

Physics Justification for an e^+e^- Linear Collider

Justification is based on need to fully understand EWSB / TeV scale physics

- Complementarity w/ LHC (discovery) physics program
- LHC will do very well but leaves large & crucial terrain open

Linear Collider (precision) physics program

- Higgs
 - Present knowledge suggests that (a) Higgs will be accessible
 - Precision Higgs measurements will probe underlying physics.
- SUSY
 - Detailed studies of accessible states (masses, spin/parity, BR's).
 - Information on SUSY breaking sector.
- Precision Measurements
 - Need depends on physics scenario that is found.
- Strong Coupling / "Exotic" Physics
 - Best machine for sorting out difficult measurements or ambiguous models.

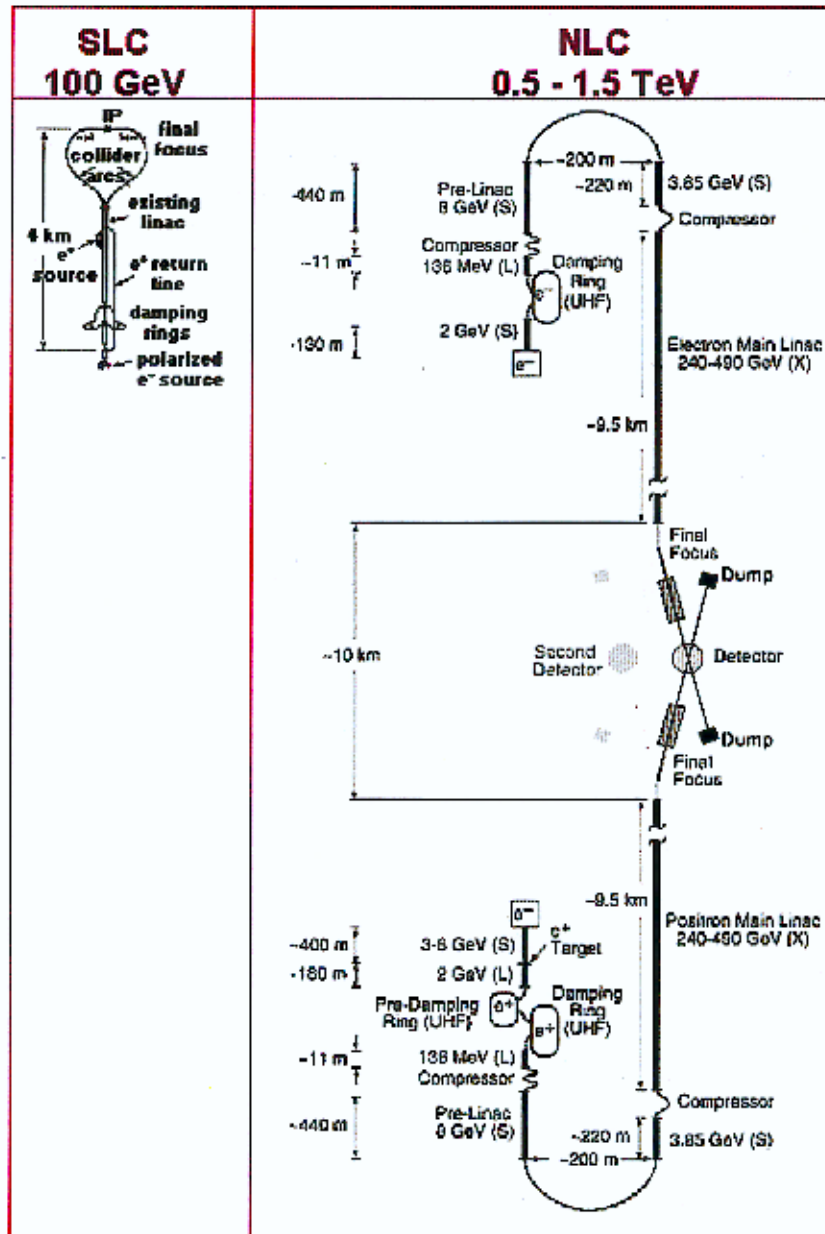
Proposal

- First stage 500 GeV, 500 pb^{-1} will teach us a lot about critical EWSB / TeV scale physics.
- Higher energy & luminosity will very probably be needed to fully explore the new scale.

References

P. Grannis, Berkeley2000 LC Physics & Detectors workshop

Next Linear Collider Complex





1 TeV NLC with phased operations: physics as early as possible

FY00 FY02 FY04 FY06 FY08 FY10 FY12

CD1 CD2



construction

Z-pole, W-pair physics - 2009



Physics operations

Higgs physics - 2010



$> 3 \times 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$

1 TeV physics - 2012

