Status Report of the LCC Detector R&D task force

Maxim Titov (CEA Saclay)
Jan Strube (Tohoku University)

Charge

The detector R&D liaison ensures productive communication between the LCC Physics and Detectors Executive Board and detector R&D groups. The liaison is a member of the Executive Board and communicates relevant information from the Executive Board to detector R&D groups and vice versa.

The liaison is in contact with all detector R&D groups relevant to linear colliders to keep track of the overall detector R&D efforts conducted or planned for linear colliders and to periodically compile summaries of the efforts.

The ILC Detectors

Purpose:

- Precision measurements of Higgs properties
- Discovery potential for (and precision measurements of) new phenomena

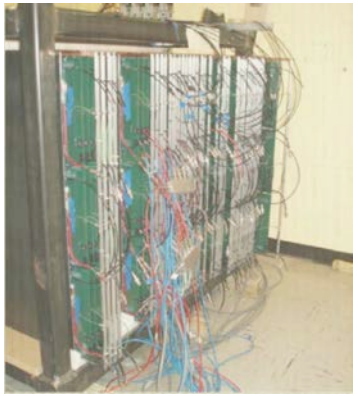
Requirements:

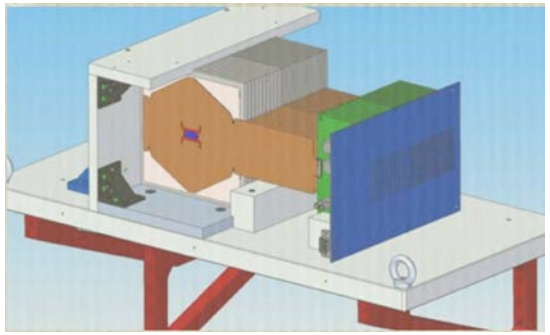
- Precision instruments that are optimized for the ILC beam structure
- Choice of PFA paradigm requires an integrated concept. All parts play together to achieve the best performance.

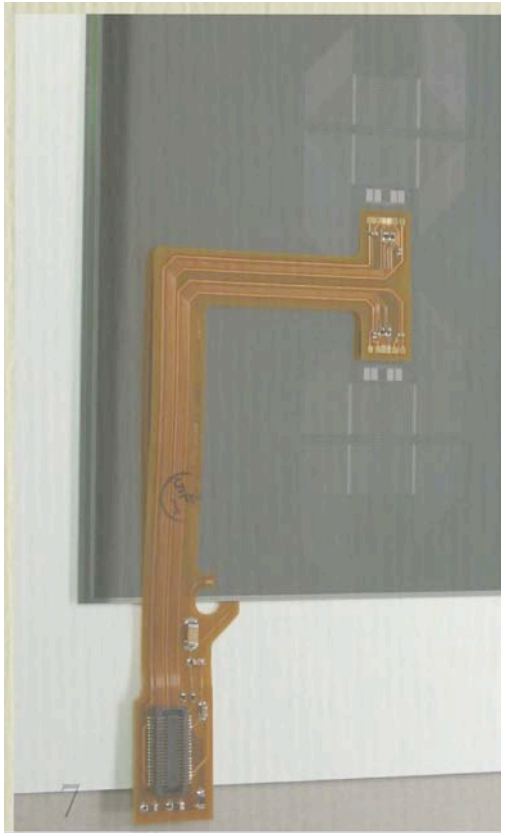
Fields of detector R&D

In spite of tight budgets, Linear Collider R&D is still an active field.

Jim Brau showed highlights yesterday.







The Plan

Get an overview over the linear collider detector R&D efforts.

Purpose:

- Publicise the technology. Make areas of overlap obvious without pointing them out.
- Provide a showcase for the technology, not individual institutes. Manpower and effort is explicitly not mentioned in the report.
- Provide an entry point for new groups.

Technical Details

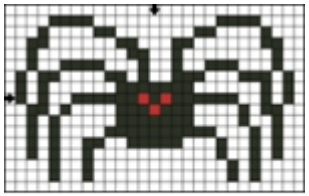
Contributions come in many formats:

- LaTeX, Word, PDF, emailed text, …
- With varying quality of references

Report is being written in LaTeX.
Currently 60+ pages + 7 pages references.
Goal was <70 pages. We might get there.
All references are verified and hyperlinked.

RPC DHCAL

Scintillator ECAL



SPiDeR

Collaborations

FCAL

CLICPix

DEPFET

LCTPC

ChronoPixel

SDHCAL

SOI

TPAC

GEM DHCAL

Calice

Silicon ECAL (SiD)

VIP

Silicon ECAL (ILD)

CMOS MAPS

KPIX

FPCCD

Scintillator HCAL

RPC Muon

Dual Readout

NB: incomplete list. For illustration purposes only.

Feedback

> 30 individuals contacted
→ overlap in technologies, ensure maximum coverage of all technologies

covering 20 Technologies

Responses ranged from
pointers to 100+ page documents, over inline text and bullet points to 18+ dedicated pages.

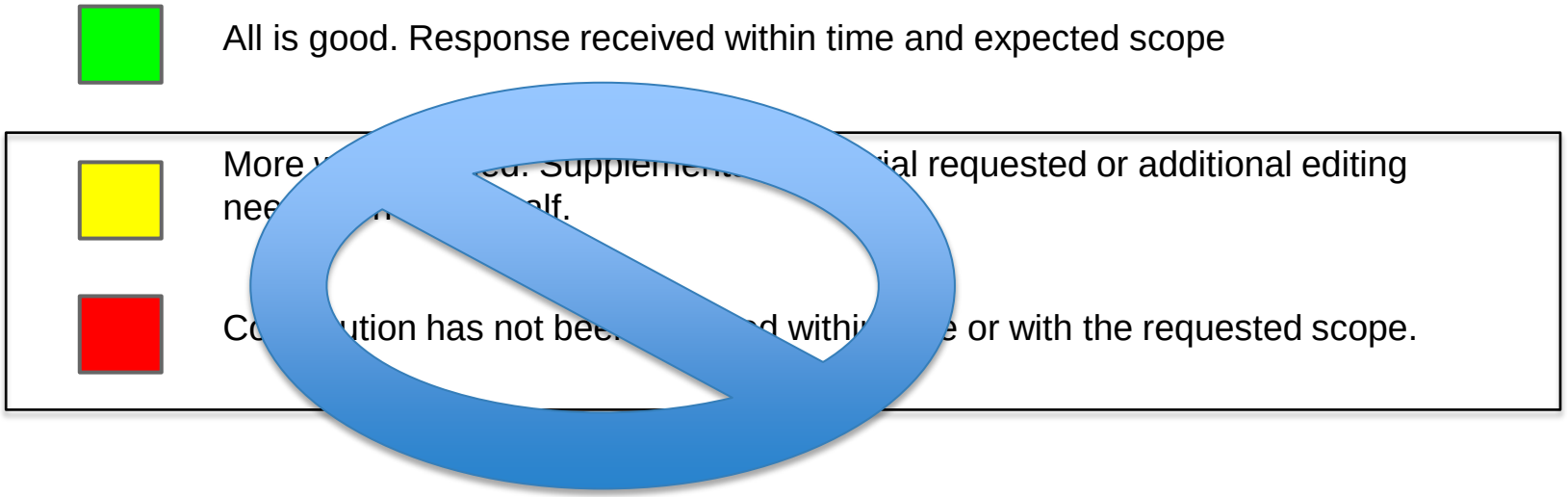
Five Questions

1. **Introduction**
   Brief overview over the technology
2. **Recent Milestones (Since DBD / CDR)**
   To avoid receiving historical data and get an idea of the activity of the group
3. **Engineering challenges**
   for putting the technology into a real-world LC detector
4. **Future Plans**
5. **Applications Outside of LC**

Overview over the responses

List of responses was rather variable. From text inline with an email to 17 page document

Some chapters are not in good shape.
We need some additional help if we are to meet our goal of ~70 pages. If your chapter is not shown in green, please talk to us.



HCal Technologies

Technology	Comments	Response acceptable
SDHCal	incomplete	
Scintillator HCAL	OK	
RPC DHCAL	OK	
GEM DHCAL	Questions not answered	
Dual Readout	OK	

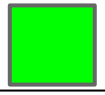
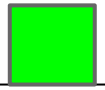
ECal Technologies

Technology	Response received	Response acceptable
Scintillator ECAL	Needs more input	
Si-W ECAL (ILD)	OK	
Si-W ECAL (SiD)	Partly missing	
TPAC MAPS	From CALICE report	(no active contact)
FCAL	Needs editing	

Tracking Technologies

Technology	Comment	Status acceptable
TPC	Needs major editing	
KPIX	OK	
SCIPP	Editing needed	

Vertex Pixel Technologies

Technology	Comment	Status acceptable
DEPFET	Waiting for update	
CMOS MAPS	Partly missing	
FPCCD	OK	
SOI	OK	
VIP	OK	
CLICPix	Bullet points only	
ChronoPixel	OK	

Current Status

Contents

Suggestion to the Community

The current layout makes it still difficult to get a quick overview.

We are working on a summary table listing collaborating institutions, mile stones, future plans. This will become the main part of an executive summary for each section (not each technology).

Should this be expanded with pointers to areas of possible contributions by newcomers (provided by the groups, not by us?)

Summary

- Compiling an overview of the field of detector R&D is a lot of work and cannot happen without the help of the community.
- If your contribution was not shown in green, we would like to talk to you.
- The overview document has been mentioned several times in the ICHEP Detector R&D talk. This is an indication that it’s seen as useful from outside the LC world.

- Thank you for your help with this effort so far. We will continue to work hard to provide a first draft around the time of LCWS.