

# The ILD simulation model in lcgeo (DD4hep)

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## 1 Envelopes

The new ILD simulation model has mandatory envelope volumes defined for the individual subdetectors. This section describes the current parameters for these envelope volumes and their shapes.

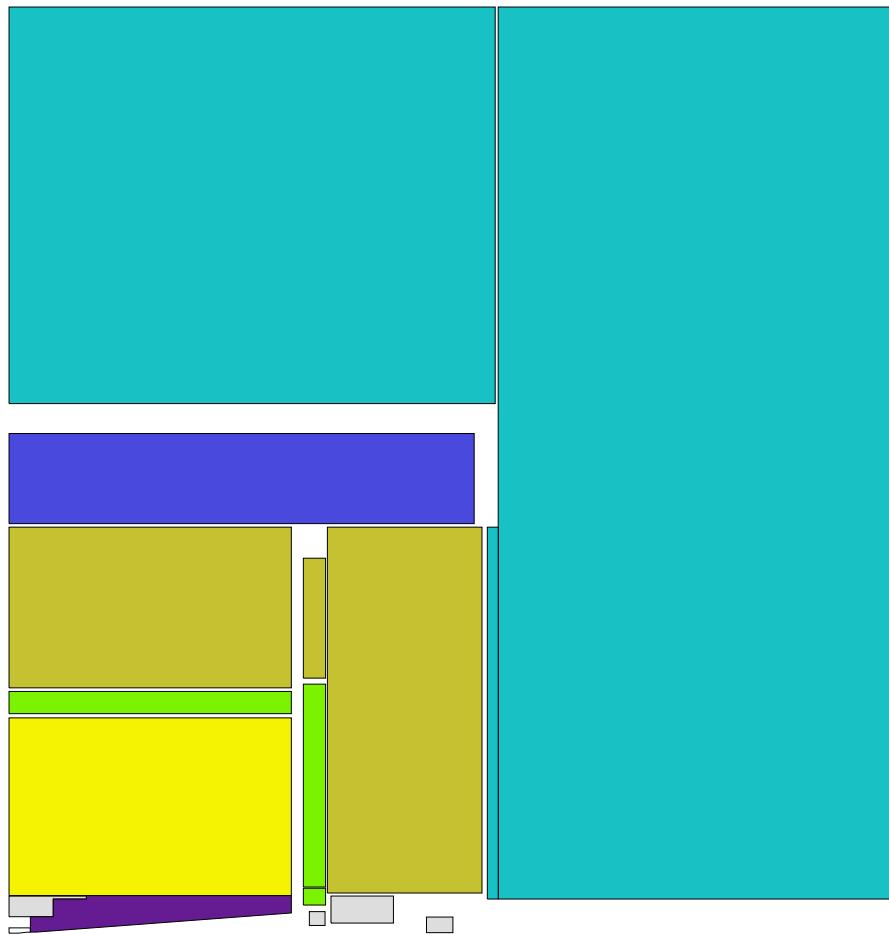


Figure 1: Envelope volumes for ILD detectors in simulation model

Envelope parameters for ILD_o1_v05					
detector	inner radius	outer radius	half length min z, max z	additional parameters	
VXD	16.0	60.0	177.6	VXD_cone_min_z	80.0
				VXD_cone_max_z	150.0
				VXD_inner_radius_1	24.1
FTD	25.1	328.9	2350.0	FTD_outer_radius_1	152.8
				FTD_outer_radius_2	299.7
				FTD_min_z_0	177.7
				FTD_min_z_1	368.2
				FTD_min_z_2	644.2
				FTD_cone_min_z	230.0
				FTD_cone_radius	184.1
SIT	152.9	324.6	644.1	SIT_outer_radius_1	299.8
				SIT_half_length_1	368.1
TPC	329.0	1808.0	2350.0		
SET	1808.1	1827.9	2350.0		
Ecal	1843.0	2028.0	2350.0	Ecal_Hcal_symmetry	8.0
				Ecal_symmetry	8.0
EcalEndcap	400.0	2088.8	2450.0, 2635.0		
EcalEndcapRing	250.0	390.0	2450.0, 2635.0		
Hcal	2058.0	3395.5	2350.0	Hcal_inner_symmetry	8.0
HcalEndcap	350.0	3395.5	2650.0, 3937.0	EcalEndcap_symmetry	8.0
HcalEndcapRing	2138.8	3137.0	2450.0, 2635.0	HcalEndcapRing_symmetry	8.0
Coil	3425.0	4175.0	3872.0		
Yoke	4424.0	7725.0	4047.0	Yoke_symmetry	12.0
YokeEndcap	300.0	7725.0	4072.0, 7373.0	YokeEndcap_symmetry	12.0
YokeEndcapPlug	300.0	3395.5	3981.5, 4072.0	YokeEndcapPlug_symmetry	12.0
BeamCal	20.0	150.0	3475.0, 3695.0	BeamCal_thickness	220.0
				BeamCal_tubeIncoming_radius	15.0
LHCAL	100.0	325.0	2680.0, 3200.0	LHCAL_thickness	520.0
LumiCal	80.0	195.2	2500.0, 2630.7	LumiCal_thickness	130.7

Table 1: Parameters of the envelope volumes in the simulation model. *Note:* inner and outer radii describe the inscribing cylinder for regular polyhedral barrel detectors. See Fig.2 for the symmetries of the barrel envelopes.

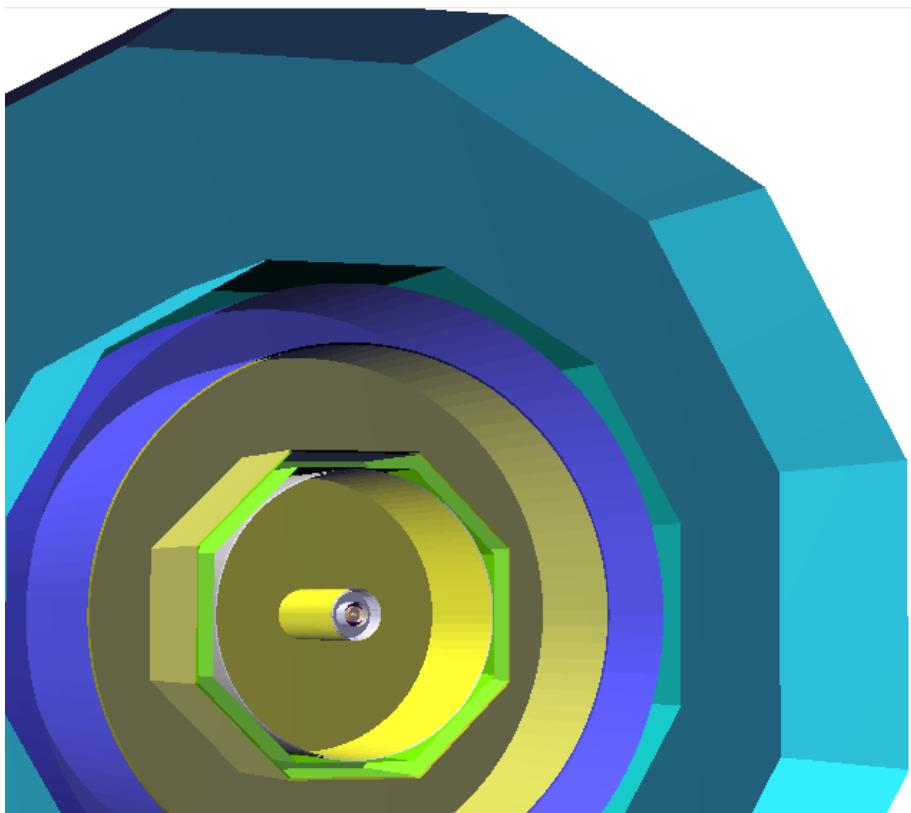


Figure 2: Barrel envelope volumes for ILD detectors in simulation model as seen from the front

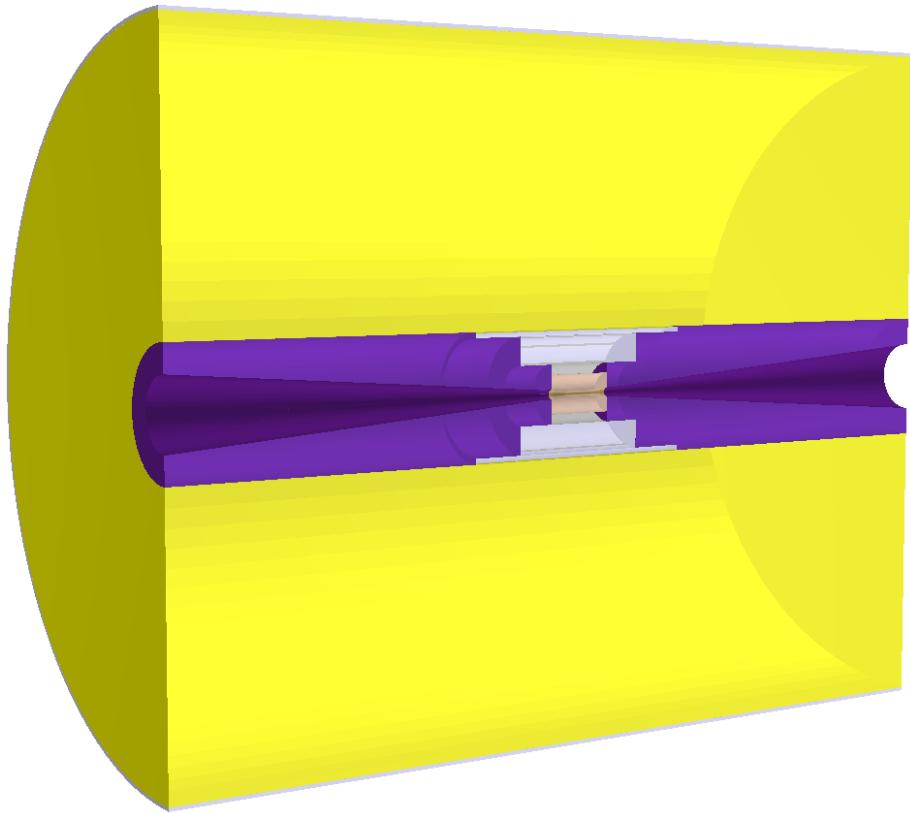


Figure 3: Envelopes for the tracking detectors in ILD: VXD, SIT, FTD, TPC, SET.

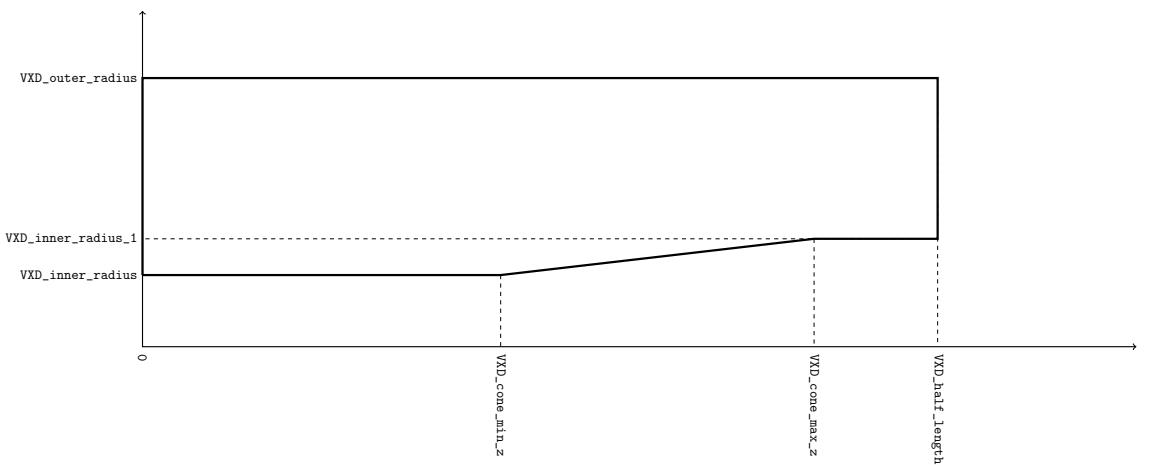


Figure 4: side view of the VXD envelope

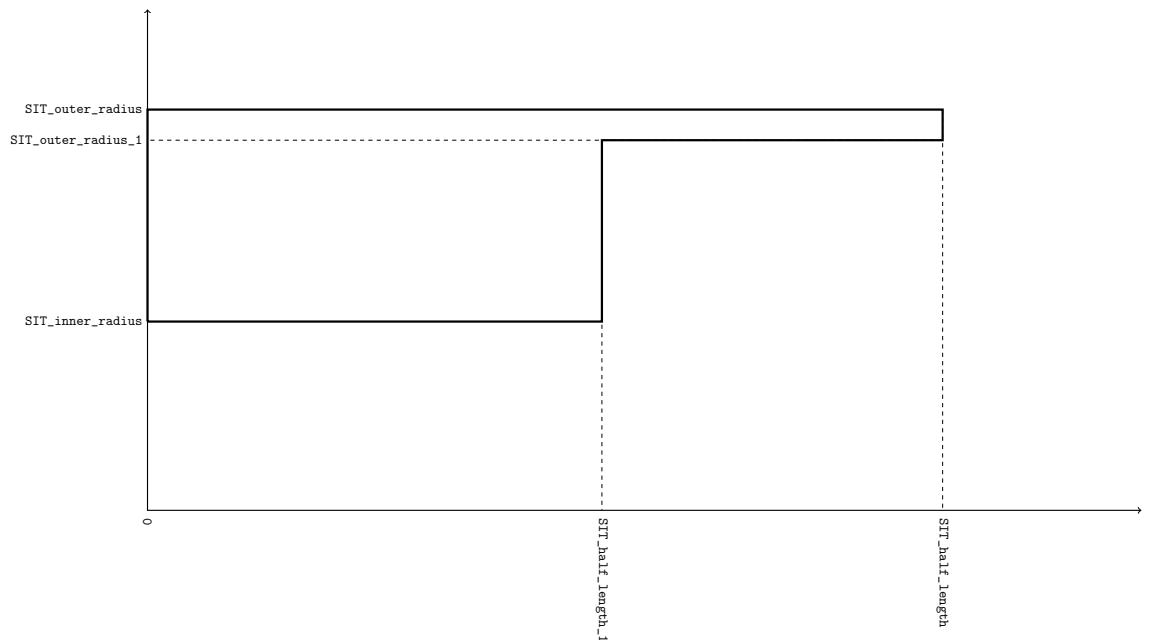


Figure 5: side view of the SIT envelope

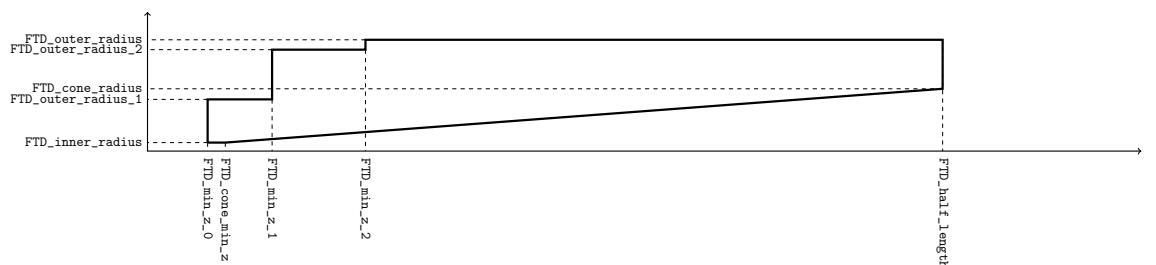


Figure 6: side view of the FTD envelope

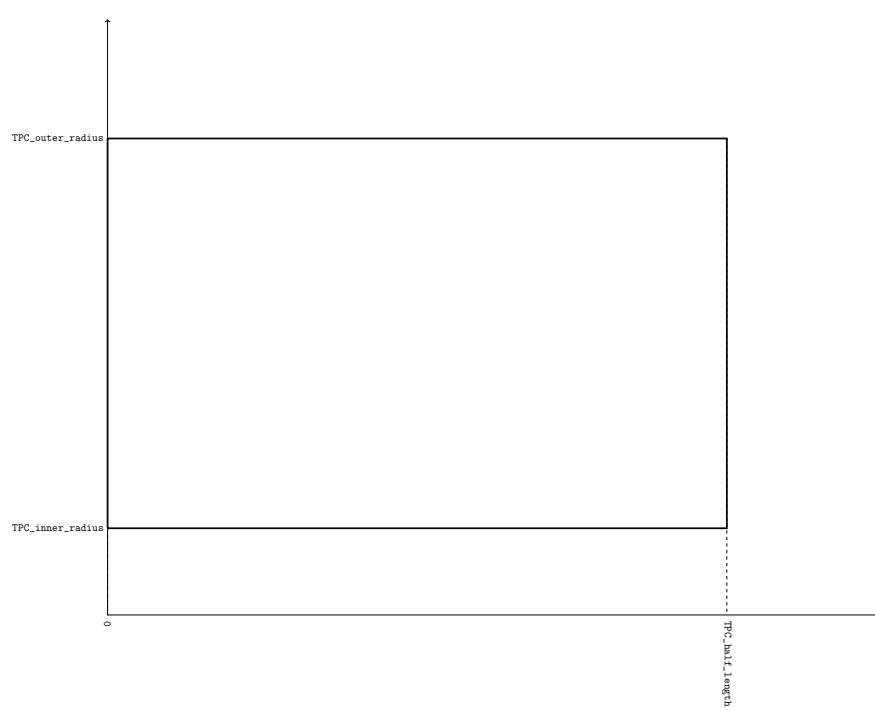


Figure 7: side view of the TPC envelope

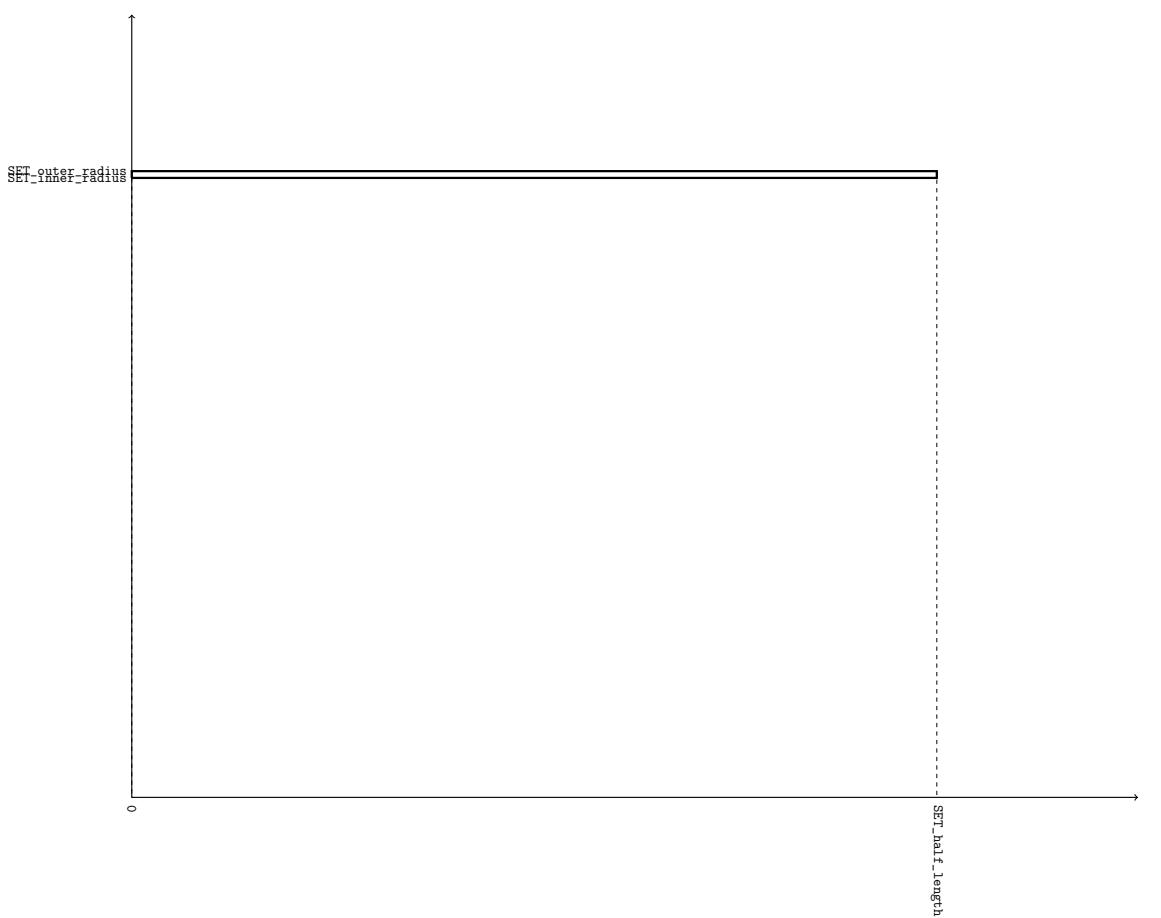


Figure 8: side view of the SET envelope