Contribution ID: **335** Contribution code: **TUP012** Type: **Poster Presentation**

Beam-based measurement of LCLS-II injector solenoid misalignments

Tuesday 12 August 2025 16:00 (2 hours)

Solenoid focusing is commonly used in accelerators for electron beam containment and to compensate for space charge-induced emittance growth at low beam energies. However, misalignment between the solenoid field and the beam trajectory can result in degraded emittance compensation due to dispersive effects and geometric aberrations in the magnetic solenoid. This paper presents a technique for beam-based measurement of solenoid misalignments, using expressions derived from a hard-edged solenoid linear transfer matrix with known beam parameters. The analysis includes the necessary scaling factors to accurately model the induced Larmor rotation and focusing effects of a thin physical solenoid. Results from measurements conducted at the LCLS-II injector are presented as a validation of this method, along with simulation studies estimating the impact of solenoid misalignments on emittance growth in the LCLS-II injector.

Please consider my poster for contributed oral presentation

Yes

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

No

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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