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Implementation of Electron–X-ray Beam Overlap Diagnostic Instrument at LCLS

Thursday 14 August 2025 16:00 (2 hours)

We report on the commissioning results of the newly implemented Beam Overlap Diagnostic (BOD) instrument, known as Station F, at the hard X-ray line of the Linac Coherent Light Source (LCLS). As part of the CBXFEL project at SLAC, Station F is designed to facilitate alignment between the relativistic electron beam entering the undulator hall and the X-rays returning from the CBXFEL cavity via the return line. The station features two interchangeable targets: (1) a diamond screen for direct imaging of the LCLS electron beam, enabling measurement of its transverse size and position; and (2) a YAP:Ce scintillator for detecting faint returning X-rays when the diamond's sensitivity is insufficient. Emission from either target, whether generated by electron-induced cathodoluminescence or X-ray-induced scintillation, is captured using a fast-gated optical/UV camera. We present results from recent commissioning runs, including direct electron beam imaging, beam size and position characterization in both single- and two-bunch modes, and observations of coherent radiation linked to early microbunching, with implications for the laser heater configuration.

Please consider my poster for contributed oral presentation

No

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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