Operational Performance of LCLS Beam Instrumentation

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The Linac Coherent Light Source (LCLS) X-ray FEL utilizing the last km of the SLAC Linac has been operational since April 2009 and finished its first successful user run last December. The various diagnostics for electron beam properties including beam position monitors, wire scanners, beam profile monitors, and bunch length diagnostics are presented as well as diagnostics for the X-ray beam. The low emittance and ultra-short electron beam required for X-ray FEL operation has implications on the transverse and longitudinal diagnostics. The coherence effects of the beam profile monitors and the challenges of measuring fs-long bunches are discussed.

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