

# The Beams and Applications Seminar Series

## Present Status of the Compact ERL in KEK

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**KEK**

**Bldg. 401, Room B-4100**  
**Monday Feb. 28, 1:30 pm**

Host: Kwang-Je Kim

### Abstract:

Compact energy recovery linac (cERL) is under construct in the East Counter Hall as a R&D machine of the future light source, 5-GeV ERL. The cERL has a 2 loop configuration for saving construction cost and space. The final electron energy and current are 245 MeV and 100 mA. At the East Counter Hall, RF sources of superconducting (SC) cavities and liquid-helium refrigerator system are installed and under test.

DC photocathode gun and drive laser are under development at AR source experimental hall. The gun voltage is 500 kV to achieve a normalized emittance lower than 1.0 mm-mrad. The segmented ceramic insulator of the gun has guard-ring electrodes to prevent the any damage. The 1.3 GHz drive laser has achieved up to 100 mW, which is enough to 1 mA electron beam.

Three 2-cell SC cavities will be installed to accelerate from 0.5 MeV to 5 MeV at cERL injector. The accelerating gradient is achieved 41 MV/m without connecting HOM pickups. 9-cell SC cavities and an input coupler of the main linac are also developed.

Start-to-end simulation is used for optimization of the beam optics because the dominant beam dynamics depends on the electron energy. The tracking simulation code, GPT can cover almost all nonlinear force such as a space charge and CSR wake but it is time consuming. We assume the CSR wake is dominant for the higher electron energy beam so the beam simulation code, *elegant* is used to save the simulation time of the optimization.

### For more information visit

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