

RF reference distribution and operation experiences in PAL-XFEL

Tuesday, October 24, 2023 2:30 PM (20 minutes)

XFELs require high-end timing synchronization in a femtosecond time scale, which is related to the short electron bunch length, phase space stability, and diagnosis of those. In the experiment side, the timing error of optical femtosecond laser pulses is also better to be less than their pulse duration for their time-correlation measurement. PAL-XFEL has been operated since 2016 based on coaxial RF distribution and ultralow phase noise DROs, which gives less than 1 femtosecond jitters. The drift can be managed using a beam-based feedback for the stable lasing condition. For the experimental lasers, a commercial optical links with phase stabilization and a home built Sagnoc PLL system has been utilized.

Keyword

Phase distribution, Free electron laser, Ultralow phase noise oscillator, femtosecond synchronization

Primary author: MIN, Chang-Ki (PAL, POSTECH)

Co-authors: KIM, Changbum (PAL, POSTECH); KIM, Gyujin (PAL, POSTECH); KANG, Heung-Sik (PAL, POSTECH); HEO, Hoon (PAL, POSTECH); NAM, Inhyuk (PAL, POSTECH); HU, Jinyul (PAL, POSTECH); JUNG, Seonghoon (PAL, POSTECH)

Presenter: MIN, Chang-Ki (PAL, POSTECH)

Session Classification: Timing

Track Classification: Timing