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CLIC01_ILD

This is an overview over what is in the simulation. Some parameters can be found in this table: Clic01Numbers

Note: Typos do happen, if something looks wrong it could very well be wrong.

Sub Detectors

Vertex Detector

The geometry of the vertex detector and the forward tracking disks is being studied by WG3.

The barrels are composed of 50 micron thick sensitive silicon, with the following inner radii and |z| extents: The silicon is placed inside the given radius. Outside the silicon a 134 micron thick support and electronics layer is placed. The ILD Vertex Detector consists of three double layers, each layer is made out of several ladders.

Layer	Inner Radius	z Extent	Number of Ladders	Ladder width
1	31.000 mm	125.0 mm	18	11.5 mm
2	32.866 mm	125.0 mm	18	11.5 mm
3	44.000 mm	125.0 mm	13	22.5 mm
4	45.866 mm	125.0 mm	13	22.5 mm
5	58.000 mm	125.0 mm	17	22.5 mm
6	59.866 mm	125.0 mm	17	22.5 mm

Forward Tracking Disks

Disk	Inner Radius	Outer Radius	z Position	Silicon Thickness
1	45.00 mm	164 mm	220.000 mm	0.025 mm
2	55.2322 mm	164 mm	371.309 mm	0.025 mm
3	74.9716 mm	308 mm	644.906 mm	0.025 mm
4	103.99 mm	309 mm	1046.12 mm	0.275 mm
5	132.946 mm	309 mm	1447.33 mm	0.275 mm
6	161.892 mm	309 mm	1848.54 mm	0.275 mm
7	190.857 mm	309 mm	2250.00 mm	0.275 mm

Silicon Inner Tracker

Layer	Radius	z Extent	Silicon Thickness
1	165 mm	371.309 mm	0.275 mm
2	309 mm	644.906 mm	0.275 mm

TPC

Inner Radius	Outer Radius	z Extent
329 mm	1808 mm	2247.5 mm

Silicon External Tracker

Layer	Radius	z Extent	Silicon Thickness
1	1833 mm	2350 mm	0.275 mm
2	1835 mm	2350 mm	0.275 mm

Endcap Tracking Disks

Layer	Inner Radius	Outer Radius	z Extent	Silicon Thickness
1	419.264 mm	1822.7 mm	2426 mm	0.275 mm
2	419.264 mm	1822.7 mm	2428 mm	0.275 mm
3	419.264 mm	1822.7 mm	2430 mm	0.275 mm

ECal

Barrel

Inner Radius	Outer Radius	z Extent
1847.4 mm	mm	2350 mm

Layers

Number of Layers	Layer Thickness	Absorber Thickness	cellSize
19	5.25 mm	2.1 mm	5.083 mm
1	6.30 mm	2.1 mm	5.083 mm
9	7.35 mm	4.2 mm	5.083 mm

Endcap

Inner Radius	Outer Radius	Inner Z	Outer Z
400 mm	2088.8 mm	2450 mm	

Layers

Number of Layers	Layer Thickness	Absorber Thickness	cellSize
19	5.25 mm	2.1 mm	5.083 mm
1	6.30 mm	2.1 mm	5.083 mm
9	7.35 mm	4.2 mm	5.083 mm

Plug

The ECal Plug is placed at the inner radius of the Ecal endcap and bridges the gap between the LumiCal and the rest of the Ecal endcap.

Inner Radius	Outer Radius	Inner Z	Outer Z

250 mm	400 mm	2450 mm	

Layers

Number of Layers	Layer Thickness	Absorber Thickness	cellSize
19	5.25 mm	2.1 mm	5.083 mm
1	6.30 mm	2.1 mm	5.083 mm
9	7.35 mm	4.2 mm	5.083 mm

HCal

Barrel

Inner Radius	Outer Radius	z Extent
2058 mm	mm	2350 mm

Layers

Number of Layers	Layer Thickness	Absorber Thickness	cellSize
77	16.5 mm	10.0 mm	30.0 mm

Endcap

Note that in the current simulation the HCal endcap is also made with tungsten absorbers. This will probably be changed to iron/steel absorbers.

Inner Radius	Outer Radius	Inner Z	Outer Z
350 mm	3089.0 mm	2650 mm	

Layers

Number of Layers	Layer Thickness	Absorber Thickness	cellSize
77	16.5 mm	10.0 mm	30.0 mm

Ring

The Hcal ring is positioned like a ring around the Ecal endcap and complements the coverage of the Hcal.

Inner Radius	Outer Radius	Inner Z	Outer Z
2138.8 mm	3089.0 mm	2450 mm	

Layers

Number of Layers	Layer Thickness	Absorber Thickness	cellSize
10	16.5 mm	10.0 mm	30.0 mm

Coil

A 4 tesla solenoid field is used in the simulation. For the very forward region studies a field map (without (anti)DID) can be used as well. The parameters given below include the size of the cryostat.

Inner Radius	Outer Radius	z Extent
3438.5 mm	4188.5 mm	3872 mm

Muon Yoke

Barrel

Inner Radius	Outer Radius	z Extent
4438.5 mm	mm	4047 mm

Layers

Number of Layers	Layer Thickness	Absorber Thickness	cellSize
10	140 mm	100 mm	30.0 mm
1	1150 mm	1110 mm	30.0 mm

Endcap

Inner Radius	Outer Radius	Inner Z	Outer Z
300 mm	6988.5 mm	4072 mm	

Layers

Number of Layers	Layer Thickness	Absorber Thickness	cellSize
10	140 mm	100 mm	30.0 mm
1	1150 mm	1110 mm	30.0 mm

Inner Radius	Outer Radius	Inner Z	Outer Z
100 mm	195.2 mm	2464.2 mm	

Layers

Number of Layers	Layer Thickness	Absorber Thickness
40	4.27 mm	3.5 mm

Inner Radius	Outer Radius	Inner Z	Outer Z
32 mm	150 mm	2.9 m	3.06032 m

Layers

Number of Layers	Layer Thickness	Absorber Thickness
40	4.0008 mm	3.5 mm

Needs to be updated for correct BeamCal position:

crossType	zStart	zEnd	rInnerStart	rInnerEnd	rOuterStart	rOuterEnd	material	Comments
0	0	230	29.5	29.5	30	30	beryllium	
0	230	2400	29.5	183	30	184	beryllium	Connical Section towards LumiCal
0	2400	2449	183	183	184	184	beryllium	

								This is a cylinder connecting the cone up to LumiCal with the flat plane directly infront of LumiCal
2	2449	2450	0	100	184	184	beryllium	Flat plane directly in front of LumiCal
2	2450	3169	99	99	100	100	iron	Beampipe inside the LumiCal up until BeamCal
2	3169	3170	2.7	34	79.5	79.5	iron	The "endcap" of the beampipe in front of BeamCal with two holes for incomming and outgoing beampipe, aligned on the outgoing beam axis. rInner is the size of the holes inside the endcap, 2.7 for incoming, 34 for outgoing
2	3170	3496	34	34	35	35	iron	
1	3170	4000	2.7	2.7	3.7	3.7	iron	Wall thickness and actual diameter might be slightly larger corresponding to the apperture of QD0
2	3500	4000	34	39	35	40	iron	Goes on with 10 mrad opening towards post collision (as long as possible.)

Crosstype: Crosstype refers to the axis the part of the beampipe is aligned to

- 0 Beampipe aligned on detector symmetry axis
- 1 Beampipe aligned on incomming beam axis
- 2 Beampipe aligned on outgoing beam axis

Computing Details

Most of this is obsolete with the newer Mokka versions

- 4 Tesla Solenoid Field, corresponding to the ILD (down from 5 Tesla for CILD00)
- The HCal Radiator(absorber) Material is now TungstenDens24, (same as for the CLID_01_SiD), with 1cm Thickness and 77 layers
- NB: The increase in layers needs a small change in the Mokka sourcecode: in source/Geometry/Tesla/include/SD.hh "#define MAX_LAYERS 64" has to be set to something larger

than 76
- To use other materials than iron or WMod as the absorber, changes have to be made to source/Geometry/LDC/src/SHcalSc02.cc after "// Set up the Radiator Material to be used"

```
else if(Hcal_radiator_material == "TungstenDens24")
  RadiatorMaterial =  CGAGeometryManager::GetMaterial("TungstenDens24");
```

The Material also has to be present in the Database.

-- AndreSailer - 24 June, 2010

This topic: CLIC > Clic01ILD
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