



ERL2024 workshop

Welcome to KEK , Tsukuba, Japan

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High Energy Accelerator Research Organization (KEK)

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- A) Introduction about ERL workshop and ERL2024 workshop
- B) Logistics of ERL2024 (by Miho Shimada of LOC chair)

2024.Sep.24 ERL2024 workshop in Tsukuba (KEK)



What is ERL (Energy Recovery Linac)



1965 M. Tigner

“A possible apparatus for electron clashing-beam experiments”

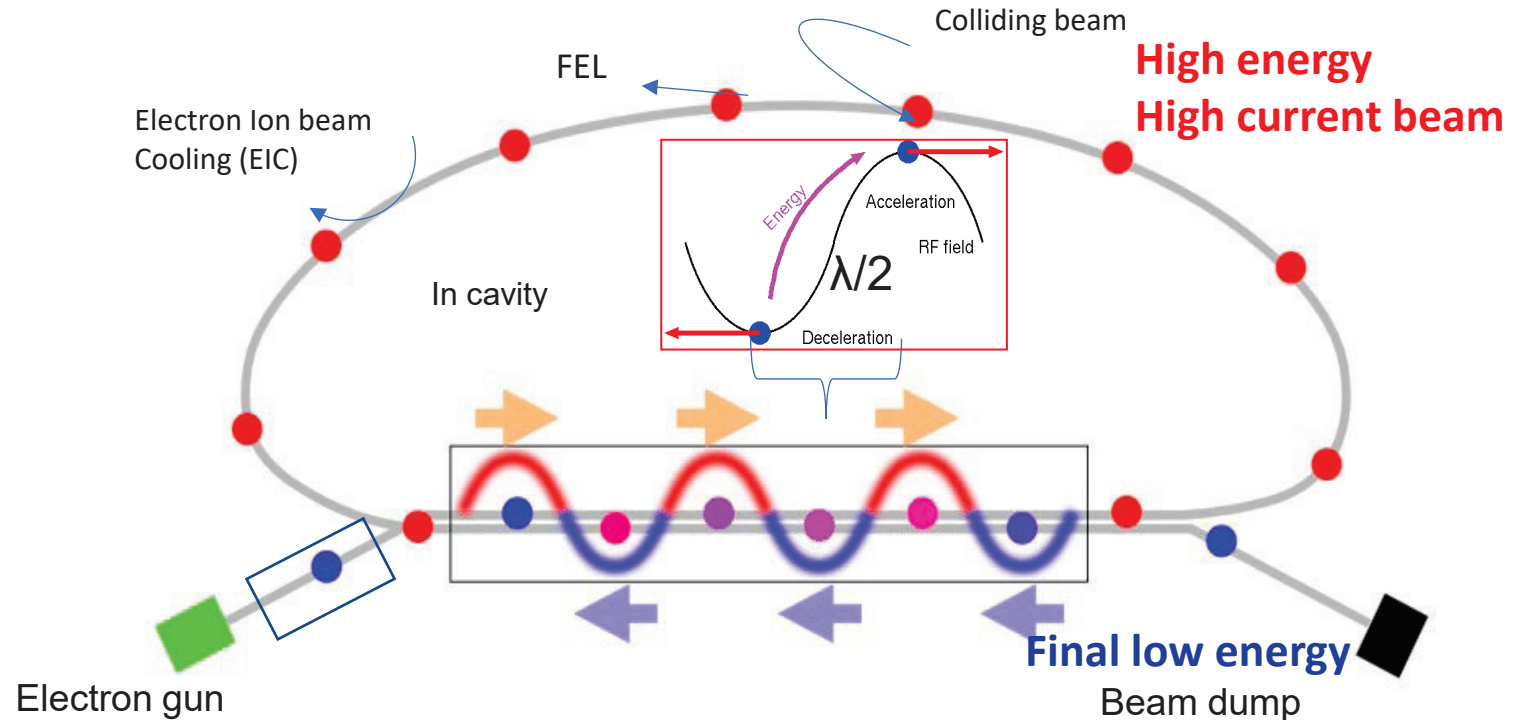
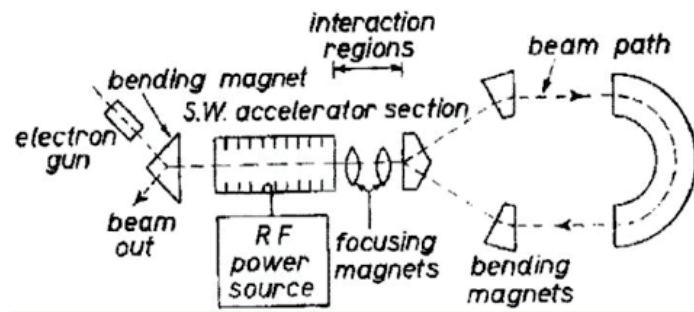


Figure of Merit of ERL

- **Linac beam with high current beam**
 - Low emittance beam (High quality beam)
 - **Short bunch** (< 100 fs) with high current beam (> 10 mA)
- It is difficult to fulfill these conditions by using storage ring
→ high current FEL and future HEP and beam cooling .

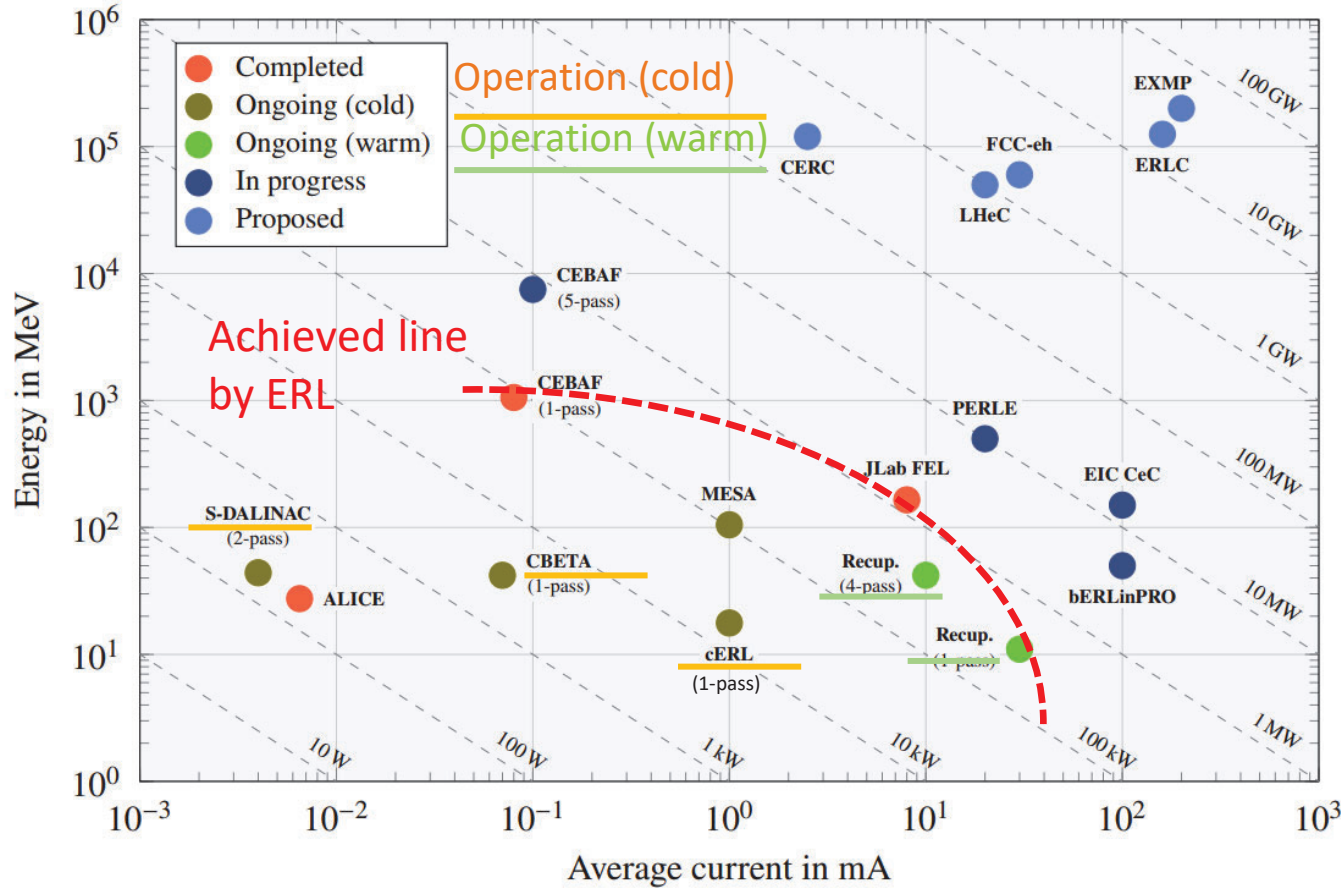
Key technologies for ERL

- **High brightness electron gun**
- **Superconducting RF (SRF) cavity**
- **Beam handling of energy recovery beam with high current**

To be discussed these technologies and applications in ERL workshop

Beam power was saved by energy recovery
→ ERL is a sustainable technology to **reduce an operational power**

ERL Roadmap (Andrew Hutton at ERL2022)



ERL application were proposed for High Energy and Nuclear Physics

- High current low emittance beam for High energy physics use of ERL machine
- Cooling of Electron Ion collider by ERL
- Dark matter search and nuclear physics by high intensity ERL machine

The unique performance gives us several important (industrial) applications as follows.

- Laser Compton Scattering (LCS) (high resolution x-ray to gamma-ray)
- Free electron laser (FEL) (IR-FEL to EUV-FEL (lithography) and X-FEL)
- High intense THz light source

The Development of Energy-Recovery Linacs

Chris Adolphsen,^f Kevin Andre,^{d,i} Deepa Angal-Kalinin,^f Michaela Arnold,^g Kurt Aulenbacher,^j Steve Benson,^o Jan Bernauer,^m Alex Bogacz,^o Maarten Boonekamp,^l Reinhard Brinkmann, Max Bruker,^o Oliver Brüning,^d Camilla Curatolo,^p Patxi Duthill,^k Oliver Fischer,ⁱ Georg Hoffstaetter,^{e,c} Bernhard Holzer,^d Ben Hounsell,^{k,i} Andrew Hutton,^{o,1} Erk Jensen,^d Walid Kaabi,^k Dmitry Kayran,^c Max Klein,^j Jens Knobloch,^{a,s} Geoff Krafft,^o Julius Kühn,^a Bettina Kuske,^a Vladimir Litvinenko,^m Frank Marhauser,^o Boris Militsyn,^f Sergei Nagaitsev,^v George Neil,^o Axel Neumann,^a Norbert Pietralla,^g Bob Rimmer,^o Luca Serafini,^o Oleg A. Shevchenko,^b Nick Shipman,^{d,q} Hubert Spiesberger,^j Olga Tanaka,ⁿ Valery Telnov,^{b,r} Chris Tennant,^o Cristina Vaccarezza,^h David Verney,^k Nikolay Vinokurov,^b Peter Williams,^f Akira Yamamoto,ⁿ Kaoru Yokoya,ⁿ Frank Zimmermann^d

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arXiv:2207.02095 [physics.acc-ph]
 European ERL Roadmap

arXiv:2207.02095v2 [physics.acc-ph] 27 Sep 2022

If you need update, please update in ERL2024.
 We will prepare poster panel to be modified.

ERL workshop history & ERL2024



- ERL'24 - KEK, High Energy Accelerator Research Organization, Tsukuba, Ibaraki, Japan (2nd)
- ERL'22 - Cornell University Ithaca, NY USA (2nd)
- ERL'19 - Helmholtz-Zentrum Berlin Germany
- ERL'17 - CERN, Geneva, Switzerland
- ERL'15 - Brookhaven National Lab, New York, USA
- ERL' 13 - Novosibirsk, Russia
- ERL'11 - KEK, High Energy Accelerator Research Organization, Tsukuba, Ibaraki, Japan
- ERL'09 - Cornell University Ithaca, NY USA
- ERL'07 - Daresbury, UK
- ERL'05 - Jefferson Lab Newport News, VA, USA



ERL workshop has about 20 years history now.



Contact: erl2024@ml.post.kek.jp
HP: <https://www2.kek.jp/casa/cERL/en/events/ERL2024/index.html>



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And we also thank more contributors to support LOC.



Thanks for Volunteer



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