



ERL R&D



, 2008 8 8 ,

1. ERL

2. R&D

3. ERL

4.

5.

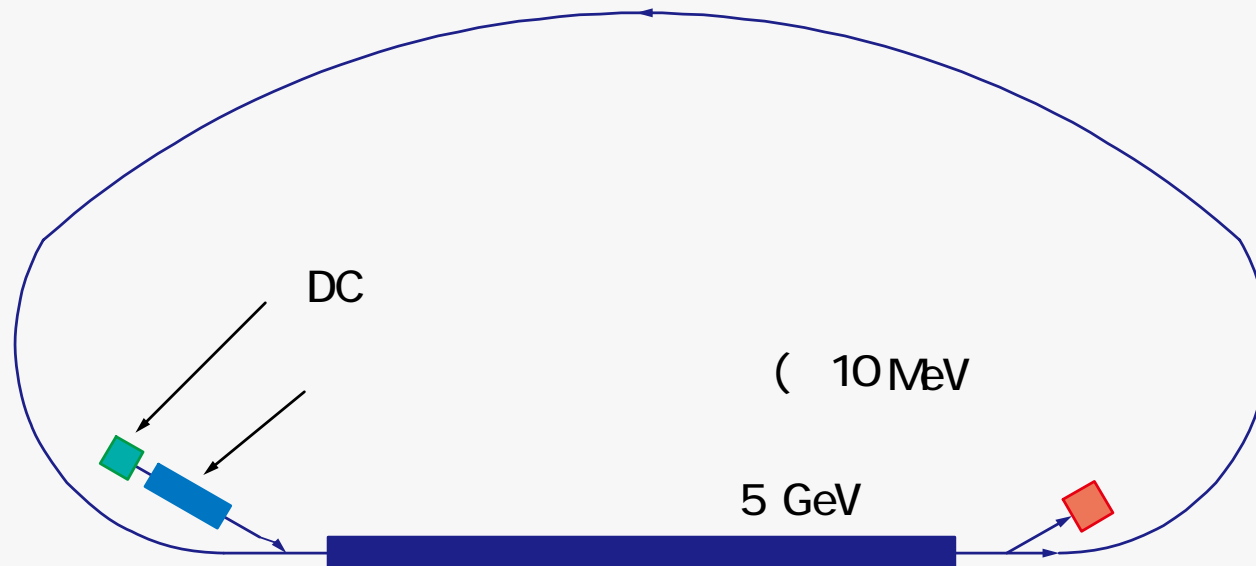
6.

ERL

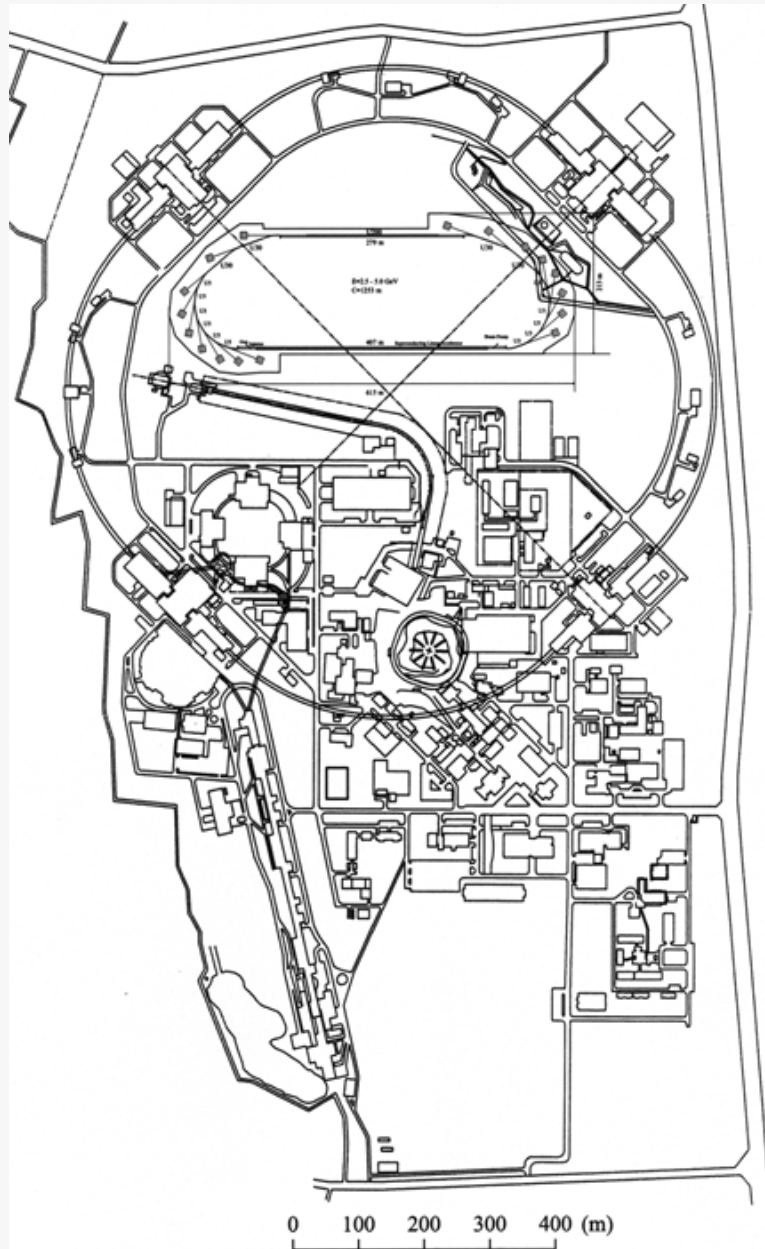


ERL

- 10 - 100 pm·rad
 - 100 fs rms
 - X FEL
- (cf.) K.-J. Kim et al., PRL **100**, 244802 (2008).



5 GeV ERL



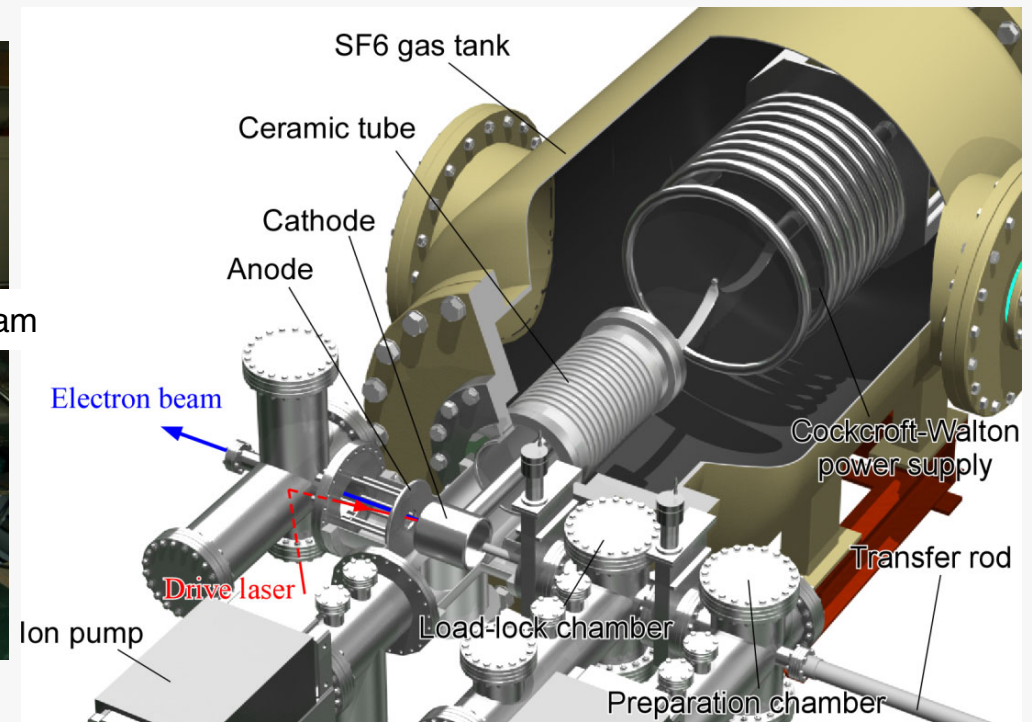
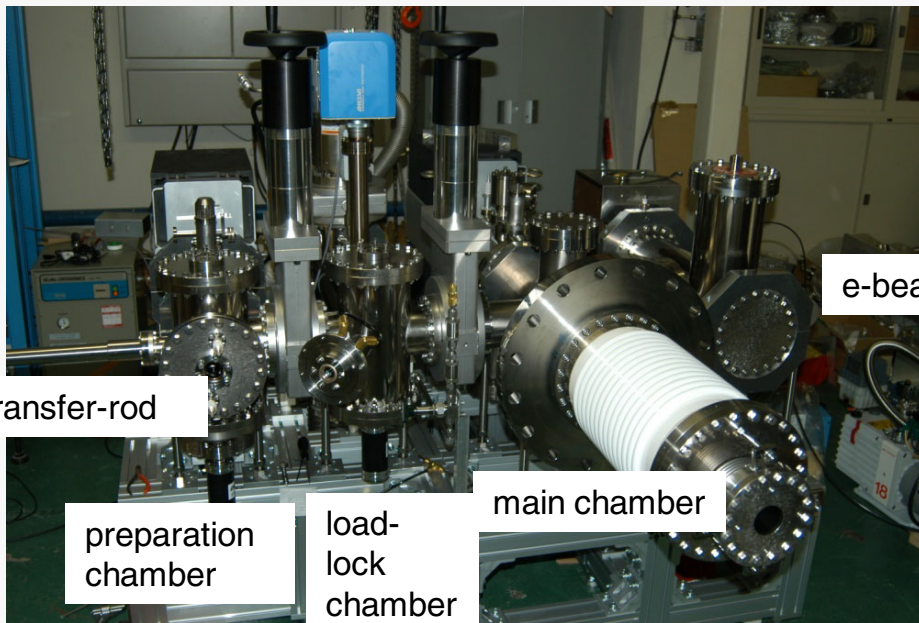
	5 GeV
	10 - 100 mA
	0.1 - 1 mm·mrad
(rms)	$(0.5 - 2) \times 10^{-4}$
(rms)	1 - 3 ps ~ 100 fs (
	1.3 GHz

	30 eV - 30 keV
	$10^{21} - 10^{23}$ ph/s/mm ² /mrad ² /0.1%bw
	$> 10^{16}$ phs/s/0.1%bw
	20 - 30

R&D

DC

- CW (100 mA) (NEA) 500 kV NEA $\sim 10^{-10}$ Pa
- 0.1 - 1 mm·mrad
- DC
- 7.7 - 77 pC
- 250 kV

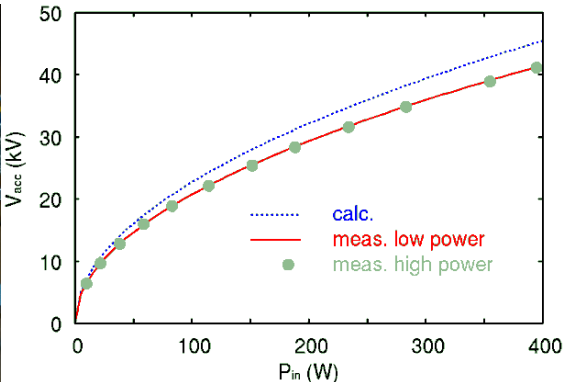
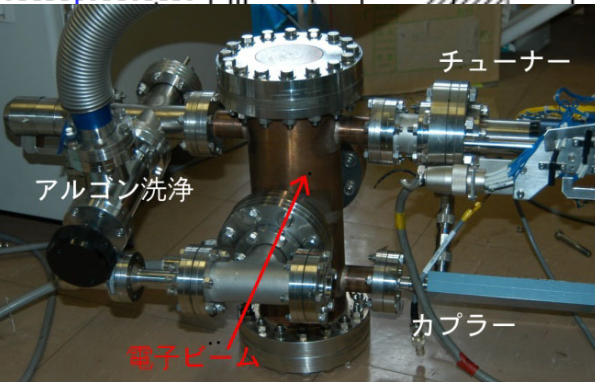
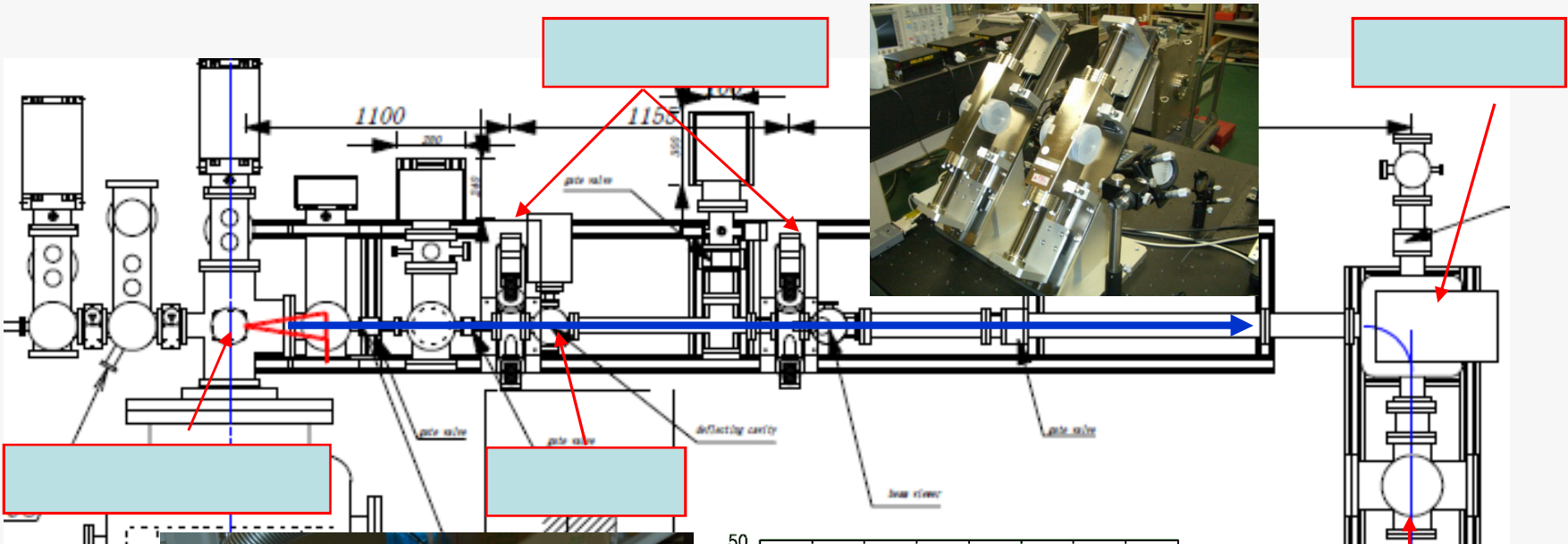


DC

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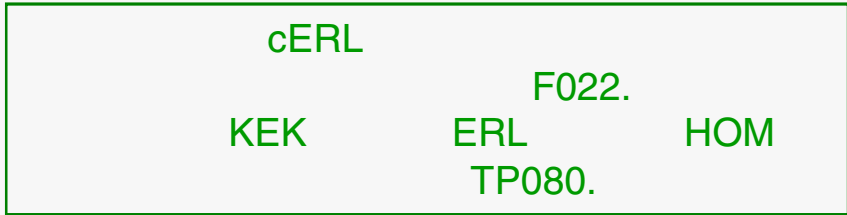
150 kV 1 μ A He-Ne 2.7 mW

15 W (@800 nm)



R&D

2

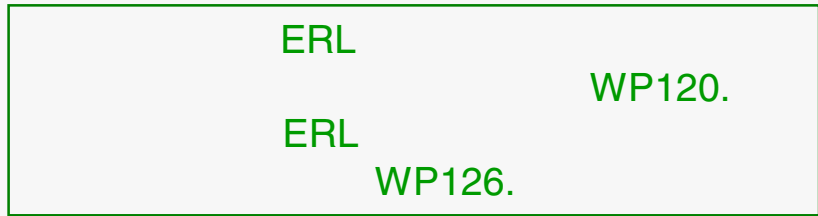


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- CW
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-
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- CW
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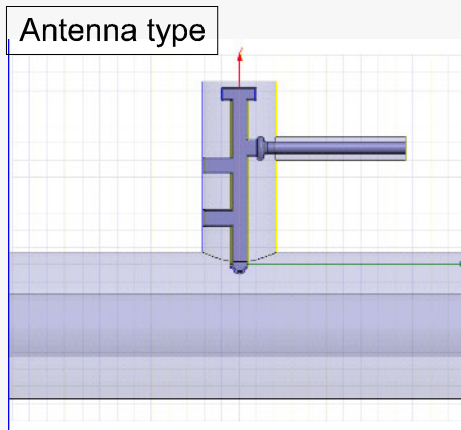
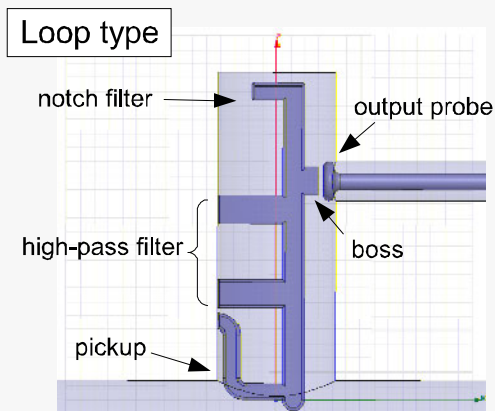
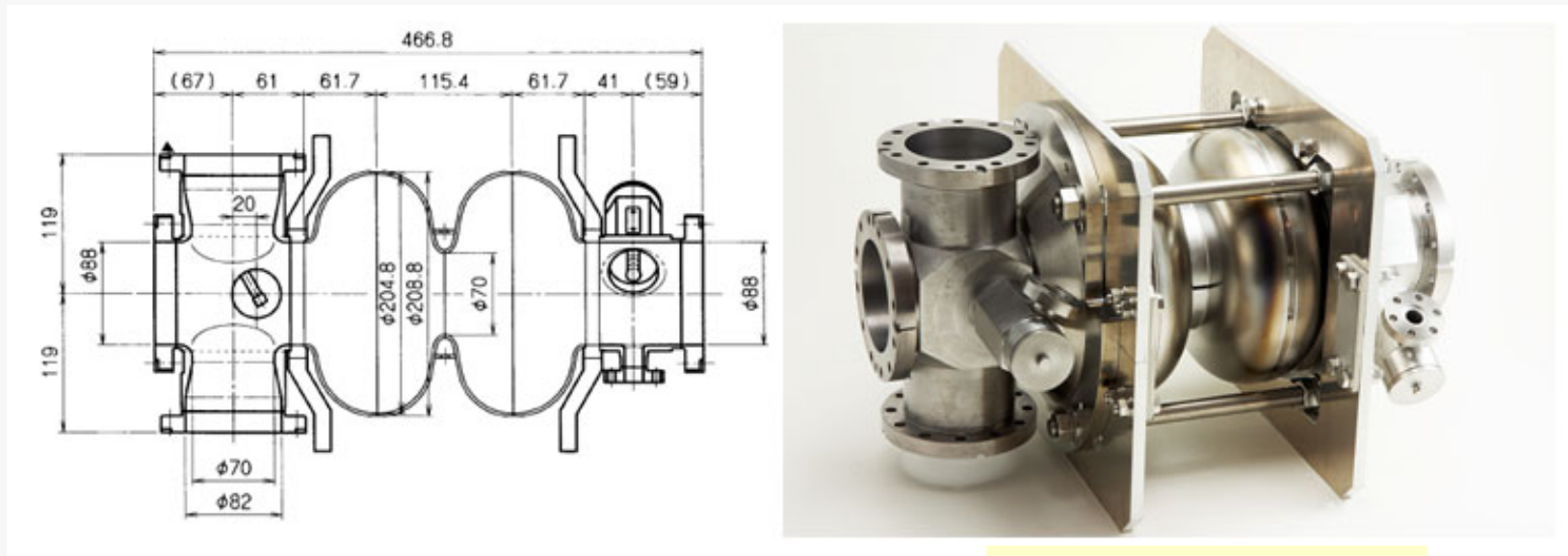
100 mA
5 – 10 MV
250 kW
HOM

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- CW
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-
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-
-
-

15-20 MV/m $Q_0 \geq 10^{10}$
100 mA + 100 mA
BBU
80K
20 kW



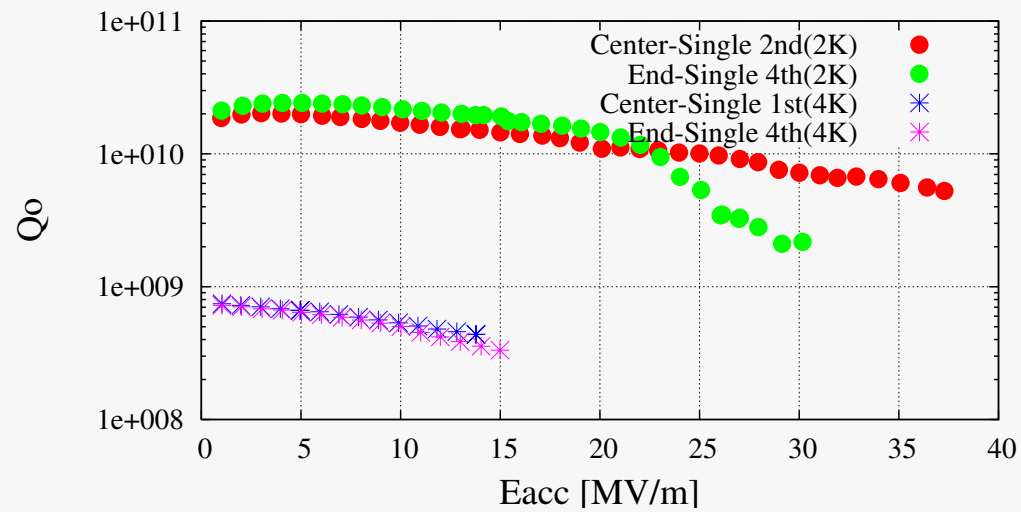
- 2 5 – 10 MV RF
- DESY HOM CW
-



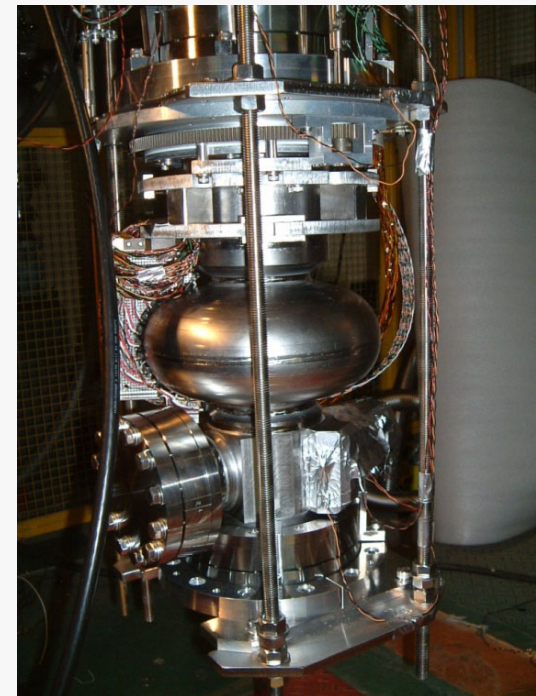
HOM

RF

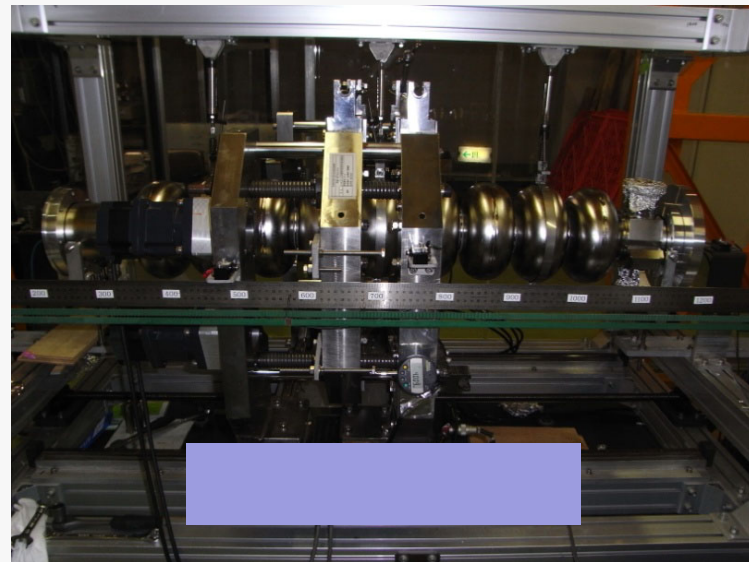
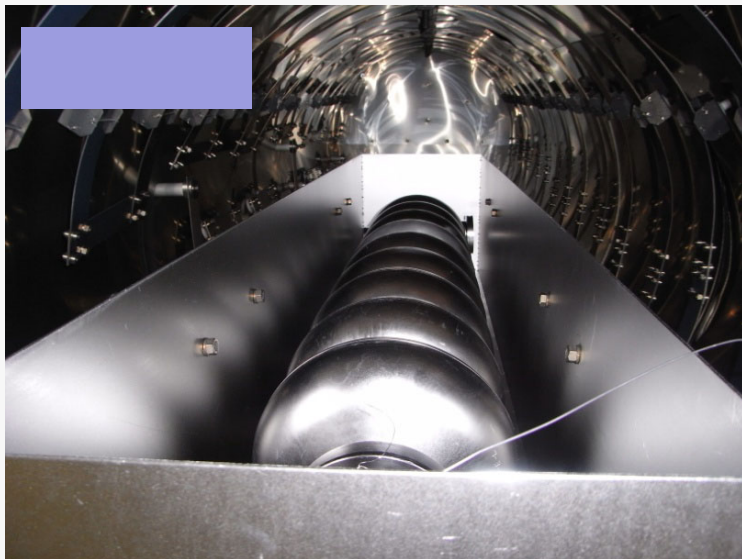
Max Eacc	37 MV/m	30 MV/m
Eacc @ $Q=1 \times 10^{10}$	25 MV/m	22 MV/m
Eacc		



20 MV/m Q 1×10^{10}

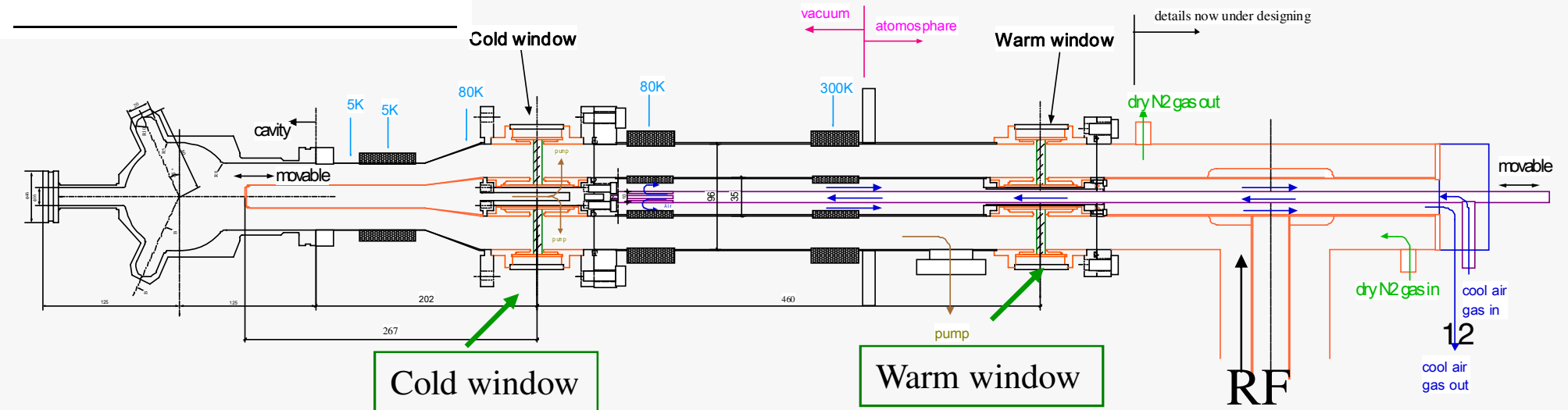
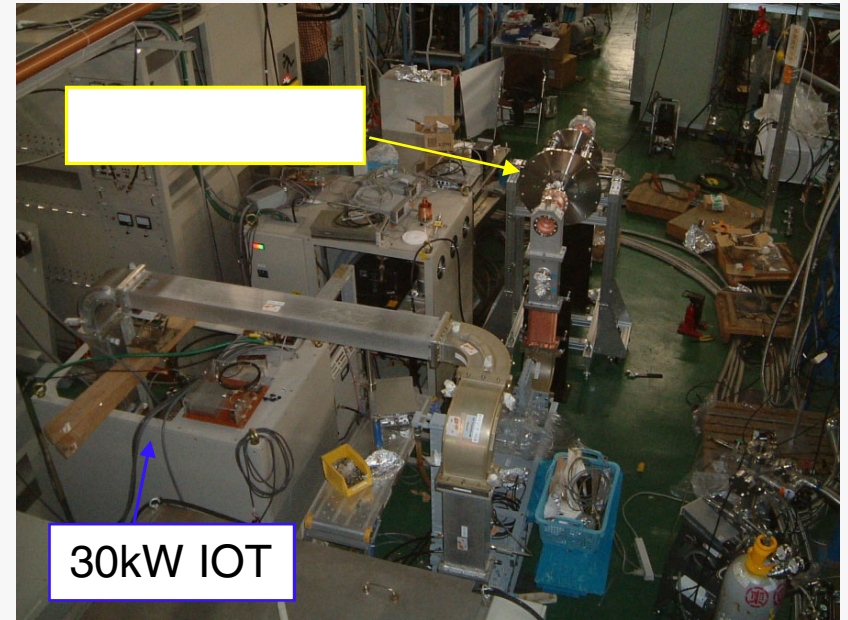


- ERL 9
- → → → →
- 9 KEK-STF



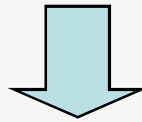
- **: 20 kW** **20 MV/m**
- **$Q_L : 5 \times 10^6 - 2 \times 10^7$**
- **1.3GHz** **ILC-BL coupler**
- **Disk type**
- **ILC** **CW**

30kW IOT



ERL

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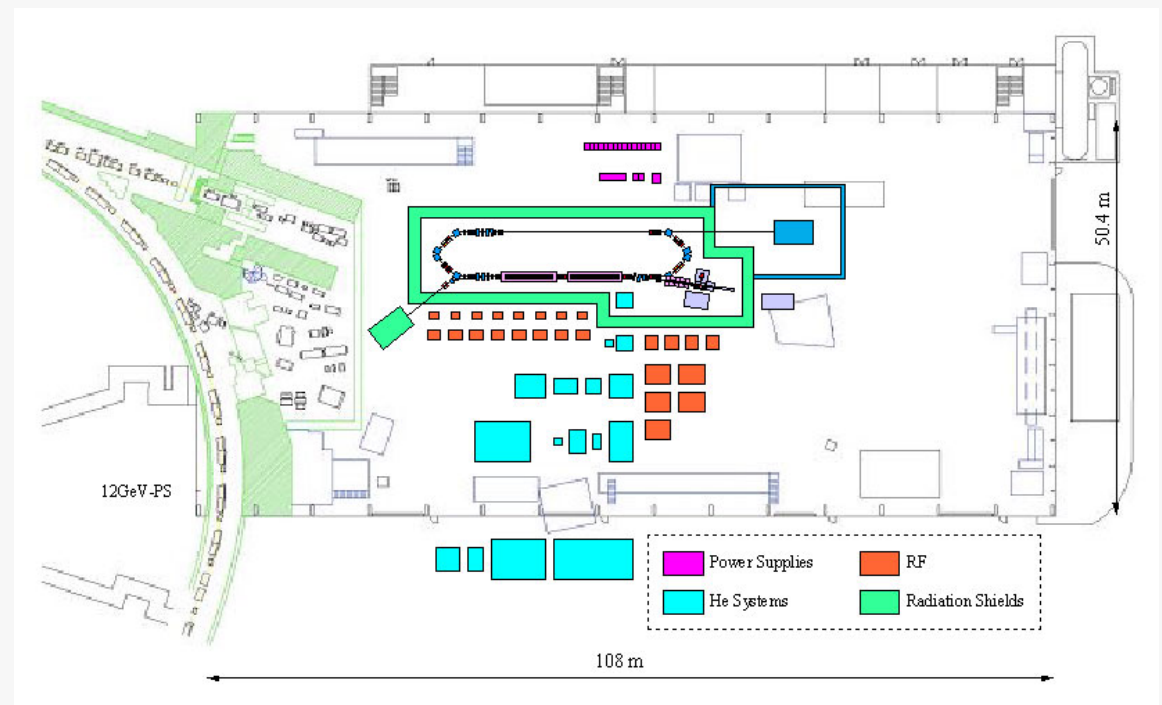


ERL

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X

X

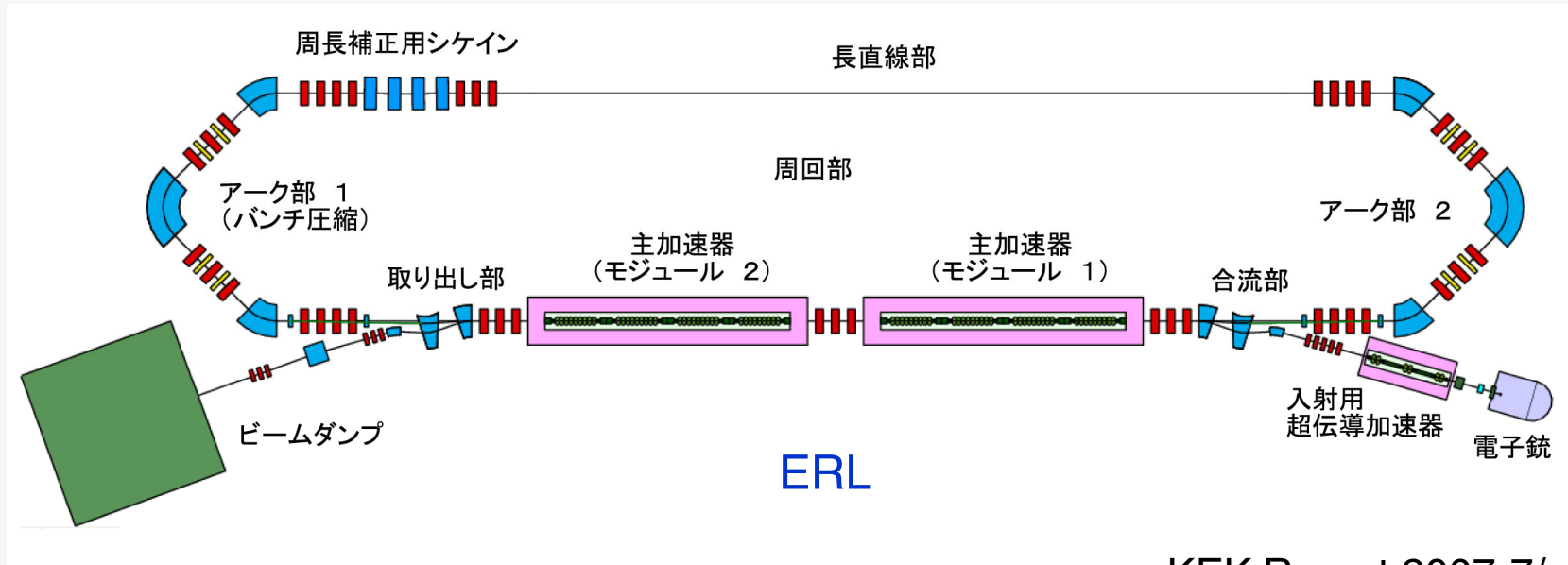


KEK

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ERL

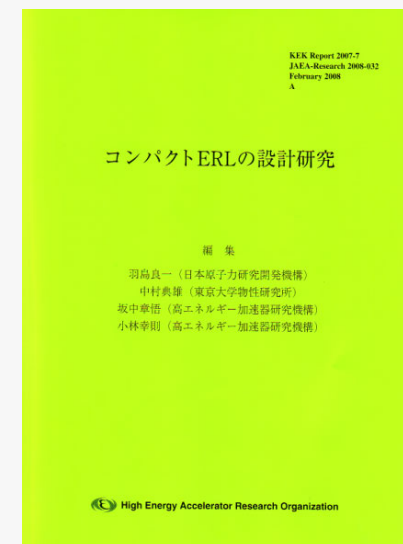
WP119.



KEK Report 2007-7/
JAEA-Research 2008-032

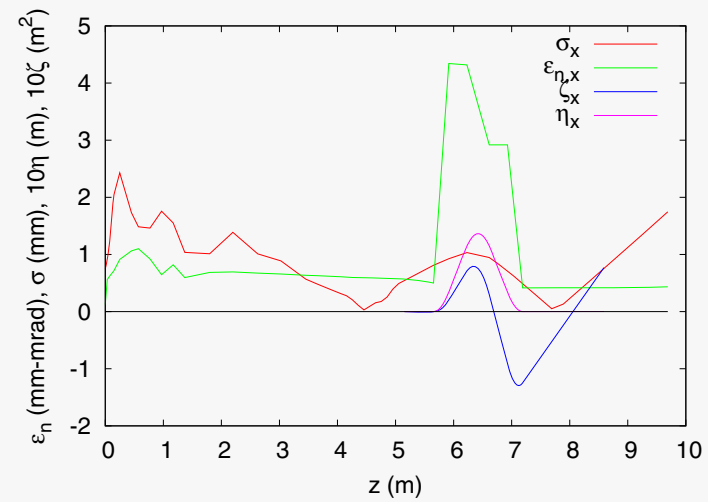
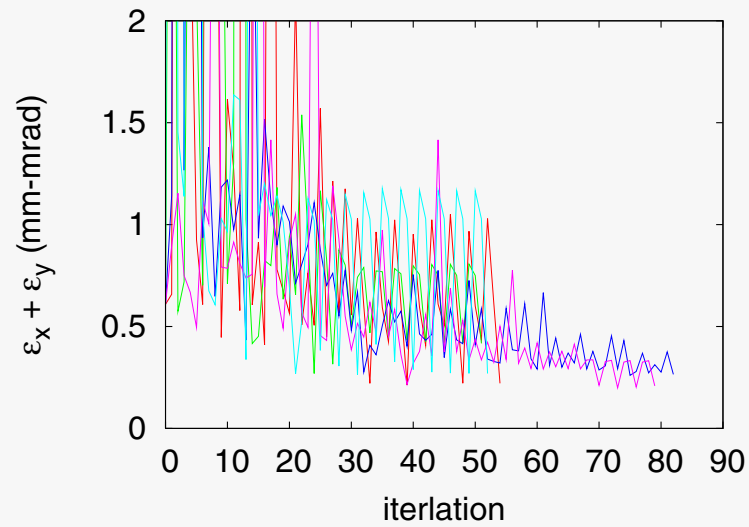
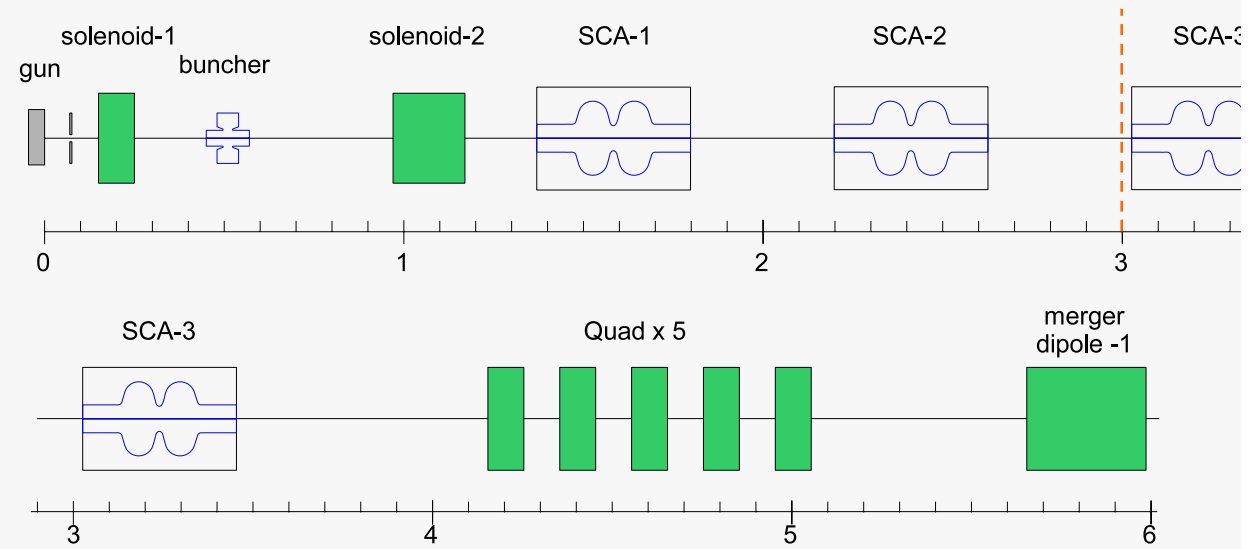
	60 – 85 MeV	200 MeV
	10 – 100 mA	
$\epsilon_n = \epsilon/(\gamma\beta)$	1 mm·mrad (77 pC/bunch) 0.1 mm·mrad (7.7 pC/bunch)	
rms	$< 3 \times 10^{-4}$	
(rms)	1 – 3 ps 100 fs	*

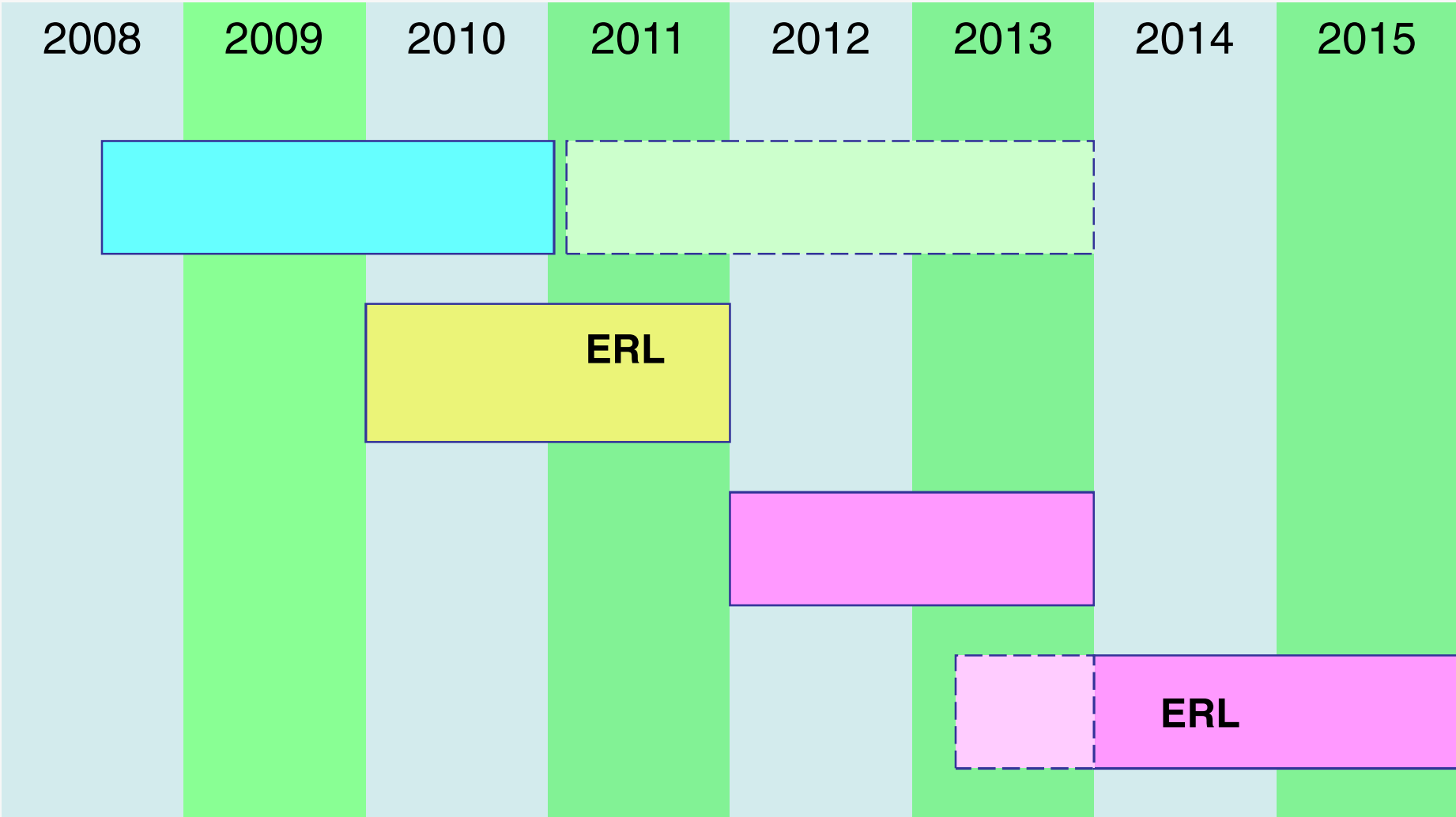
* CSR



ERL

-
- RF focusing





ERL

-

X

XFEL

-

DC

-

15 W @800nm

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- 250 kV

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ERL

ERL