Contribution ID: **276** Type: **Poster Presentation**

Beam profile monitoring using incoherent Cherenkov Diffraction Radiation and scintillating screens at ILSF

Tuesday, 10 September 2024 16:00 (1h 30m)

The Iranian Light Source Facility (ILSF) plays a crucial role in advancing accelerator science and applications. In this study, we explore innovative techniques for precise beam profile monitoring, focusing on two complementary methods: Incoherent Cherenkov Diffraction Radiation (ChDR) and scintillating screens. Incoherent ChDR occurs when a charged particle passes through a dielectric medium with a velocity exceeding the phase velocity of light in that medium. This phenomenon leads to the emission of electromagnetic radiation in the form of a cone. Our investigation focuses on incoherent ChDR as a powerful tool for beam position diagnostics. By analyzing the angular distribution of ChDR photons, we extract valuable information about the transverse position of the electron bunch. Our simulations demonstrate the feasibility of ChDR-based diagnostics at ILSF. We discuss optimal radiator materials, geometries, and detection strategies.
in addition, We also present our findings on scintillating screen calibration, spatial resolution, and dynamic range.
We believe that our research significantly contributes to the development of robust and efficient beam diagnostics at the storage ring of ILSF. By investigating Cherenkov Diffraction Radiation (ChDR) and utilizing radiation from scintillating screens, we enhance accelerator performance and facilitate future experiments.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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