Contribution ID: **209** Contribution code: **MOP020** Type: **Poster Presentation**

Towards real-time calibration of CBPMs using synchronous RF injection

Monday 11 August 2025 16:00 (2 hours)

Cavity beam position monitors (CBPMs) are very high-precision devices that, in recent years, have progressed from experimental equipment to standard linac diagnostics in many prominent facilities, most notably free electron lasers. However, the high sensitivity of these devices comes at the cost of a limited measurement range, even with high dynamic range electronics. Furthermore, CBPMs need to be calibrated in situ, ideally by introducing a known beam offset, which is often impractical in large installations. This paper reports on a method to match CBPM beam signals by injecting synchronized and tightly controlled bursts of radio frequency (RF) oscillations into the sensor cavity and reading back their superposition. The method allows compensation for static beam offsets (with beam) and calibrates CBPMs electronically (no beam required), thus removing some of the operational hurdles. We discuss the first demonstration of this method at the Accelerator Test Facility 2 (ATF2)

Please consider my poster for contributed oral presentation

No

Would you like to submit this poster in student poster session on Sunday (August 10th)

Yes

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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Session Classification: Monday Poster Session

Track Classification: MC6 - Beam Instrumentation, Controls, AI/ML, and Operational Aspects