



Contribution ID: 2347 Contribution code: SUPS048

Type: Student Poster Presentation

Cavity beam position monitor signal matching by injection pulse

Sunday 1 June 2025 14:00 (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).

Footnotes

Paper preparation format

LaTeX

Region represented

Europe

Funding Agency

Author: MCCALLUM, Mark (John Adams Institute)

Presenter: MCCALLUM, Mark (John Adams Institute)

Session Classification: Student Poster

Track Classification: MC6: Beam Instrumentation and Controls, Feedback and Operational Aspects: MC6.T03 Beam Diagnostics and Instrumentation