ILD MDI/Integration WG Plan

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Charge of the ILD MDI/Integration WG

Charge issued by the ILD Joint Steering Board:

- The MDI/working group is charged to produce a self-consistent design of the structure of the ILD detector from the viewpoint of machine-detector interface (MDI) and detector integration for the LOI that is to be submitted by October 1, 2008.

- Specifically, it covers the design of the beam pipes, magnets,iron return yoke, beam instrumentations, and their supports that require works by the detector group.

- Also, it should address general detector structure and assembly issues, where the aspects that affect the machine design will have initial priority. Beam background studies should be performed when necessary.

- The group should work closely with the machine people and the groups working on subdetectors that affect the structure of the ILD detector.

- (...)

MDI Issues

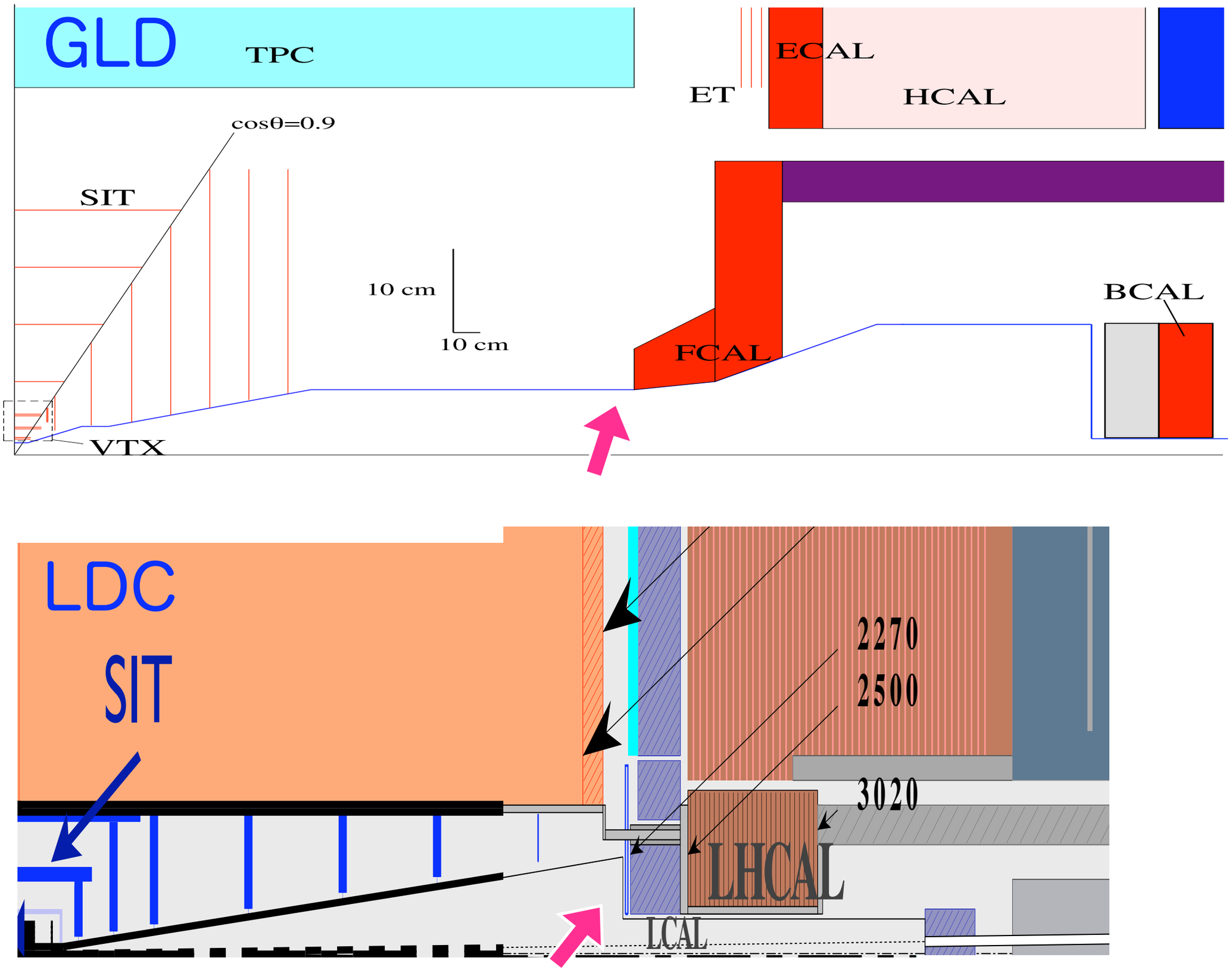
IR Design Optimization with engineering studies

- beam pipes, pumps, wakefields
- innermost raidus of VTX and B-field
- outer radius of support tube and inner radius of TPC
- calorimeters, pair monitor and beam instrument

Background Estimation

- pairs v.s. B-field, (anti-)DID
- muons v.s. muon spoilers, collimation depth
- synchrotron radiations v.s. collimation depth, masks
- neutrons from pairs, extraction line and dump v.s. mask

IR of GLD and LDC



Relevant parameters for IR optimization

	GLD and GLDc		LDC
Machine parameter sets	1TeV, HiLum-1		Nominal?
L* (m)	4.5	same at GLDc	4.05
B (Tesla)	3	3.5 at GLDc	4
R_{Be} (cm)	1.5	z < 5cm	1.4
R_{VTX} (cm)	2.0	FPCCD	1.6
VTX angular acceptance	|cos|<0.95	3 super-layers	|cos|<0.952
R_{FCAL} (cm)	8	z=2.3m	8
R_{BCAL} (cm)	1 and 1.8	z=4.3m	1.3
QD0,FCAL,BCAL support	canti-lever 70cm Φ	W-tube	canti-lever 58cm Φ

Differences will be studied and tried to be understood.

Detector Integration Issues

Detector assembly on surface

Iron structure ;

- deformation due to B-field
- Field uniformity and Leakage magnetic field

How to support inner detectors and QD0 (39cmΦ)

Opening, closing procedures, etc.

Underground hall requirements ;

- temperature, humidity stability, the gradient
- utility (power, cooling water, gases, cables etc.)
- safety for fire, earth quake

Push-pull issues such as ;

- alignment of VTX and QD0
- slow settlement (100μm/month is tolerable ?)
- Radiation, shielding around beam line
- Cryogenics system for solenoid, QD0

Major Discussion Issues

1. Sub working groups to be organized
   - IR design optimization
   - Detector integration

2. Engineering studies
   - Who are engineers at institutes ?
     specialty and availability of FTE
   - What engineering level is necessary ?
     for LoI by 1 October 2008
     for EDR by July 2010

3. How to share tasks ?

Roadmap to ILD - LoI

http://ilcagenda.linearcollider.org/categoryDisplay.py?categId=129

1. Working group activities an meetings

   Phone meetings with Webex etc, and
   the WG mailing lists.

2. Series of ILD Workshop

   1st (2.5 days), in Europe, early January 2008
   2nd (1.5 days), TILC08, Sendai, 3-7 March 2008
   more

3. Decision of ILD Detector Parameters

   in May 2008

4. ILD-LoI Submission , 1 October 2008