

Utilization of corrugated dechirper at the PAL-XFEL: femtoseconds HXFEL generation via fresh-slice technique and longitudinal phase space measurement as a passive deflector

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Many years ago, the use of a corrugated dechirper for energy-chirp control in a relativistic electron beam was experimentally demonstrated at the Pohang Accelerator Laboratory (PAL). Since then, a lot of efforts have been made at the PAL-XFEL to utilize the dechirper for the electron beam diagnostics and the short pulse generation as well as the removal of energy correlation. Currently, the PAL-XFEL operates the two undulator sections: one for the hard x-ray (HX) and the other for the soft x-ray (SX), both of which employ the corrugated dechirper (vertical streaking at HX while horizontal streaking at SX). Using these dechirpers, we have conducted experiments to generate the short-pulse FEL down to a few femtoseconds via the fresh-slice technique at the hard x-ray regime and to measure the longitudinal phase space (LPS) of electron beam at the soft x-ray line of PAL-XFEL. The results of these experiments using the dechirper will be presented.

Footnotes

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Primary author: SUNG, Chang-Kyu (Pohang Accelerator Laboratory)

Co-authors: SHIM, Chi Hyun (Pohang Accelerator Laboratory); YANG, Haeryong (Pohang Accelerator Laboratory); NAM, Inhyuk (Pohang Accelerator Laboratory); MOON, Kookjin (Pohang Accelerator Laboratory); CHO, MyungHoon (Pohang Accelerator Laboratory); KIM, Seongyeol (Pohang Accelerator Laboratory)

Presenter: SUNG, Chang-Kyu (Pohang Accelerator Laboratory)

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