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Recent studies on high current operation at the compact ERL

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The compact ERL (cERL) is operated at mid-energy region around 17 MeV for beam studies on industrial applications since 2017. Toward the future high power FEL source for EUV lithography, high current beam operation was demonstrated at low bunch charge after install of undulators as a first step. It is critical to reduce beam loss not to exceed 20 $\mu\text{Sv/h}$ outside the shield wall of the cERL acceleration room, however, it can increase especially at the arc sections, the undulators, and superconducting cavities for decelerating. Therefore, 16 high-speed loss monitors are located along the whole beam line as the machine protection system. Recently, machine learning is applied for beam tuning to reduce all loss monitor signal. In addition, we tried the energy recovery operation while undulator light is amplified at a high bunch charge around 60 pC.

Footnotes

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Paper preparation format

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Region represented

Asia

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