Mini-workshop on impedance modeling and impedance effects at SuperKEKB and future colliders

Contacts:

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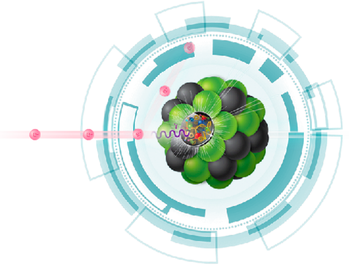
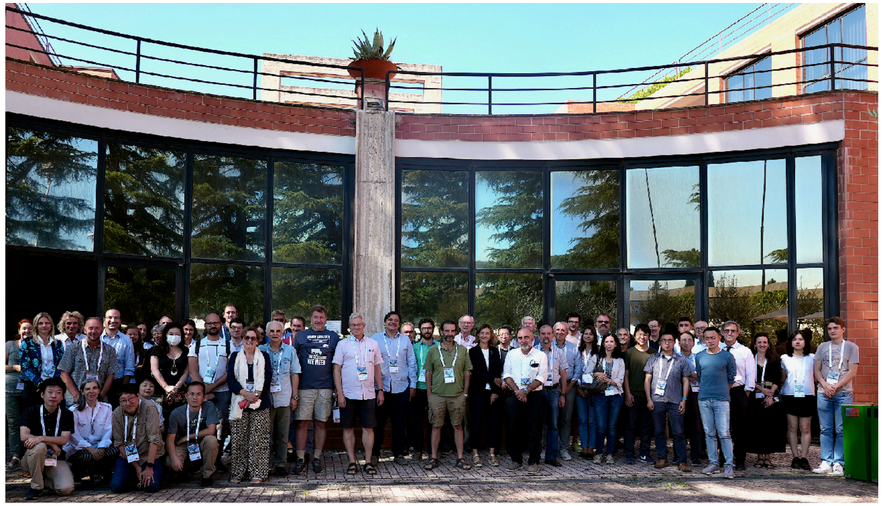


KEK, Dec. 15-16, 2022

This topical two-day mini-workshop is a follow-up workshop after the eeFACT2022 for scientists working on various projects to discuss impedance modeling and impedance effects at circular accelerators, including colliders SuperKEKB, FCC-ee, CEPC, EIC, and light sources ESRF, NSLS-II, etc.

65th ICFA Advanced Beam Dynamics Workshop on High Luminosity Circular e+e- Colliders (eeFACT2022)



The workshop will be held - in person - at the INFN-LNF, Via Enrico Fermi, 54 - Frascati (Rome, Italy) from September 12 to 15, 2022.

The INFN Frascati National Laboratories is hosting the ICFA Advanced Beam Dynamics Workshop on High Luminosity Circular e+e- Colliders (eeFACT2022).

This workshop is organized in the context and with sponsoring of the ICFA Beam Dynamics Panel and EU/IFAST funded European Network for Accelerator Performance and Concepts (APEC).

eeFACT2022 scope:

- Reviewing and documenting the state of the art in e+e- factory design
- Reviewing and drawing lessons from SuperKEKB phase 3 commissioning
- Catalyzing further contributions to the SuperKEKB, FCC, CEPC & tau-charm design efforts
- Fostering synergies and new collaborations across communities, in particular with low-emittance light sources and other colliders (muon, linear, e-ion) and between continents
- Jointly developing novel solutions to outstanding problems

→ Motivating this mini-workshop

Workshop organization

- Consider the impact of covid-19
  - High travel expenses
  - Non-pleasant local rules
  - Less in-person communications (expensive), but enjoyable online connections (economic) via Zoom

- Morning sessions start from 9 AM JST, friendly to remote speakers from the USA.
- Afternoon sessions start from 3 PM JST, friendly to remote speakers from Europe.
- Presentations from China and Japan are allocated to the sessions depending on the relevance of the topics.

- Goals of the workshop
  - To share knowledge and experience on impedance modeling and studies of impedance effects.
  - To provide an opportunity of triggering collaborations.

- Post-workshop task
  - To work on a review article that summarizes the achievements and the future trends, highlighting common problems and addressing possible solutions.

Scientific program- Day 1 (Thu 15/12)

09:00

Opening remark 09:00 - 09:10

Generalized Nyquist Criterion for Transverse Stability *Dr Michael Blaskiewicz* 09:10 - 09:40

Coupled-bunch instability for arbitrary multibunch configurations *Dr Gabriele Bassi* 09:40 - 10:10

10:00

Impedance modeling and its application to the analysis of the collective effects *Dr Alexei Blednykh* 10:10 - 10:40

Break 10:40 - 10:50

Collimator model & FCC-ee impedance model *Dr Mostafa Behtouei* 10:50 - 11:20

11:00

Resistive wall impedance and incoherent tune shift for elliptical multilayer beam pipe *Yuting Wang* 11:20 - 11:50

15:00

Impedance modeling for SuperKEKB *Takuya ISHIBASHI* 15:00 - 15:30

-1 mode instability at SuperKEKB LER *Prof. Kazuhito Ohmi* 15:30 - 16:00

16:00

Development and operation experience of collimators at SuperKEKB *Shinji Terui* 16:00 - 16:30

Break 16:30 - 16:40

Coupled-bunch instability driven by resistive wall impedance at SuperKEKB main rings *Demin ZHOU* 16:40 - 17:10

17:00

Optimization of Belle II background and its impact on collimator settings *Dr Andrii Natochii* 17:10 - 17:40

Methods and results of bunch length measurements at SuperKEKB (Canceled) *Dr Gaku Mitsuka* 17:40 - 18:10

18:00

Scientific program- Day 2 (Fri 16/12)

09:00
- **Impedance computations and beam-based measurements: A problem of discrepancy** — *Dr Victor Smalyuk* — 09:00 - 09:30
- **Beam Induced Heating Analysis for the EIC Vacuum Components** — *Dr Medani Sangroula* — 09:30 - 10:00

10:00
- **A cross-check of wakefield simulations by GdfidL and ECHO3D codes** — *Dr Aamna Khan* — 10:00 - 10:30
- **Break** — 10:30 - 10:40
- **Fokker-Planck analysis of transverse collective instabilities in electron storage rings (Canceled)** — *Dr Ryan Lindberg* — 10:40 - 11:10

11:00

15:00
- **Interplay of beam-beam and impedance effects** — *Dr Yuan Zhang* — 15:00 - 15:30
- **Impedance modeling and related effects at CEPC** — *Dr Na Wang* — 15:30 - 16:00

16:00
- **FCC-ee collective effects** — *Emanuela Carideo* — 16:00 - 16:30
- **Break** — 16:30 - 16:40
- **Resistive wall impedance with arbitrary cross section** — *Ali Rajabi* — 16:40 - 17:10

17:00
- **Collective Effects at the ESRF** — *Lee Carver* — 17:10 - 17:40
- **Resistive wall impedance calculations using neural network method (Canceled)** — *Dr Kazuhiro Fujita* — 17:40 - 18:10

18:00
- **Close remark** — 18:10 - 18:20

Further messages

- We will take video recordings of the presentations, for participants who can only follow some talks due to continental time differences.

- Zoom link for Day 1 [Dec. 15 (Thu.), 2022 (JST)]
  - https://us06web.zoom.us/j/86477803363?pwd=SDlsSVhRZDRKNWRoQW82VXR6cHBkQT09
  - Meeting ID: 864 7780 3363
  - Passcode: 969597

- Zoom link for Day 2 [Dec. 16 (Fri.), 2022 (JST)]
  - https://us06web.zoom.us/j/84960326327?pwd=TXE4ejBoM3F1YnlxY0t2T0ljVHAwZz09
  - Meeting ID: 849 6032 6327
  - Passcode: 554874

Thanks to all contributors
and have a productive workshop!