

LCLS-II: AN UPGRADE FOR THE LINAC COHERENT LIGHT SOURCE

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Abstract

The success of LCLS [1] generates strong motivation and solid technical basis to extend its capabilities. The upgrade will extend x-rays wavelength range down to 0.06 nm. A new soft x-ray adjustable-gap undulator line will produce FEL with wavelengths up to 6 nm. To allow full electron beam rate and independent electron beam parameters in each line, a new injector and pair of bunch compressors will be added to the second kilometer of SLAC linac. The electron from this linac part will bypass the LCLS accelerator into the soft x-ray undulators which can provide two FEL pulses with variable delay and photon energy and may be configured for narrow bandwidth pulse via self-seeding. External seeding with the echo-enabled harmonic generation can improve temporal coherence. The new bypass line can add multiple electron bunches within each RF pulse. LCLS-II will provide polarization control and can incorporate the low-charge, few-femtosecond pulse duration operating mode. A THz radiation source will be included to provide x-ray/THz pump-probe capabilities. The schemes and parameters are based on measurements and experience at LCLS.

**CONTRIBUTION NOT
RECEIVED**