



Contribution ID: 1174 Contribution code: WEBD3

Type: **Contributed Oral Presentation**

Technologies and concepts for the next generation of heavy ion synchrotrons

Wednesday, 22 May 2024 12:10 (20 minutes)

New technical approaches are under investigation to further push the intensity frontier of the next generation heavy ion synchrotrons. Residual gas dynamics and corresponding charge exchange processes are key issues which need to be overcome by means of advanced UHV system technologies, but also by a focused design of the synchrotron as a whole. Cryogenics and superconductivity enable high field operation but in synergy also enable technologies for stabilizing the dynamic vacuum. Beam loss usually implicated as driver for activation and damages is as well an important initiator for residual gas pressure dynamics. Advanced superconducting cables promise lower energy consumption, fast ramping and higher average beam intensities. The cryo-pumping properties of specially developed cryogenic inserts, can also be used to upgrade existing synchrotrons and enable operation with lower charge states and higher intensities. The advancement of laser technologies may be applied as new devices in heavy ion synchrotrons for advanced manipulations, e.g. non-liouville injection or laser cooling. With FAIR, GSI has expanded its competence for the design of novel high intensity heavy ion synchrotrons.

Footnotes

Funding Agency

Paper preparation format

Word

Region represented

Europe

Primary author: SPILLER, Peter (GSI Helmholtzzentrum für Schwerionenforschung GmbH)

Co-authors: ROUX, Christian (GSI Helmholtzzentrum für Schwerionenforschung GmbH); WINTERS, Danyal (GSI Helmholtzzentrum für Schwerionenforschung GmbH); ONDREKA, David (GSI Helmholtzzentrum für Schwerionenforschung GmbH); SCHULTE-URLICHS, Kathrin (GSI Helmholtzzentrum für Schwerionenforschung GmbH); SUGITA, Kei (GSI Helmholtzzentrum für Schwerionenforschung GmbH); BOZYK, Lars (GSI Helmholtzzentrum für Schwerionenforschung GmbH); KLAMMES, Sebastian (GSI Helmholtzzentrum für Schwerionenforschung GmbH); WIL-

FERT, Stefan (GSI Helmholtzzentrum für Schwerionenforschung GmbH); WINKLER, Tiemo (GSI Helmholtzzentrum für Schwerionenforschung GmbH)

Presenter: SPILLER, Peter (GSI Helmholtzzentrum für Schwerionenforschung GmbH)

Session Classification: WEBD: Colliders and other Particle and Nuclear Physics Accelerators

Track Classification: MC1: Colliders and other Particle and Nuclear and Physics Accelerators:
MC1.A16 Advanced Concepts