



Contribution ID: 682 Contribution code: **THPA069**

Type: **Poster Presentation**

Phase reference line synchronization for LCLS-I and LCLS-II at SLAC

Thursday, 11 May 2023 16:30 (2 hours)

With LCLS-II commissioning started and transfer-to-operations being scheduled, users will have more choices to use different scales of X-Ray FEL. LCLS-I instrument hutches and the beam diagnostic systems at SLAC have the requirements to use the same facilities to detect the X-Rays or electron beams from both LCLS-I and LCLS-II accelerators. Synchronization of the phase reference systems between the two machines is the prerequisite to achieve this goal. The LINAC Locking System at SLAC replaces the LCLS-I stand-alone 476 MHz master oscillator with one derived from the LCLS-II 1300 MHz phase reference signal. The phase initiation is realized with the timing alignment of the LCLS-I LINAC event generator (EVG) to the LCLS-II timing pattern generator (TPG) using a common subharmonic frequency. The new low noise 476 MHz phase reference is to be distributed to LCLS-I LINAC master oscillator and the instrument hutches via RF-over-Fiber system over a 1km distance in an uncontrolled environment. This paper will discuss the system design architecture and the test results gathered during the system's commissioning.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

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Session Classification: Thursday Poster Session

Track Classification: MC6: Beam Instrumentation, Controls, Feedback and Operational Aspects: MC6.T24: Timing and Synchronization