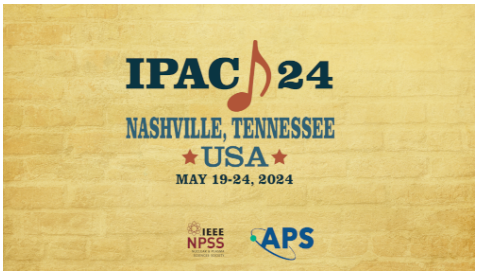

Contribution ID: **492** Contribution code: **WEPS79** Type: **Poster Presentation**

Optimization studies on accelerator sample components for energy management purposes

Wednesday, 22 May 2024 16:00 (2 hours)

The large amount of energy required to operate large-scale facilities with particle accelerators within has been considered as one of the important research topics over the past years. This sheds light on the importance of the research field of energy management that entitles, with a view to long-term operations, the implementation of smart and sustainable technologies.
One of the key technologies in accelerators are superconductor (SC)-based designs. The vanishing electrical resistance together with the ability to provide field values well above those from conventional conductors is the main motivation behind exploiting superconducting wires in building coils and magnets for large-scale accelerators. However, these superconductors can also quench under certain conditions, driving the wires into the normal state and potentially allowing for overheating and destruction of the conductor material and/or the whole design.
This work will present the results of optimization-based analyses performed on accelerator SC-sample components aiming at goal designs that are more energy efficient at a reference operational field or current. A compromise between getting the best performance for excellent science from a design (with superconductivity preserved and safe operation maintained) and reducing its power consumption (and eventually its effective cost) will be addressed too.

Footnotes

Funding Agency

Paper preparation format

LaTeX

Region represented

Europe

Primary author: ABUSAIF, Falastine (Karlsruhe Institute of Technology)

Co-authors: GRAU, Andreas (Karlsruhe Institute of Technology); MUELLER, Anke-Susanne (Karlsruhe Institute of Technology); Dr KRASCH, Bennet (Karlsruhe Institute of Technology); SAEZ DE JAUREGUI, David

(Karlsruhe Institute of Technology); BRUENDERMANN, Erik (Karlsruhe Institute of Technology); DE CARNE, Giovanni (Karlsruhe Institute of Technology)

Presenter: ABUSAIF, Falastine (Karlsruhe Institute of Technology)

Session Classification: Wednesday Poster Session

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T10 Superconducting Magnets