

# Low Emittance Rings workshop 2024



## Report of Contributions

Contribution ID: 1

Type: **not specified**

## Welcome and introduction

*Tuesday, 13 February 2024 08:30 (20 minutes)*

**Presenter:** PAPAPHILIPPOU, Yannis (CERN)

Contribution ID: 2

Type: **not specified**

## **Registration (Desk next to the Cafeteria, Building 6, 1st floor)**

*Tuesday, 13 February 2024 08:00 (30 minutes)*

Contribution ID: 3

Type: **not specified**

## Lattice design for BESSY III

*Tuesday, 13 February 2024 08:50 (20 minutes)*

**Presenter:** GOSLAWSKI, Paul (Helmholtz-Zentrum Berlin, BESSY II, MLS)

**Session Classification:** Lattice Design

Contribution ID: 4

Type: **not specified**

## **Complex Bend lattice design for NSLS-II Upgrade**

*Tuesday, 13 February 2024 09:10 (20 minutes)*

**Presenter:** LI, Yongjun (BNL)

**Session Classification:** Lattice Design

Contribution ID: 5

Type: **not specified**

## **Lattice design for Korea-4GSR Light Source**

*Tuesday, 13 February 2024 09:30 (20 minutes)*

**Presenter:** SEOK, Jimin

**Session Classification:** Lattice Design

Contribution ID: 6

Type: **not specified**

## **Deterministic approach to MBA lattice design**

*Tuesday, 13 February 2024 09:50 (20 minutes)*

**Presenter:** KUSKE, Bettina (HZB)

**Session Classification:** Lattice Design

Contribution ID: 7

Type: **not specified**

## Discussion

*Tuesday, 13 February 2024 10:10 (10 minutes)*

**Session Classification:** Lattice Design



Contribution ID: 8

Type: **not specified**

## **Optics corrections and beam-based alignment for low emittance rings**

*Tuesday, 13 February 2024 10:40 (20 minutes)*

**Presenter:** HUANG, Xiaobiao (SLAC National Accelerator Laboratory)

**Session Classification:** Optics measurements, correction and low-vertical emittance tuning

Contribution ID: 9

Type: **not specified**

## **Implementation of fully analytic orbit response analysis in python**

*Tuesday, 13 February 2024 11:00 (20 minutes)*

**Presenter:** FRANCHI, Andrea

**Session Classification:** Optics measurements, correction and low-vertical emittance tuning

Contribution ID: **10**

Type: **not specified**

## **Online tuning and optics monitoring at ESRF**

*Tuesday, 13 February 2024 11:20 (20 minutes)*

**Presenter:** LIUZZO, Simone (ESRF)

**Session Classification:** Optics measurements, correction and low-vertical emittance tuning

Contribution ID: 11

Type: **not specified**

## Single power supply optics correction for combined function dipoles

*Tuesday, 13 February 2024 11:40 (20 minutes)*

**Presenter:** Dr MARTI, Zeus (CELLS-ALBA)

**Session Classification:** Optics measurements, correction and low-vertical emittance tuning

Contribution ID: 12

Type: **not specified**

## Vertical emittance control in DIAMOND-II

*Tuesday, 13 February 2024 12:00 (20 minutes)*

**Presenter:** MARTIN, Ian

**Session Classification:** Optics measurements, correction and low-vertical emittance tuning

Contribution ID: 13

Type: **not specified**

## Discussion

*Tuesday, 13 February 2024 12:20 (10 minutes)*

**Session Classification:** Optics measurements, correction and low-vertical emittance tuning

Contribution ID: 14

Type: **not specified**

# Symplectic tracking through arbitrary magnetic fields

*Tuesday, 13 February 2024 14:00 (20 minutes)*

**Presenter:** LINDBERG, Ryan (Argonne National Lab)

**Session Classification:** Non-linear dynamics

Contribution ID: 15

Type: **not specified**

## **Nonlinear dynamics optimization in ultra-low-emittance rings by minimizing the fluctuations of resonance driving terms (RDTs) along the ring**

*Tuesday, 13 February 2024 14:20 (20 minutes)*

**Presenter:** ZHENGHE, Bai (NSRL)

**Session Classification:** Non-linear dynamics



Contribution ID: 16

Type: **not specified**

## **Review of the workshop on permanent magnets for low emittance rings**

*Tuesday, 13 February 2024 14:40 (20 minutes)*

**Presenter:** KARANTZOULIS, Emanuel (Elettra - Sincrotrone Trieste)

**Session Classification:** Magnet design

Contribution ID: 17

Type: **not specified**

# High-Temperature Superconducting Undulators: Potential, Status, and Application

*Tuesday, 13 February 2024 15:00 (20 minutes)*

**Presenter:** RICHTER, Sebastian (Paul Scherrer Institut, PSI (CH))

**Session Classification:** Magnet design

Contribution ID: **18**

Type: **not specified**

## **Magnetic designs and tests of the complex bend at NLSL**

*Tuesday, 13 February 2024 15:20 (20 minutes)*

**Presenter:** SHAFTAN, Timur (Brookhaven National Laboratory)

**Session Classification:** Magnet design

Contribution ID: **19**

Type: **not specified**

## Discussion

*Tuesday, 13 February 2024 15:40 (20 minutes)*

**Session Classification:** Magnet design

Contribution ID: 20

Type: **not specified**

## **Perturbation sources and improvements of Sirius Beam Stability**

*Tuesday, 13 February 2024 16:20 (20 minutes)*

**Presenter:** DE SA, Fernando (LNLS)

**Session Classification:** Beam stability, feedback and diagnostics

Contribution ID: 21

Type: **not specified**

## **SLS 2.0 BPM and Fast Orbit Feedback System**

*Tuesday, 13 February 2024 16:40 (20 minutes)*

**Presenter:** KEIL, Boris (Paul Scherrer Institute)

**Session Classification:** Beam stability, feedback and diagnostics

Contribution ID: 22

Type: **not specified**

## Two slit diagnostics beamline design for ALS-U

*Tuesday, 13 February 2024 17:00 (20 minutes)*

**Presenter:** SUN, Changchun (LBNL)

**Session Classification:** Beam stability, feedback and diagnostics

Contribution ID: 23

Type: **not specified**

## **Bending Magnet Synchrotron Radiation Imaging with Large Orbital Collection Angles**

*Tuesday, 13 February 2024 17:20 (20 minutes)*

**Presenter:** ANDERSSON, Åke (Lund University)

**Session Classification:** Beam stability, feedback and diagnostics



Contribution ID: 24

Type: **not specified**

## Discussion

*Tuesday, 13 February 2024 17:40 (20 minutes)*

**Session Classification:** Beam stability, feedback and diagnostics

Contribution ID: 25

Type: **not specified**

## Design and challenges of PETRAIV

*Wednesday, 14 February 2024 08:30 (25 minutes)*

**Presenter:** BARTOLINI, Riccardo (DESY)

**Session Classification:** Design challenges

Contribution ID: 26

Type: **not specified**

## **Elettra 2.0 Lattice and technical challenges**

*Wednesday, 14 February 2024 08:55 (25 minutes)*

**Presenter:** KARANTZOULIS, Emanuel (Elettra - Sincrotrone Trieste)

**Session Classification:** Design challenges

Contribution ID: 27

Type: **not specified**

## Challenges for the FCC ultimate storage rings

*Wednesday, 14 February 2024 09:20 (25 minutes)*

**Presenter:** ZIMMERMANN, Frank (CERN)

**Session Classification:** Design challenges

Contribution ID: 28

Type: **not specified**

## Discussion

*Wednesday, 14 February 2024 09:45 (15 minutes)*

**Session Classification:** Design challenges

Contribution ID: 29

Type: **not specified**

## **CSR impedance and the impact of quadrupolar wakes on beam dynamics**

*Wednesday, 14 February 2024 10:00 (20 minutes)*

**Presenter:** NAGAOKA, Ryutaro

**Session Classification:** Collective effects and mitigations

Contribution ID: **30**

Type: **not specified**

## **Challenges of short light pulses in fourth-generation storage rings**

*Wednesday, 14 February 2024 10:20 (20 minutes)*

**Presenter:** DI MITRI, SIMONE

**Session Classification:** Collective effects and mitigations

Contribution ID: **31**

Type: **not specified**

## Discussion

*Wednesday, 14 February 2024 10:40 (10 minutes)*

**Session Classification:** Collective effects and mitigations



Contribution ID: 32

Type: **not specified**

## **Controlling and manipulating the electron-bunch dynamics during the microbunching instability in storage ring**

*Wednesday, 14 February 2024 11:10 (20 minutes)*

**Presenter:** CLEMENT, Evain (PhLAM laboratory)

**Session Classification:** Collective effects and mitigations

Contribution ID: 33

Type: **not specified**

## **Low Longitudinal Emittance and Steady-State Micro-Bunching Storage Rings**

*Wednesday, 14 February 2024 11:30 (20 minutes)*

**Presenter:** XIUJIE, Deng (Tsinghua University)

**Session Classification:** Collective effects and mitigations

Contribution ID: 34

Type: **not specified**

## **CSR effects in low-emittance electron storage rings**

*Wednesday, 14 February 2024 11:50 (20 minutes)*

**Presenters:** ZHOU, Demin; ZHOU, Demin (Japan Atomic Energy Agency (JP))

**Session Classification:** Collective effects and mitigations

Contribution ID: 35

Type: **not specified**

## Discussion

*Wednesday, 14 February 2024 12:10 (20 minutes)*

**Session Classification:** Collective effects and mitigations

Contribution ID: 36

Type: **not specified**

## **Mode 1 Instabilities in fourth generation Storage Rings**

*Wednesday, 14 February 2024 14:20 (20 minutes)*

**Presenter:** CULLINAN, Francis (MAX IV)

**Session Classification:** Collective effects and mitigations

Contribution ID: 37

Type: **not specified**

## **Collective Effects at injection into Small Aperture Storage rings: Pros and cons of on-axis swap-out vs off-axis accumulation injection schemes**

*Wednesday, 14 February 2024 14:00 (20 minutes)*

**Presenter:** LINDBERG, Ryan (Argonne National Lab)

**Session Classification:** Collective effects and mitigations

Contribution ID: **38**

Type: **not specified**

## **TMCI theory of flat chambers revisited**

*Wednesday, 14 February 2024 14:40 (20 minutes)*

**Presenter:** GUNZEL, Thomas (ALBA-CELLS)

**Session Classification:** Collective effects and mitigations

Contribution ID: 39

Type: **not specified**

## **Investigating the transverse mode-coupling instability at the MAX IV 3 GeV storage ring**

*Wednesday, 14 February 2024 15:00 (20 minutes)*

**Presenter:** BROSI, Miriam (MAX IV Laboratory)

**Session Classification:** Collective effects and mitigations



Contribution ID: 40

Type: **not specified**

## **Impact of beam-ion interactions in diffraction limited storage rings**

*Wednesday, 14 February 2024 15:20 (20 minutes)*

**Presenter:** GUBAIDULIN, Vadim

**Session Classification:** Collective effects and mitigations

Contribution ID: 41

Type: **not specified**

## Discussion

*Wednesday, 14 February 2024 15:40 (20 minutes)*

**Session Classification:** Collective effects and mitigations

Contribution ID: 42

Type: **not specified**

## **Multi-frequency harmonic cavity system at MAX-IV**

*Wednesday, 14 February 2024 16:20 (20 minutes)*

**Presenter:** ANDERSSON, Åke

**Session Classification:** Harmonic cavity design and experiments - energy calibration

Contribution ID: 43

Type: **not specified**

## **Tests with beam at BESSY II of the ALBA 3rd Harmonic Active Cavity**

*Wednesday, 14 February 2024 16:40 (20 minutes)*

**Presenter:** BELLAFONT, Ignasi (CELLS)

**Session Classification:** Harmonic cavity design and experiments - energy calibration

Contribution ID: 44

Type: **not specified**

## **Energy calibration with resonant depolarisation & beam tests at KARA**

*Wednesday, 14 February 2024 17:00 (20 minutes)*

**Presenter:** HAERER, Bastian

**Session Classification:** Harmonic cavity design and experiments - energy calibration

Contribution ID: 45

Type: **not specified**

## Discussion

*Wednesday, 14 February 2024 17:20 (20 minutes)*

**Session Classification:** Harmonic cavity design and experiments - energy calibration

Contribution ID: 46

Type: **not specified**

## **Sustainable Concepts and Technologies at IFAST**

*Thursday, 15 February 2024 08:30 (20 minutes)*

**Presenter:** SEIDEL, Mike

**Session Classification:** Power consumption, energy efficiency and sustainability

Contribution ID: 47

Type: **not specified**

## **Sustainability, Energy efficiency and power consumption at CERN**

*Thursday, 15 February 2024 08:50 (20 minutes)*

**Presenter:** LOSITO, Roberto (CERN)

**Session Classification:** Power consumption, energy efficiency and sustainability



Contribution ID: 48

Type: **not specified**

## **Approach to sustainability at DESY**

*Thursday, 15 February 2024 09:10 (20 minutes)*

**Presenter:** KLUMPP, Andrea (DESY)

**Session Classification:** Power consumption, energy efficiency and sustainability

Contribution ID: 49

Type: **not specified**

## **Sustainability and energy efficiency at ESRF**

*Thursday, 15 February 2024 09:30 (20 minutes)*

**Presenter:** Dr REVOL, Jean-Luc (ESRF)

**Session Classification:** Power consumption, energy efficiency and sustainability

Contribution ID: 50

Type: **not specified**

## **Sustainability at BESSY-III**

*Thursday, 15 February 2024 09:50 (20 minutes)*

**Presenter:** VÖLKER, Jens (Helmholtz Zentrum Berlin)

**Session Classification:** Power consumption, energy efficiency and sustainability

Contribution ID: 51

Type: **not specified**

## **Accelerator impact review and other sustainable accelerator activities at STFC**

*Thursday, 15 February 2024 10:10 (20 minutes)*

**Presenter:** MORROW, Katherine (STFC)

**Session Classification:** Power consumption, energy efficiency and sustainability

Contribution ID: 52

Type: **not specified**

## Discussion

*Thursday, 15 February 2024 10:30 (20 minutes)*

**Session Classification:** Power consumption, energy efficiency and sustainability

Contribution ID: 53

Type: **not specified**

## Highly efficient RF power sources

*Thursday, 15 February 2024 11:10 (20 minutes)*

**Presenter:** SYRATCHEV, Igor (CERN)

**Session Classification:** Energy efficient technologies

Contribution ID: 54

Type: **not specified**

## **Superconducting thin films for RF cavities in low emittance rings**

*Thursday, 15 February 2024 11:30 (20 minutes)*

**Presenter:** Dr ANTOINE, Claire (CEA)

**Session Classification:** Energy efficient technologies

Contribution ID: 55

Type: **not specified**

## Energy efficiency and power consumption of ERLs

*Thursday, 15 February 2024 11:50 (20 minutes)*

**Presenter:** ANDRE, Kevin Daniel Joel (CERN)

**Session Classification:** Energy efficient technologies



Contribution ID: 56

Type: **not specified**

## Discussion

*Thursday, 15 February 2024 12:10 (20 minutes)*

**Session Classification:** Energy efficient technologies

Contribution ID: 57

Type: **not specified**

## **Xsuite - an integrated framework for beam dynamics simulations**

*Thursday, 15 February 2024 14:00 (20 minutes)*

**Presenter:** IADAROLA, Giovanni (CERN)

**Session Classification:** Computing tools, machine learning and AI

Contribution ID: 58

Type: **not specified**

## Overview of ML methods at PETRA

*Thursday, 15 February 2024 14:20 (20 minutes)*

**Presenter:** AGAPOV, Iliya (DESY)

**Session Classification:** Computing tools, machine learning and AI

Contribution ID: 59

Type: **not specified**

## Unlocking Insights from Logbooks using AI at DESY and BESSY

*Thursday, 15 February 2024 14:40 (20 minutes)*

**Presenter:** SULC, Antonin (DESY)

**Session Classification:** Computing tools, machine learning and AI

Contribution ID: **60**

Type: **not specified**

## **ML approaches for the operation of the CERN accelerator complex**

*Thursday, 15 February 2024 15:00 (20 minutes)*

**Presenter:** KAIN, Verena (CERN)

**Session Classification:** Computing tools, machine learning and AI

Contribution ID: **61**

Type: **not specified**

## Discussion

*Thursday, 15 February 2024 15:20 (20 minutes)*

**Session Classification:** Computing tools, machine learning and AI

Contribution ID: 62

Type: **not specified**

## DA studies with deep neural networks

*Thursday, 15 February 2024 16:10 (20 minutes)*

**Presenter:** DI CROCE, Davide (EPFL - Ecole Polytechnique Federale Lausanne (CH))

**Session Classification:** Computing tools, machine learning and AI

Contribution ID: 63

Type: **not specified**

## **Machine Learning-Based Modeling at the LHC and Muon collider studies**

*Thursday, 15 February 2024 16:30 (20 minutes)*

**Presenter:** Dr FOL, Elena (CERN)

**Session Classification:** Computing tools, machine learning and AI



Contribution ID: 64

Type: **not specified**

# High-dimensional nonlinear beam dynamics tuning with Bayesian optimization

*Thursday, 15 February 2024 16:50 (20 minutes)*

**Presenter:** KUKLEV, Nikita (Argonne National Laboratory)

**Session Classification:** Computing tools, machine learning and AI

Contribution ID: 65

Type: **not specified**

## **Non-linear correction with ML at the LHC**

*Thursday, 15 February 2024 17:10 (20 minutes)*

**Presenter:** BORJESSON CARAZO, Alejandro (Universidad de Granada (ES))

**Session Classification:** Computing tools, machine learning and AI

Contribution ID: **66**

Type: **not specified**

## Discussion

*Thursday, 15 February 2024 17:40 (20 minutes)*

**Session Classification:** Computing tools, machine learning and AI

Contribution ID: 67

Type: **not specified**

## **Design, commissioning and operation of the collimation for the ESRF-EBS**

*Friday, 16 February 2024 08:30 (20 minutes)*

**Presenter:** VERSTEEGEN, reine (esrf)

**Session Classification:** Machine protection and collimation

Contribution ID: **68**

Type: **not specified**

## **Collimators for low-emittance whole-beam aborts**

*Friday, 16 February 2024 08:50 (20 minutes)*

**Presenter:** DOOLING, Jeffrey (Argonne National Laboratory)

**Session Classification:** Machine protection and collimation

Contribution ID: 69

Type: **not specified**

## **Characterization of the vertical beam halo for reduced in-vacuum undulator gap**

*Friday, 16 February 2024 09:10 (20 minutes)*

**Presenter:** STEFANELLI, Mattia (ESRF)

**Session Classification:** Machine protection and collimation

Contribution ID: 70

Type: **not specified**

## Collimation studies for FCCee

*Friday, 16 February 2024 09:30 (20 minutes)*

**Presenter:** ABRAMOV, Andrey (CERN)

**Session Classification:** Machine protection and collimation

Contribution ID: 71

Type: **not specified**

# Machine Interlock and Beam Abort System for SLS 2.0

*Friday, 16 February 2024 09:50 (20 minutes)*

**Presenter:** ARMBORST, Felix (Paul Scherrer Institut (PSI))

**Session Classification:** Machine protection and collimation



Contribution ID: 72

Type: **not specified**

## Discussion

*Friday, 16 February 2024 10:10 (20 minutes)*

**Session Classification:** Machine protection and collimation

Contribution ID: 73

Type: **not specified**

# Injection efficiency and accumulation limit in PETRA IV

*Friday, 16 February 2024 10:50 (20 minutes)*

**Presenter:** ANTIPOV, Sergey

**Session Classification:** Injection dynamics and hardware chair

Contribution ID: 74

Type: **not specified**

## **A Kick-and-Cancel Injection Scheme for Diamond-II**

*Friday, 16 February 2024 11:10 (20 minutes)*

**Presenter:** MARTIN, Ian

**Session Classification:** Injection dynamics and hardware chair

Contribution ID: 75

Type: **not specified**

## **Injection Hardware Challenges of Low Emittance Rings - SLS 2.0 Injection Elements,**

*Friday, 16 February 2024 11:30 (20 minutes)*

**Presenter:** Dr PARALIEV, Martin (Paul Scherrer Institute)

**Session Classification:** Injection dynamics and hardware chair

Contribution ID: 76

Type: **not specified**

## **Review of multipole injection kicker designs**

*Friday, 16 February 2024 11:50 (20 minutes)*

**Presenter:** ALEXANDRE, Patrick (Synchrotron SOLEIL)

**Session Classification:** Injection dynamics and hardware chair

Contribution ID: 77

Type: **not specified**

## Discussion

*Friday, 16 February 2024 12:10 (10 minutes)*

**Session Classification:** Injection dynamics and hardware chair

Contribution ID: 78

Type: **not specified**

## Close-out

*Friday, 16 February 2024 12:20 (10 minutes)*

**Presenter:** PAPAPHILIPPOU, Yannis (CERN)

**Session Classification:** Injection dynamics and hardware chair

Contribution ID: 79

Type: **not specified**

## Optimising resonance driving terms using MAD-NG

*Thursday, 15 February 2024 17:30 (10 minutes)*

**Presenter:** Dr DENIAU, Laurent (CERN)

**Session Classification:** Computing tools, machine learning and AI