FLASH User Operations Newsletter, March 2020

Dear colleagues,

in order to support and inspire you when writing a proposal for FLASH, we put together this sixth issue of our newsletter. With this, we want to keep you updated on our recent activities and developments at the FLASH user facility. References and contact names for the corresponding in-depth information on new instrumentation and features are added to the brief summaries given here. This and all former newsletters are also available at http://photon-science.desy.de/facilities/flash/news_and_research_highlights/user_operations_newsletter/index_eng.html

We would be happy to provide you with further specific details on request and are looking forward to receive your experiment proposal.

With best regards,

Martin Beye * and *Rolf Treusch* for the FLASH team

* = acting scientific head of FLASH

Only one call for proposals this year with deadline on April 1, 2020

The present call with a deadline for proposal submission on April 1, 2020 is the only envisaged call for FLASH proposals this year. The reason is that, as described below, we are planning our first major shutdown for upgrades within the FLASH2020+ project for the year 2021 and will hence only provide about half of the usual annual beamtime for FEL experiments. Therefore this call relates to the run period in the full year 2021. Most likely, the user beamtime blocks will be in the 1st half of 2021.

Contact: Rolf Treusch (rolf.treusch@desy.de)

Status of the FLASH2020+ project: funded and ready to go

Within the FLASH2020+ project, substantial improvements to the photon beam parameters are planned, as highly requested by the user community. The first major shutdown for these upgrades will most probably start in summer 2021 and end early 2022. In this initial step two old accelerator modules are planned to be replaced by better performing new ones. This will result in an increase of the electron beam energy to 1.35 GeV and prepares the extension of the wavelength range up to the oxygen K-edge. Furthermore, our bunch compression scheme will be improved and a so called laser heater will be installed to avoid microbunching instabilities. FLASH2 will be equipped with a device to measure the electron bunch phase space with femtosecond resolution (PolariX TDS), and the installation of an afterburner to produce circularly polarized SASE radiation will be prepared.

The FLASH2020+ CDR was presented to the DESY advisory bodies Photon Science Committee (PSC), Machine Advisory Committee (MAC), and Laser Advisory Committee (LAC) in spring 2019. All three committees are very supportive and suggested to start with the upgrade plans as soon as possible. Recently, also the budget for planned upgrades was approved in the DESY Scientific Council as well as the Foundation council. Hence the funding is secured and the detailed design/construction phase has started while all critical technical details are compiled in a technical design report (TDR).

FLASH2020+ is well on track!

CDR for FLASH2020+ available online:

https://bib-pubdb1.desy.de/record/434950/files/FLASH2020pCDR.pdf

Contact: Siegfried Schreiber (siegfried.schreiber@desy.de)

Martin Beye (martin.beye@desy.de)

Remarks on the use of pressurized gases: Plan well ahead

In case you plan to use pressurized gases in your experiment, please allow for sufficient lead time if we are supposed to supply them. Alternatively arrange to order/bring them yourself.

Gases that we have on stock locally (at our gases group MEA6), such as all noble gases, nitrogen, oxygen, hydrogen, carbon monoxide and others, can be seen in our stock listing here. Some of the gases are listed with a stored quantity of 0.0 kg, however, all gases in the list are on stock, sometimes in small quantities only – and not necessarily with the right purity. To check the availability according to your needs, please get in touch with your local contact 4 - 6 weeks before your experiment.

For the gases on stock in a sufficient quantity and with the required purity, it normally takes 1-2 working days for delivery, and there is no delivery at the weekend. For same day delivery – which should be restricted to the really urgent cases – the request for an order needs to be placed before 8:00 in the morning with the hall technician (for FLASH: M.Duske).

For the gases not appearing in our stock list, the process from ordering to delivery might take up to 12 weeks! This is because, e.g., not all gas suppliers have them on stock either, or are not producing them in the small quantities we typically need and hence it needs substantial time to get an offer on an ordering request.

Web page with further regulations regarding the use of gases for experiments

Contact: the local contact for your experiment

We will change our scheduling mode: First trial in second half of 2020

Starting with the second half of this year, we will – similar to other FEL facilities – schedule such that the experiments get all shifts in one block, meaning an experiment with 10 respectively 12 shifts runs 5 respectively 6 days in a row.

The idea behind that is to

- allow for a more structured planning with regular start and end dates of beamtimes.
- minimize the fraction of setup times and hence provide more user beamtime.
- spend more time on a thorough setup only once to ensure more reliable conditions over the full beamtime, instead of having to set up two or three times, potentially with slightly different conditions.
- minimize the required duration of stay for the experimental teams, hence saving time and travel expenses for everybody.

The figure below sketches an example schedule. Note that if a FLASH1 experiment requires several wavelengths it obviously still requires a corresponding number of machine setups – and might not necessarily perfectly fit for combining it with a parallel experiment at FLASH2.

Aug/Sep 2020, FLASH1 - Block 4

		setup time in hours	day shift (7:00-19:00)				
10.8.20	Mo		Contingency				
11.8.20	Tu		Setup				
12.8.20	We	7	User A	6.59 nm	PG2	L, train	11001234
13.8.20	Th		User A	6.59 nm	PG2	L, train	11001234
14.8.20	Fr		User A	6.59 nm	PG2	L, train	11001234
15.8.20	Sa		User A	6.59 nm	PG2	L, train	11001234
16.8.20	Su		User A	6.59 nm	PG2	L, train	11001234
17.8.20	Mo		User A	6.59 nm	PG2	L, train	11001234
18.8.20	Tu		Setup				
19.8.20	We		User@FL2				
20.8.20	Th		User@FL2				
21.8.20	Fr		User@FL2				
22.8.20	Sa		User@FL2				
23.8.20	Su		User@FL2				
24.8.20	Mo		User@FL2				
25.8.20	Tu		Maintenance				
26.8.20	We	8	User B	8.3 nm	PG2	L, train	11002345
27.8.20	Th		User B	8.3 nm	PG2	L, train	11002345
28.8.20	Fr		User B	8.3 nm	PG2	L, train	11002345
29.8.20	Sa		User B	8.3 nm	PG2	L, train	11002345
30.8.20	Su		User B	8.3 nm	PG2	L, train	11002345
31.8.20	Mo		User B	8.3 nm	PG2	L, train	11002345
1.9.20	Tu						
2.9.20	We	8	User C	30.0 nm	THz	THz	11003456
3.9.20	Th		User C	30.0 nm	THz	THz	11003456
4.9.20	Fr		User C	30.0 nm	THz	THz	11003456
5.9.20	Sa		User C	30.0 nm	THz	THz	11003456
6.9.20	Su		User C	30.0 nm	THz	THz	11003456
7.9.20	Mo		User C	30.0 nm	THz	THz	11003456

User	wavelength			# bunches	rep rate	pulse dur.
User A	6.59 nm	+/-	0.10 nm	400	1MHz	<= 50 fs
User B	8.3 nm	+/-	1.00 nm	300	1MHz	50-100 fs
User C	30.0 nm	+/-	1.00 nm	30	1MHz	>100 fs (uncritical)

Aug/Sep 2020, FLASH2 - Block 4

		setup time in hours	day shift (7:00-19:00)				
10.8.20	Mo		Contingency				
11.8.20	Tu		Setup				
12.8.20	We	7	FL2 Operation	6.6 nm -	19.8 nm		
13.8.20	Th		FL2 Operation	6.6 nm -	19.8 nm		
14.8.20	Fr		FL2 Operation	6.6 nm -	19.8 nm		
15.8.20	Sa		FL2 Operation	6.6 nm -	19.8 nm		
16.8.20	Su		FL2 Operation	6.6 nm -	19.8 nm		
17.8.20	Mo		FL2 Operation	6.6 nm -	19.8 nm		
18.8.20	Tu		Setup				
19.8.20	We	8	User Y	6.6 nm	FL24		11005678a
20.8.20	Th		User Y	6.6 nm	FL24		11005678a
21.8.20	Fr		User Y	6.6 nm	FL24		11005678a
22.8.20	Sa	9	User Y	4.4 nm	FL24		11005678b
23.8.20	Su		User Y	4.4 nm	FL24		11005678b
24.8.20	Mo		User Y	4.4 nm	FL24		11005678b
25.8.20	Tu		Maintenance				
26.8.20	We	8	User X	15 nm	FL24	FL2, train	11004567a
27.8.20	Th		User X	15 nm	FL24	FL2, train	11004567a
28.8.20	Fr		User X	15 nm	FL24	FL2, train	11004567a
29.8.20	Sa		User X	15 nm	FL24	FL2, train	11004567a
30.8.20	Su	2	User X	25 nm	FL24	FL2, train	11004567b
31.8.20	Mo		User X	25 nm	FL24	FL2, train	11004567b
1.9.20	Tu		Setup				
2.9.20	We	8	User Z	49.6 nm	FL26		11006789
3.9.20	Th		User Z	49.6 nm	FL26		11006789
4.9.20	Fr		User Z	49.6 nm	FL26		11006789
5.9.20	Sa		User Z	49.6 nm	FL26		11006789
6.9.20	Su		User Z	49.6 nm	FL26		11006789
7.9.20	Mo		Contingency				

User	wavelength			# bunches	rep rate	pulse dur.
User X	15 nm	+/-	1.50 nm	30	100kHz	50-100 fs
User X	25 nm	+/-	2.50 nm	30	100kHz	50-100 fs
User Y	6.6 nm	+/-	0.10 nm	400	1MHz	50-100 fs
User Y	4.4 nm	+/-	0.10 nm	400	1MHz	50-100 fs
User Z	49.6 nm	+/-	1.00 nm	80	200kHz	<= 50 fs

We would be glad to afterwards collect your feedback on the advantages and also potential drawbacks of this scheduling approach.

Contact: Rolf Treusch (rolf.treusch@desy.de)