PSI Center for Accelerator Science and Engineering

Workshop Overview

Longitudinal Electron beam Dynamics for Coherent Light Sources

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Overview

Location: Haus der Universität, Bern, Switzerland.

Dates: 17th-20th September

Scope: Workshop discussing high brightness beams in linear and circular electron accelerators, primarily focusing on light sources. Sessions focused on certain phenomena that limit the beam brightness or may be used to improve it through special operational modes.

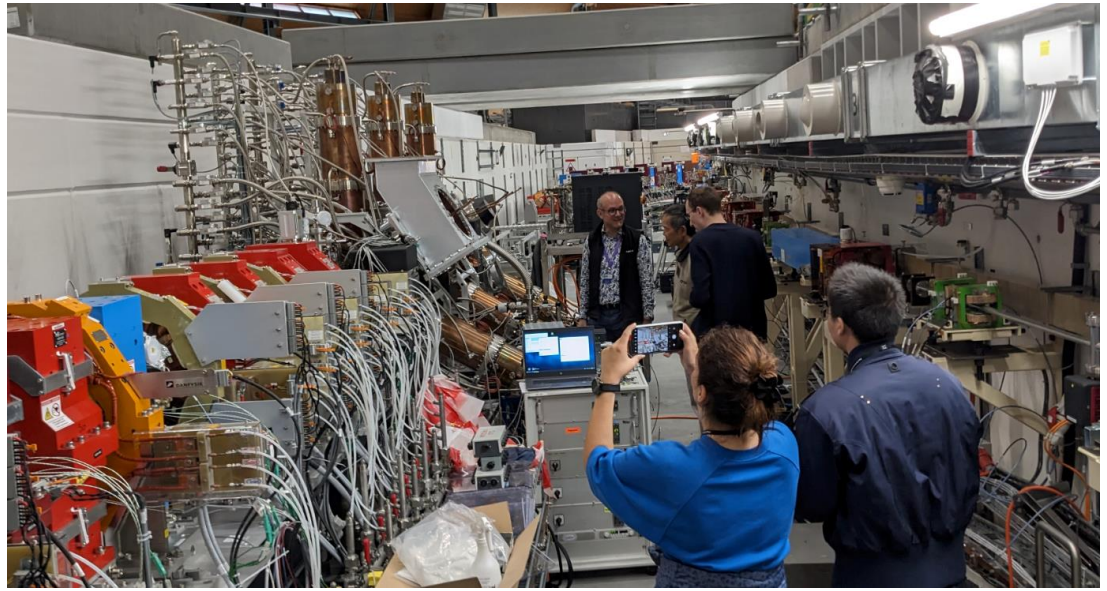
Website: https://indico.psi.ch/event/15973/

Venue for the Workshop.

Facility Visit and Social Activities

- Facility visits at the Paul Scherrer Institut:
  - HIPA Proton Source
  - WLHA electron source test stand
  - SLS 2.0 Ring

- Events during workshop:
  - Dinner on the Aare River
  - Visit to Einstein Museum
  - BBQ on the Aare.



Participants and Collaborations built

- 33 participants from a total of 8 different countries, including Switzerland, Germany, China, Italy, US, France, Japan, Sweden.
- Discussion time that has led to future collaborations:
  - PSI and CERN on IBS calculations
  - Elettra and CERN on IBS modelling
  - Supportive action by some Institutions to a Swiss call for funds, to build and characterize (with beam!) an innovative TW S-band Gun test facility.

Conclusions and Outlook

- Longitudinal e-beam dynamics and manipulation is highly relevant to remove show-stoppers for full coherence in soft X-rays, e.g., seeded FELs.
- Additional benchmarking of modelling and measurements, both at low and high energy, and for relatively complex transport lines in the presence of microbunching instability, are required to boost the accuracy of control and prediction of e-beam parameters as required by new FEL schemes and specifications.
- New numerical and experimental data are expected to be collected in < 2 years from now, at different linac facilities.

- SSMB studies, both numerical and experimental (MLS, Berlin), have confirmed coherent emission, but at micron scale, and on a few-turn basis only, at this stage. Next phases require a dedicated facility.

- A «LEDS» mailing exists, and will be used in the following months to update the LEDS participants about new initiatives, scientific activities, results.