Contribution ID: **70** Type: **Poster Presentation**

Data acquisition and processing platform design for SHINE wire scanners

Wednesday, 11 September 2024 14:20 (1h 30m)

Shanghai High repetition rate XFEL and Extreme light facility (SHINE) accelerates electrons to 8GeV with a high repetition rate of up to 1MHz. Wire Scanner stations are used to measure beam profile and emittance at SHINE. The data acquisition and processing platform for Wire Scanners are required to acquire time-stamped readings for each individual bunch. The platform consists of three parts: BLM(Beam Loss Monitor) data acquisition, BPM(Beam Position Monitor) data acquisition, and measurement software. The BLM data acquisition is used for collecting BLM head signal, parsing grating-ruler signal, and receiving White-Rabbit timestamp. The BPM data acquisition is used for collecting SBPM head signal, computing the beam position, and receiving White-Rabbit timestamp. The both acquisition parts have some common parts, so a generic FPGA carrier is designed which provides FPGA-based pre-processing and EPICS IOC by using MPSOC. While the BLM head signal and BPM head signal have different spectrums, so different mezzanine boards are designed for high-speed sampling. The measurement software running on a server is implemented by Python. The software can control the scanning mode, collect the BLM and BPM data, and calculate the beam profile and emittance. Finally, the prototype of data acquisition and processing platform is installed in Shanghai soft X-ray Free Electron Laser (SXFEL). The experimental results show that the platform can be used for SHINE.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

Primary author: Mr DONG, Jian (Shanghai Synchrotron Radiation Facility)

Co-authors: CHEN, Fangzhou (Shanghai Synchrotron Radiation Facility); Mr CHEN, Jie (Shanghai Synchrotron Radiation Facility); Mr YU, Luyang (Shanghai Synchrotron Radiation Facility); Mr YUAN, Renxian (Shanghai Synchrotron Radiation Facility); CAO, Shanshan (Shanghai Advanced Research Institute)

Presenter: Mr DONG, Jian (Shanghai Synchrotron Radiation Facility)

Session Classification: WEP: Wednesday Poster Session

Track Classification: MC7: Data Acquisition and Processing Platforms