



Contribution ID: 549 Contribution code: MOPM100

Type: **Poster Presentation**

Magnetic field errors and possible correction schemes in SCUs

Monday, 8 May 2023 16:30 (2 hours)

One of the design challenges of Superconducting undulators (SCUs) is the fulfilment of tight mechanical tolerances. Simulations show that to guarantee high quality of the emitted radiation local mechanical errors must be below a few tens of micrometres. Such requirements are at the limit of the most precise machines and techniques for mechanical manufacturing. In addition, once the SCU is assembled with the support structure, mechanical deformations can affect the device in the long range.

In this contribution, we describe the possible long and short-range errors that can arise in the SCU and we present various schemes based on shimming coils to correct the short-range errors.

Funding Agency

Footnotes

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Session Classification: Monday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.T15: Undulators and Wignlers