RD's Report

SiD Workshop

@SLAC

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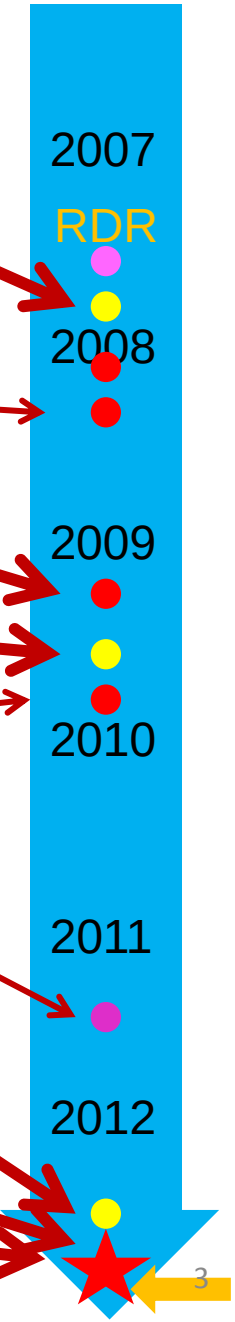
The time line of the LOI process

- Oct. 2007: **Call for LOIs was made by ILCSC**
  appointment of RD to conduct the process
- Jan. 2008: Detector management was formed
- Mar.2008: IDAG formed, 3 LOI groups known
- Mar.2009: **3 LOIs submitted**
- Summer 09: **IDAG recommendation for validation and ILCSC's approval**
- Oct 2009: Work plan of the validated groups
- End 2011: ***Interim Report***
- ***October 2012: DBD draft reviewed by IDAG***
- ***December 2012: PAC review***
- **End 2012: Detailed Baseline Design Report**



Present status of the DBD

- **We have *almost* reached the expected goal of the LOI process.**
- **The completed DBD draft is a compilation of the achievements of many colleagues during the LOI period.**
- **The draft was submitted to PAC in November and was reviewed in December. (details later)**
- ***It is still under the final edit, and a few numbers are yet to be filled in.***

The messages in the DBD

- **The case of ILC physics be presented.**

  (Beside theoretical considerations, convincing and well-understood simulations are crucial.)
- **The feasibility of the detectors and software technologies be proven.**
- **The capability of the detectors to accomplish aimed physics be demonstrated.**

For this, the communication with the GDE teams was important.

e.g. IR design, Push-pull issues, SB2009, beam parameters/b.g.

Some Remarks

- **The LOI process set a framework to coordinate the efforts of the community to produce two detector designs for physics programs at ILC.**

- **The scheme did not provide any budget for R&D. The participating groups worked for the resources and there were difficult moments.**
- ***The DBD report is a symbol of the strong wish and will of the community for ILC, which we relied upon and appreciate much.***

The review/monitoring by IDAG

- **IDAG first validated the LOIs, and watched all the activities through the entire process to give us advices.**

  We owe much to IDAG for the accomplishments.
- IDAG is informed of every detail of the progress of the groups and the DBD contents.
- **For DBD, IDAG monitored:**

  the planned contents during KILC12, April 2012,

  the first raw draft during LCWS12, October 2012.

  After this review the draft was finalized through November to be submitted to PAC.

  The groups tried their best to meet the suggestions.

IDAG joined the PAC review

- Three members, including the chair, joined the PAC review in December.
- The final version had been sent to PAC and IDAG.
- IDAG chair reported its tasks and outcomes through the LOI process;

  validation of the LOIs and

  monitoring of the physics/detector activities,

  given advices on the DBD outlines and drafts,

  in particular

  IDAG's observation of the final draft of DBD.

IDAG report at PAC by the chair

General assessment of DBD (1)

•The physics case of ILC is strongly documented in the excellent physics chapter

•Discovery of the 126 GeV boson gives a solid boost for going beyond the LHC, both in terms of precision of couplings and masses and for accessing new observables

•The 2 validated detector concepts have demonstrated through benchmarking with a realistic detector simulation that the physics goals can be met (compensation of degradation with improvements in analysis software).

•.The studied processes encompass the full range of ILC operation, from 250 GeV to 1 TeV with the same detector designs (also down to Z and WW regions).

IDAG report at PAC by the chair(continued)

General assessment of DBD (2)

- The vigorous R&D programs carried out have validated the considered solutions for subsystems. Still different options remain in some cases which is reasonable at this stage.
- R&D should continue, in addition many spin-offs.
- Ambitious detector designs (resolution, granularity, hermeticity, integration) have met the challenge of addressing the unique possibilities of the ILC.
- Many of the results rely on the powerful technique of particle flow (PFA) which drives the designs and is essential to reach the goals. ILD and SiD are optimized differently which is an asset for crosschecking results. This is the most important complementarity issue

IDAG chair's caveats

- Serious editing is required to improve hurried last-minute writing.
- Benchmarking results should be validated through crosschecking and understanding irreducible differences.
- ILD costing is still very crude (need a baseline).
- Are there some remaining/un-assessed risks in order to achieve the foreseen performance?
- - power-pulsing of on-board electronics is mandatory
- - large solenoids: SiD comparable in size to CMS but 5T instead of 4, ILD larger than CMS but same field

Call for signatory

- **The draft is now open to the community in the nearly completed form.**

http://ific.uv.es/~fuster/DBD-Chapters/

- There is a call for signatory on-going.

Contributors, Possible future participants,

Supporters of the ILC project

The signatory list will appear in all the volumes combined with the accelerator's contributors.

http://www-flc.desy.de/dbd/

DBD volumes

The 2 volumes of DB will make a part of TDR

TDR Volume 1: Physics
TDR Volume 2 (2 parts): Accelerator
TDR Volume 3: Detector &simulation

(There will also be an executive summary.)

Physics volume

By the group convened by Michael Peskin

- **All the considerable physics topics are summarized in 220 pages. They include:**
- ***Precise measurements on the Higgs particle in various channels at different energies,***
- ***including the identification of the newly discovered 125GeV Higgs boson-like particle,***
- ***Possible deviations from the SM Higgs case,***
- ***And many others for the possible future directions.***

Physics and Detector Volume

- **Introduction chapter**

  general matters like a brief physics summary, requirements on the detectors and experimental conditions

- **Common chapter**

  Common activities/matters to both ILD & SiD

  (component R&D, MDI issues, beam instrumentations, Eng. Tool, Simulation Tool)

Detector chapters, SiD and ILD

- Written by each group
- These are the main part of the volume

  with ~190 pages each.

  Concept, design, component R&D (feasibility), integration, software, performance (benchmark simulation), cost estimation

Some simulation results are yet under production. We have to fill the numbers. (Cross check between the groups in advance needed.)

Summary and Future chapter

Summary: short summary text.

Future:

- **We are still in the R&D phase.**

  The R&D will continue for better performance or cost reduction.

  Engineering studies need to be enhanced toward construction phase.

- **More over, we wish the project advances toward realization with the completed TDR.**

Draft handover to ILCSC

- We announced the completion of the draft on Dec.15 and handed the completed draft to the ILCSC chair.

  This was an event for the media (in Japan).

(**Personal observation:**

This was received positively by the ILC colleagues and by the press or TV.)

- **This was very good to mark our progress and to look forward to the next step based on that.**
- **However: We should not forget**

  the draft is yet under work to be fully completed.

Remaining works

- ***Simulations need to be finished.***
- ***The results must be compared between ILD and SiD, and difference need to be understood if any.***
- ***Cost estimation is not reached to the expected level of completeness (for ILD in particular).***
- ***Editing and format arrangement, etc.***
- ***Prepare for printing (e.g. high quality figures)***
- ***Complete the signatory list***

Unless we finish these, we can't fully set out for the next step.

Post 2012 program

It is desirable to define the next objectives of the activity *in concrete*.

We, the RD, will hand the completed report to ILCSC early February, finishing the final polishing, and complete the mandate except printing, which will be made by June.

(Transition period; February to June)

The concept groups wish to continue R&D and include engineering studies toward project realization.

How to organize this and to secure resources for these works are important tasks for the next scheme.

The groups may wish

- to plan how to advance the detector designs and approach the construction phase,
- to secure resources to continue the further R&D,
- to think how to participate in the project realization.

The new scheme must function to help these.

The groups can be proactive in designing it to promote the further progress.

Final remark

- The new LCC seems to have a clear goal:
  the realization of ILC.

The enthusiasm and desire for this will be the key element and best driving force.