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Evaluation of accuracy and resolution of the electron beam profile scanner at the Fermilab Main Injector

Tuesday 9 September 2025 16:00 (2 hours)

The objective of this work is to assess the accuracy of measurements made by the Electron Beam Profile Scanner (EBPS), which captures the trajectory of an electron beam with and without a proton beam present. The proton beam induces deflection in the electron beam, which is influenced by proton charges.
For high-resolution images, the probe beam needs to be of high intensity, small diameter, and small divergence, evaluated using a YAG screen and an optical transition radiation (OTR) screen. Additionally, the point spread function (PSF) will be calculated to characterize the optical system's properties using ZEMAX software. The capabilities of the Hamamatsu Charge-Injection Device (CID) camera and Kimball Physics electron gun (e-gun) will be considered for accuracy.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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