Contribution ID: **101** Contribution code: **FRB04** Type: **Invited Oral Presentation**

Machine learning experience at SuperKEKB

Friday 7 March 2025 10:50 (30 minutes)

The SuperKEKB accelerator has been studying accelerator operations using machine learning since 2022. Machine learning has been introduced in Linac to control the orbit of electron and positron beams to achieve highly efficient generation and transport of electron and positron beams downstream of Linac. Similarly, machine learning has been applied to orbit control to suppress emittance increase in the beam transport line. In the main ring, beam injection tuning based on Bayesian optimization has been put into practical use, and a high injection efficiency, temporarily comparable to that of the operators' skill, has been achieved. Anomaly detection of vacuum components, such as leaks, has also been started. In the future, orbit control at the beam interaction point and automatic collimator adjustment will also be considered. In this presentation, we will introduce the accelerator control based on machine learning, which has been or will be introduced in the SuperKEKB accelerator.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

Author: MITSUKA, Gaku (High Energy Accelerator Research Organization)

Presenter: MITSUKA, Gaku (High Energy Accelerator Research Organization)

Session Classification: Machine learning and automatic tuning

Track Classification: WG13 : Machine learning and automatic tuning