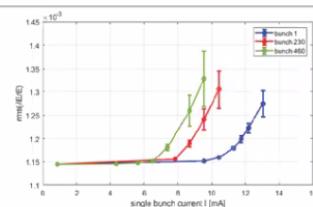


Figure 6: Energy spread versus single bunch current initial, middle and final bunch with harmonic cavity.

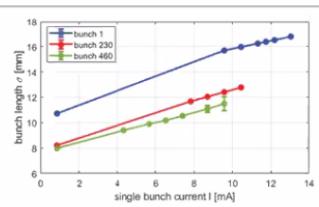


Figure 7: Bunch lengths (rms) as a function of the single bunch current for the MWI tracking with harmonic cavity.

energy spread and bunchlength for different bunches in train as function of single bunch current, with 3rd harmonic cavity.
Nominal value = 0.89 mA

From TDR p.204

Anonymous 09:49 AM

Regarding ID's, will you also include wigglers in SLS 2.0?

Phil Willmott 09:50 AM

No

Anonymous 09:50 AM

How long will the current SLS be fully operational?

Phil Willmott 09:52 AM

Until ca. 20.10.2023. Correction: Until 01.10.2023

Macromolecules and Bioimaging (LSB) – Oliver Bunk

felix.buechi@psi.ch 10:32 AM

When will s-Tomcat be available for users. i.e. when is the first call planned for which period?

Thank you for feedback.

Phil Willmott 10:37 AM

S-TOMCAT will be online after first shutdown but with the warm superbend magnet (2.1 T). The 5-T superbend will be installed in the second shutdown in early 2026

Anonymous 10:35 AM

Thank you for the great talk. Could you please summarize the developments and changes for MX and time-resolved crystallography for SLS 2.0?

Oliver Bunk: Main new opportunities will be provided by having a high-flux 'pink beam' option available at PX I. In addition to this, non-standard experiments like injector-based serial crystallography will become easier to conduct.

Phil Willmott 10:38 AM

Time-resolved studies at PX I. Fragment screening at PX III for MX, there will be a dedicated user meeting tomorrow afternoon - <https://indico.psi.ch/event/12441/>

MIGUEL A.G. ARANDA 10:36 AM

I see the resolution/sec vs. years very interesting, but is there any info/estimation about a plot of unreported data from imaging BL vs. year and their expected evolution? Thanks

Oliver Bunk: Of course, everybody in the field is aware of unpublished data. Most fruitful are collaborations with beamline staff for the data analysis, but we don't have sufficient resources for collaborating with all users. With our remote-analysis cluster and the new scientific computing division, we aim at supporting the data analysis beyond the immediate online analysis, thus improving productivity and publishing of data.

Christian Schlepütz 10:43 AM

1000 tps measurements for now can be run for about 1 minute continuous. Data rates are about 8 GB/s. Reducing the detector field of view is required to reach the necessary frame rates

Anonymous 10:51 AM

Are all the presentations from today going to be available later?

Andreas Streun 11:01 AM

They are on this web page: <https://indico.psi.ch/event/11625/timetable/#20220228>

Jens Wenzel Andreasen 10:58 AM

Access to the sulfur K-edge is very attractive for many applications. Is it out of the question to extend down to 2.4 keV?

Related, what is the upper range limit in energy for SIM?

To be more specific: Any beam line that can do ptychography at 2.4 keV?

Phil Willmott 11:11 AM

PolLux up to 1.6 keV (below S K-edge, sorry) BUT: NAPP double BM source will extend up to 6 keV SIM up to 1.9 keV. I believe PHOENIX will be able to perform ptychography at the S-edge. See talk by Christoph Bostedt after lunch

Frithjof Nolting 11:16 AM

The endstation at the SIM beamline can be moved to the Phonix beamline, where 2.4 keV can be used.

Condensed Matter (LSC) – Frithjof Nolting

Claude Monney 11:26 AM

Did you consider having angle-resolved time-of-flight analyzers on your ARPES endstations?

Phil Willmott 11:29 AM

Currently sticking to a CHA rather than TOF.

Femtochemistry (LSF) – Christoph Bostedt

Prof. Dr. Ingo Fischer 01:11 PM

Will photon flux at VUV beamline increase or stay constant?

Christoph Bostedt 01:23 PM

Will probably increase slightly depending on the energy, and useful flux can be increased by softer focusing. These all contribute to the hoped 1 order of magnitude increase in dynamic range

Paula Abdala 01:19 PM

For Debye BL: What is the time resolution target for PDF –XAS measurements? Will be the access be done through “normal” proposal based mode as for SuperXAS?

Christoph Bostedt 01:27 PM

The targeted time resolution for XAS is ms-s, for PDF also ms-s. For their combination, one-two minutes.

The detailed access model for Debye is still under discussion but we will make sure that the user community is well served, also with ‘normal’ based proposals as for SuperXAS.

christian.david@psi.ch 01:21 PM

A question to Christoph: You mentioned a full-field microscope at microXAS in collaboration with TOMCAT - could you please expand on that?

Christoph Bostedt 01:35 PM

Full-field tomography combined with spectroscopy (analogous to time-resolved tomography you do energy-resolved tomography. Multiple tomograms across an absorbing elemental edge results in XANES tomography.

Please see recent Nature Catalysis paper of Dario in collaboration with KIT. This paper was using fulfilled XANES tomography. <https://doi.org/10.1038/s41929-020-00552-3>

Collaboration with TOMCAT takes advantage of their expertise.

X-ray Nanoscience and Technologies (LXN) – Yasin Ekinci

Pablo Villanueva Perez 01:37 PM

You showed an achromat using and inverse CRL stack + FZP. How does it compare with a single lens using anomalous scattering +FZP?

Yasin Ekinci 01:52 PM

Dear Pablo,

I tried to answer according to my understanding and limited knowledge of the topic. Please contact me for further information.

Anonymous 01:41 PM

With the EUV Interference method for lithography mask, could you comment on the limit thickness and structure integrity of the mask layer?

Yasin Ekinci 01:54 PM

Dear Attendee,

I tried to answer according to my understanding.

I am sorry if there is any misunderstanding from my part and please email me for further information.

Malgorzata Makowska 02:36 PM

Is the paper with the achromat already available online?

Marie-Christine Andree Zdora 03:12 PM

Hello, I am the corresponding author of this paper and I can answer this question
It is unfortunately not available online yet.
It is currently in typesetting :)

IT-Overview – Alun Ashton

Anonymous 02:01 PM

BlueSky and Bliss - would that require a procurement?

Phil Willmott 02:20 PM

No, if PSI choose to go with BlueSky or Bliss both would be collaborations with the respective groups.

Roland Müller (HZB) 02:07 PM

Do Diamond II activities to move from GDA towards BlueSky influence your evaluation process?

Phil Willmott 02:22 PM

Currently I don't know if Diamond II has made a final decision to move to BlueSky. Having more European facilities contributing to, collaborating and using BlueSky will undoubtedly make it a stronger collaboration with more capabilities that will be considered as part of the evaluation.

Olaf Schwarzkopf 02:15 PM

Could you comment on the eLogbook you're thinking of?

Phil Willmott 02:23 PM

Electronic logbooks were reviewed about 18 months ago. Nothing that matched all the needs that was easily integrated was found. An inhouse development was undertaken and outlined in the Annex of the Controls and Science IT CDR. While it is not ideal to start another software product, the electronic logbook is a relatively small package (unlike e.g. a controls system), and is predominantly made up of existing open source libraries.

General discussions – Phil Willmott

Felix Armbrorst 03:14 PM

Is there already a foreseeable need from users for special filling patterns, e.g. camshaft, or special operation modes, e.g., low-alpha for the SLS 2.0?

Phil Willmott 03:20 PM

Low-alpha not possible due to use of permanent magnets. Camshaft mode is not presently planned and simulations need to be made to see what maximum charge is possible (normal pulse – 1 nC, present camshaft 5 nC. Fear that Touschek scattering would quickly destroy a 5-nC camshaft pulse).

Damien Freitas 03:18 PM

Hi, its maybe a naïve question, but do we expect any disruption in access for the data archived on tape from previous beamtimes during dark time and various IT upgrades at PSI?

Alun Ashton: We currently don't envisage an extended period of disruption. Some scheduled short downtime is however inevitable.



Christian Schlepuetz 03:19 PM

Can you confirm whether during the first operation period there will be any superbends available, or will all superbend beamlines be operated on the standard bending magnets?

Or will it be possible to run those four superbending magnet beamlines on the “modest” superbends mentioned by Phil?

So no way to run the two superconducting superbends on warm superbends during the first period?

Andreas Streun and Phil Willmott stated that the superconducting SB beamlines (S-TOMCAT and Debye) will have to operate using the 1.35-T normal bends until the SCSBs are installed in the second shutdown in 2026. THIS WAS WRONG!! These two beamlines will be installed with 2.1-T warm superbends, as these are almost no more costly than the normal 1.35-T BMs.

Anonymous 09:54 AM

Thank you for the talk. What is the deadline for last application submission before the planned dark time?

Phil Willmott 10:05 AM

Plan is: Last call in Aug 2022, deadline Sep 15, 2022 with PRC in Oct 2022 for the Period Jan - Oct 2023, i.e. a long period

Christian Schlepuetz 09:55 AM

How will the Proposal rounds be organized/timed until the dark time? Currently, the call for the second half of 2022 is open. But will there be one long call for 2023 until the dark, or will that still be split up into two calls?

Phil Willmott 10:05 AM

Plan is: Last call in Aug 2022, deadline Sep 15, 2022 with PRC in Oct 2022 for the Period Jan - Oct 2023, i.e. a long period