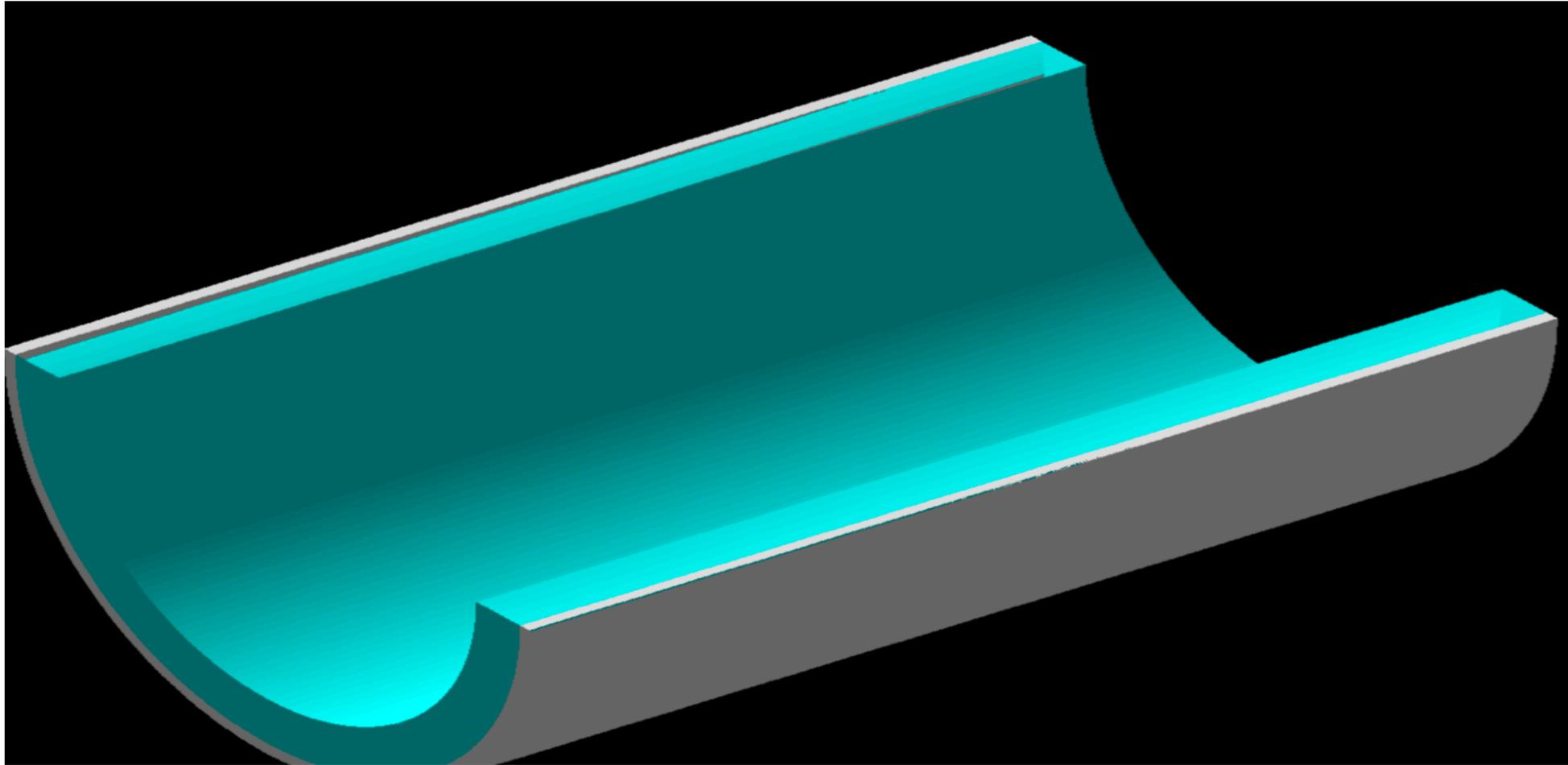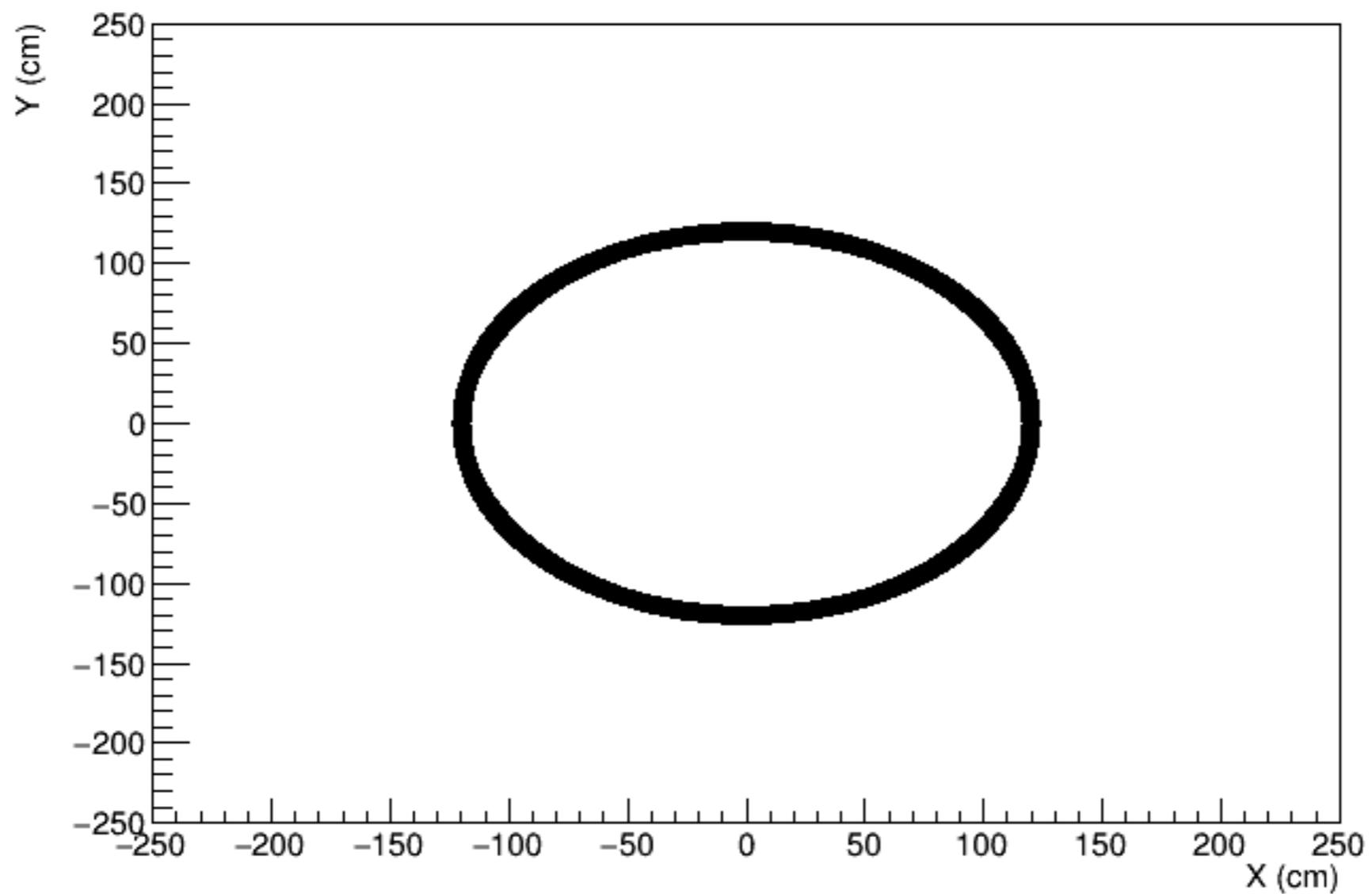# Barrel Calorimeter

06/01/2021

Working on …

Implementing :

An array of readouts on a cylindrical volume.

A single PbWO layer of 20 cm with the same structure -> the original version.

Geant4 Hit distribution

From Last Week:

Generating events using
Simple Version:
with only 5 GeV electrons

Issues
→

No hits
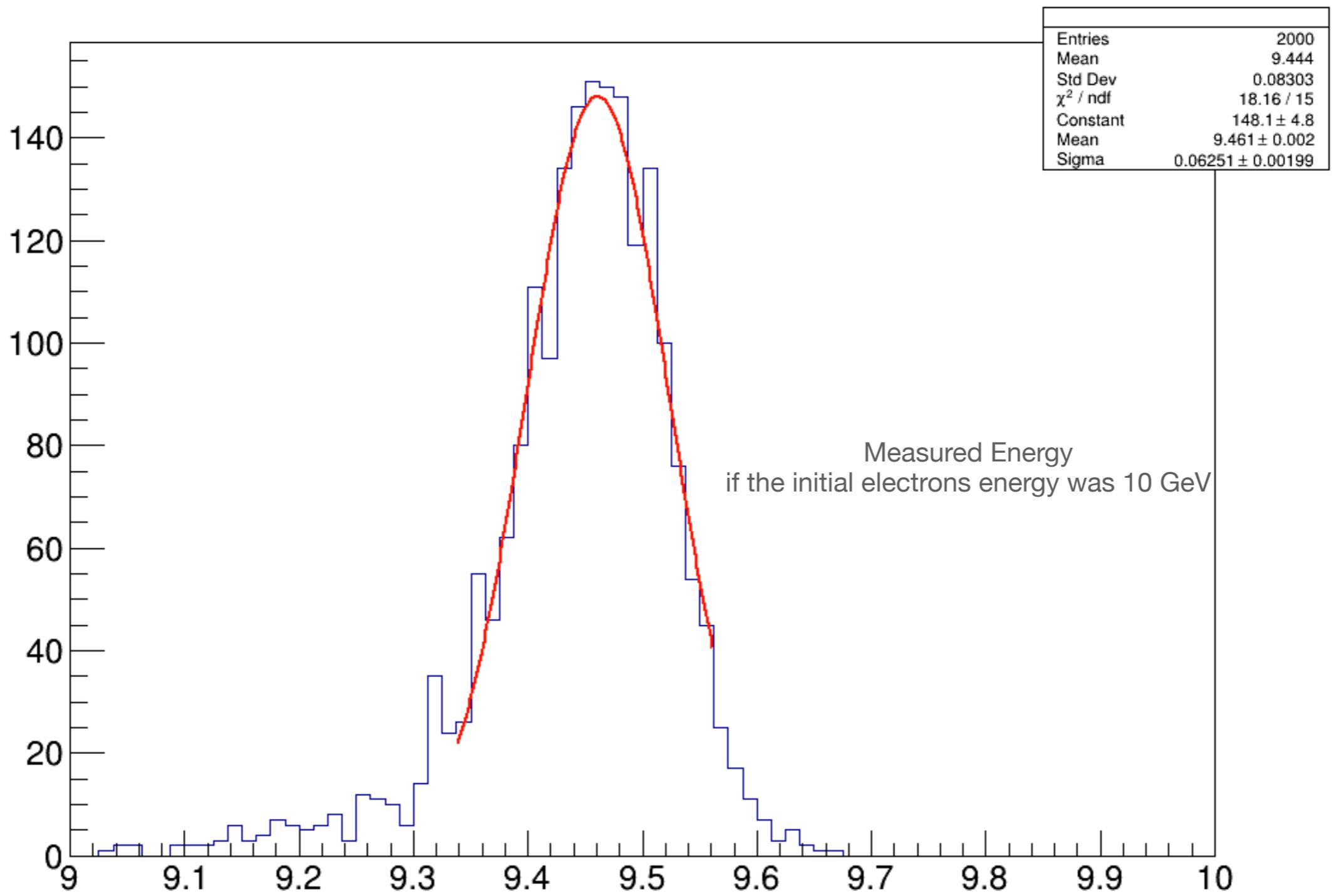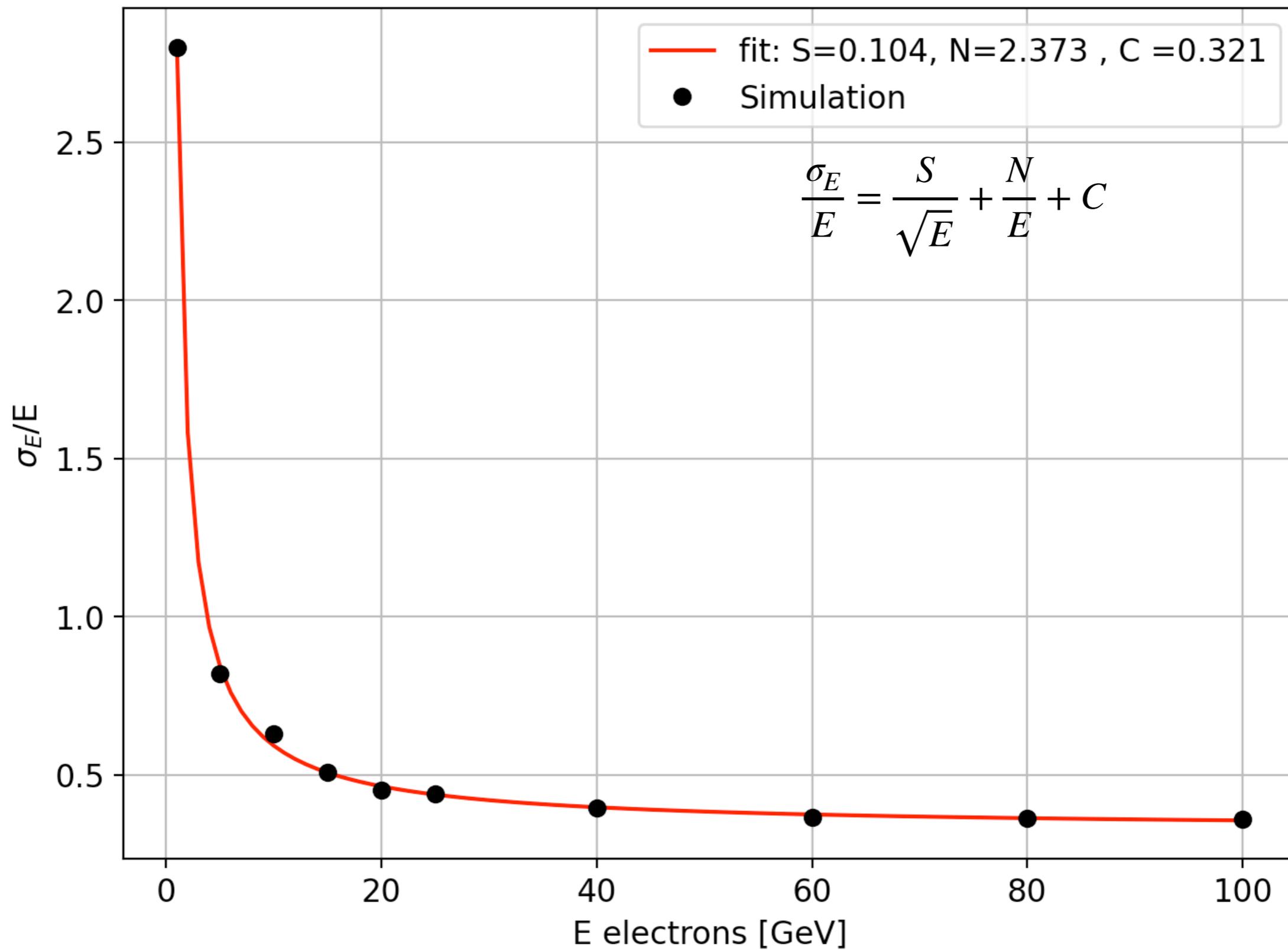Not all events were measured

Solution:

Proper location

```
cemc->set_double_param("place_z", layer_shift);
```

Add a blackhole:

```
BlackHoleGeometry::max_radius = std::max(BlackHoleGeometry::max_radius, radius + G4CEMC::electronics_width);
BlackHoleGeometry::max_z = std::max(BlackHoleGeometry::max_z, layer_shift + (l1 + l2) / 2.);
BlackHoleGeometry::min_z = std::min(BlackHoleGeometry::min_z, layer_shift - (l1 + l2) / 2.);
```
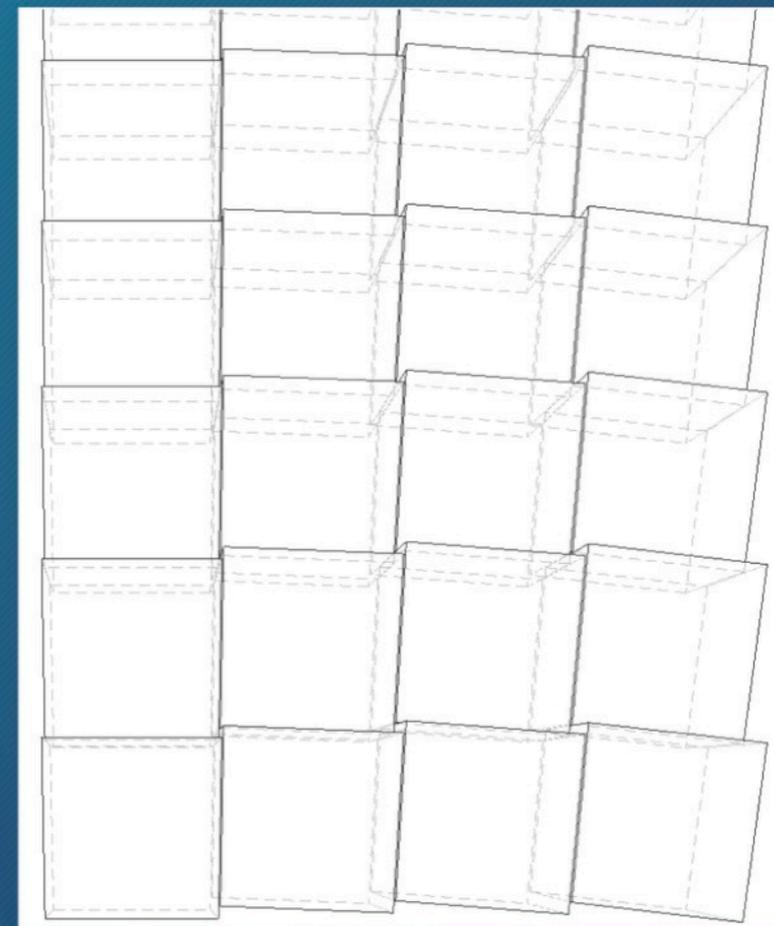
e

|	
Entries	2000
Mean	9.444
Std Dev	0.08303
χ^2 / ndf	18.16 / 15
Constant	148.1 ± 4.8
Mean	9.461 ± 0.002
Sigma	0.06251 ± 0.00199

Measured Energy
if the initial electrons energy was 10 GeV

fit: S=0.104, N=2.373 , C =0.321

Simulation

$$\frac{\sigma_E}{E} = \frac{S}{\sqrt{E}} + \frac{N}{E} + C$$

EMCal Blocks

- Sawtooth pattern within a modal.

- 164 mrad is the angle of the third (last 1D projective) block relative to the IP.

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Removing the optical fibers, lightguides and filling the crystals with Sciglass
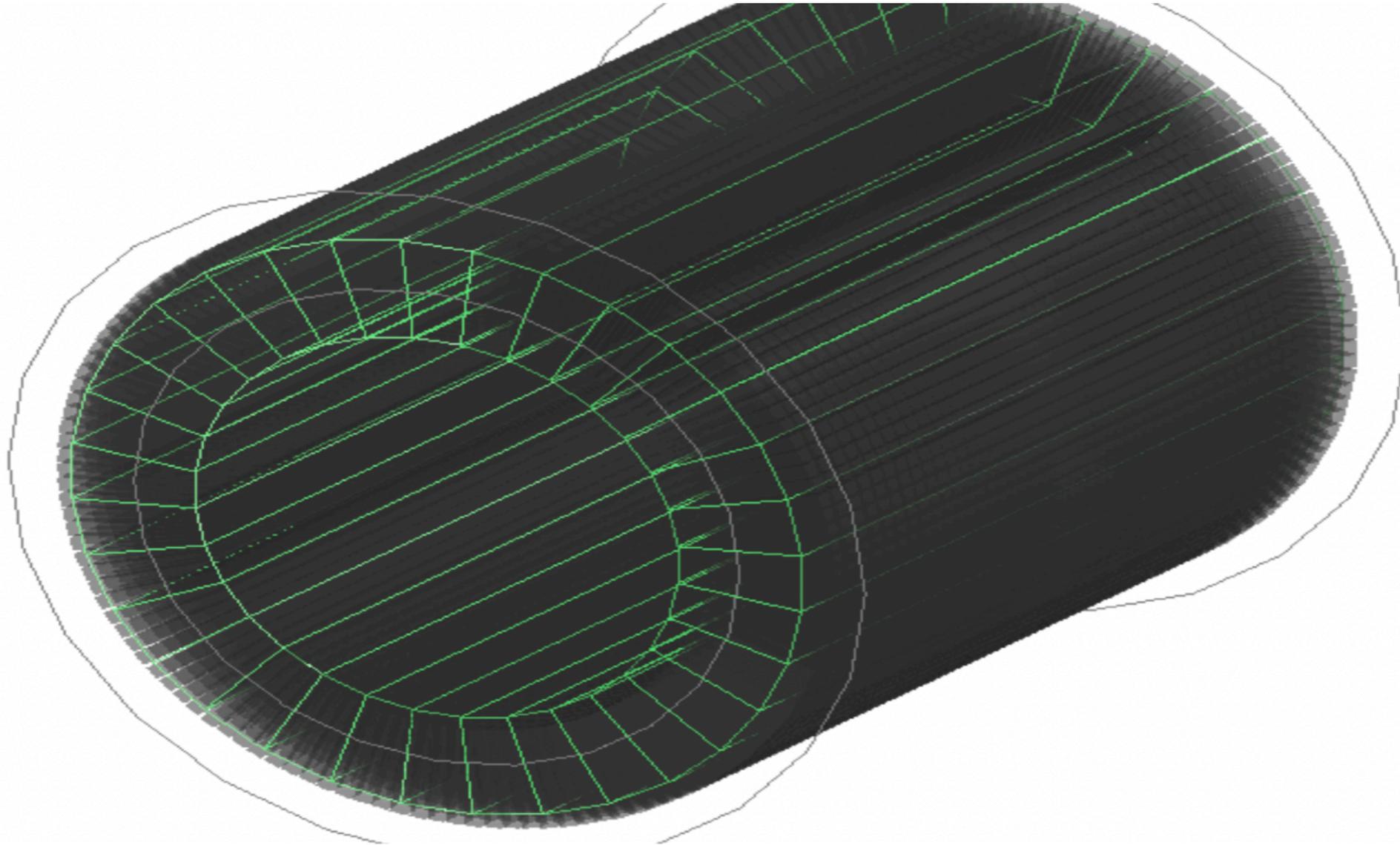
*Plan: Keep this dimensions
*Modify in Hits/Showers/..