



Contribution ID: 272

Type: **Poster Presentation**

Evaluation of a 4D phase-space mapping using two orthogonal slits

Tuesday 9 September 2025 16:00 (2 hours)

To enhance the performance of next-generation X-ray Free Electron Lasers (XFELs), it is crucial to produce high-quality electron beams with low emittance, particularly for attaining emittances below 0.2 mm.mrad for 100 pC bunch charges. This study introduces an emittance measurement method using an orthogonal dual-slit technique, aimed at enhancing measurement efficiency and achieving the necessary measurement accuracy for such small emittances. An emittance meter based on this method has been designed for a C-band photocathode RF gun at the CSNS campus. Finally, we present numerical simulations to optimize the primary parameters of the emittance meter, focusing on beam drift distance, combined with the motion accuracy of the stepper motor and the expected resolution of the optical observation system to ensure the accuracy of the emittance measurement.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

Author: CHEN, Weiwen (Institute of High Energy Physics)

Presenter: CHEN, Weiwen (Institute of High Energy Physics)

Session Classification: TUP

Track Classification: MC04: Transverse Profile and Emittance Monitors