

RD's Report on Detector Activity

General Overview

Project Advisory Committee
@KEK

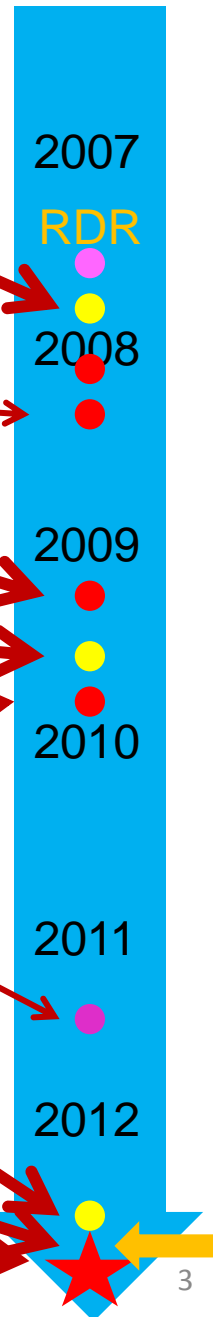
Sakue Yamada
December 14, 2012

Contents

- **Time line of the LOI process**
- **Overview of the submitted DBD**
- **Post 2012 stage for physics/detector**

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**



Milestones till draft completion

- Format WG started December, last year.
 - 2 from each group + management
- Monitoring of the planned contents by IDAG
 - During KILC12 in Daegu, Korea, Last April
 - Some rearrangement
- **Review of the first draft by IDAG**
 - The entire draft was submitted end Sept.**
 - IDAG met during LCWS12, in Arlington, last October
 - Each author group was interviewed by IDAG
- **Submission to PAC after polishing end November**

The review by IDAG

- IDAG validated the LOIs, and has watched all the activities through the entire process to give us advices. We owe much to IDAG for the accomplishment.
- Formally IDAG gives advices to the RD. In that sense, the DBD monitoring or review was an internal review.
- Nevertheless, **the IDAG members are experienced physicists mostly from outside of ILC community;**
- IDAG is informed of every detail of the progress of the groups and the DBD contents.

➔ **IDAG is the ideal body to review the DBD with PAC.**

DBD presents our achievements

- **We believe we have reached the expected goal of the LOI process.**

In the DBD:

- ✓ The case of ILC physics could be presented.
- ✓ The feasibility of the detectors and software technologies could be proven.
- ✓ The capability of the detectors to accomplish aimed physics was demonstrated.
- For the last point, good communication with the GDE teams was crucial and was kept.

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

Remarks on the achievements

- **The completed drafts are a result of the efforts of very many people during the LOI period.**
- The LOI process provided a framework to coordinate the efforts of the community.
- **The management did not provide any budget for R&D. The participating groups worked for their budget themselves and there were difficult moments.**
- **This report is a symbol of the strong desire and will of the community for ILC, which we relied upon and appreciate much.**

DBD volumes

There are 2 volumes.

These volumes will make a part of TDR

TDR Volume 1: Physics

(220 pages)

physics case for ILC

TDR Volume 3: Detailed Baseline Designs

(500 pages)

*Detector designs and performance
of SiD and ILD, and common matters*

Physics volume

- All the considerable physics topics are summarized. They include:
- *Precise measurements on the Higgs particle at different energies,*
- *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.*

Details will be presented by M. Peskin.

Physics and Detector, DBD, volume

- **Introduction chapter**

Physics summary and general items for ILC experiments (e.g. required detector performance, beam backgrounds) **(J. Fuster)**

- **Common chapter**

Common activities or matters to the both groups

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

(W. Lohmann, K. Buesser, C. Clerc, A. Miyamoto)

Detector chapters, SiD and ILD

- 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

(These are result of advanced R&D, of little engineering study. I.e. some items for integration or cost estimation depend on the engineering studies or site are left for future studies.)

SiD by M. Stanitzki, T. Barklow,

ILD by Y. Sugimoto

Summary and Future chapter

- **Summary**

The both ILC detectors, SiD and ILD, are feasible and capable to provide the physics aims with good accuracy under the push-pull operation and with the expected accelerator performance.

Summary and Future chapter

Future:

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

The R&D will continue until the groups freeze their design.

It is important for better performance or cost reduction.

This is the common part with CLIC detector activity.

- **Engineering studies need to be enhanced toward construction phase.**
- **More over we wish the project advances toward realization with the completed TDR.**

Post 2012 program

We have come to the goal of the LOI process.

It is strongly desired to define the next objectives of the activity *in concrete as soon as possible*.

We, the RD, will hand the completed report to ILCSC next February, finishing the final polishing, and complete the mandate except printing the report.

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 is a critical issue now.

Summary

- We have completed the DBD draft, which presents the physics cases of ILC, feasibility and capability of the designed detectors.
- It requires some more work to be the final document to be handed to ILCSC.
- The community made big contribution for this accomplishment and wish to step forward to the next stage toward ILC realization.