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A high-precision motion profile data stream pipeline for LCLS-II fast wire scanner

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The LCLS-II is the first X-ray Free Electron Laser (XFEL) to utilize continuous-wave superconducting accelerator technology (CW-SCRF), capable of delivering X-ray pulses at repetition rates up to 1 MHz. The LCLS-II fast wire scanner motion control system, based on the Aerotech Ensemble controller, is designed to measure the beam profile across both high and low repetition rates. To effectively and timely analyse the motion trajectory of the fast wire scanner, we have developed a data stream pipeline that transmits high-precision profile data from the Ensemble controller to the LCLS-II server. This system integrates the motion profile into the EPICS control system, displaying the scan profile in real time via a PyDM GUI. This paper outlines the design of the data transmission pipeline and the software development process.

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Footnotes

Author: HUANG, Ziyu (SLAC National Accelerator Laboratory)

Co-authors: JACOBSON, Bryce (SLAC National Accelerator Laboratory); BONG, James (SLAC National Accelerator Laboratory); BALAKRISHNAN, Namrata (SLAC National Accelerator Laboratory); THAYER, Tom (SLAC National Accelerator Laboratory)

Presenter: HUANG, Ziyu (SLAC National Accelerator Laboratory)

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