ld3.1-oct05

This is a version of the Large Detector modelled as of Oct. 1, 2005. The compact description of this detector in xml format can be found at http://www.lcsim.org/detectors/ld3.1-oct05.zip . What follows is a plain text description of the file compact.xml found in this zip file.

The tracking region is defined to be a cylinder with radius 175. cm and z extent +/- 282. cm.

Beampipe:

Vertex Detector:

The vertex detector is composed of a central barrel system with five layers.

The first barrel layer is 10 cm long and the rest are 25. cm long, and are composed of 0.028 cm Beryllium and a .0005 cm Silicon slice which is sensitive.
The inner radii of the layers are:

1.55, 2.7, 3.8, 4.9, 6.0

Tracker:

The intermediate tracker is composed of two barrels composed of 0.05616 cm of silicon.
The inner radii and z extent of the two barrel layers are:

z	inner radius
16.	29.
30.	63.

The small angle endcap tracker is composed of 5 double sided disks with sensitive slices of 0.03 cm silicon.
The position and size of the disks are:

z	inner radius	outer radius
30.0	4.0	25.0 cm
65.0	7.9	30.0 cm
120.	11.8	30.0 cm
180.	15.6	30.0 cm
240.	18.9	30.0 cm

The central TPC tracker consists of a 250 cm long, 161.8 cm radius sensitive volume filled with P10 gas.
The inner and outer carbon-fiber field cages are at radii of 32. and 161.8 cm.

The forward TPC endcap tracker consists of a double-sided disk with sensitive slices of 0.03 cm silicon at
z = 279 cm with inner and outer radii of 26 and 185 cm.

Calorimeters:
Electromagnetic Calorimeter:

The inner radius for the barrel is 175 cm.

The EM calorimeter is a sampling calorimeter composed of 20 layers of

material	thickness
Tungsten	.250cm
G10	.068cm
Silicon	.032cm
Air	.025cm

follow by 10 additional layers with 0.5 cm Tungsten.

The z extent of the barrel cylinder is +/- 275 cm.
The endcap starts at an inner radius of 26 cm and extends out to 185 cm.

Hadron calorimeter:

The hadron calorimeter is a W scintillator sampling calorimeter composed of 50 layers of

material	thickness

Tungsten	0.75 cm
Polystyrene	0.5 cm
G10	0.25 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 250cm. 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	360 cm
Air	8.5cm	360 cm
Aluminum	39.3cm 340 cm	
Steel	6.0cm	340 cm
Air	20.0cm	360 cm
Steel	3.0cm	360 cm

This is capped with disk endplates of 6cm steel from r=294.5 cm to 339.8 cm.

Muon System:

The muon system is implemented as a sampling calorimeter composed of 48 layers of:

material	thickness
Iron	5.0 cm
G10	0.3 cm
PyrexGlass	0.11 cm
RPCGas	0.12 cm
PyrexGlass	0.11 cm
Air	0.86 cm

The barrel inner radius is 380 cm with z extent of +/- 375 cm.
The endcap sits outside the barrel at an inner z of 380 cm and radius from 26 cm to 690 cm.

The field is solenoidal, constant 4 Tesla along z up to half the coil thickness and -0.6 outside.

Masks and far forward detectors remain to be implemented.