

Construction and commissioning of cERL IR-FEL toward realization of the EUV-FEL

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An ERL-based EUV-FEL is one of promising candidates for future high-power EUV light sources for lithography and can provide EUV light of more than 1 kW for multiple scanners simultaneously. Design study of the EUV-FEL has been carried out, but an experimental demonstration of an ERL-based single-pass FEL should be realized as a PoC of the EUV-FEL. An infrared FEL (IR-FEL) project based on the Compact ERL (cERL) at KEK started as one of NEDO projects from 2019 for the purpose of developing high-power mid-infrared lasers for high-efficiency processing utilizing molecular vibrational absorption. The south straight section of the cERL was reconstructed and two undulators were installed for the IR-FEL, as shown in Fig. 1. The IR-FEL construction was completed in May 2020 and the commissioning was performed in March and June 2020. In this presentation, I briefly review the EUV-FEL for lithography and present the construction and commissioning of the cERL IR-FEL including future work.

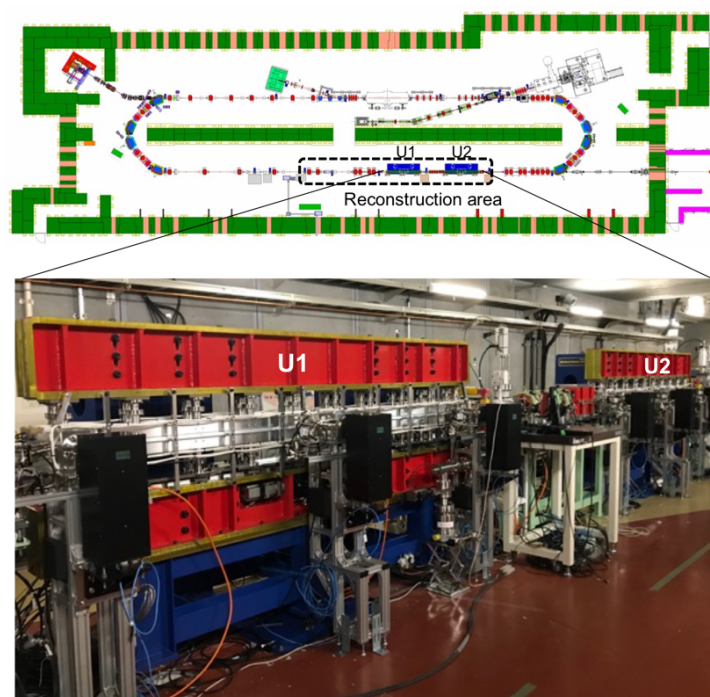


Figure 1: Layout of the reconstructed cERL (upper) and photograph of the two undulators U1 and U2 (lower) for the IR-FEL.

Presenter Biography: Norio Nakamura is a professor and a leader of the beam dynamics and magnet group in Accelerator Division VI (light source division) of the Accelerator Laboratory at KEK. He received his Ph. D in Physics from the University of Tokyo in 1987. He worked for the Photon Factory at KEK from 1987 to 1996 and then for the Synchrotron Radiation Laboratory of the Institute for Solid State Physics at the University of Tokyo from 1996 to 2011.