

First WG2 Workshop



Report of Contributions

Contribution ID: 1

Type: **not specified**

Compact sources

Tuesday, 8 September 2020 14:10 (20 minutes)

Compact photon sources based on novel accelerator concepts promise a miniaturization of future facilities and may enable new mobile applications. This presentation will review the recent progress in compact source R&D at the LEAPS partners and it should stimulate discussions on the future role of LEAPS in compact source development.

Presenter: Dr OSTERHOFF, Jens (DESY)

Session Classification: Topical working group leaders

Contribution ID: 2

Type: **not specified**

FELs

Tuesday, 8 September 2020 14:30 (20 minutes)

Presenter: Prof. DI MITRI, Simone (Elettra Sincrotrone Trieste)

Session Classification: Topical working group leaders

Contribution ID: 3

Type: **not specified**

Synchrotrons

Tuesday, 8 September 2020 14:50 (20 minutes)

Presenter: Prof. JANKOWIAK, Andreas (Humboldt-Universität zu Berlin)

Session Classification: Topical working group leaders

Contribution ID: 7

Type: **not specified**

Novel two-stage concept for ultra-low energy spread beams from plasma accelerators

Tuesday, 8 September 2020 16:10 (20 minutes)

Plasma-based accelerators are a promising technology that could significantly reduce the size and cost of future accelerator facilities. However, the quality of the produced beams, particularly regarding the energy spread (typically on the 1-10% range), is still not sufficient for applications. We present here a novel concept for plasma-based acceleration which could deliver multi-GeV beams with an unprecedented energy spread performance on the 0.1% (total) and 0.01% (slice) range. This scheme, based on the combined use of a magnetic chicane with multiple plasma-accelerating stages, therefore offers a new path towards groundbreaking applications such as compact free-electron lasers.

Presenter: Dr FERRAN-POUSA, Angel (DESY)

Session Classification: Special topics

Contribution ID: 8

Type: **not specified**

Steady State Microbunching in Storage Rings - Proof of Principle Results at MLS

Tuesday, 8 September 2020 16:30 (20 minutes)

Coherent radiation is a powerful scheme for storage ring based synchrotron radiation sources as its intensity increases with the square of the number of radiating electrons (N^2) instead only linearly as in common storage ring based light sources. Formation of bunches or sub-bunches shorter than the radiation wavelength is necessary for the radiation from different electrons to add in phase and therefore cohere. Recently at the MLS it was shown that in a dedicated isochronous optics an electron beam energy modulation induced by an externally applied laser in an undulator section leads to the formation of sub-bunches with a length of $1 \mu\text{m}$ one turn later. It was proven that these micro-bunches radiate coherently in that same undulator at exactly that wavelength. This is the first step towards the so called "Steady State micro Bunching" concept (SSMB) for storage rings proposed by Alex Chao and Daniel Ratner in 2010 as a new type of synchrotron light source.

Presenter: Dr FEIKES, Jörg (Helmholtz Berlin)

Session Classification: Special topics

Contribution ID: 9

Type: **not specified**

Lasing beyond 20 keV, recent achievements and future prospects

Tuesday, 8 September 2020 16:50 (20 minutes)

European XFEL is the world leading FEL facility in terms of electron and photon energies. The new regime above 20 keV allows for novel photon science opportunities, especially in combination with the high repetition rate of EuXFEL. This presentation shows both the to-date achievements as well as future plans to strive for even higher photon energies within the next years.

Presenter: Dr GUETG, Marc (DESY)

Session Classification: Special topics

Contribution ID: 10

Type: **not specified**

The SXL project: Towards a sub-fs soft X-ray FEL at MAX IV

Tuesday, 8 September 2020 17:10 (20 minutes)

The SXL project gathered the needs of a broad science case coming mainly from Swedish users and aims to build a soft X-ray FEL targeting the range from 5 to 1 nm. Given the energy (3 GeV) of the already existing linac at the MAX IV laboratory, which serves as injector for two storage rings and the short pulse facility, it was proposed to work on a conceptual design that builds-up on that. Short electron bunches needed to drive the FEL process can be obtained by tuning the two double-achromat bunch compressors and even shorter (sub-fs) are foreseen with low charge operation of the photocathode gun. Two color two pulses modes are foreseen with the split undulator scheme, in which a big chicane can control the delay between the two pulses/colors. The current design relies also on very compact undulators that allow variable polarization. Although already equipped with the basic features to drive an FEL in the soft X-ray range, some developments and improvements are needed to reach the desired performance, both in terms of additional diagnostics and further advanced operation schemes. In particular, contrary to conventional chicanes compressors, the double-achromat system impinges the longitudinal phase space with an energy chirp and with a strongly not flat current profile. Current studies are aiming for manipulating the longitudinal phase space in order to accommodate other FEL schemes than SASE (fresh slice, chic, echo, seeding).

Presenter: CURBIS, Francesca (MAX IV laboratory)

Session Classification: Special topics

Contribution ID: 11

Type: **not specified**

Status of LIDs

Tuesday, 8 September 2020 15:10 (20 minutes)

Presenter: Dr COUPRIE, Marie-Emmanuelle (Synchrotron SOLEIL)

Session Classification: News from LIDs & CLSI

Contribution ID: 12

Type: **not specified**

Canadian Light source

Tuesday, 8 September 2020 15:30 (20 minutes)

Presenter: Dr BOLAND, Mark (Canadian Light Source Inc.)

Session Classification: News from LIDs & CLSI