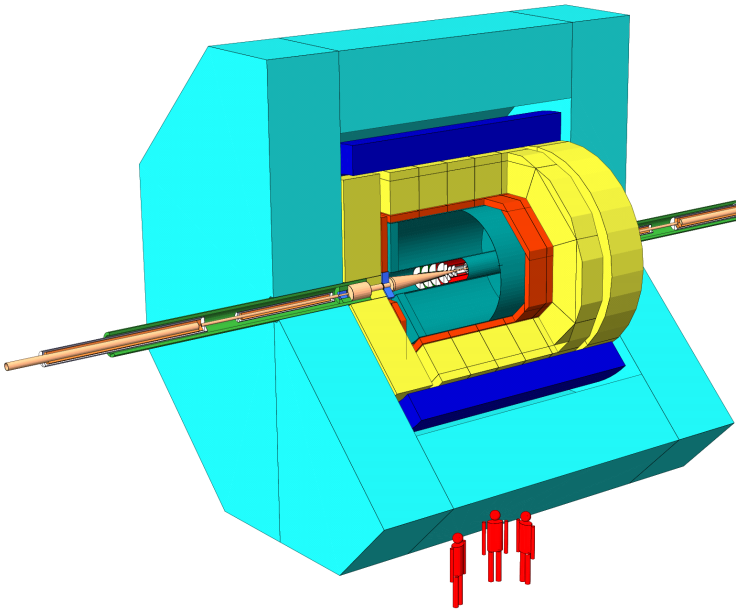
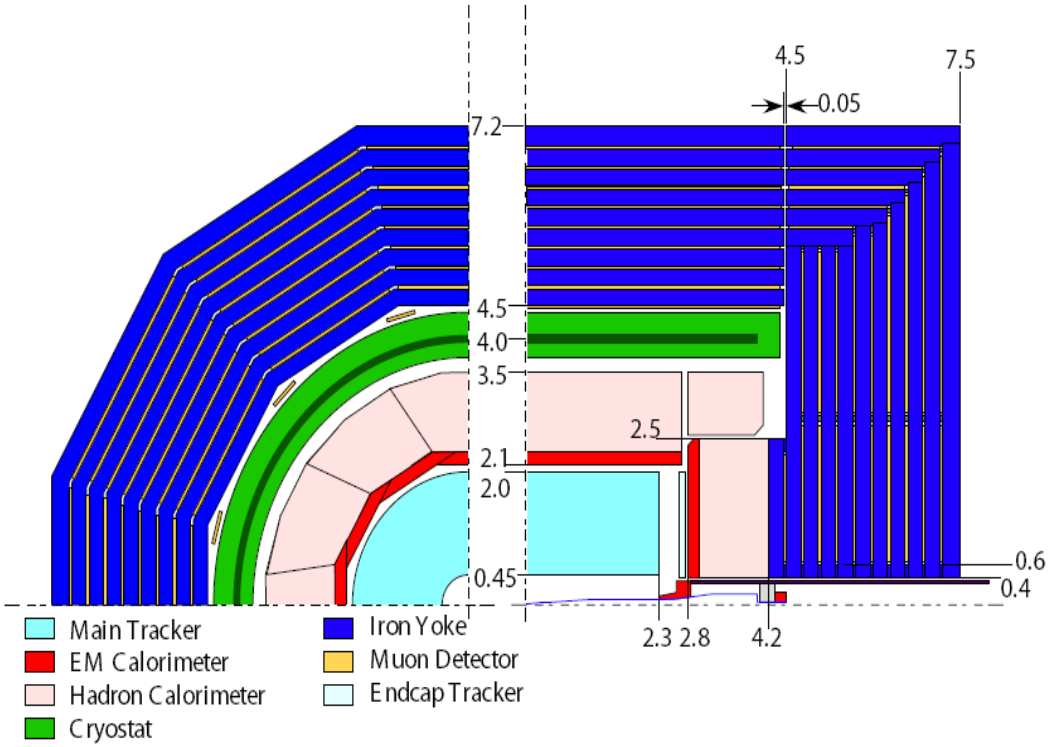
ILD: an Introduction

Ties Behnke, DESY





LDC DOD:
see http://www.ilcldc.org

Large Detector Concept

GLD DOD
see arXiv:physics/0607154v1

Global Detector Concept

ILD: International Linear Collider Detector

LCWS2007: plan to merge LDC and GLD has been formulated

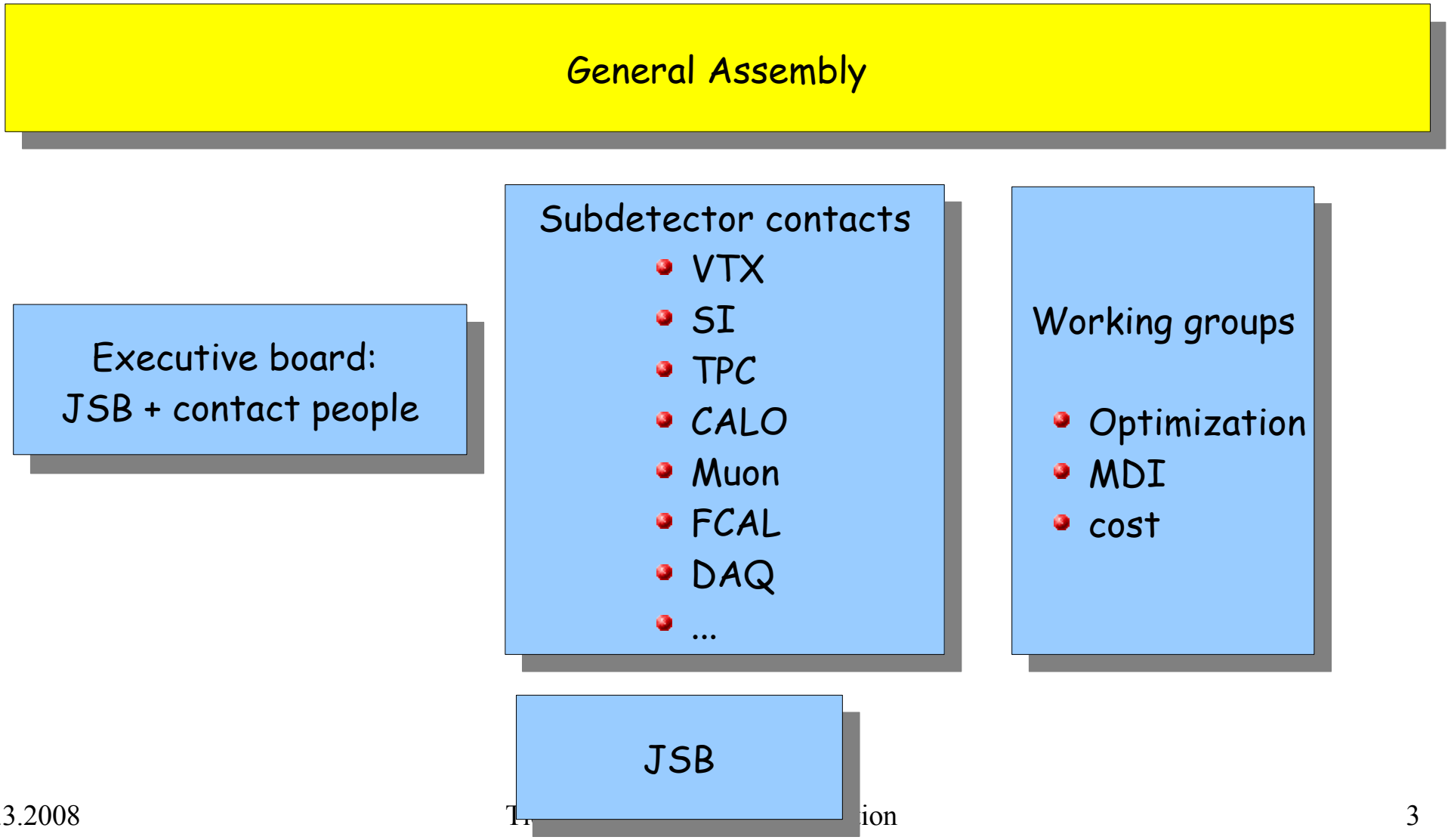
Summer 2007: discussions between LDC and GLD management on how to proceed

September 2007: Joint Steering Board for ILD established

November 2007: ILD meeting at ALCPG in Chicago

January 2008: ILD workshop in DESY Zeuthen

Structure of ILD



Joint Steering Board

Joint Steering board takes care of the overall direction and management of ILD

Membership is defined until the submission of the LOI

Current members:

Ties Behnke, Dean Karlen, Yasuhiro Sugimoti, Henri Videau,
Graham Wilson, Hitoshi Yamamoto

Approx. bi-weekly meeting, agenda and minutes are on the ILD web page.

Group structure

- ILD structure
  - **Working groups:**
    - Optimization (Thomson, Tamaki)
    - MDI (Buesser, Tauchi)
    - Cost (Videau, Maki)
  - **Subdetector contacts:**
    - VTX Winter, Sugimoto (acting contacts)
    - SI tracking no contacts defined yet
    - TPC Settles, Fujii
    - Calorimeter Brient, Laktineh, Sefkow, Kawagoe

This structure is a starting point, and will be adjusted as needs arise

We are lacking US involvement at this stage.

Executive Board

Executive board is the "decision body" of ILD

Members:

JSB members
WG leaders
Subdetector contacts

Decisions of general importance to the ILD will be taken by the executive board.

General Assembly

All institutes who are working on ILD can send a representative to the general assembly.

Until a clearly defined membership of ILD exists, everyone is invited to the general assembly.

The general assembly does not decide things, but its opinion and votes are crucial for the decision finding process in the executive board.

The role of the EB might change once things become more settled.

Decisions

To operate efficiently we need a procedure to take decisions

We propose the following decision path

1) As much as possible, the subdetector / technology groups should work out proposals for needed decisions, and propose solutions

2) If needed different subdetector groups should interact with each others to sort out interdependencies, and agree on common proposals

3) If no agreement can be found, the JSB will participate in the discussion

4) The final decision for ILD will be with the executive board, after (for important points) a process of consultation and discussion with the general assembly

Open Questions

Definition of ILD:

- VTX layout
- Inner SI tracking layout

- Calorimeter: which options to we continue to pursue

- Coil: length, thickness

- Muon System: layout

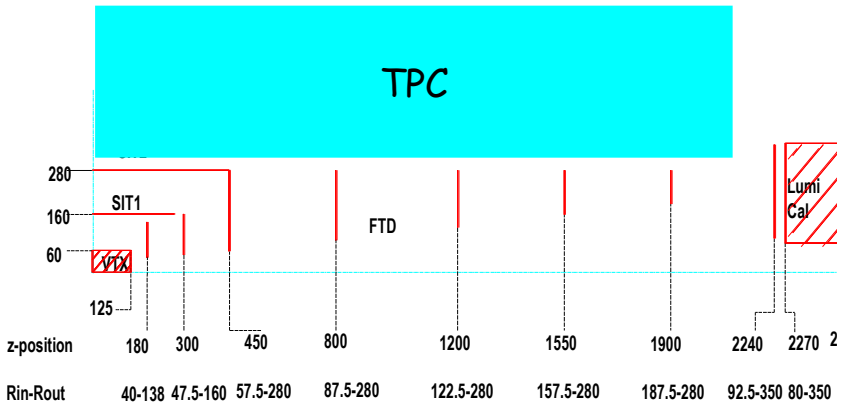
- Forward region layout

Particularly critical:
forward region layout, since
this drives many other decisions

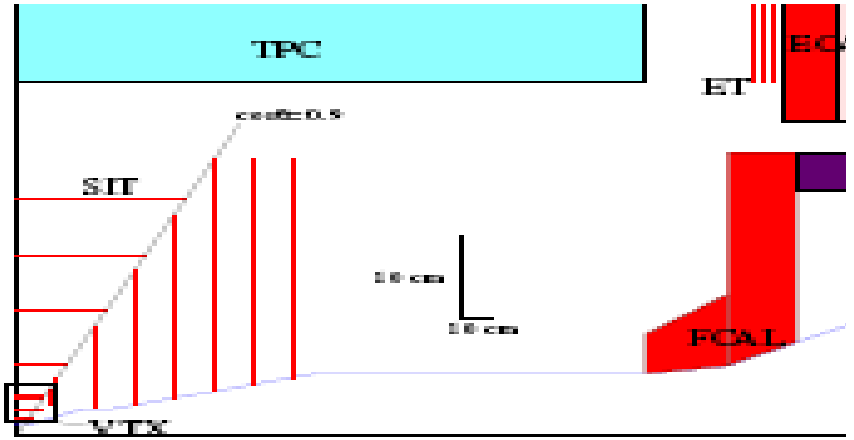
The inner detector

Basic layout:

high precision VTX detector
auxiliary SI tracking to bridge the gap between VTX and TPC
high precision many point TPC



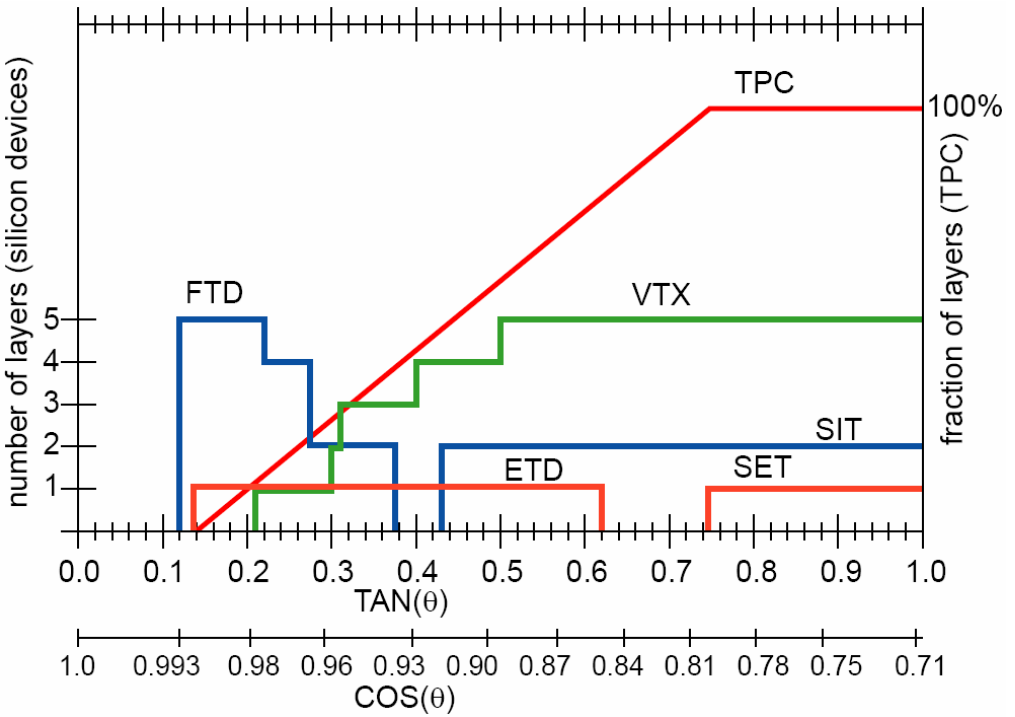
2 SIT layers



4 SIT layers

Tracking Configuration

Coverage of subdetectors:



LDC coverage

- Role of additional detectors?
- External Si tracker?
- SI detector behind the TPC endplate?

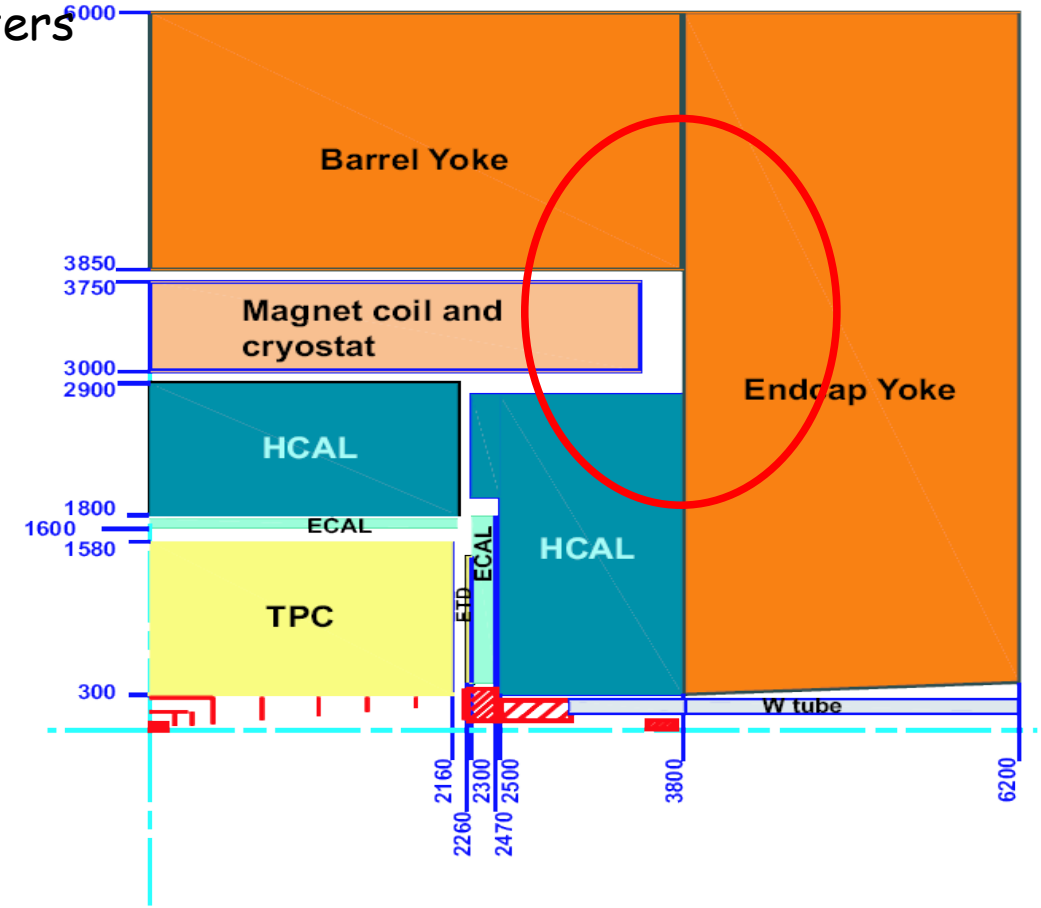
Calorimetery: Layout

COIL layout, coverage of calorimeters

corner region?

LDC: short coil
but highly inhomogeneous
field region

GLD: longer coil, better
coverage of the HCAL corner



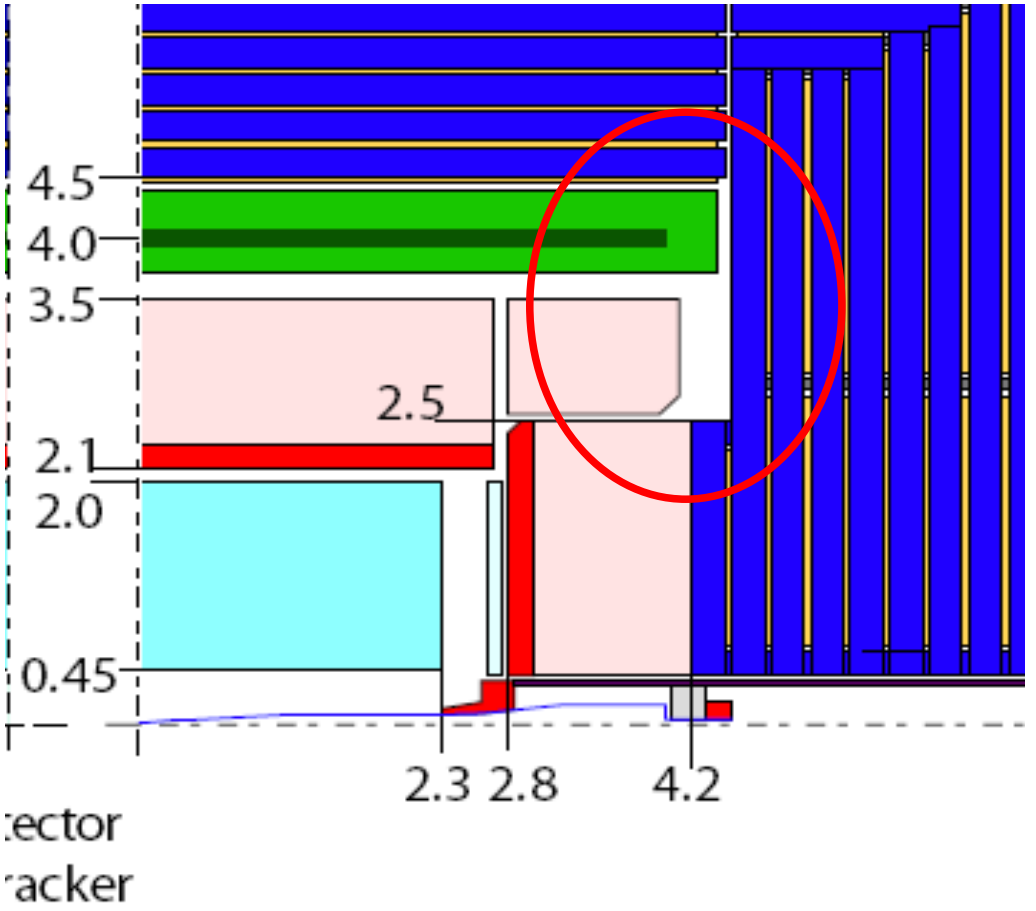
Calorimetery: Layout

Layout of the magnet relative to the HCAL:

corner region?

LDC: short coil
but highly inhomogeneous field region

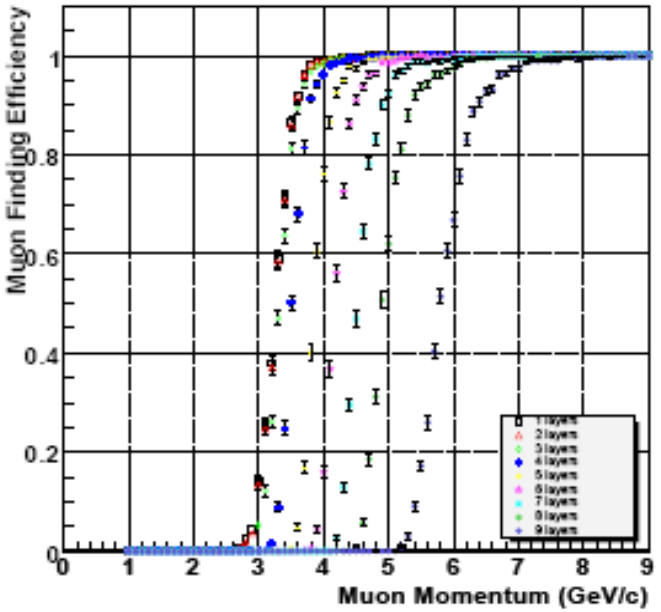
GLD: longer coil, better coverage of the HCAL corner



Outer Detectors

Muon system: instrumented iron return yoke

Options are Scintillator strip or large area RPC



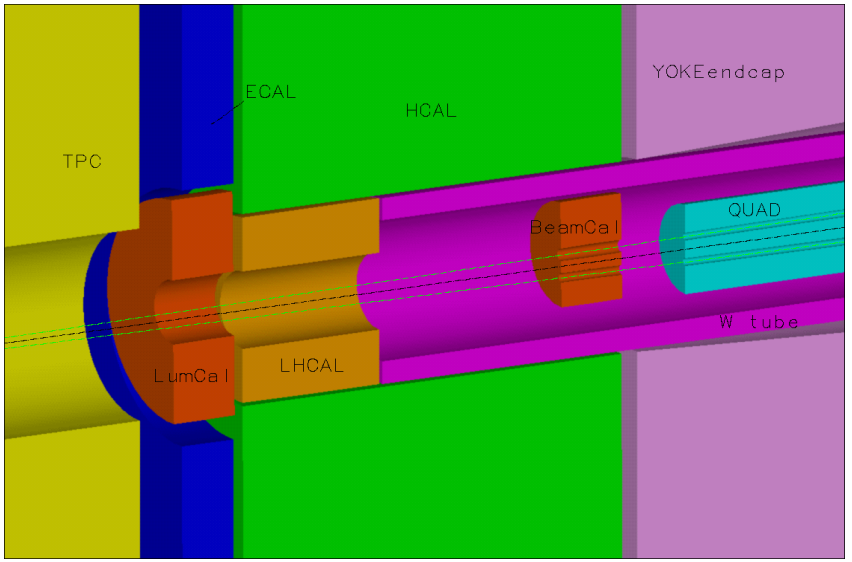
Number and spacing of layers need to be optimized

Role of Muon detector in a PFLOW detector needs to be understood

Very forward detectors

Layout of GLD and LDC are different in detail,

but similar in principle



MDI working group is
already studying this in detail

expect progress very soon

This has far-reaching consequences for the overall detector design: high priority!

How to continue

Optimization working group:

prepares for large scale production of simulated events
based on intermediate versions of the detector

actual detector optimization will be done more on dedicated samples

time scale: see Marks presentation

Summer: need to agree on the ILD outline

Fall: review analyses, start forming the LOI editorial board

LCWS 2008: decide, what goes into the LOI

LOI

Delivery date has been delayed by approx. 6 month:

LOI is due April 2009

New scope of the LOI:

Define the concept group, assemble interested partners who want to contribute to the definition and development of the concept

LOI's will be reviewed by IDAG, who will make recommendations (but no hard downselect to two concepts is foreseen, given the changed situation).

Scope of LOI

- Make a convincing case for the ILD detector:

  Demonstrate the needed performance based on the agreed reference reactions.

- Demonstrate that the proposed detector has been optimized

  Show on key examples why the detector looks as it does: needs detailed and full simulation studies

- Show that the proposed ILD detector is feasible

  no complete engineering, but show a path towards this
  illustrate that an integration into a complete detector is possible
  Keep costs under control!

This is a very ambitious program, which will need the support from everyone!

Meeting schedules

- This meeting (Sendai): 1.5 days
  - Dedicated MDI meeting during Sendai meeting
  - Meetings of R&D collaborations before/ after Sendai: LCTPC, SiLC, FCAL
- Warsaw (June): ECFA meeting, 1 day?
- Regular phone meetings
  - Optimzation group (approx. bi-weekly)
  - MDI group

We should start planning for a dedicated ILD meeting this summer to define and fix the ILD layout

- Delivery of LOI: April 2009
  - LOI – 5 month: have editorial board in place and functional
  - LOI – 2 month: have first draft version ready for circulation
  - LOI – 1 month: have reviewed version ready, start finalization

Summary and Conclusion

ILD: an exciting exercise in global detector development

Integration of LDC and GLD into one concept is proceeding

Basic structure has been defined, starts to become active

LOI is a challenging goal, which unites the community

ILD is well positioned to meet the challenge

ILD biggest strength is its strong ties to the R&D collaborations and the commitment to these to contribute to the detector.