## 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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