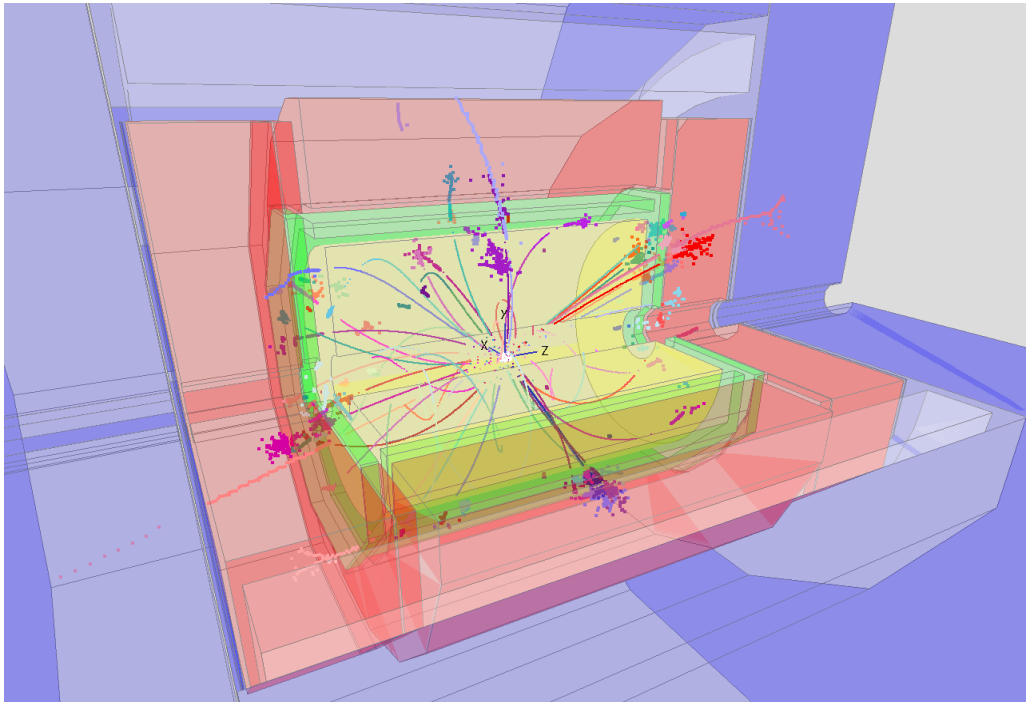
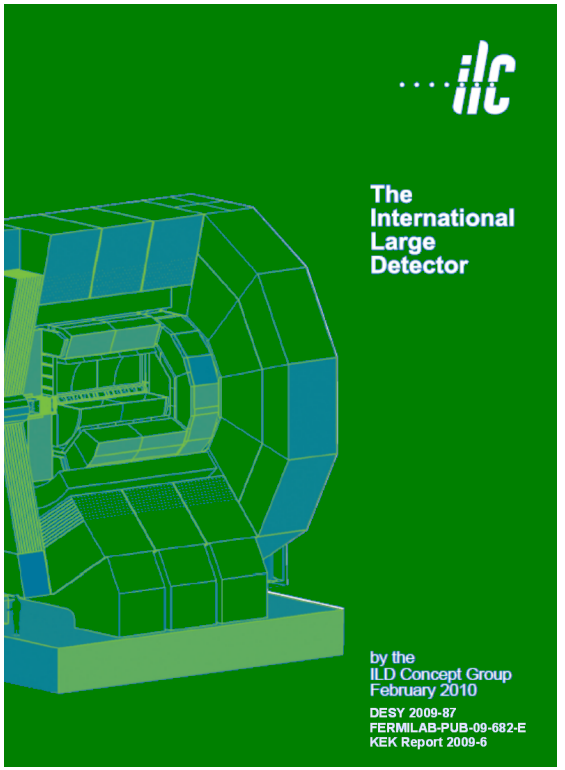
ILD en route to the DBD

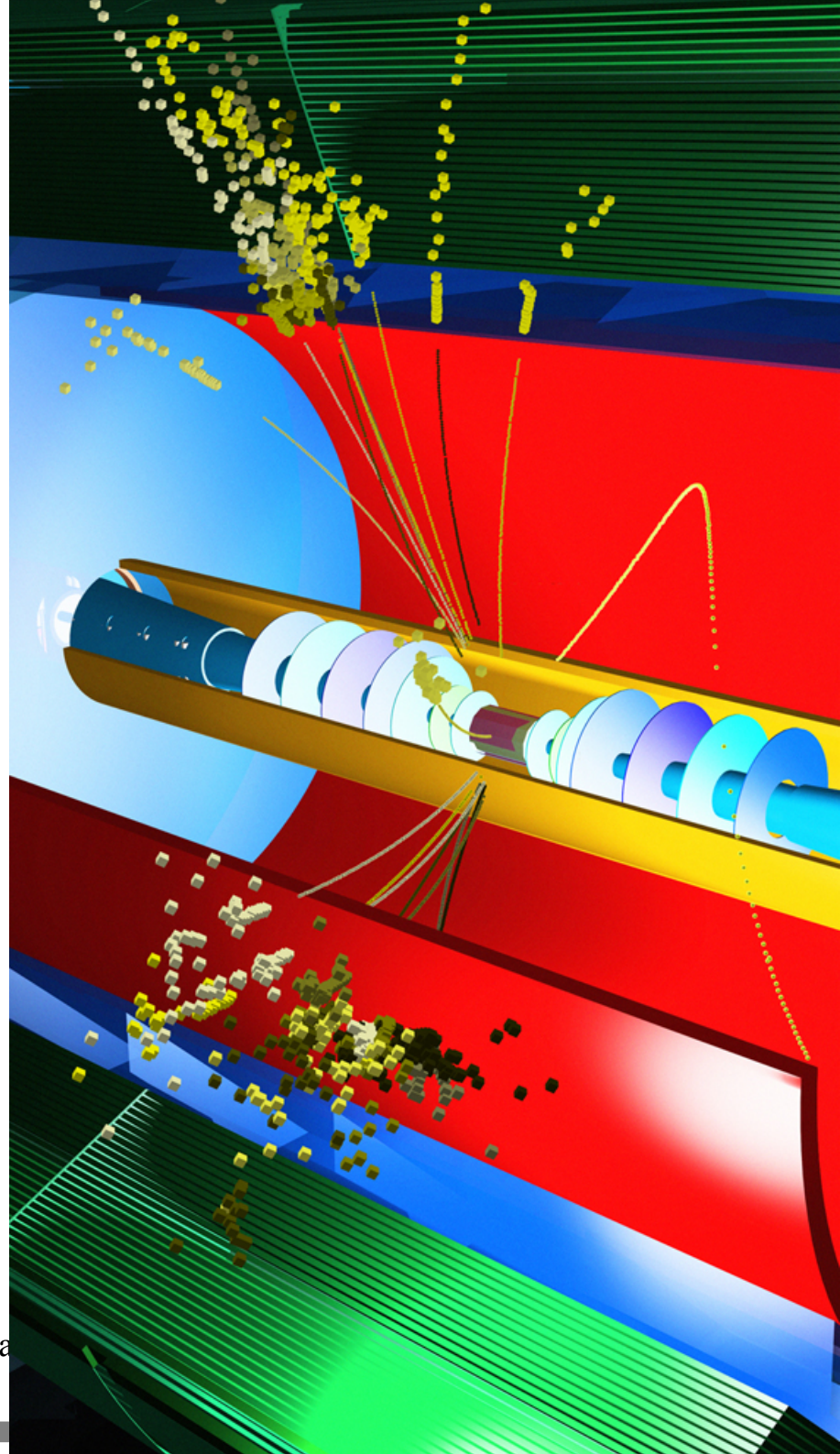


Ties Behnke, DESY
IDL JSB



ILD meeting in Paris, May 25, 2011

An old friend revisited



DBD: Content

Firm up the case for ILD:

- Extend studies to 1 TeV
- Cover missing physics scenarios, improve existing analyses

Present an integrated detector

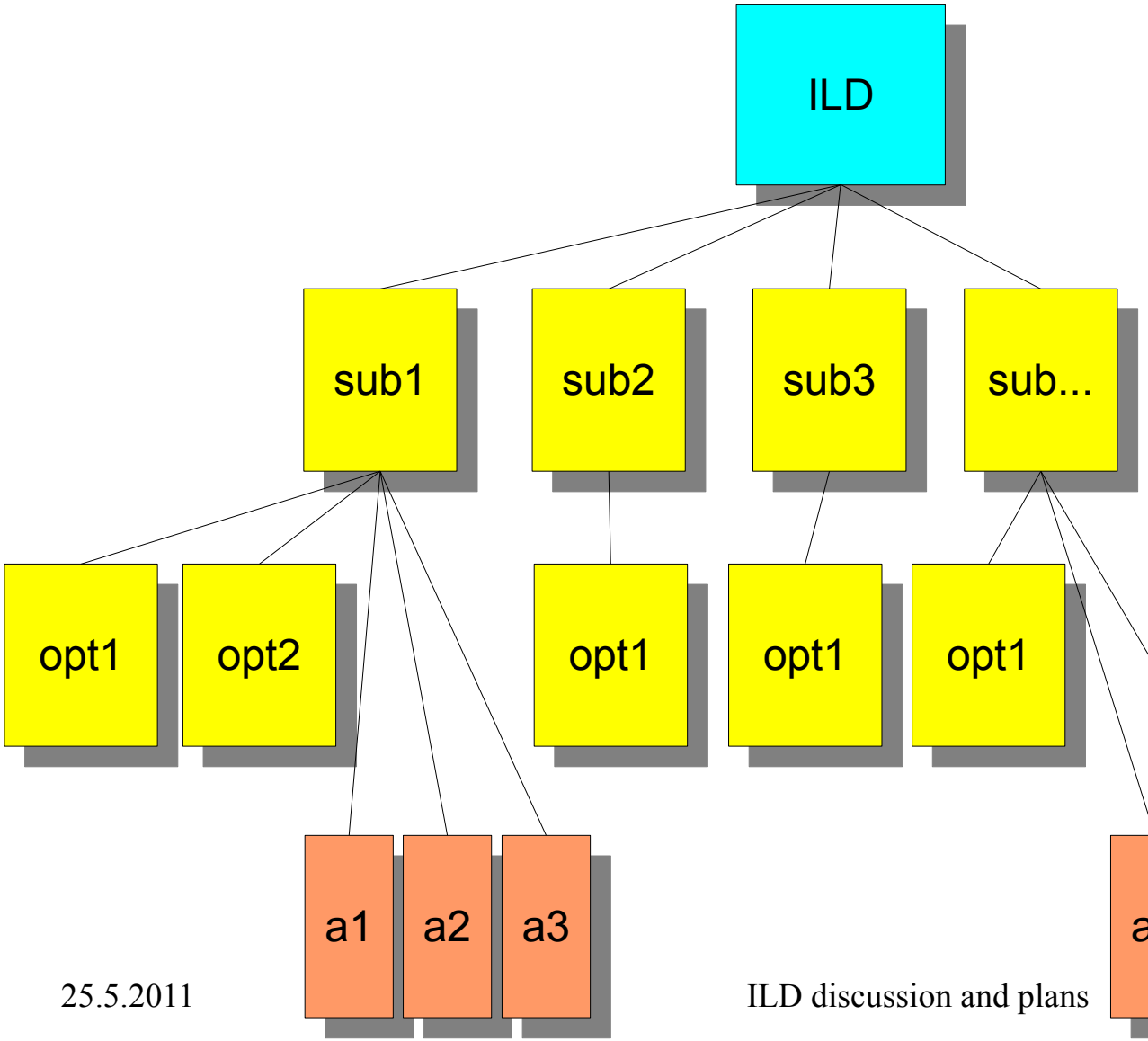
- Advance subdetectors beyond the conceptual state
- Present a fully integrated detector

1. level engineering

Exclude fundamental problems with any design

Formal editorial process has not yet started
(consider this too early)
But discussions on scope and organisation of document have

ILD baseline



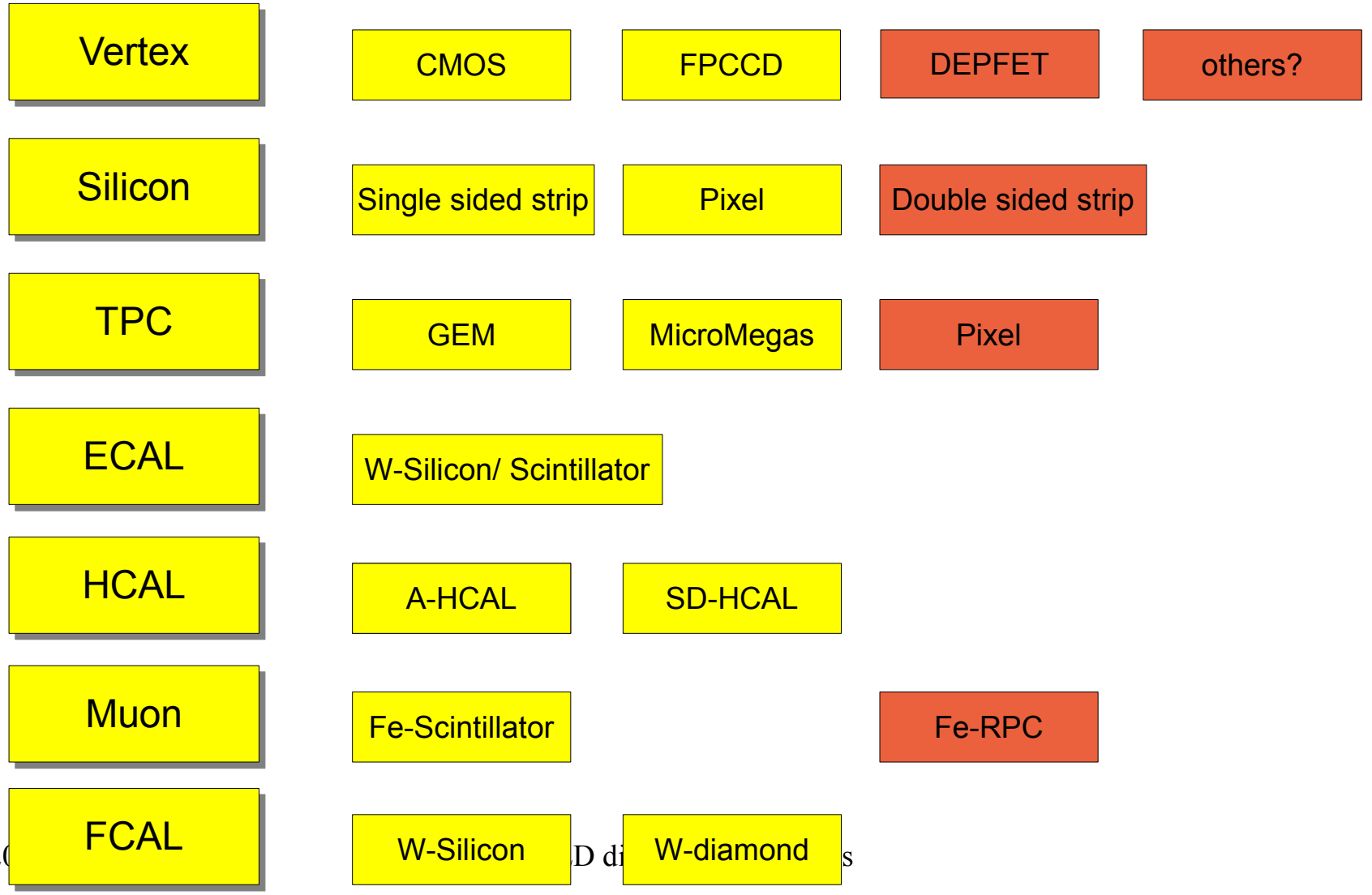
No attempt to exclude technologies or do a downselect

Subdetector Systems

Options within the baseline:
as much as possible technologically comparable

Alternatives

ILD: baseline detector
The current picture



What do we want for the DBD

Subdetector Technologies:

- Demonstrate technology by test beam in a realistic prototype
- Demonstrate basic performance by analysis of test beam data
- Demonstrate ILD performance by integration into simulation with realistic model
- Demonstrate integration into ILD by 1st level engineering solutions
  - Per subdetector
  - Globally for ILD

Note: R&D for ILD is done by the R&D collaborations in close cooperation and coordination with ILD.

What do we not want for the DBD

We do not want to exclude any technology

We do not want to select one baseline, if there is no need to do so

We do not want to define the detector too early

However we want to make sure that we have
at least one working solution for each sub-detector
realistically modeled and prototyped.

Plans subdetectors

Vertex	Full scale ladder prototype (mechanics) including cooling concept, several chip technologies (FPCCD, DEPFET, MAPS)	PLUME project
Silicon	Single sided Silicon sensor tested edgeless sensors tested Readout chip prototyped	SiLC
TPC	GEM, muMegas readout tested with multi-module in LP, pixel readout demonstrated under realistic conditions Model for advanced end plate demonstrated	LCTPC
ECAL	Extensive test beam data, demonstrate system integration, second generation prototype	CALICE
AHCAL	Extensive test beam results, second generation readout designed and tested, second generation prototype demonstrated	CALICE
DHCAL	Extensive test beam results, feasibility established, readout concept established, second generation prototype demonstrated and validated	CALICE
Muon	Extensive Simulation and optimization, Scintillator readout with SiPM established and prototyped, mechanical design established	
FCAL	Sensor tests and readout chain done, system established	FCAL

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Integrated readout

Plans subdetectors

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Power pulsing/ power management

Analysis

Goals:

Want to sharpen the case for ILD and the ILC

Want to show the performance of ILD at 1TeV

Effort is starting to re-gain momentum after a period of “quiet” following the LOI

Significant number of analyses are being pursued, in general good progress over the last few months.

Benchmark analyses are well covered
Important additional analyses have started or continue

Impressive progress shown in this meeting, lots of activity:
very encouraging to see!

Analysis	Group	BM
$e^+e^- \rightarrow ZH \rightarrow l^+ l^- X$	Youssef Khoulaki, Hassan II, Morocco	
$e^+e^- \rightarrow ZH \rightarrow l^+ l^- X$ (for Vertex detector background/ optimisation)	Georgios Gerasimos Voutsinas, Strassbourg	
BR(H→bb/ cc/ gg) in BR(H-> bb/ cc/ gg) at 250 GeV and 350 GeV	i) Nina Herder, Bonn ii) Hiroaki Ono, Nippon Dental University	
Little Higgs with T- Parity at 1 TeV	Eriko Kato, Tohoku	
Top Physics at 500 GeV	Phillipe Doublet, Roman Poescl, Francois Richard, LAL	
W e nu, ZZ, Z nu nu, nu nu h at 1 TeV	Graham Wilson, Brian van Doren, and Marco Carrasco-Lizaragga, Kansas	
ZHH	i) Tomohiko Tanabe + Taikan Suehara Tokyo ii) Junping Tian, Tsinghua	
ttH	i) Harjah Tabassam, Edinburgh ii) Ryo Yonamine, KEK	
long- lived staus	Wataru Yamaura and Katsushige Kotera, Shinshu, DESY	
Model-independent WIMP searches in e+e-->ngamma + invisible	Christoph Bartels, DESY	
Bi-linear R-parity violating SUSY	Benedikt Vormwald, DESY	
SPS1a' in general, selectrons with small mass-differences (for SB2009-BAW)	Mikael Berggren, DESY	
TGC:s and polarisation (at least for SB2009-BAW)	Ivan Marchesini, DESY	
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All done in full simulation

Software

Discussion of software baseline

This meeting: accept a multiple baseline with the relevant options and scale the physics production accordingly

Most significant update:

Hope to be able to establish new tracking software

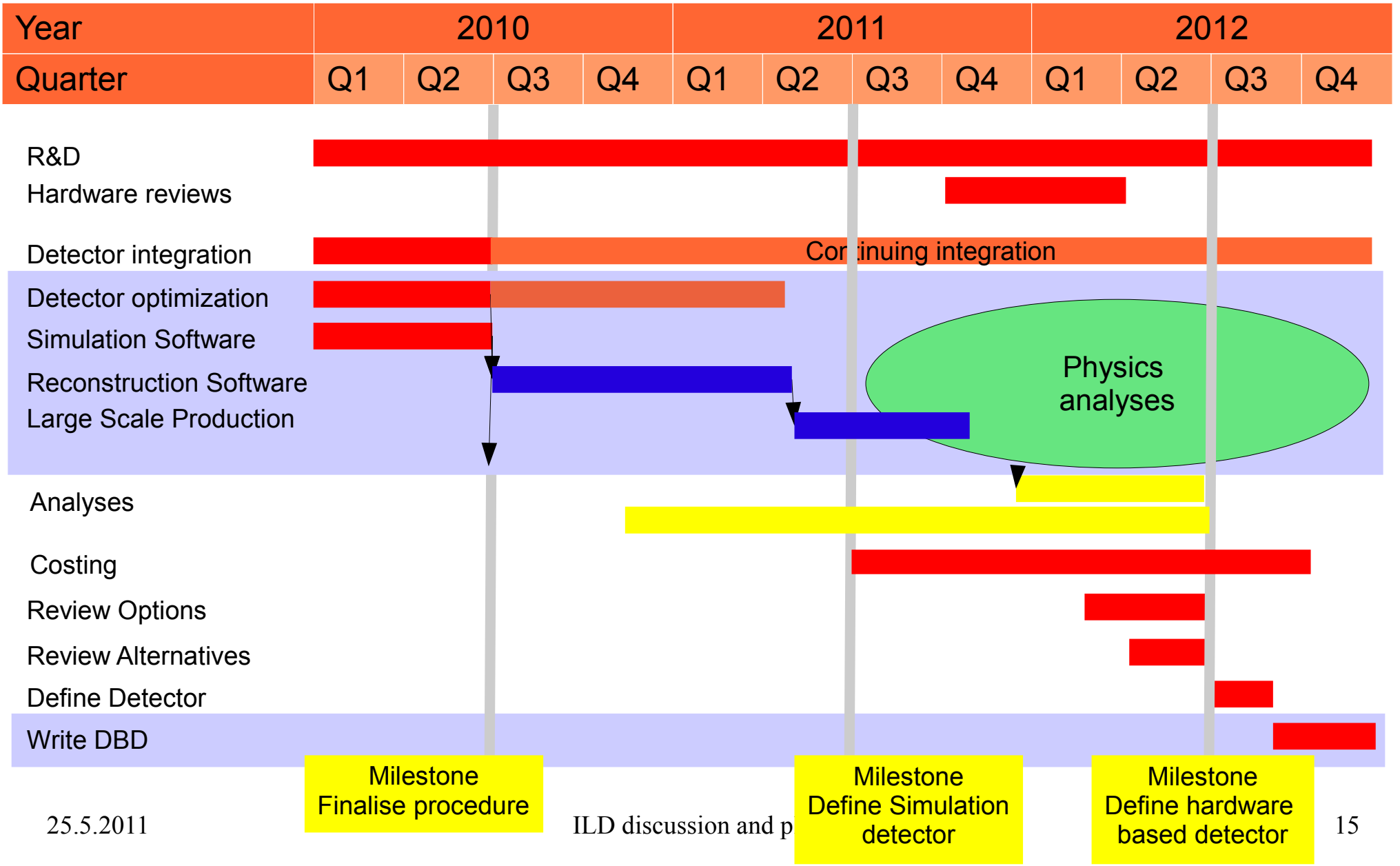
Continuing small (but significant) upgrades to the system

Significant progress in geometry/ database support/ other issues.

Problem: personpower is tight,
Problems in background studies
Support for simulation software reduced

Important:
Support for the software should be available from the subdetector groups!

ILD Milestones



DBD plans

What is the DBD:

DBD has two faces:

Officially: a fairly short (<100 pages) document on the detector concept

For us: a complete document describing the ILD detector in detail (possibly much longer than 100 pages)

My proposal: we concentrate on the second option, to make sure that we create a reasonable and complete summary of ILD work

The official version, once clearly defined, can then be extracted from the other if needed.

DBD layout

Details have not been discussed, but

- Similar to the LOI, but more advanced and more complete
- Stronger section on engineering questions and integration
- More emphasis on costing, more details provided
- Include a more complete risk discussion, including R&D risks

DBD

End 2011: start to assemble editorial team

Early 2012: discuss and define outline, assign chapter editors, identify leading authors

Summer 2012: start writing in earnest

Fall 2012: finish draft, internal circulation, internal review

End 2012: submission through RD to ILCSC

ILD organization

Up to now the ILD organisation has been rather loose

In preparing the DBD we have to slightly change our structure:

- in particular we need to ensure that we cover all open aspects: clear responsiblities

- we need to establish a clear mechnism to “decide” issues within ILD
  which are of relevance for the DBD

ILD organsation

Integration: need improved communications to subdetectors

Documentation: see talk by Karsten: EDMS will ramp up, we have to use it

(in the AIDA context we are hiring a person who will support specifically the ILD EDMS)

Help on many of the central tasks would be highly welcome: if you can help, please let us know!

Proposed decision procedure

Open issues are identified by working group/ subdetector people

Experts agree on (ideally) one proposal

Group accepts expert proposal (or sevearl, if no agreement is possible) and puts together a (short) memo proposing the decision.

Memo is submitted to ILD:

EB discusses proposal, if necessary institutes panel of experts to study this in more detail

EB proposes a decision to the JSB (or several, if no agreement)

JSB takes the final decision

Future meetings

Next small scale ILD meeting: attached to the Granada workshop, details to be worked out

Small scale ILD meeting attached to ACFA meeting next spring

Next dedicated ILD meeting: 1. half of 2012, in step with the hardware options discussion

Date: not yet fixed.

Location: My (personal) proposal: Japan, since we were not able to go there this time. Location in Japan: to be discussed.

Summary

ILD has a clear plan to move towards the DBD

Significant progress has been achieved over the last year.

Significant effort in Europe and Asia, less significant in Americas (but very valuable)

Funding problems in many areas and regions:

- Progress in most areas is funding limited
- Personpower is low and (overall) decreasing, but still existing, and groups are still committed

We expect to be able to deliver a meaningful DBD in time.

I think we had a very fruitful and interesting meeting, and made significant progress