Contribution ID: **263** Contribution code: **TUCI02** Type: **Invited Oral Presentation**

Progress towards construction of cavity-based XFEL at SLAC

Tuesday 20 August 2024 15:05 (25 minutes)

Cavity-based free-electron lasers (CBXFELs) offer the potential to significantly enhance the stability and coherence of FELs. The CBXFEL project is a collaborative effort between SLAC, Argonne, and RIKEN, focused on constructing a 65-meter rectangular X-ray cavity at the LCLS. The primary goal is to demonstrate low-loss cavity ring-down and, ultimately, achieve two-pass FEL gain. This talk presents recent simulation and measurement results that support these objectives, including efforts related to FEL gain and the delivery of two electron bunches separated by 624 RF buckets. Additionally, we report on progress in testing and installing X-ray optics and diagnostics components, the Bragg mirror nano-positioning and diagnostics stages, and the X-ray return line.

Footnotes

Funding Agency

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Session Classification: FEL oscilators & IR-FEL

Track Classification: FEL oscillators & IR-FEL