

Workshop on coupling simulation of beam impact on accelerator components

Organisers: Christoph Wiesner, Yuancun Nie, Daniel Wollmann

<https://indico.cern.ch/event/769087/>



MPE-PE

Responsible for a wide range of R&D, studies, simulations, experiments and data analysis aiming to further enhance the operational performance of the LHC and to optimize performance of future accelerators.

Circuit Modeling

- Magnet and circuit protection studies & thresholds
- LHC circuit issues
- STEAM
- **MP3**

UFO studies

Reliability & Availability

- R&A studies
- Accelerator Fault Tracking
- AvailSim
- **MARP**
- **AWG**

Beam induced quenches & BLM thresholds

Beam Impact & Machine Protection

- Machine protection
- Damage limits & hydrodynamic tunnelling
- Fast beam losses & diamond BLM's
- **MPP**

What we do (among many other things):

- Analyse and assure the coherency of **machine protection across equipment and protection systems**,
- Estimation of criticality of equipment (but no equipment design),
- Analyse **(extreme) failure scenario's** & estimate probabilities and **consequences**.

What we like to get out of this workshop:

- Create a **discussion forum** among people doing very similar type of calculations/studies, using similar software tools
- Define **how we should continue** over the next ~2-3 years: what kind of studies?, what kind of tools?, additional benchmarking?, ...
- Ways to **improve the coupling** between codes. Is there synergy with the STEAM co-simulations on magnet circuits?

Program

Introduction to Coupling Simulations of Beam Impact on Accelerator Components

Rudiger Schmidt

Thermo-Mechanical Simulation of Beam-Intercepting Devices by EN-STI

Antonio Perillo Marcone

Thermo-Mechanical Simulation of Beam Impacts at CERN EN-MME

Federico Carra

The Physics of Hydrodynamic Tunnelling

Naeem Tahir (GSI Darmstadt)

Coffee break

Review of Hydrodynamic-Tunnelling Studies with FLUKA and BIG2
Naeem Tahir (GSI Darmstadt)

Recent Hydrodynamic-Tunnelling Studies, coupling FLUKA and Autodyn
Yuancun Nie

Experience in Co-Simulations with STEAM
Michal Maciejewski

12:30 → 14:15 Lunch break

Outlook on Future Hydrodynamic-Tunnelling Studies and Scope of Discussion
Christoph Wiesner

Open Discussion

Summary
Daniel Wollmann

