

RECENT PROGRESS OF CONSTRUCTION FOR COMPACT ENERGY RECOVER LINAC

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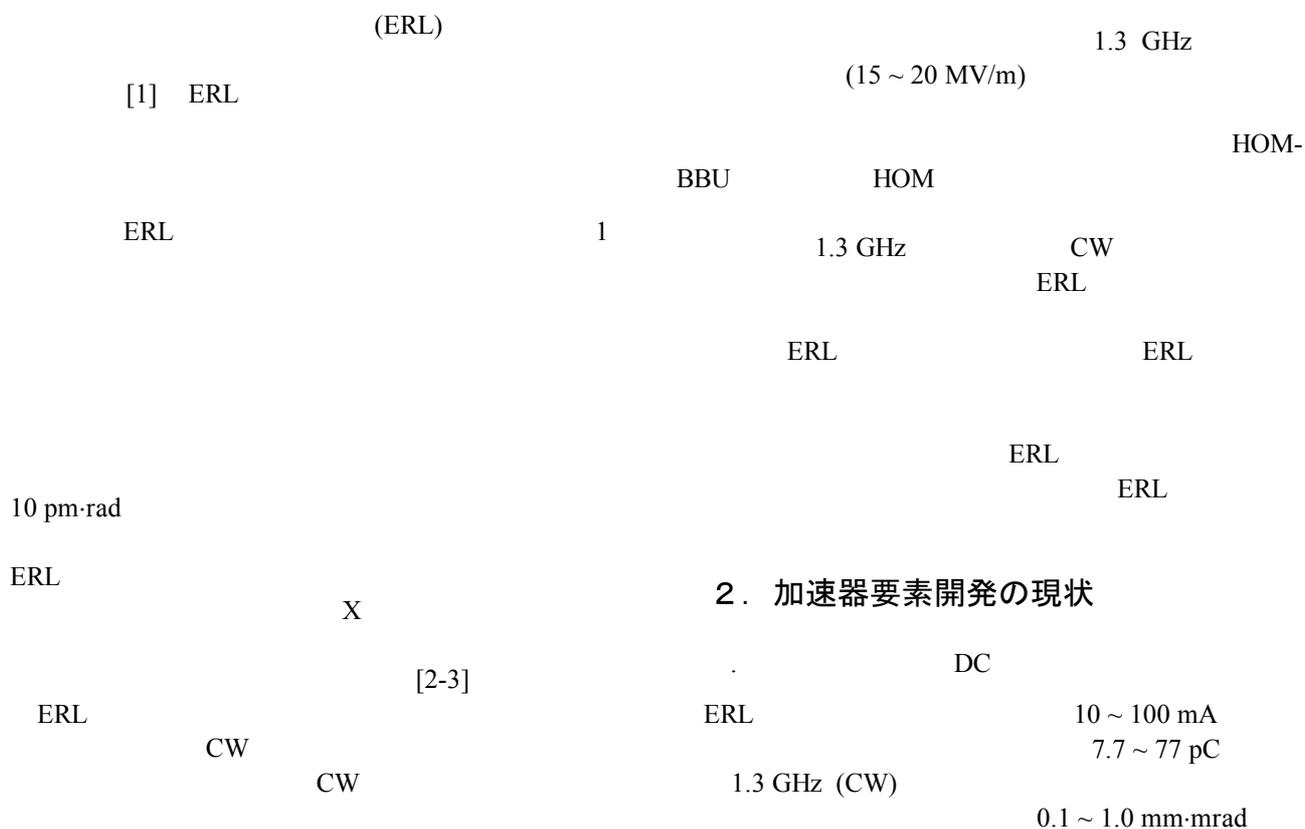
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Abstract

Future synchrotron light source based on the Energy Recovery Linac (ERL) is expected to be capable of producing super-brilliant and/or ultra-short pulses of synchrotron radiation with a potential of the oscillating type for x-ray free electron laser. We are constructing the R&D machine which is called the compact ERL including the developments of an ultra-low emittance electron gun and superconducting cavities for both the injector and the main linacs under the collaboration between KEK, JAEA, ISSP, and other institutes. In this paper, we report recent progress of the construction for the compact ERL with a repair of a KEK east counter hall.

1. はじめに



35 meV

DC (NEA)

NEA-GaAs 867 nm 1.43 eV

GaAs (530 nm) Yb 2

530 nm 100 mA 23 W 1 %

JAEA-FEL 250 kV-50 mA DC NEA [4] 100 MHz

425 MHz

1.3 GHz

500 kV [5] 250 kV 500 kV [6-8] DC(CW) JLAB-ERL 350 kV 500 kV DC 500 kV (1) 2 (2) (3) 500 kV



JAEA-250 kV-FEL 200 kV 500 kV-ERL 250 kV-JAEA-FEL

1.3 GHz (1) (2) (3) (4) 550 kV [6] 10.5 MeV 500 kV 100 mA 2 3 10.5 MeV-100 mA 14.7 MV/m

170 kW

1

2

HOM

9

120 mm 100 mm
monopole

ERL

2

ILC

dipole

KEK-STF-BL

RF

9

88 mm

STF-BL 9

TESLA

quadrupole

BBU

quadrupole

quadrupole

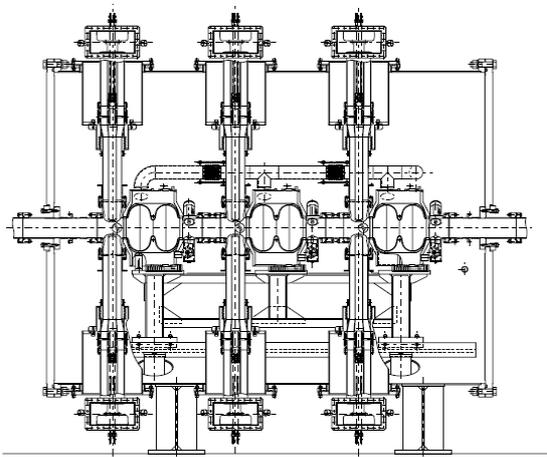
dipole
dipole

65 mm

3

1

2



3

3

9

2 K

37 MV/m 30 MV/m
20 MV/m

1×10^{10} Q

ERL

TESLA

[10]

9

17 MV/m
Q

[11]

HOM

100 mA

100 mA

CW

15 ~ 20 MV/m

Q 10^{10}
200 mA

2 K

Beam

[13]

9

[12]

2

Breakup (BBU)

(HOM)

2012



3. コンパクトERLの建設状況

ERL			
		ERL	
		ERL	
12 GeV			
	[14]		
	ERL		
	240 MeV		
	[15]		
4. 今後の予定			
ERL		2 ~ 3	
		2010	3
			9 2
		2012	
ERL			
ERL			
		2014	



ERL

5. 謝辞

ERL KEK JAEA

JASRI/Spring-8

参考文献

[1] Sol M. Gruner and M. Tigner (ed.), "Study for a proposed Phase I Energy Recovery Linac (ERL) Synchrotron Light Source at Cornell University", CHESSTechnical Memo 01-003/JLAB-ACT-01-04 (2001).

[2] K.-J. Kim et al., Phys. Rev. Lett. **100**, 244802 (2008).

[3] "ERL XFEL WPLSA05.

[4] "ERL WOPSB03.

[5] "JAEA250kV NEA-GaAs", FPPSA16.

[6] "ERL 500kVDC

[7] "ERL 500kVDC

[8] "KEK ERL 500kVDC FPPSA10.

[9] "ERL Yb FPPSA08.

[10] "ERL WPLSA04.

[11] "KEK cERL WOACB04.

[12] "ERL HOM TOACC05.

[13] "ERL FPACA03. 1.3

[14] "ERL WPCEA06.

[15] "ERL WPLSA03.