Contribution ID: **219** Contribution code: **THBC04** Type: **Contributed Oral Presentation**

# Challenges for the LCLS-II HE Instrument Suites

*Thursday 22 August 2024 12:30 (20 minutes)*

The recent LCLS-II upgrade allows operation with bunch rates up to 1MHz for photon energies ranging from 200eV up to about 5keV. The LCLS-II-HE design will extend the high rate capability to 12keV and beyond from an 8GeV superconducting RF linac. The high energy upgrade imposes technical challenges on the X-Ray photon transport line devices to effectively deliver high average power beams to the X-Ray instruments.
This talk provides an overview of the LCLS-II-HE project and summarizes the design challenges on the photon beam transport line diagnostics, optics, and beam containment components. There are thermal and stability challenges faced by the optics deflecting the coherent FEL X-Ray pulses with minimal wave front distortion. The X-Ray pulses are manipulated by attenuators, apertures, focusing optics and monochromators, each presenting its own set of challenges.
Additionally, there are programmatic and management challenges. The project's scope deliverables need to align with the facilities vision. Misalignment constrains experimental capability and incur expenses. We'll touch on some areas that required realignment with the long-term vision of the LCLS HXR instrument suite.

## Footnotes

## Funding Agency

U.S. Department of Energy Office of Science.

**Authors:** BATYUK, Alex; ZHU, Diling (SLAC National Accelerator Laboratory); ORTIZ, Eliazar (SLAC National Accelerator Laboratory); O'DOWD, Frank; YAVAS, Hasan; WANG, Hengzi; ZHANG, Lin (SLAC National Accelerator Laboratory); SEABERG, Matthew (SLAC National Accelerator Laboratory); CHOLLET, Matthieu (SLAC National Accelerator Laboratory); LIANG, Mengning (SLAC National Accelerator Laboratory); ARMENTA, Rebecca; GUILLET, Serge

**Presenter:** ORTIZ, Eliazar (SLAC National Accelerator Laboratory)

**Session Classification:** Photon beamline instrumentation & undulators

**Track Classification:** Photon beamline instrumentation & undulators