hd3_1-oct05

This is a version of the **Global Large Detector** (**GLD**) modelled as of Oct. 1, 2005 and updated on June 1, 2006 to conform to the current baseline detector design, see http://ilcphys.kek.jp/gld/design/. The compact description of this detector in xml format can be found at http://www.lcsim.org/detectors/hd3_1-oct05.zip. What follows is a plain text description of the file compact.xml found in this zip file.

The central TPC tracking region is defined to be a cylinder with inner radius of 45 cm and outer radius of 200 cm and z extent +/- 230 cm.

Beampipe:

Vertex Detector:
The vertex detector is composed of a central barrel system with six layers:

The first two barrel layers are 13 cm long and the rest are 20. cm long, and are composed of 80 micron thick silicon CCD detectors, which are fully sensitive.

The inner radii of the layers are:
2.0, 2.2, 3.2, 3.4, 4.8, 5.0 cm

There are two end disk layers located at 12 and 12.2 cm from the interaction point (Z=0).

The disks extend from inner radii of 4.0 cm to outer radii of 5.8 cm, and are taken to be 80 microns thick as well.

Tracker:
The intermediate tracker is composed of four barrels composed of 560 micron thick of silicon CCD detectors.
The inner radii and z extent of the barrel layers are:

z	inner radius
9.	18.5 cm
16.	33.0 cm
23.	47.5 cm
30.	62.0 cm

The small angle endcap intermediate ttracker is composed of 7 single-sided disks with sensitive slices of 560 micron silicon.
The position and size of the disks are:

z	inner radius	outer radius
15.5 cm	2.4 cm	7.6 cm
29.0	3.2	14.0
43.5	3.7	21.0
58.0	4.7	28.0
72.5	5.7	38.0
87.0	6.6	38.0
101.5	7.6	38.0

The central TPC tracker consists of a 4.6 m long, 2.0 m radius sensitive volume filled with P10 gas.
The inner and outer carbon-fiber field cages are at radii of 45 and 198 cm.

The forward endcap tracker consists of a three disks with sensitive slices of 560 micron thick silicon at
z = 270, 274 and 278 cm with inner and outer radii of 45 and 205 cm.

Calorimeters:
Electromagnetic Calorimeter (ECal):
The inner radius for the barrel is 211 cm.

The EM calorimeter is a Pb-scintillator sampling calorimeter composed of 38 layers of

material	thickness
Lead	0.4 cm
Polystyrene	0.1 cm

The z extent of the barrel cylinder is +/- 300 cm.
The endcap starts at an inner radius of 30 cm and extends out to 207.5 cm.

Hadron Calorimeter (HCal):
The hadron calorimeter is also a Pb-scintillator sampling calorimeter composed of 130 layers of

material	thickness
Lead	0.4 cm
Polystyrene	0.1 cm

The barrel inner radius is 195 cm with a z extent of +/- 275 cm.
The endcap extends from an inner radius of 26 cm to an outer radius of 260 cm.

Solenoid:
The solenoid is modelled as a cylinder with an inner radius of 310 cm. This is larger than the outer radius of the hadron calorimeter since we will not be building a cylindrical detector, but a polygonal one (current thinking is octagonal). The barrel composition is as follows:

material	thickness	z
Steel	6.0cm	420 cm
Air	8.5cm	420 cm
Aluminum	39.3cm	400 cm
Steel	6.0cm	400 cm
Air	20.0cm	420 cm
Steel	3.0cm	420 cm

This is capped with disk endplates of 6cm steel from r=332 cm to 337.5 cm.

Muon System:
The barrel muon system is implemented as a sampling calorimeter composed of 4 layers of:
material thickness
Iron 60. cm
Polystyrene 10. cm

The barrel inner radius is 400 cm with z extent of +/- 720 cm.
The endcap sits inside the barrel at an inner z of 460 cm and radius from 45 cm to 395 cm.

The field is solenoidal, constant 3 Tesla along z up to half the coil thickness and -0.6 outside.

Masks and far forward detectors remain to be implemented.