Barrel ECM

Sciglass BECM

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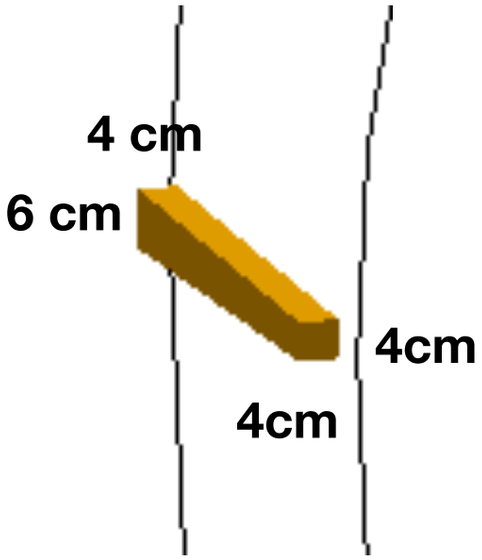
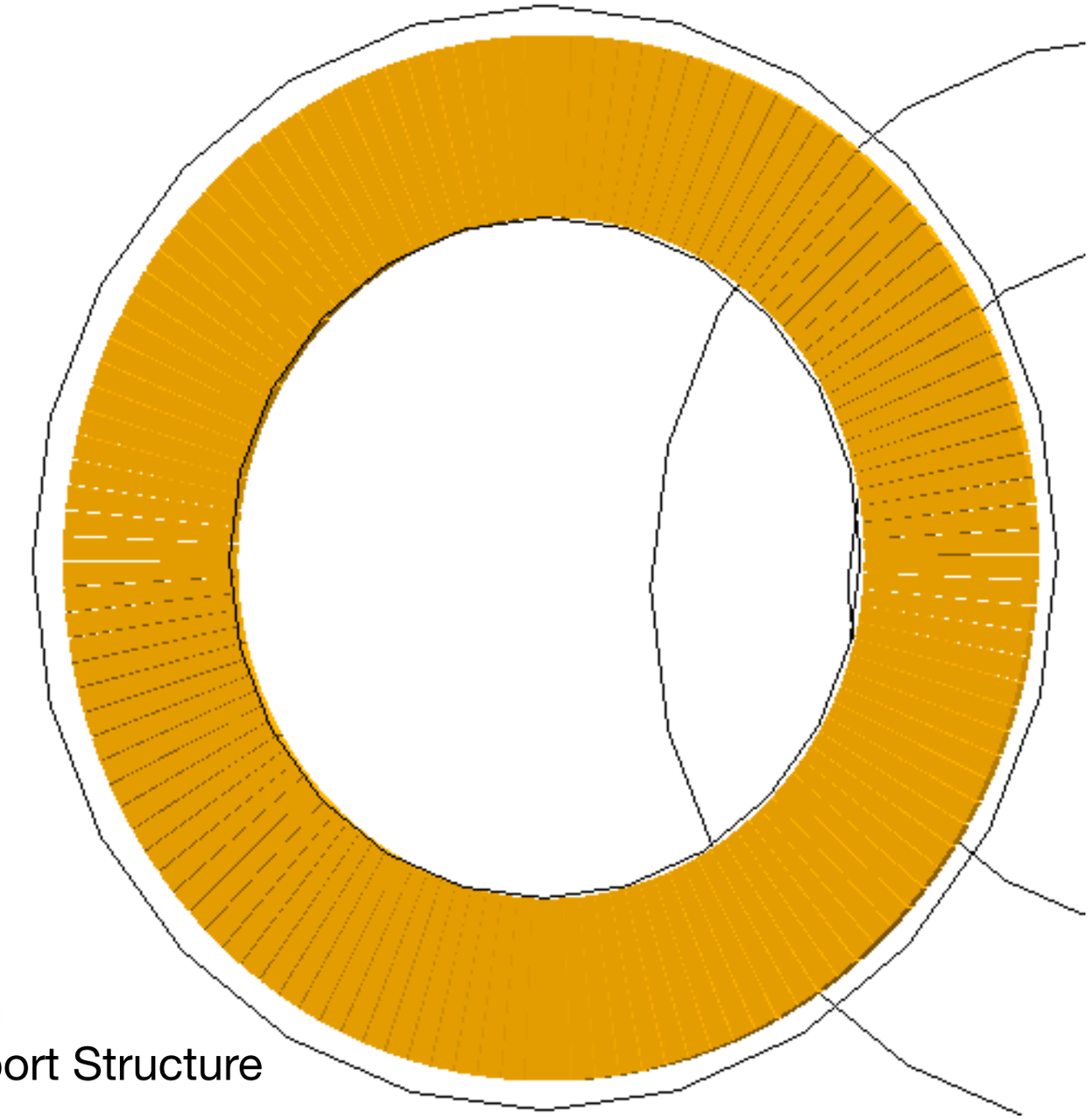


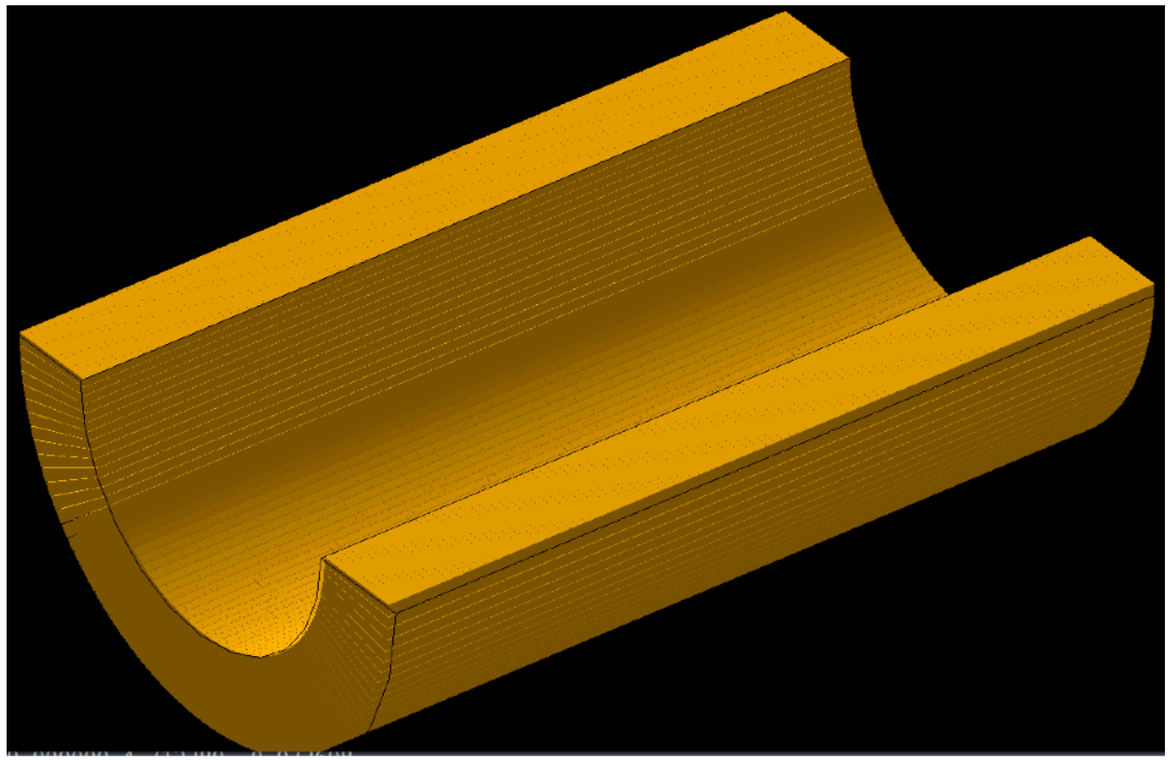
45.5 cm Length



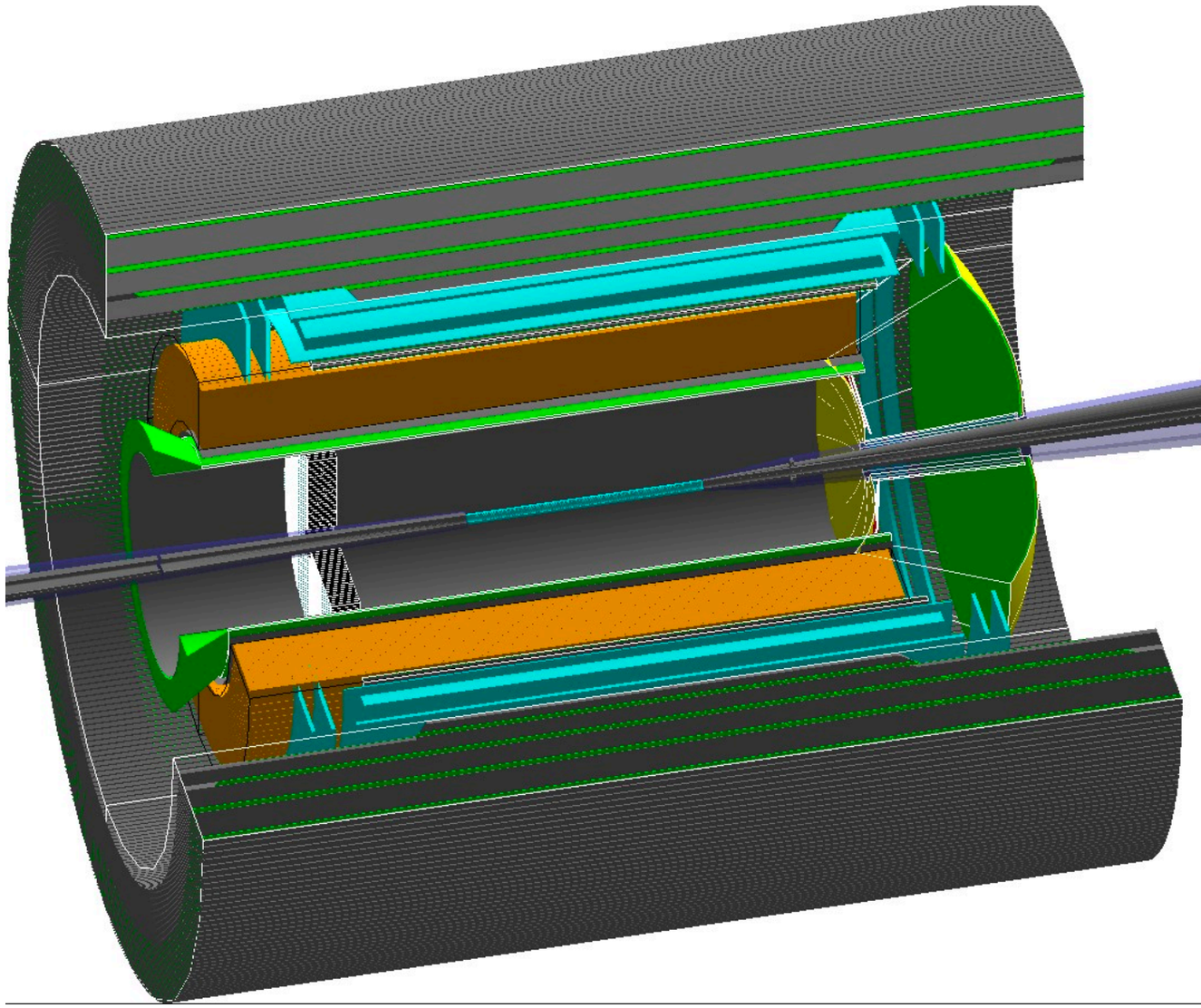
10 cm
Electronics + Support Structure

128 towers/layer
101 layers

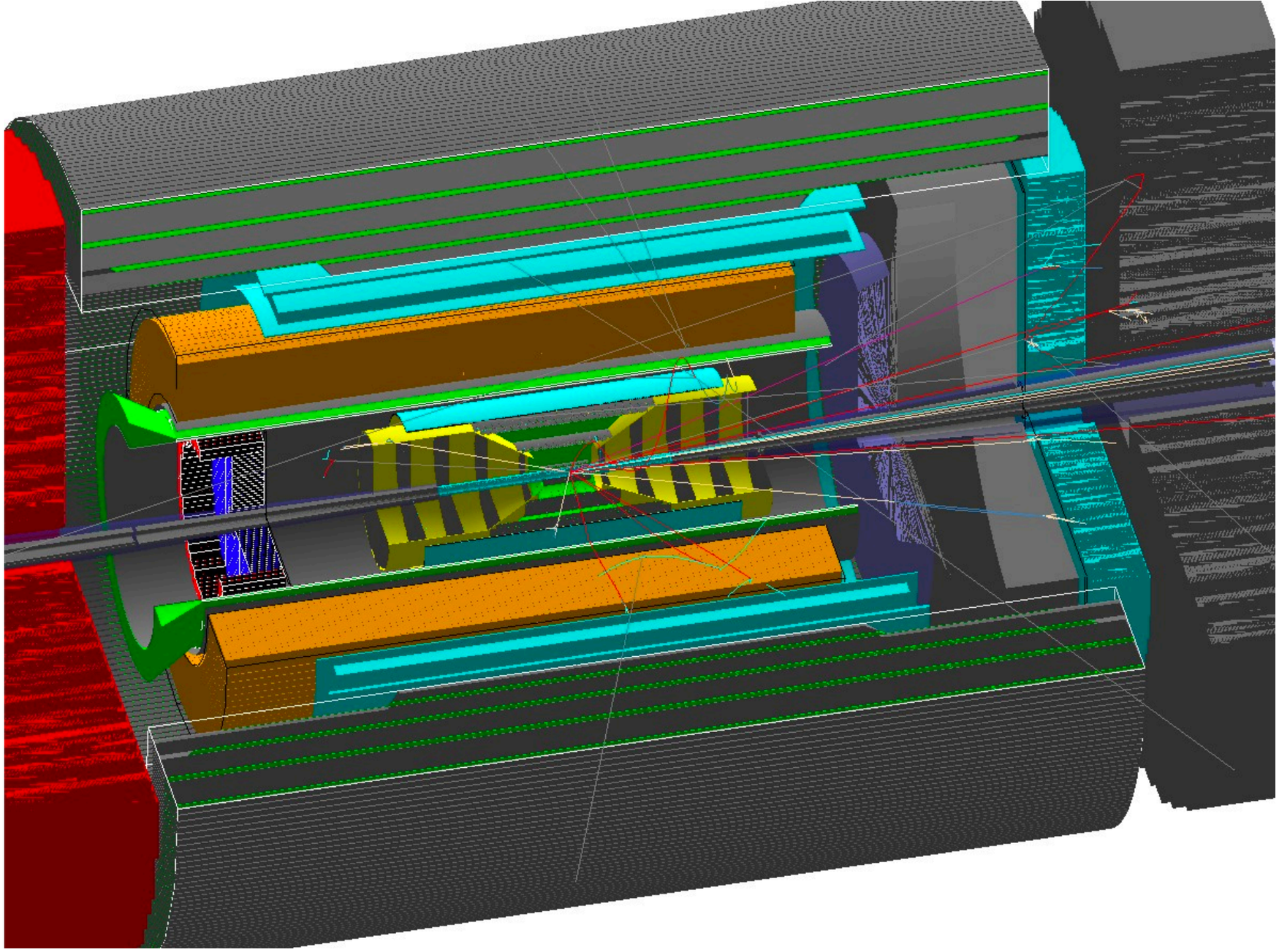
```
G4Material *sciglass1 = new G4Material("sciglass1", density = 4.22 * g / cm3, ncomponents = 4,  kStateSolid);
sciglass1->AddElement(G4Element::GetElement("Ba"), 0.3875);
sciglass1->AddElement(G4Element::GetElement("Gd"), 0.2146);
sciglass1->AddElement(G4Element::GetElement("Si"), 0.1369);
sciglass1->AddElement(G4Element::GetElement("O"),  0.2610);
```



1928 Towers
Zmax = 165 cm
Zmin = -247 cm



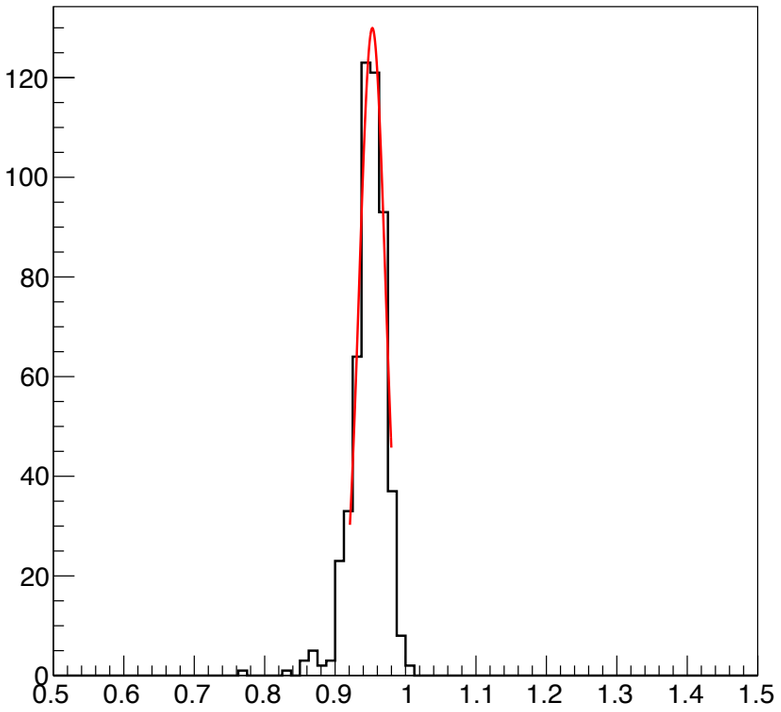
Inner Radius = 85 cm
Outer Radius = 138 cm



BECAL Detector:

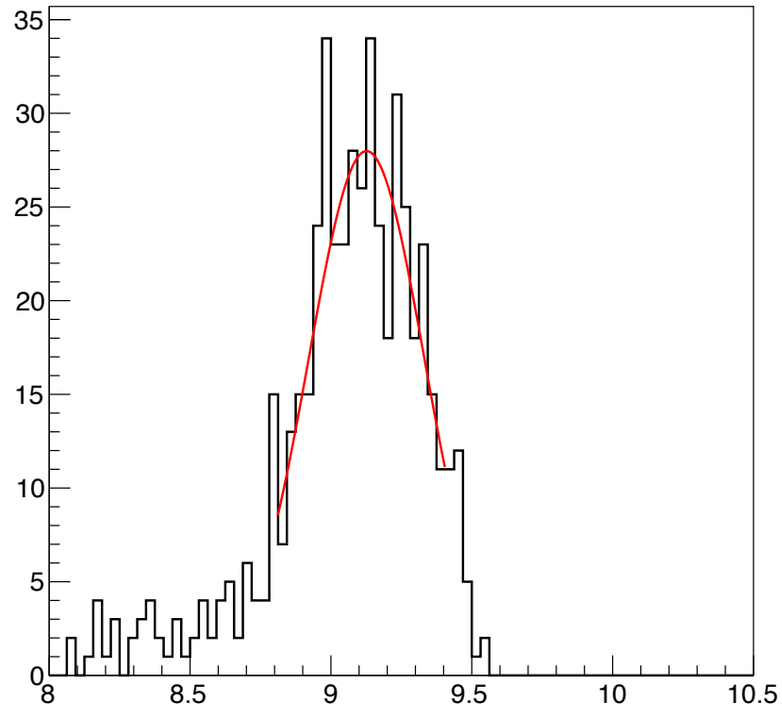
- New BuildTowerbyIndexBECAL class in the coresoftware
- New PHG4BarrelECalDetector in fun4all_EICdetectors
- New G4_BECAL.C macro
- Digitalization, DSTReader and Modular detector implementation courtesy of Friederike Bock

1 Gev Generated e



E [GeV]

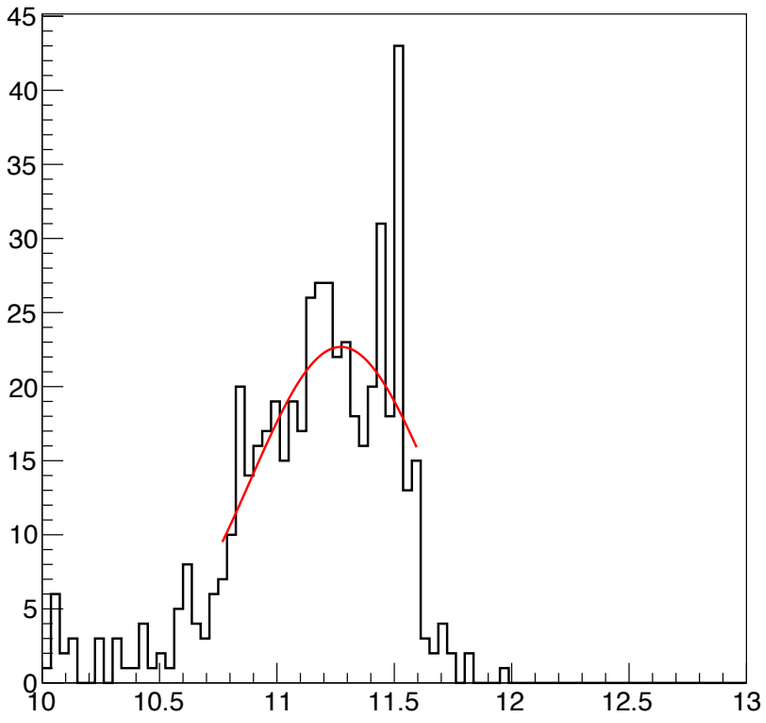
10 Gev Generated e



E [GeV]

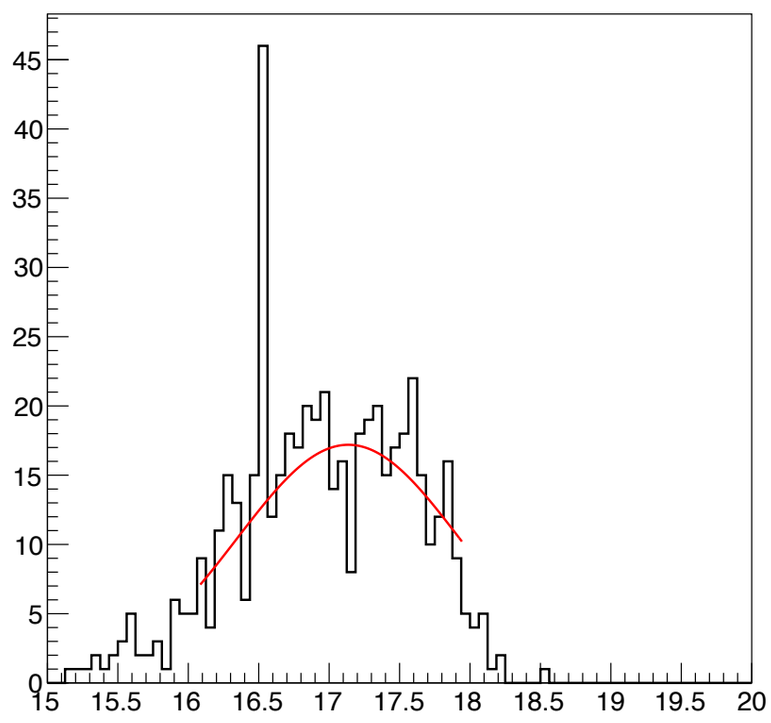
Eta Range (-0.2,0.2)

12.5 Gev Generated e



E [GeV]

20 Gev Generated e

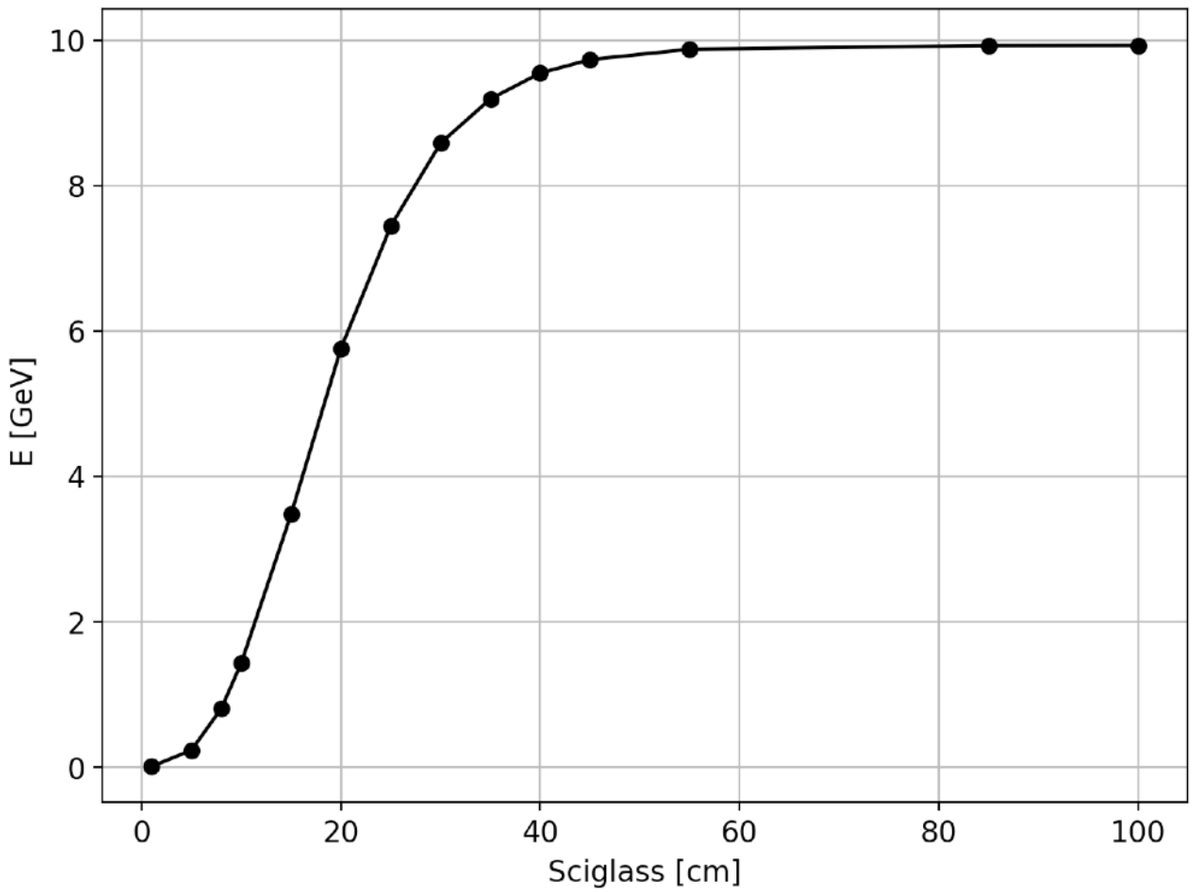


E [GeV]

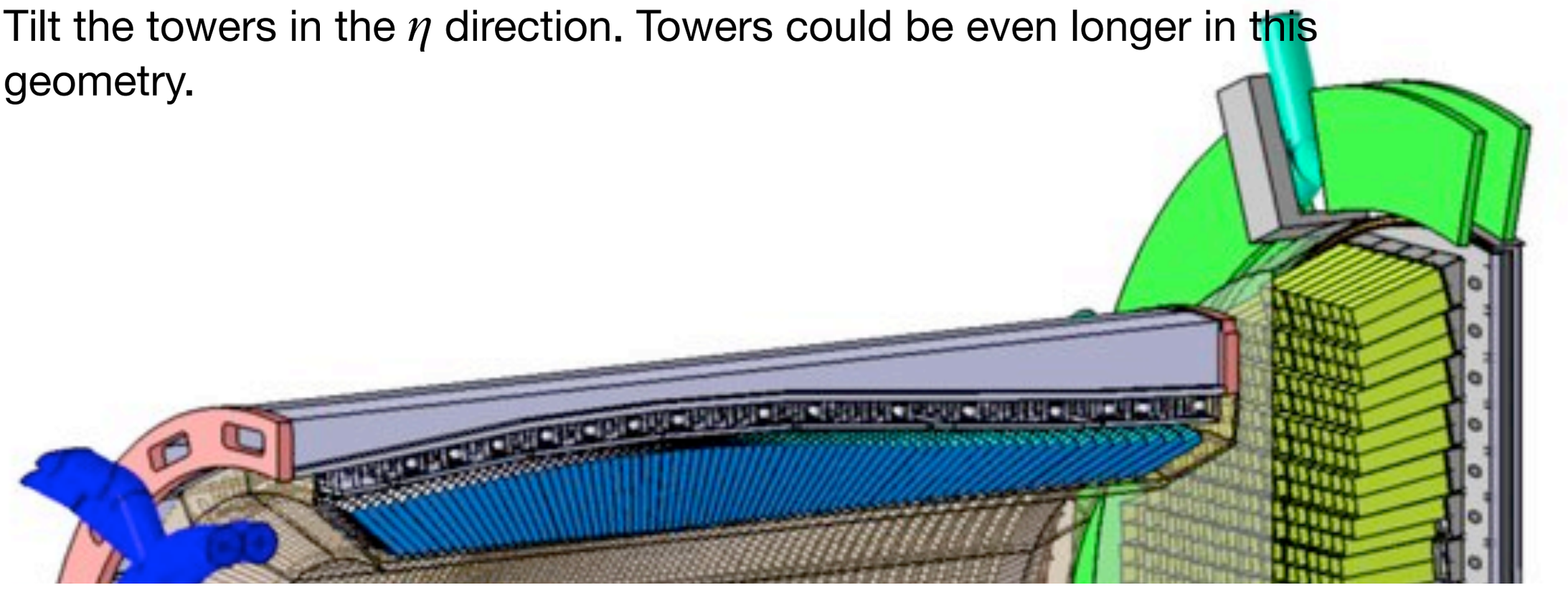
Recalling from the simple cylinder test

Generating:

Simple Sample
Electrons at 10 GeV
Eta Range (-0.2,0.2)
All other detectors and magnet are off



- Calorimeter does not seem to contain all the energy for electrons with E>10 GeV.
  Next step:
  Increase the size of the towers: 3-4 cm (?)
  Tilt the towers in the η direction. Towers could be even longer in this geometry.



1. All the towers will be tilted to Z = 0
2. Size of the towers will be the same (need to evaluate in eta)
   First simple tests studies with the cylinder did not show eta dependence.

Towers

10 GeV

η(#)	ϕ(#)	Emeas[GeV]
36	39	0.0218
37	39	0.0224
37	40	0.0608
37	41	0.0424
37	42	0.014
38	39	0.0398
38	40	0.5362
38	41	0.3732
38	42	0.0412
39	38	0.0124
39	39	0.0482
39	40	2.3384
39	41	4.0732
39	42	0.0362
40	39	0.231
40	40	0.1914
40	41	0.09
40	42	0.017
41	39	0.0282
41	40	0.0286
41	41	0.012
42	36	0.0186
42	40	0.0176
42	41	0.012
42	42	0.0108

25 GeV

η(#)	ϕ(#)	Emeas[GeV]
39	71	0.011
40	72	0.0122
40	74	0.02
40	75	0.014
40	76	0.0102
41	71	0.019
41	72	0.0404
41	73	0.1188
41	74	0.1196
41	75	0.0544
41	76	0.012
42	72	0.0488
42	73	0.6032
42	74	6.1778
42	75	0.168
42	76	0.033
43	71	0.0486
43	72	0.1
43	73	1.4158
43	74	7.2474
43	75	0.2872
43	76	0.0514
44	71	0.015
44	72	0.0436
44	73	0.1854
44	74	0.2382
44	75	0.1108
44	76	0.0176
45	72	0.0128
45	73	0.0264
45	74	0.0632
45	75	0.0304
46	72	0.0148
46	74	0.027
46	75	0.0184