CEPC Muon Detector Simulation in CEPCSW

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Detector

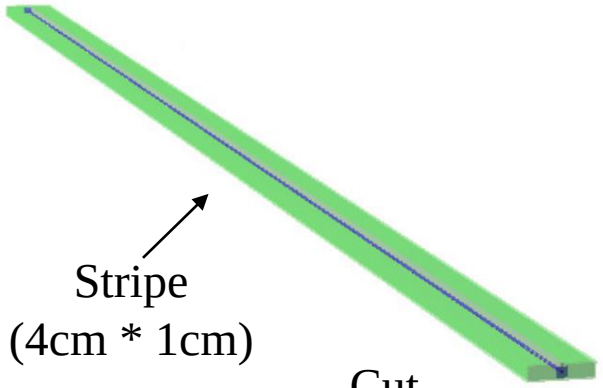
- =DetectorConstruction in Geant4
- Stripes(surface+scintillator+cut+fiber+SiPM)

  ↓
- Super Layers × 6

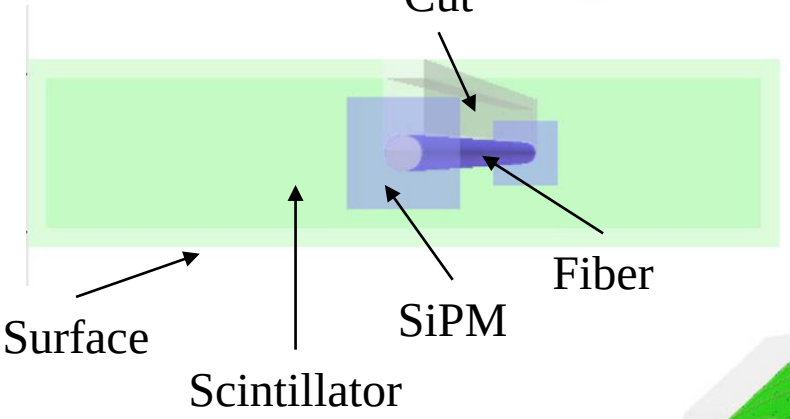
  ↓
- Trds × 12

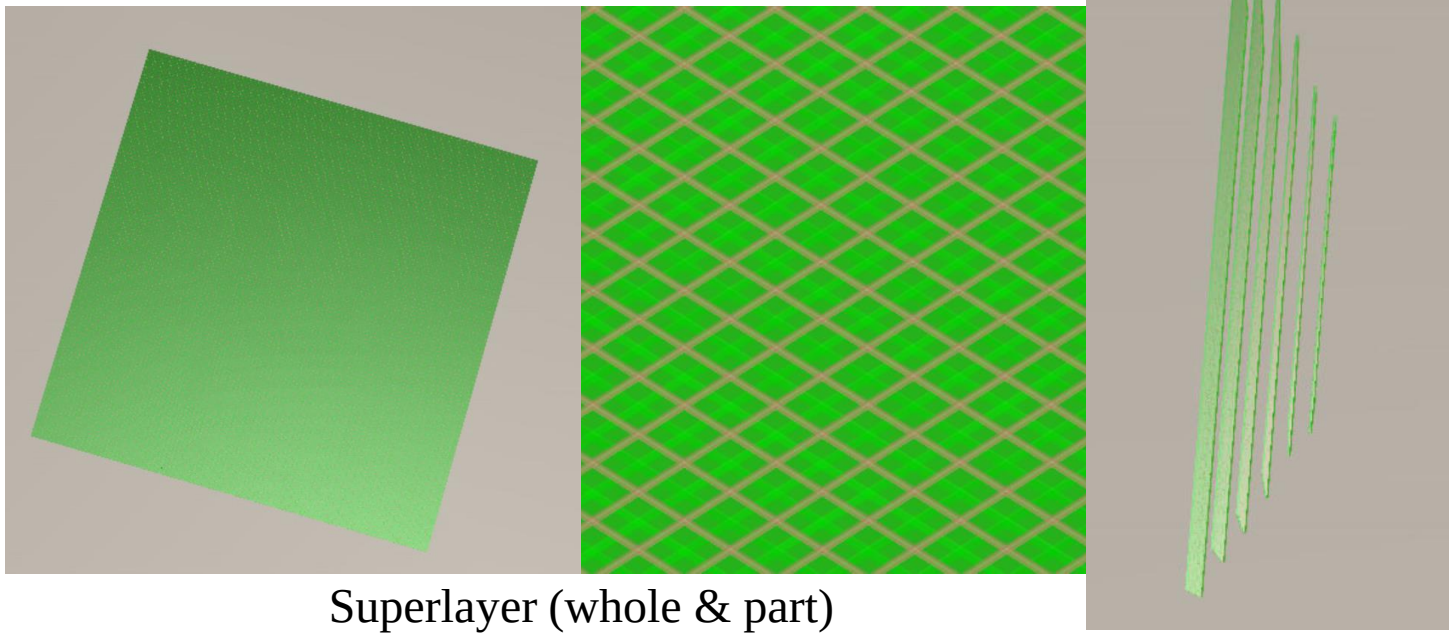
  ↓
- Barrel

Stripe→Superlayer

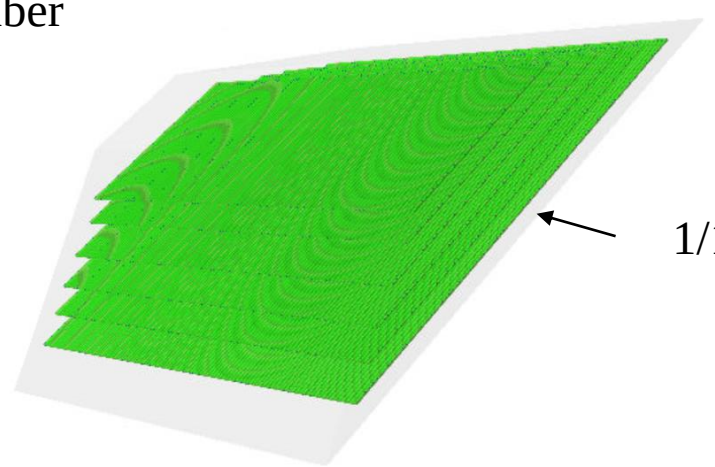


Stripe
(4cm * 1cm)



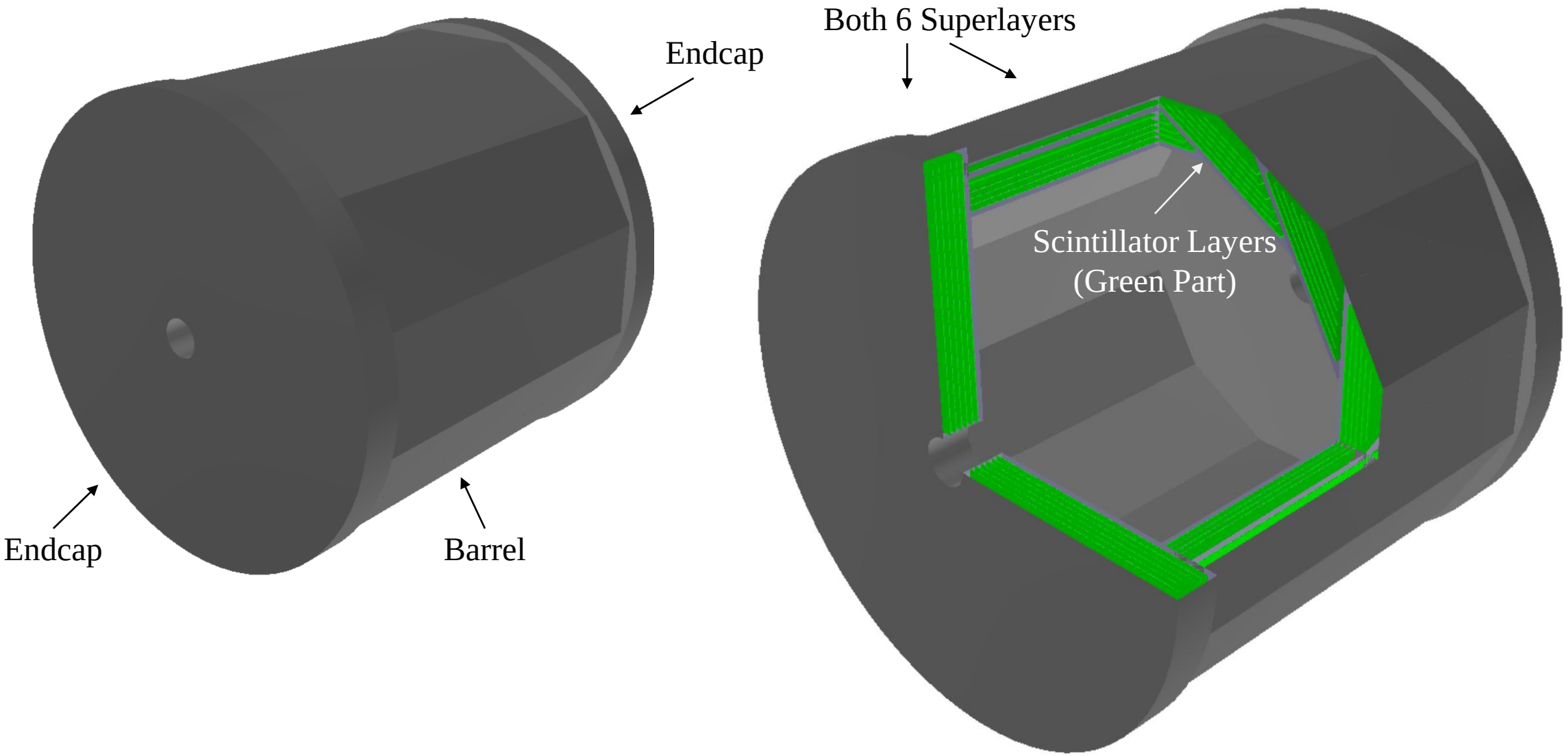


Superlayer (whole & part)

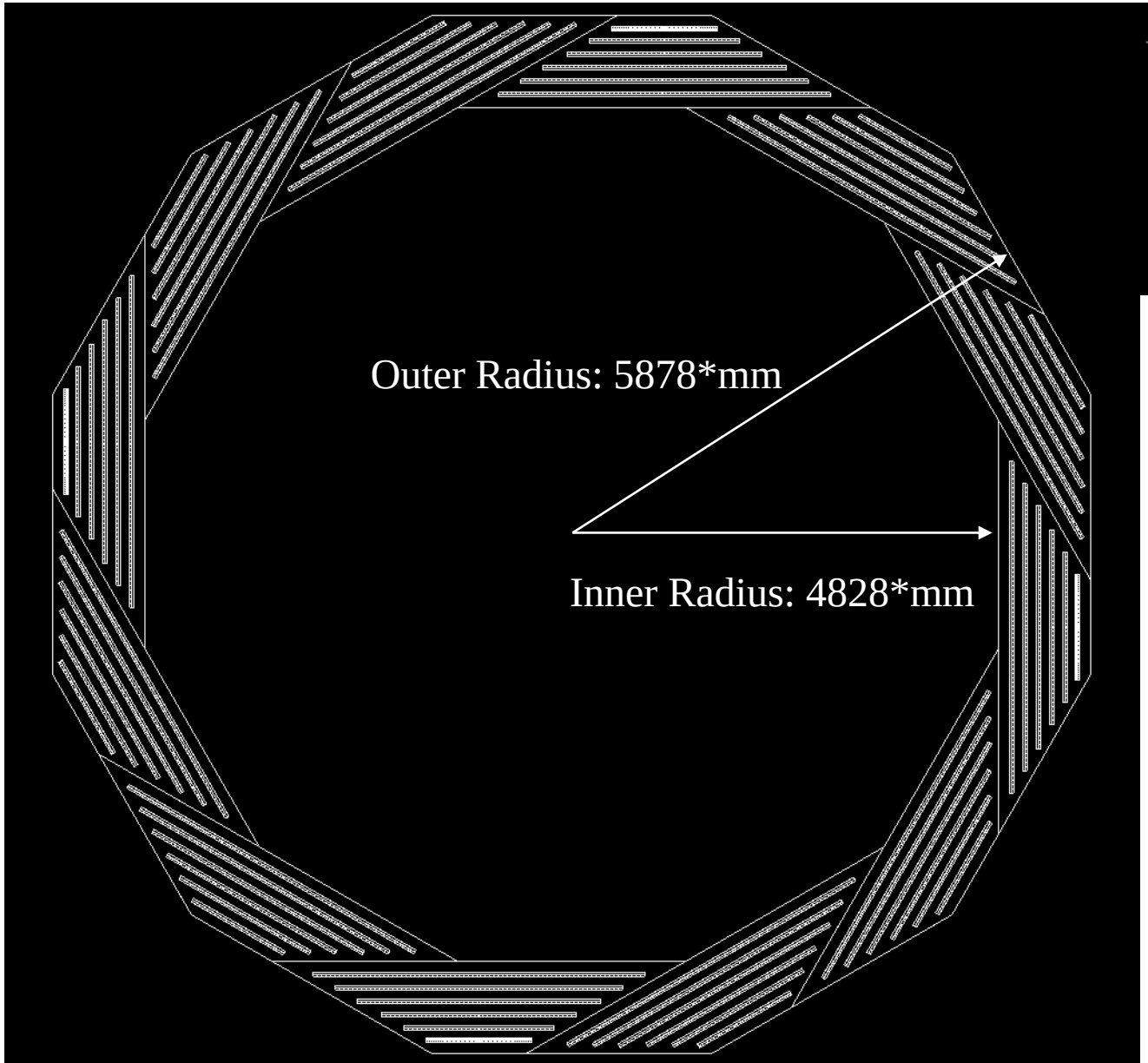


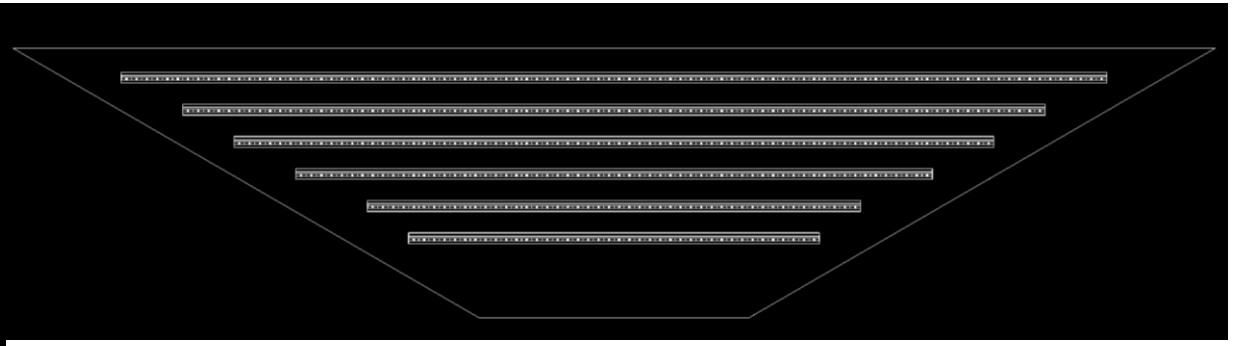
1/12 of a single Barrel

Barrel & Endcap



Barrel



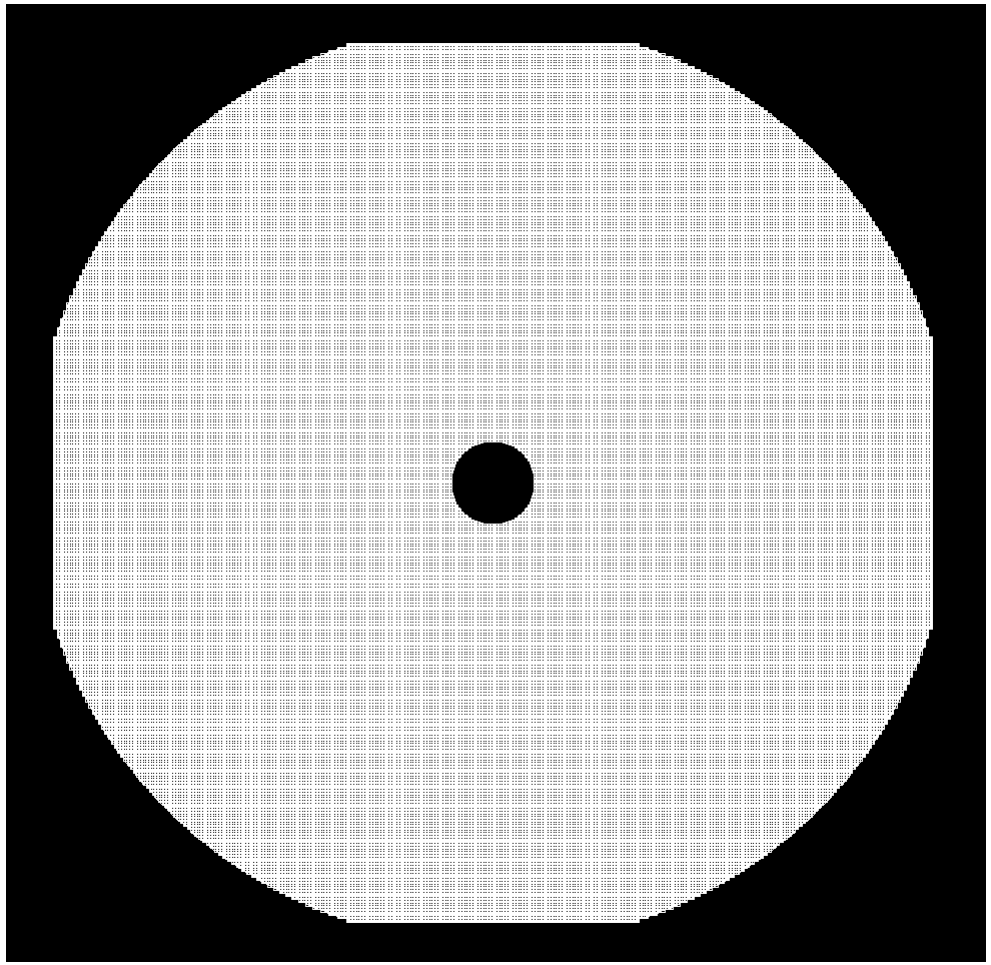


Superlayer: 2cm of Scintillator in the middle, two 1cm Air & Aluminum on the top and the bottom

Gap between Superlayers (the superlayer conclude 2cm Air & Aluminum): 85*mm

The Iron Layer in the bottom: 30*mm

Endcap



Inner Radius: 520*mm

Barrel & Endcap

Barrel:

Two layers of scintillators are arranged vertically to form a superlayer.

Every superlayer has a different size_x & the same size_y, so:

One layer of superlayer is consist of a fixed size (4.88 m) & variable amount of stripes;

The other layer is consist of variable size & a fixed amount (122) of stripes;

- 4.88m :

404×12×2=9696 (stripes)

- Variable :

122×6×12×2=17568 (stripes)

- Total Stripe Length:

9696×4.88m+122×12×2×(1.6m+1.92m+2.48m+2.96m+3.36m+3.84m) =94632.96m

Detection Area:

- 94632.96m×0.04m=3785.3184m^2

Layer	Stripe	Length
1	40	4.88m
3	48	4.88m
5	62	4.88m
7	74	4.88m
9	84	4.88m
11	96	4.88m

Layer	Stripe	Length
2	122	1.6m
4	122	1.92m
6	122	2.48m
8	122	2.96m
10	122	3.36m
12	122	3.84m

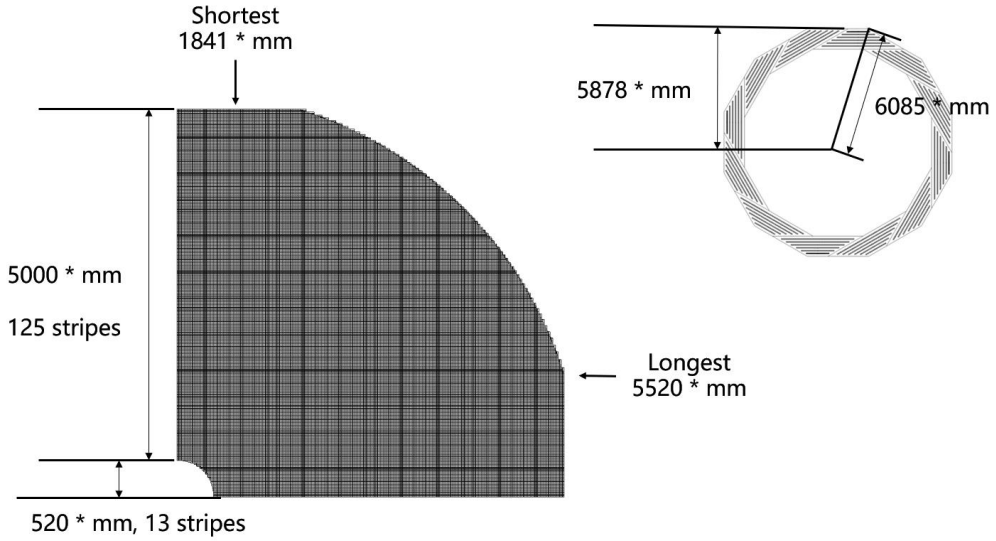
Endcaps:

One layer of superlayer is consist of four part shown below, and combined with a vertical layer.

- 2(endcaps)×6(superlayers)×5100.48m(every superlayer)=61205.76m

Detection Area:

- 61205.76m×0.04m=2448.2304m^2



Total Area:

- 2448.2304m^2 + 3785.3184m^2 = 6233.5488m^2

Barrel & Endcap

Some splicing details: