ILD dimensions
Updates

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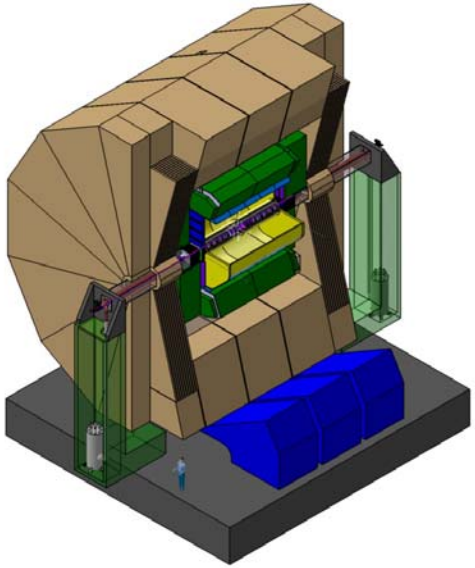
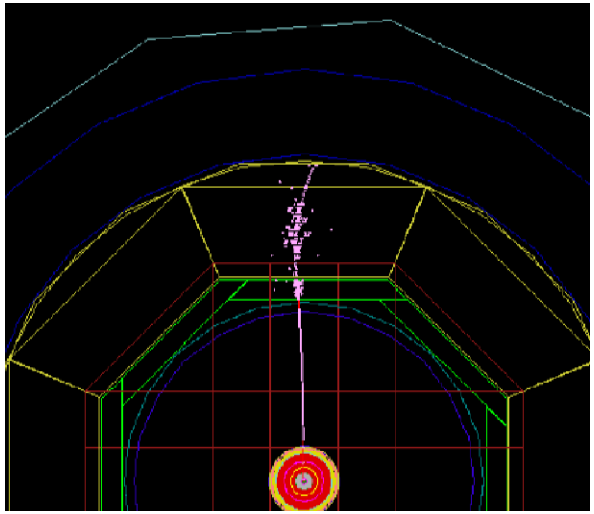
ILD overall dimensions

http://www.ilcild.org/groups/mdi/ILD0dimensions-weigth130209.xls

- Those dimensions were defined as **the overall envelops of the subdetectors**. All the detailed mechanical design studies were supposed to stick to those limits

- These are the dimensions currently used in the simulation and corresponding to the overall detector's envelope





But, in July at ILD meeting (DESY) :

1) *Differences appeared with some values used by subdetectors.*
2) *Missing room for some detectors...*
3) *Some gaps are partly filled by subdetectors materials...*

(1) Differences (Calos/TPC/Forward region)

magnet		nominal 3,5T; max 4T; 2,4?GJ	No changes
Hcal			**OK for DHCAl ; differences for AHCAL**
	Barrel Rin	2058	K.Gadow : 2000
	Barrel Rout	flat/corner=3345/3410.5	K.Gadow : 3378
	Barrel 1/2 length	2350 (sensitive =2330)	K.Gadow : 2350 + 100 electronic boards
	thick.		(K.Gadow @ DESY jul 2010)
	thick.	1287	
Hcal ring	Rin	2190	
Ecal			No changes
TPC			No changes
Fcal (lumical)			
	Rin(support/sensitive)	76/80	differences with EUDET memo Dec. 2009
	Rout active	196	and LLR meeting (summer 2009)
	Rout support	240	Has to be checked quickly
	Zin	2450	
	Zout	2635	
Bcal			from L.Zawiejski@ Paris (janv2010)
	Rin(in/outBeams)	13/20	
	Rout	220(support)	Rout =200(support); 150 (sensors)
	Zin	3595	Zin= 3450 with 10 cm graphite in front
	Zout	3795	Thickness 170 mm ?
LHCal			No changes
Ering			No changes

(1) Differences (ETD/SET/Inners)

ETD			From A.S.N@DESY (jul 2010) 3 XUV planes
	Rin	square 400	620 ?
	Rout	octogonal 1843	**circular** = 1890 (sensors)/1930 (support)
	Z 1st disk	2420 (support)	
	Z 2nd disk		
	Z 3d disk	2450(support)	Thickness 15 per plane (i.e = 45 mm total)
SET			From A.S.N@DESy (jul 2010) mechanical support
	Rin	1818	1921
	Rout	1843	1938 Warning : see Ecal Rin
	Zout	2350	2428 Warning : partly in the gap
VTX			Inner meeting@LLR (june 2010) J.Baudot
	R & 1/2 length	16/62.5	case of 5 layers : single and double sided ladders
		17.9/62.5	VTX-SL1= 15/62,5 VTX-DL= 16-18/62,5
		37/125	VTX-SL2= 26/125 VTX-DL= 37-39/125
		38.9/125	VTX-SL3= 37/125 VTX-DL= 58-60/125
		58/125	VTX-SL4=48/125
		60/125	VTX-SL5= 60/125
VTX cryo			
VTX support shell			
SIT			From A.S.N@DESy (jul 2010) mechanical support
	R & 1/2 length	175/	Rmin-Rmax&1/2length :172,3-179,6/ 354,2
		290/	Rmin-Rmax&1/2length : 319,5-323,5/657,8
Fdisk			EMPTY !!!!
muons chamber			

(2) Missing

ETD			From A.S.N@DESY (jul 2010) 3 XUV planes
	Rin	square 400	620 ?
	Rout	octogonal 1843	**circular** = 1890 (sensors)/1930 (support)
	Z 1st disk	2420 (support)	
	Z 2nd disk		
	Z 3d disk	2450(support)	Thickness 15 per plane (i.e = 45 mm total)
SET			From A.S.N@DESy (jul 2010) mechanical support
	Rin	1818	1921
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	Zout	2350	2428 Warning : partly in the gap
VTX			Inner meeting@LLR (june 2010) J Baudot
	R & 1/2 length	16/62.5	case of 5 layers : single and double sided ladders
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VTX cryo			
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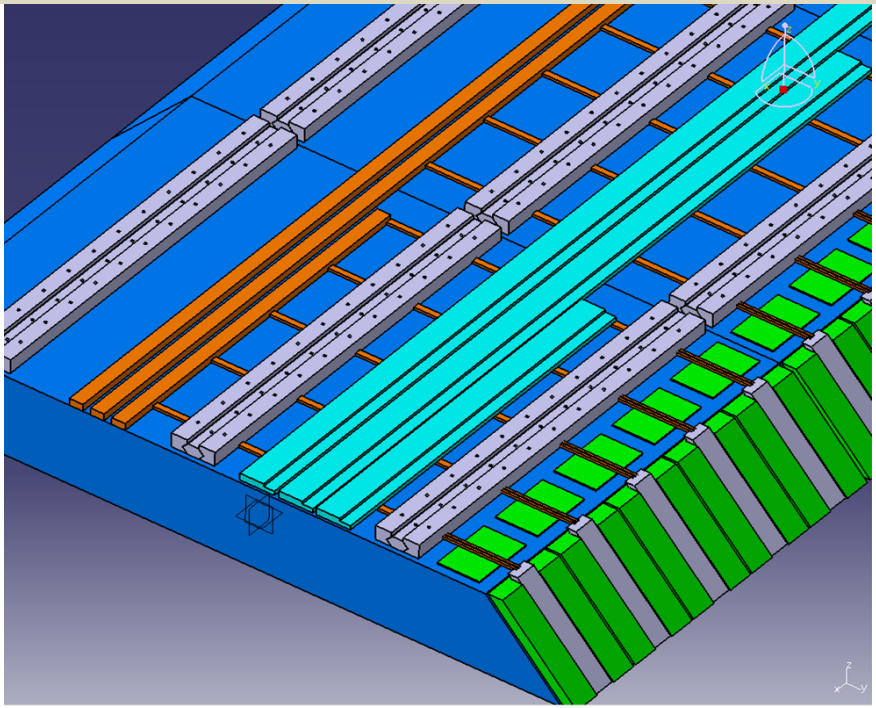
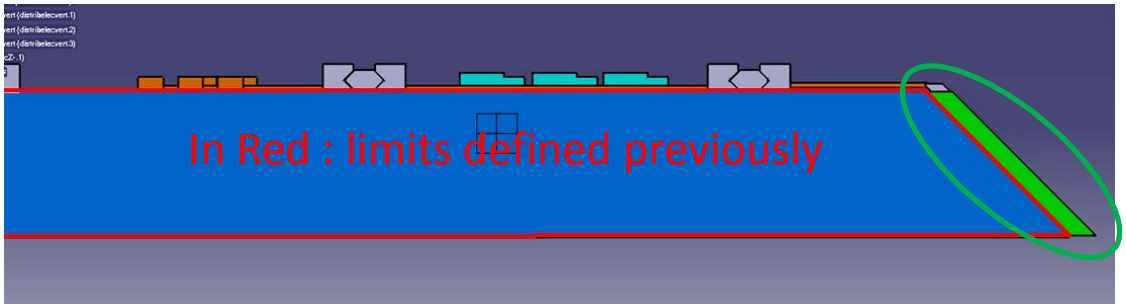
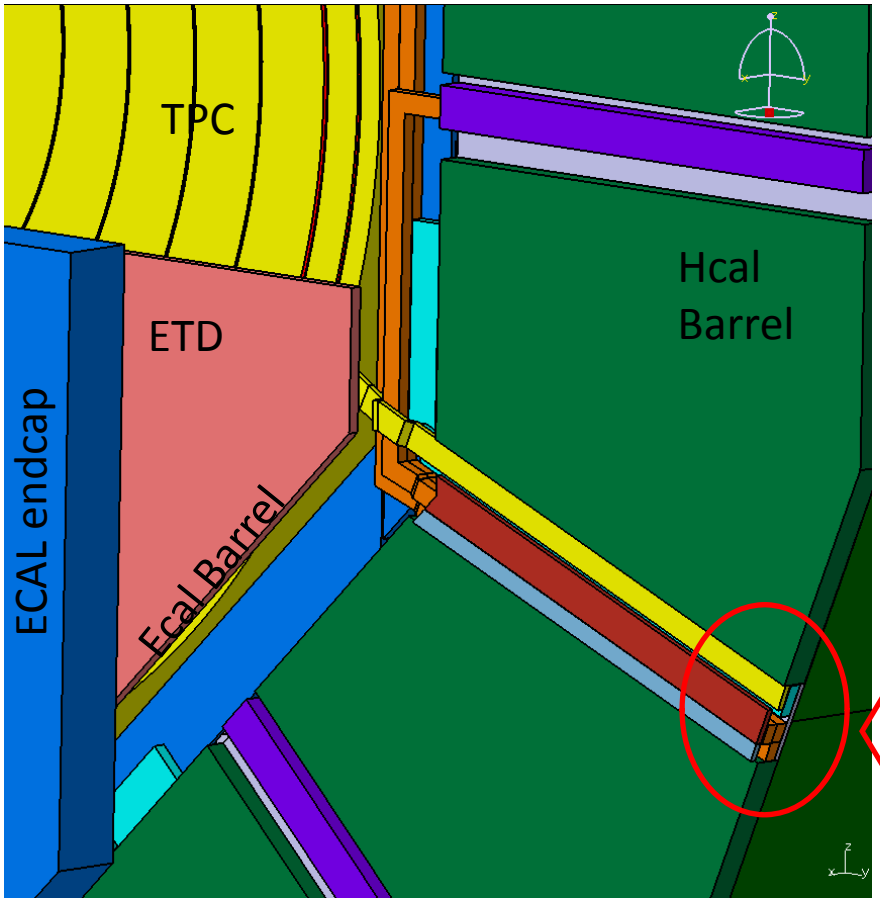


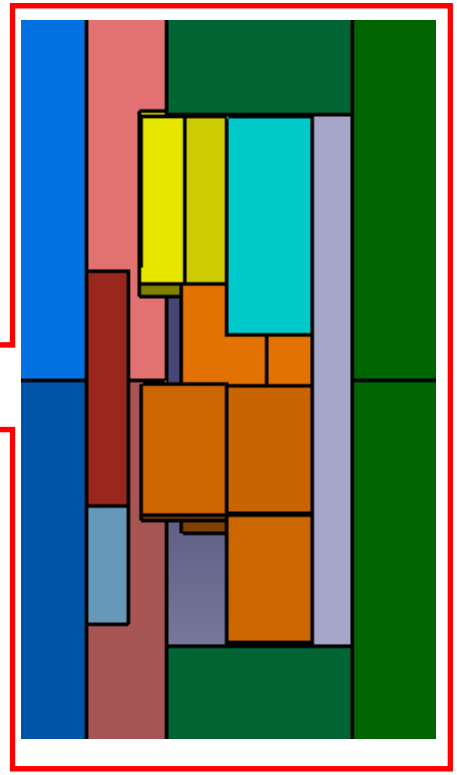


Front end of slabs inside the gap Ecal-Hcal Barrel

Foreseen thickness of 10 cm : but AHCAL elec spilling out = 10 cm by now



Keep only 16 ways out of 170 cm² each for services...



Defining the minimal gaps between sub-detectors

- Space for services,cables, supports, screens, patch panels needed for assembly and maintenance

- Space for assembling tools

- Watching plays imposed by
  - construction
  - alignment,
  - mechanical deformations,

- *Electronics protruding out of the subdetectors placeholders?*

Overall dimensions

- These are the dimensions currently used in the simulation and corresponding to the overall detector's envelope
- All the detailed mechanical design studies were done to stick to those limits

Placeholders definition

Placeholder 1 , corresponds to the structural occupancy, including :

- Overall mechanical dimensions
- Front end electronic card going overboard the mechanical structure
- Tolerances :
  - ✓ for alignement,
  - ✓ mechanical deformation
  - ✓ Contructions tolerances
- Fastening system
- Room for integration's tooling

Subdetector dimensions

+

Placeholder2, concerns the services

- PLace and way-out for cables,
- Place and way-out for piping,
- Both should include
  - ✓ cables or pipes dimensions,
  - ✓ supports
  - ✓ Screening
  - ✓ Patch panels

Gaps

Conclusion(s):

- Is it possible to have a “ universal “ placeholder definition or has it to be checked subsystem by subsystem ?
- Who to supervise :

  the updates in dimensions,

  Definition of “ what is what “

- How to manage and share that : EDMS ??