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A low-latency feedback system for the control of horizontal betatron oscillations

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Reinforcement learning (RL) algorithms are investigated at KIT as an option to control the beam dynamics at storage rings.

These methods require specialized hardware to satisfy throughput and latency constraints dictated by the timescale of the relevant phenomena.

The KINGFISHER platform, based on the novel Xilinx Versal Adaptive Compute and Acceleration Platform, is an ideal candidate to deploy RL-on-a-chip thanks to its ability to execute computationally intensive and low latency feedback loops in the order of tens of microseconds.

In this publication, we will present the integration of the KINGFISHER system at the Karlsruhe Research Accelerator (KARA), as a proof-of-principle turn-by-turn control feedback loop, to control induced transversal oscillations of an electron beam.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: SCOMPARIN, Luca (Karlsruhe Institute of Technology)

Co-authors: BLOMLEY, Edmund (Karlsruhe Institute of Technology); BRÜNDERMANN, Erik (Karlsruhe Institute of Technology); CASELLE, Michele (Karlsruhe Institute of Technology); KOPMANN, Andreas (Karlsruhe Institute of Technology); MUELLER, Anke-Susanne (Karlsruhe Institute of Technology); SANTAMARIA GARCIA, Andrea (Karlsruhe Institute of Technology); STEINMANN, Johannes (Karlsruhe Institute of Technology); WEBER, Marc (Karlsruhe Institute of Technology)

Presenter: SCOMPARIN, Luca (Karlsruhe Institute of Technology)

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