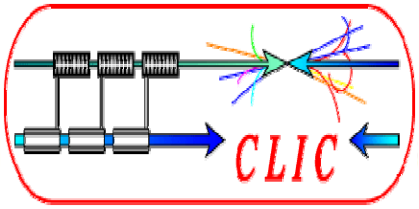


CLIC/ILC Collaboration Report:

Marc Ross (Fermilab);
for Nick Walker, Akira Yamamoto
Project Managers
International Linear Collider – Global Design Effort

CLIC – ILC Collaboration Strategy

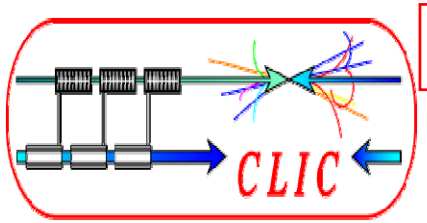
What can ILC bring to CLIC?

- **Use the same cost basis. – develop a credible comparison**
- **(ILC will help in the costing of CLIC)**

And CLIC to ILC:

- **CERN & CLIC-collaboration experts to work with ILC team on common design issues**

- The credibility of each project within our community will be facilitated through communication



Conclusion

- **CLIC/ILC collaboration on subjects with strong synergy**

  Win –Win for both studies and for HEP

- **Ambitious but realistic and practical approach**
  - **starting on limited number of subjects**
  - **conveners to define plan of (limited) actions**
- **Most efficient use of limited resources**
- **Provide credibility to Linear Collider Community by:**
  - **mutual understanding of status, advantages, issues of both tech.**
  - **responsible preparation of the future comparison of possible options for HEP with agreed pro&cons and criteria**

Collaborative Competition and / or Competitive Collaboration

CLIC – ILC Collaboration Chronology

- November 2007 – Barish / Aymar meet and agree on basis
- First plenary meeting: February 8, 2008
  - **Working Group Definition and convener assignment (typically 2+2 conveners/group)**
- Second plenary meeting: May 13, 2008
  - **Working Group Mandates – what should be accomplished prior to the fall project meetings**
    - (CLIC 08 / ILC 08 workshops)
- Third plenary meeting – teleconference: September 19, 2008
  - **Progress reports from each group**
- Collaboration website:
  - **http://clic-study.web.cern.ch/CLIC-Study/CLIC_ILC_Collab_Mtg/Index.htm (Thank you Sonia)**

Five (initial) Working Groups:

- Civil Engineering and Conventional Facilities (CFS)
- Beam Delivery and Machine Detector Interface
- Detector and Physics
- Cost and Schedule
- Beam Dynamics

- Each is ‘mapped’ into a CLIC08 Working Group –
  - **Each CLIC08 WG will have collaboration reporting in their agenda**
  - **(CFS and Cost and Schedule will meet in the ‘Technical Issues, Integration & Cost’ Working Group)**

Two new Working Groups planned:

- Damping Rings
- Positron Generation

- Overlap criteria readily met ("**subjects with strong synergy**")
- Conveners to be named soon

- (work already started)

ILC08

- Chicago, November 16-20, 2008
- Presentation of Collaboration WG activities to GDE
- Convener instructions:
- “It is important that we maintain a visible component in the working groups to address those identified issues of common interest between the CLIC and ILC collaborations. Specifically the ILC08 WG (where appropriate) should include in their schedule some block to discuss the collaborative work. It is expected that a brief progress report on CLIC-ILC collaboration activities will form part of the close-out summary.
- “The ILC-CLIC collaboration is currently focused on four working groups (five including Physics and Detectors) which have identified points of contact. As conveners of the ILC08 WGs, please make sure the relevant people are included in the planning discussions for this part of the programme.”

Review of Mandates (CFS):

- **both groups will work together on areas of mutual interest for both projects, including :**
- **Civil Engineering Studies**
  - Optimisation of Tunnel and Shaft diameters, distance between shafts (linked to safety)
  - Overall layout of the machine and interaction region infrastructure
  - Shallow site v Deep Tunnel Option
  - Tunnel
  - Single Tunnel v Double – Safety issues such as emergency egress
  - Environmental issues
- **Other Infrastructure**
  - Cooling Water ?
  - Power Distribution
  - Air Handling
  - Transport Issues
  - Radiation simulations / shielding ?

Review of Mandates (BDS):

- provides a forum where those technically responsible
  - **for the beam delivery systems and**
  - **for the issues at the interface between the machines and experiments from the ILC and CLIC projects**
- can meet and discuss issues of mutual interest.

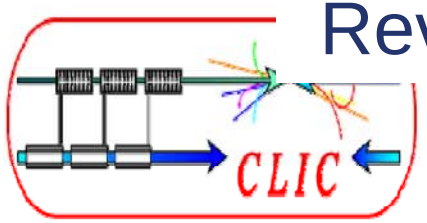
- The subjects treated cover everything of common importance to the machines and experiments and includes,
  - **(but not limited to),**
  - **machine performance for the experiments,**
  - **design and integration of the beam delivery system and**
  - **corresponding interaction regions and experimental areas,**
  - **experimental beampipes and the vacuum, radiation shielding and monitoring,**
  - **collimation system,**
  - **beam instrumentation,**
  - **luminosity and background measurement and monitoring,**
  - **mechanical supports and stabilisation,**
  - **design of the near-beam forward detectors,**
  - **data exchange and common safety issues.**

Proposal for a Mandate:
Detector WG for CLIC-ILC Collaboration

Operation of CLIC or ILC will pose different constraints on the detector requirements. However, fundamentally the concepts will be very similarly, some of the sub-systems may even be identical.
Impressive R&D and development of detector concepts have been done by the ILC community for a 500 GeV LC. To study an extension to higher energy would be a natural goal for this collaboration.

- Foster ideas and favour exchange.
- Initiate establishment of an evolving list of common activities for detector concepts and R&D topics.
- Encourage strategy for direct comparison of detector performance
- Encourage agreement on benchmark processes, preferentially at the same energy.
- Support common technical solutions (e.g. "push-pull") and common parameters (e.g. Crossing angle).
- Foster participation of both communities in LC workshops and meetings

This collaboration should be seen as part of the effort towards Technical Designs for ILC and CLIC.



Review of Mandates: (Cost and Schedule)

Draft mandate

- Compare the **assumptions and methodology** adopted by both projects in matter of cost.
- Establish **functionalities for cost data analysis**:
  - Parametric cost models to define variation of costs as a function of the main parameters
  - Risk/uncertainty assessment.
- **Compare costs for certain items** (to be defined with the agreement of management) to better understand the difference subsystem by subsystem between the two technologies
- Approaches to **traceability**: requirements; cost estimates; and the bases of estimates.
- Compare the basic **assumptions and baseline units for schedule**.

Review of Mandates: (Beam Dynamics)

The working group should foster the exploitation of synergy between the ILC and CLIC beam physics studies. It should promote common meetings, standards, codes and studies.

Collaboration issues

- Note the nature of the collaboration:
  - **What does each team bring?**
  - **What does each expect?**

  - **ILC to CLIC:**
    - Use the same cost basis.
    - (ILC could even help in the costing of CLIC.)
  - **CLIC to ILC:**
    - CERN expertise helpful in design studies

- Work a practical balance into the mandates