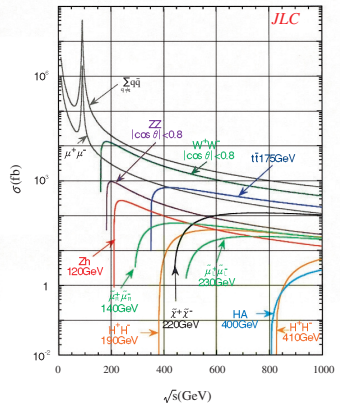
The JLC Project

In quest for unified understanding of seemingly different entities such as "quarks and leptons", "fermions and bosons" and "their interactions", the JLC project aims at construction of a high-luminosity electron-positron linear collider that should allow us to explore a new energy region, up to 500 GeV in its initial phase.

A high precision experiment at JLC will search for and will make detailed studies of Higgs and super-symmetric particles with advanced particle detectors.

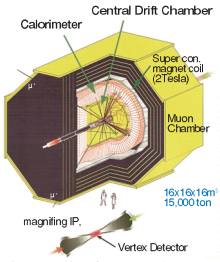
International cooperation is playing a key role in both technology development and physics/detector studies.

PHYSICS TARGET



DETECTOR MODEL

for physics/detector studies

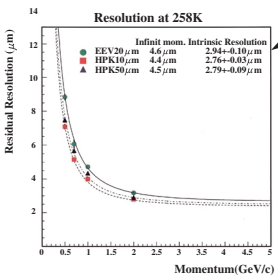


Required resolutions[%]

- Momentum $1.1\times10^{-2}p_t \oplus 0.1$
- Energy $15/\sqrt{E} \oplus 1$ (e, γ)
  $40/\sqrt{E} \oplus 2$ (hadrons)

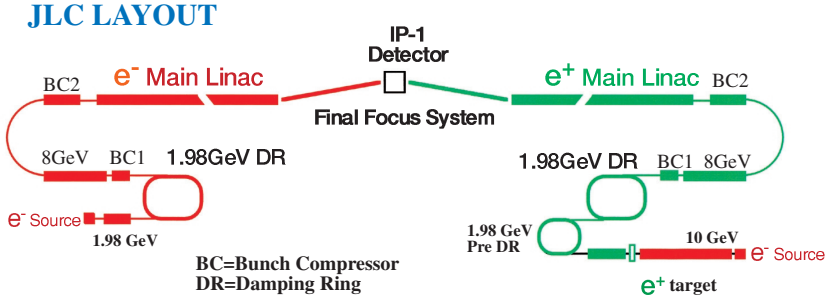
DETECTOR R&D

Muon detector,
Calorimeter,
Central tracker,
Vertex detector,etc.



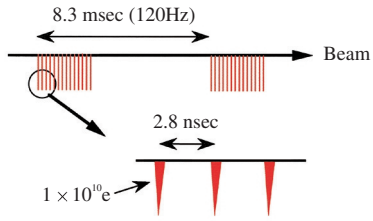
3 μm resolution
with CCD's

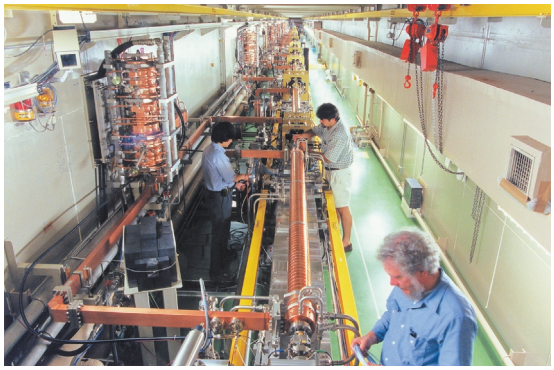
JLC LAYOUT



BC=Bunch Compressor
DR=Damping Ring

Bunch-Train Structure





S-BAND INJECTOR LINAC

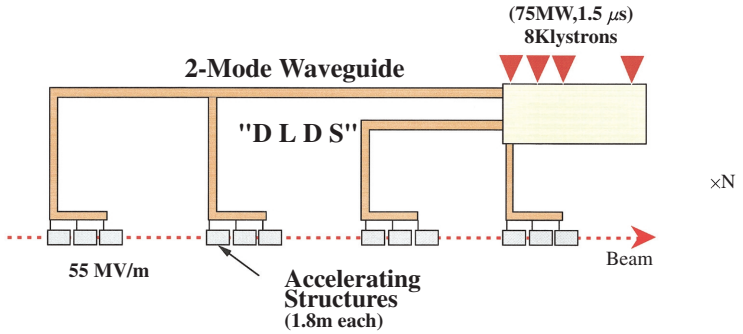
Single-bunch charge : 2×10^{10}e @1.3GeV
Accelerating gradient : av.29 MV/m with beam
ΔE for multi-bunch : 0.37%(FWHM)with ECS

1.54GeV DAMPING RING

Observerd emittance[rad.nm]@1.3GeV, 8×10^{9}e

	H	V
Stored	1.4±0.6	0.04±0.03
Extracted	1.3±0.2	

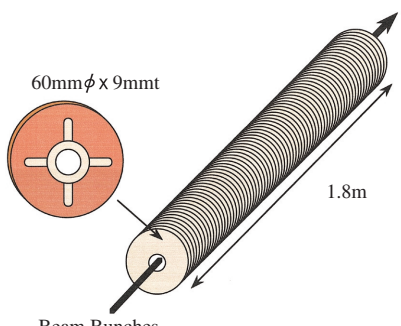
X-BAND RF SYSTEM for Main Linacs



(Also C-band under development as a backup option)

Currently, 50MW, 1.5 μs with solenoid focussing klystron
55MW, 0.4 μs with ppm focussing klystron
DLDS(Delay-Line Distribution System) components under tests

X-BAND ACCLERATING STRUCTURES



Wakefield suppression by

- Gaussian detuning
- Weak damping by slots

Alignment tolerances;
< 5 μm for cells
< 10 μm for structures

With Ultra-fine machining + Diffusion bonding

KEK