



Wayforlight: The Catalogue of European Light Sources

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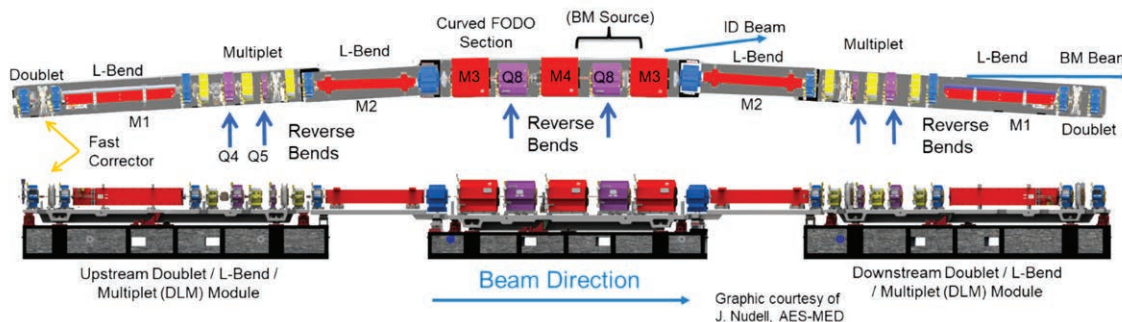
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Plan for one of the 7-bend achromat sectors.

correlation spectroscopy (XPCS), ptychography/spectromicroscopy, coherent grazing incidence small angle scattering (GiSAXS), and diffraction microscopy. Two of these beamlines will extend beyond the present APS experiment hall into end stations housed in a new building. About a quarter of the existing beamlines will be upgraded with new X-ray optics (mirrors, monochromators, focusing elements, etc.), and many of the remaining beamlines will receive performance enhancing changes.

To maintain beam stability in position, angle, size, and energy will be required to avoid degrading the quality of photon beam active orbit feedback with 1 kHz bandwidth, multi-bunch longitudinal and possibly transverse feedback and optical component feedback will be needed. The most stringent orbit stability

goal is of the order of $<0.3 \mu\text{m}$ rms for vertical beam position in ID straight sections in a 0.01–2.1 kHz bandwidth.

Going forward

With the baseline schedule and budget established, the APS-U project is moving forward to obtain DOE approval for full project spending authority. To obtain full spending authority, the designs for accelerator and beamline systems must be advanced enough to ensure a timely expenditure of funds. The goal is to obtain this approval in the coming months.

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Wayforlight: The Catalogue of European Light Sources

Wayforlight.eu [1] is the gateway to finding the most suitable instruments for experiments with synchrotron, FEL, and laser light sources. The portal's main asset is a detailed searchable catalogue of facilities, beamlines, and instrumentation available at European light sources. Thanks to its advanced search tools, a visitor can filter beamlines by scientific discipline, by technique, but also by energy range or sample type.

The original dataset included European synchrotron and free electron laser (FEL) sources, and was created under the EC FP7-funded project CALIPSO. The Horizon 2020 EUCALL project [2] grouped together advanced light sources, including synchrotrons, FELs, and op-

tical laser light sources. The experts involved in EUCALL performed a comprehensive analysis of the technical and scientific resources on offer at such sources, and proposed recommendations for optimal use of these facilities. For the benefit of the different and growing user communities, the information was incorporated into the wayforlight database, integrating the laser-driven advanced light sources for the first time in the same catalogue. The newly augmented database, created and maintained at Elettra, became publicly available in September 2018.

The facilities and beamline datasheets are standardized; users are now able to explore the database and directly compare instrumentation at a much larger number of facilities in

greater depth, allowing them to develop more elaborate, comparative, and complementary experiments at various facilities.

The capabilities of the wayforlight database were also extended by including a set of Advanced Programming Interfaces (APIs), such that information entered by instrument scientists can be automatically displayed on their own individual facility website. In this way, description of instrumentation at the participating facilities has been standardized, while avoiding the disadvantage that beamline



scientists have to manually enter instrumentation data into multiple platforms. These two factors represent the key towards a sustainable future for the catalogue as a whole.

Discussions on further data integration are presently ongoing with several facilities, as well as with the FELs of Europe association and the global website lightsources.org [4]. Wayforlight was also presented at a MERIL [5] meeting, and the possibility to interlink the two portals has been considered to be very promising.

On wayforlight, researchers have all major European light sources, now including not only synchrotrons and FELs, but also laser sources, at a glance. Thanks to the joint efforts of EU-CALL and CALIPSOplus, it is a smart system, since data will be more easily transferrable to other websites, ensuring future interoperability. Within the CALIPSOplus project [6], the portal was expanded with two additional sections targeting academic and industrial users.

Inexperienced users might be especially interested in the section introducing the European Synchrotron and FEL User Organisation (ESUO), created in 2010 [8], composed of national delegates from 30 countries of the European Research Area as well as Israel and Turkey. Dedicated webpages for each of the 30 countries involved in ESUO provide the contact data of the national delegates and information about the activities of the national user organizations, where applicable. In addition, an online tutorial on how to write a competitive proposal and how to submit it is offered. In the near future, access to a dedicated Proposal Dashboard to visualize the status of the various beamtime proposals submitted at the different facilities will also be available.

Industry can benefit from a multi-language section that explains the capability of light sources and facilitates interaction with the industrial liaison offices of the facilities. Moreover, small and medium enterprises (SMEs) can apply for access to light sources via wayforlight. Financed by the CALIPSOplus project, feasibility tests, as well as complete beam times including data analysis, are offered free of charge [9].

The portal is continuously updated with a strong focus on future sustainability. In this respect, a pilot project is being developed within the League of European Accelerator-based Photon Sources (LEAPS) initiative [10], grouping together all accelerator-based European light sources with the goal of creating a European Technology Roadmap [11, 12].

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