Contribution ID: **964** Contribution code: **TUPM069** Type: **Poster Presentation**

New compact modular in-vacuum undulators for SLS 2.0

Tuesday 3 June 2025 16:00 (2 hours)

A new design for in-vacuum undulators has been developed for the upgraded SLS 2.0 at the Paul Scherrer Institute (PSI), combining several new, beneficial concepts: modular, compact construction, integrated keepers for automated field optimization, and magnetic force compensation. This enables a scalable and relatively lightweight realization. The basis is solid aluminum vacuum chamber modules capable of handling the forces, replacing the classic bulky support. These 50 cm-long modules are connected on girders up to the desired length. A wedge-based drive, operated selectively by a hydraulic or an electrical system, adjusts the gap. The magnetic forces are compensated in the keeper, where the magnets are adjustable via flexor elements, facilitating automated field optimization.
This contribution shows the status by presenting measurements and optimization results of our new design, currently realized at PSI, employing a hydraulic drive system for a one-meter-long undulator with a period length of 15 mm. Furthermore, an outlook is given on the manufacturing of such three-meter-long undulators using NdFeB with a period length of 17 mm and 1.2 T maximum field amplitude at a 4 mm gap.

Footnotes

Paper preparation format

LaTeX

Region represented

Europe

Funding Agency

Author: RICHTER, Sebastian (Paul Scherrer Institut)

Co-authors: SCHMIDT, Thomas (Paul Scherrer Institute); ARSENAULT, Alexandre (Paul Scherrer Institut); BOEHLER, Pirmin (Paul Scherrer Institut); GIGER, Mike (Paul Scherrer Institut); KELLER, Andreas (Paul Scherrer Institut); PAULUHN, Anuschka (Paul Scherrer Institut); RAABE, Joerg (Paul Scherrer Institute); CALVI, Marco (Paul Scherrer Institut)

Presenter: RICHTER, Sebastian (Paul Scherrer Institut)

Session Classification: Tuesday Poster Session

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