Contribution ID: **1543** Contribution code: **WEPB052** Type: **Poster Presentation**

The impact of insertion devices on Solaris storage ring optics

Wednesday 4 June 2025 16:00 (2 hours)

This study investigates the influence of insertion devices (IDs) on the optical properties of the Solaris electron storage ring through a combination of experimental measurements and simulations. The effects of various ID settings were analyzed using tune measurements and the Linear Optics from Closed Orbits (LOCO) method. These results were compared with simulations performed using the Python Accelerator Toolbox (pyAT). Furthermore, a Long Short-Term Memory (LSTM) neural network was developed and tested for forecasting corrector magnet currents associated with the IDs. Diagnostics included monitoring the electron beam in the storage ring and photons delivered to beamlines. Additionally, the performance of both slow and fast orbit correction systems in response to ID-induced perturbations was assessed. This work provides insights into ID impact on beam dynamics and highlights the potential of machine learning for predictive control in accelerator systems.

Footnotes

Paper preparation format

LaTeX

Region represented

Europe

Funding Agency

Author: PANAS, Roman (National Synchrotron Radiation Centre)

Co-authors: WAWRZYNIAK, Adriana (National Synchrotron Radiation Centre); BIERNAT, Jacek (National Synchrotron Radiation Centre); WIECHECKI, Jaroslaw (National Synchrotron Radiation Centre); ÜNAL, Maria (National Synchrotron Radiation Centre); PIEKARSKI, Michal (National Synchrotron Radiation Centre); WROBEL, Mikolaj (National Synchrotron Radiation Centre); KASI¿SKA, Sonia (National Synchrotron Radiation Centre); WIATROWSKA, Wiktoria (National Synchrotron Radiation Centre)

Presenter: PANAS, Roman (National Synchrotron Radiation Centre)

Session Classification: Wednesday Poster Session

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T15 Undulators and Wigglers