Contribution ID: **112** Type: **Oral**

IQ award: Unleashing the full potential of LLRF algorithm: enhancing stability, reliability, and automation in RF systems

Wednesday, October 25, 2023 1:20 PM (30 minutes)

This presentation showcases groundbreaking advancements in Low-Level Radio Frequency (LLRF) control systems. These include the innovative application of disturbance-observer control for precise beam energy spread control, leveraging prior knowledge of the beam profile to develop an FPGA-based real-time iterative learning control system for suppressing beam-induced RF transient instabilities, proposing a novel cross-talk calibration algorithm for accurate beam synchronous phase calibration, and developing a real-time digital filter with robustness to field emission-induced burst noise to improve machine reliability and performance. These advancements represent significant breakthroughs in the LLRF community and contribute to the overall enhancement of accelerator systems.

Keyword

Iterative Learning Control, Transient Beam-loading, Cross-talk calibration,

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Session Classification: IQ award

Track Classification: Other