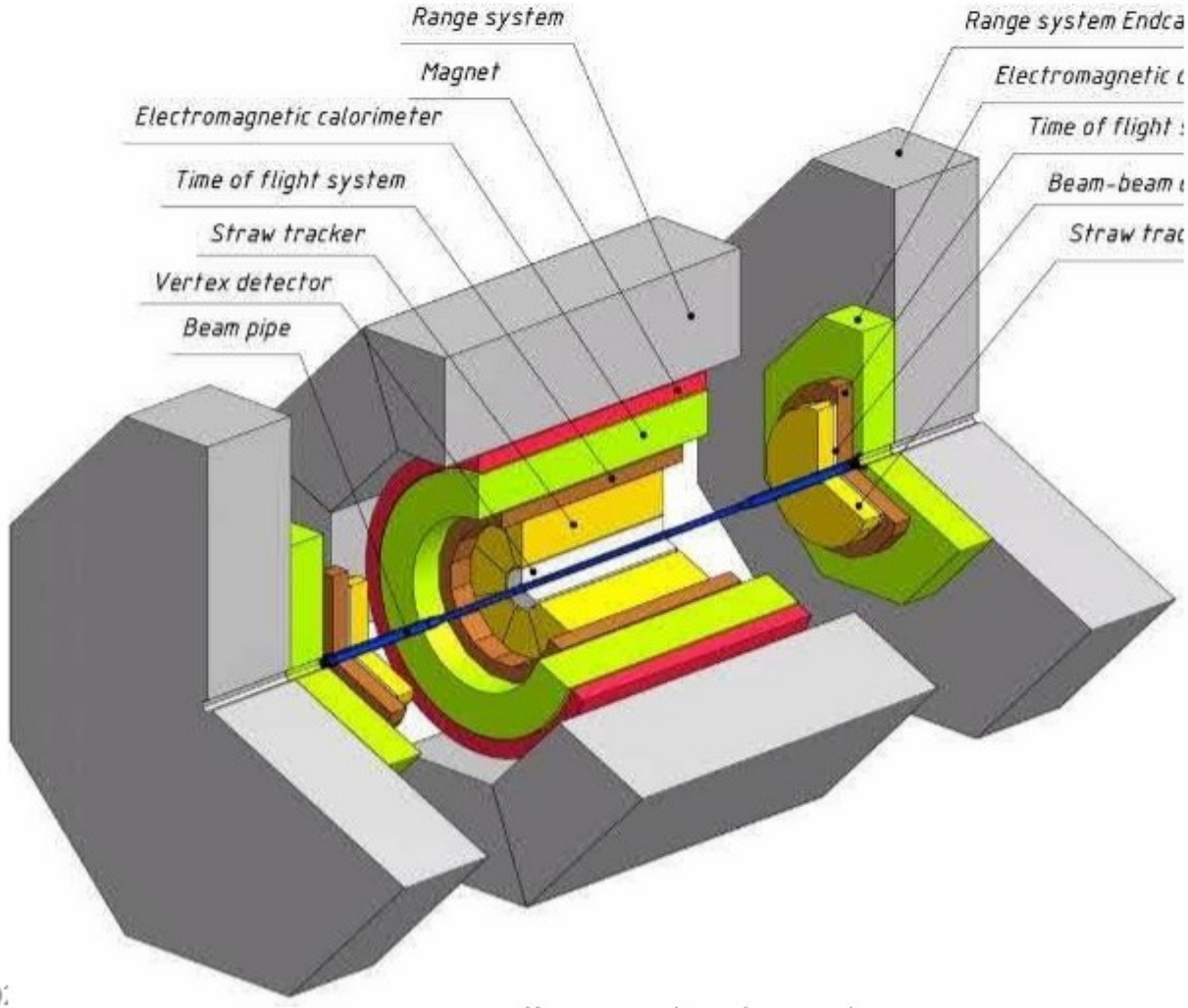
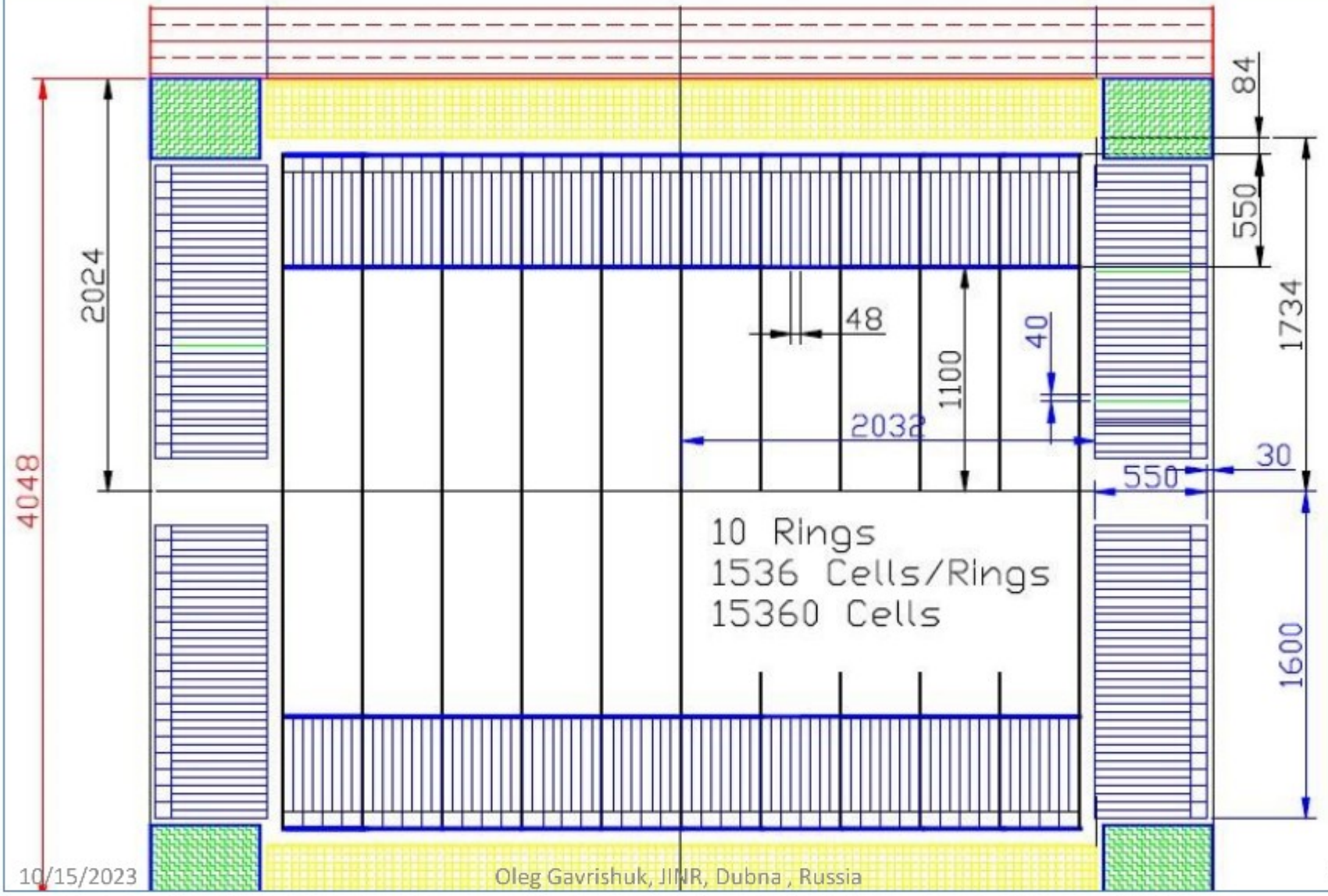
SPD ECAL models

Nazim Huseynov, Andre Maltsev, Aleksandr Boikov

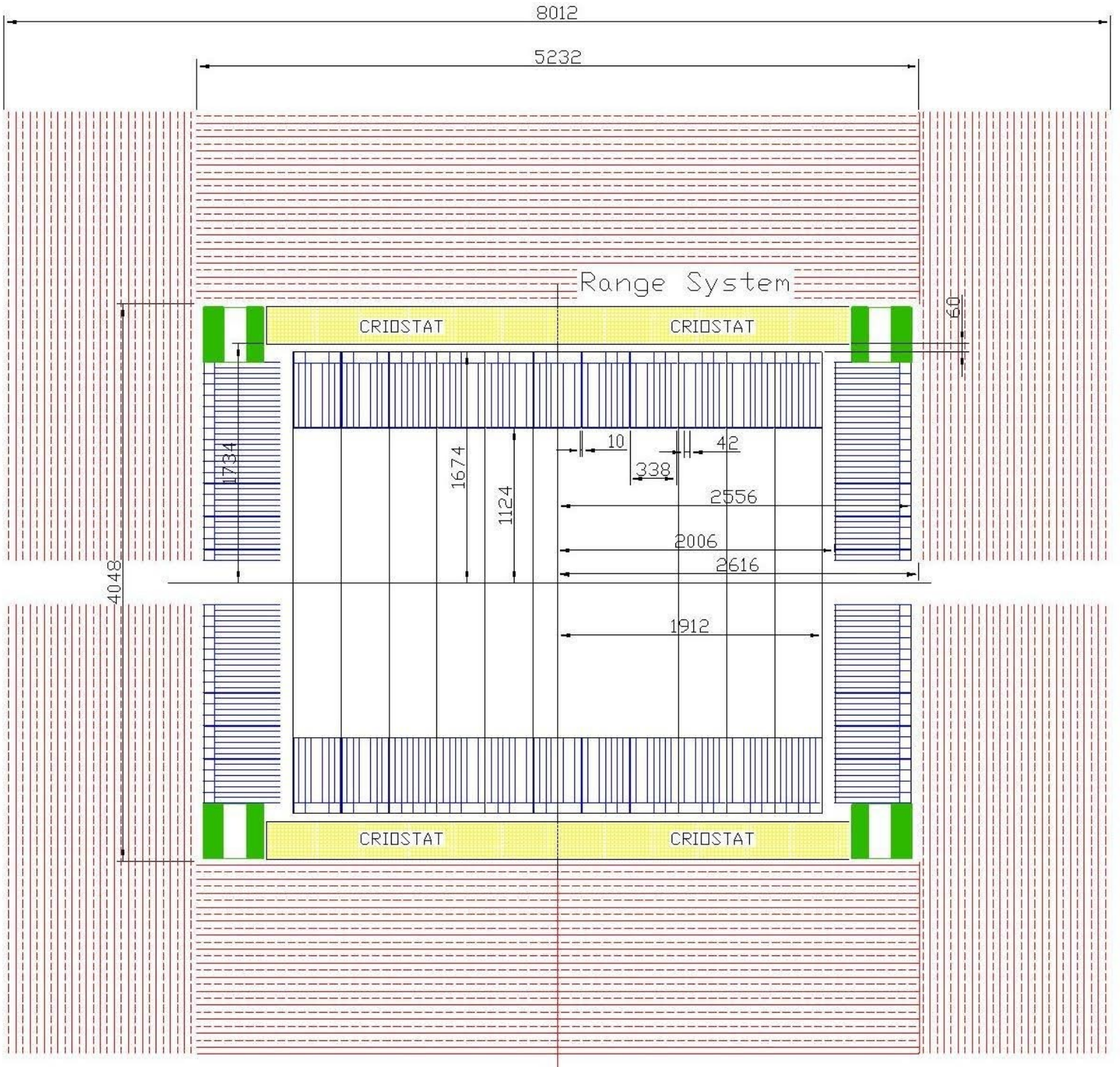
ECAL integration inside of SPD



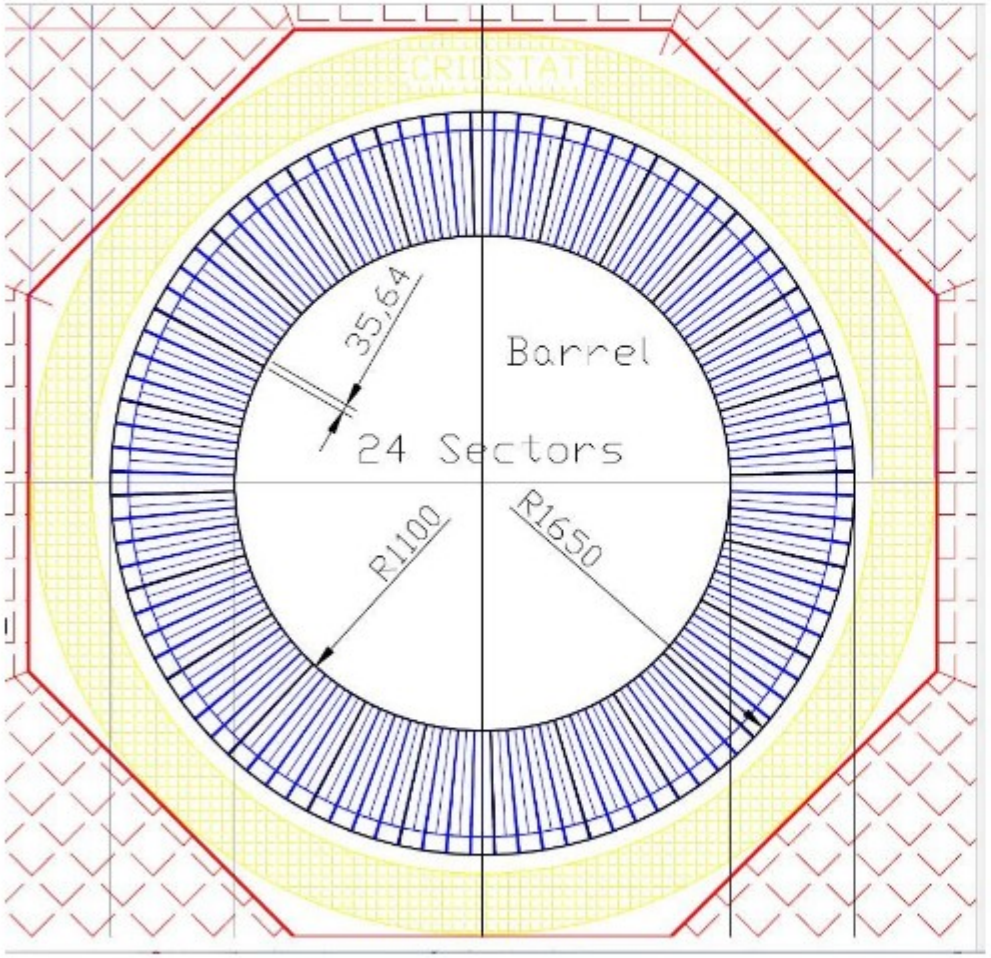
ECAL with New Sizes in 2023

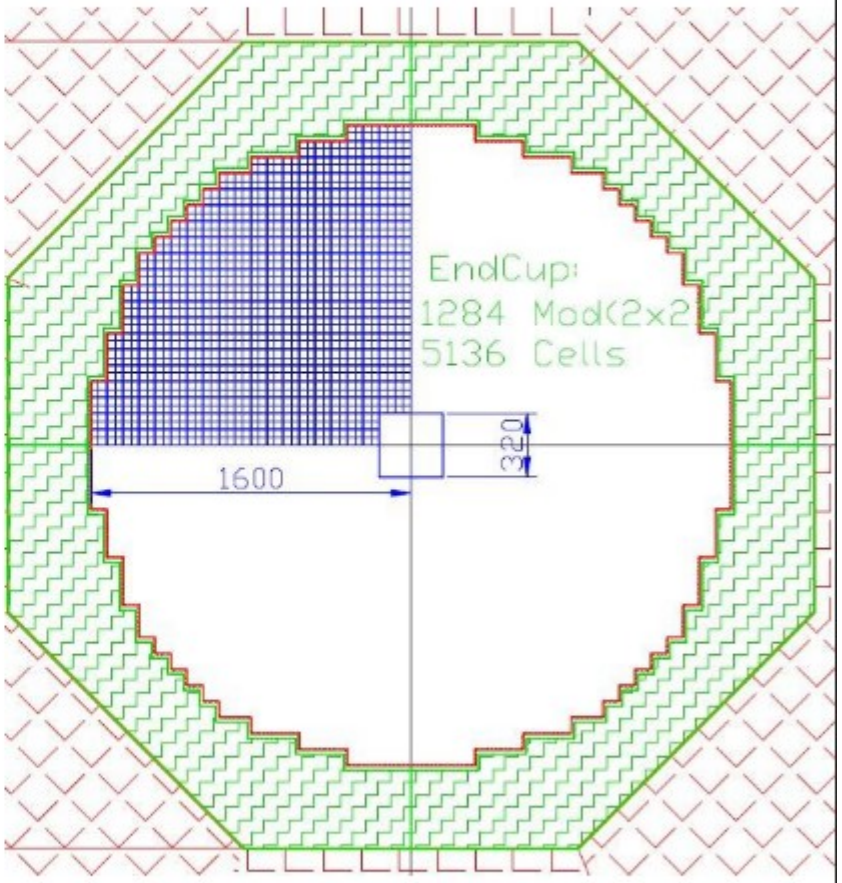


ECAL with New Sizes in 2024

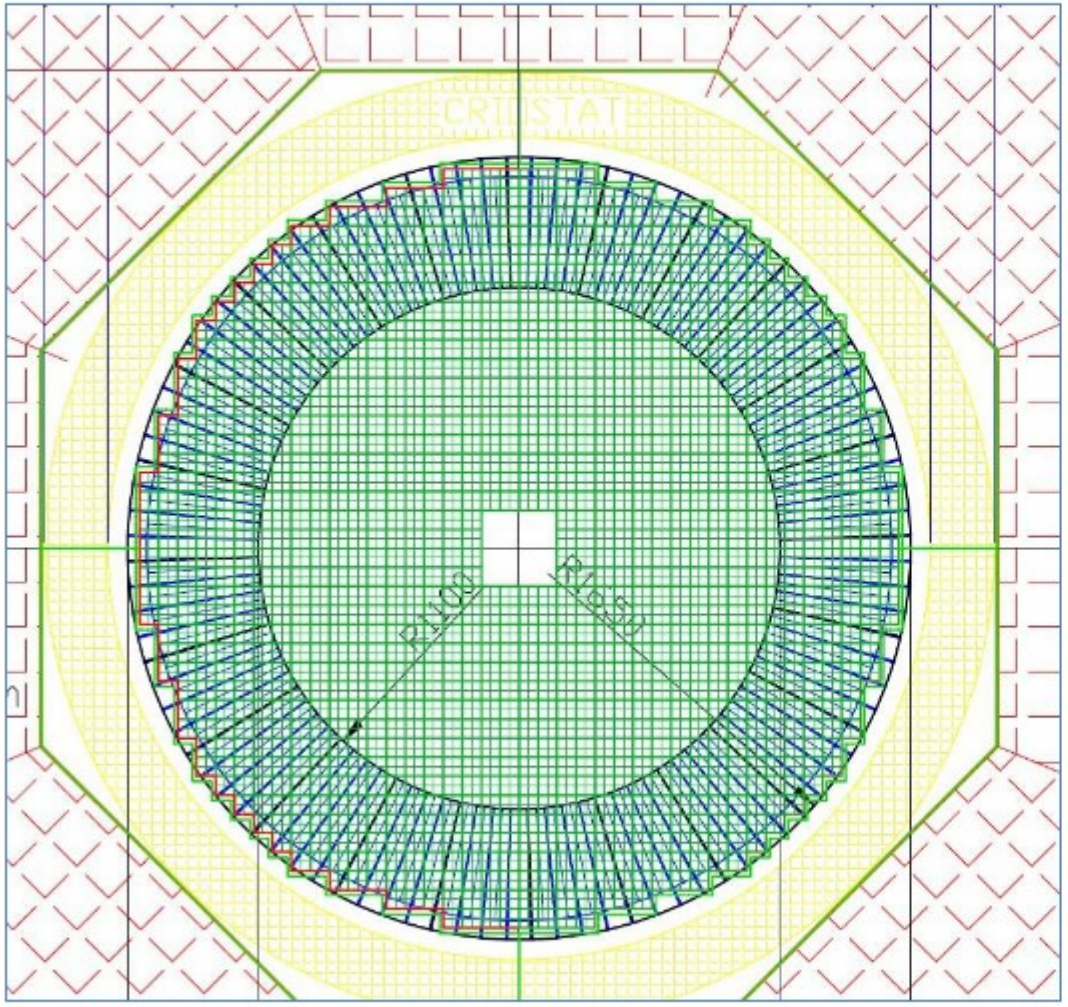


ECAL with New Sizes in 2023





ECAL composition with New Sizes in 2023



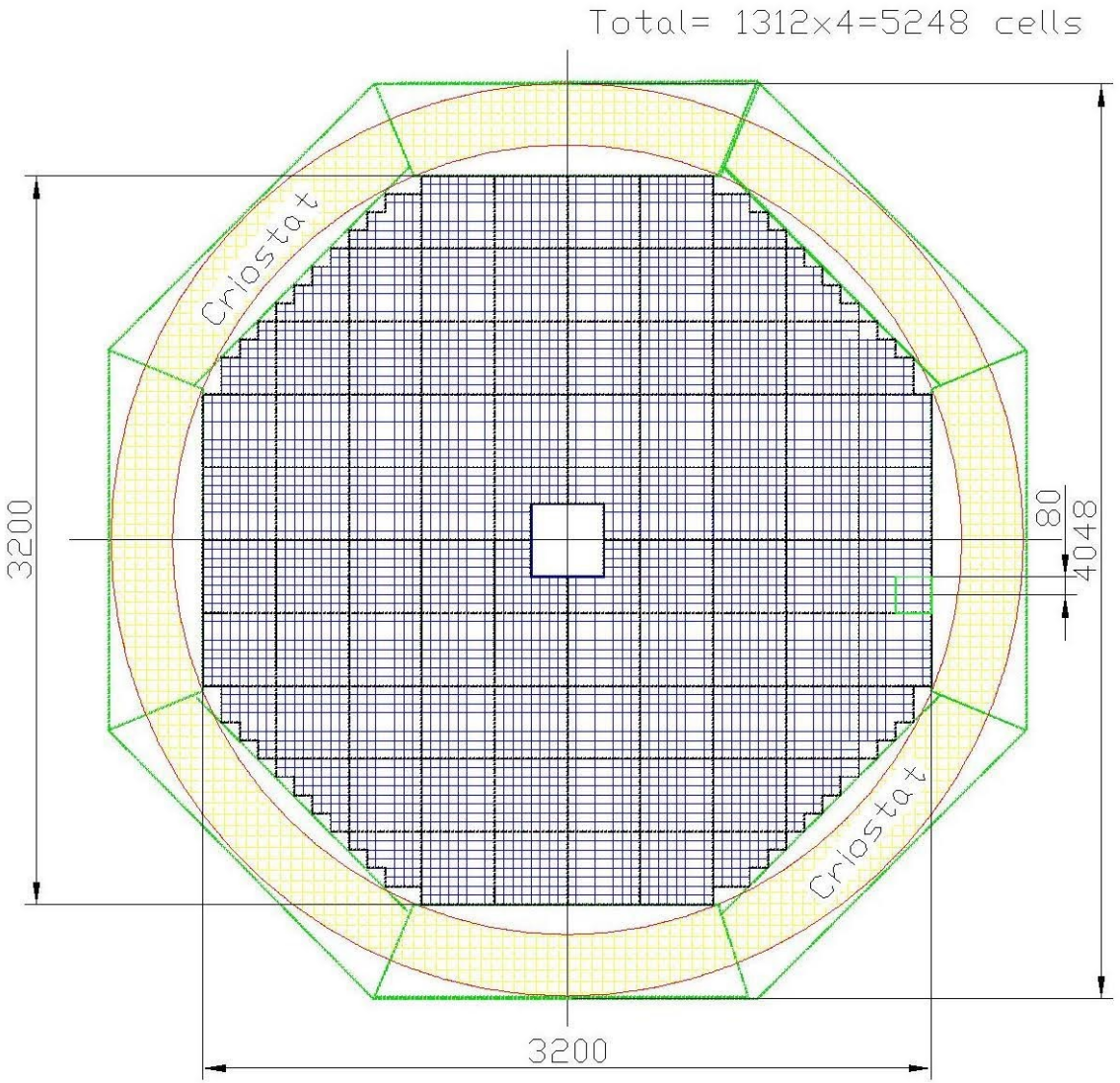
Barrel :

1. 10 Rings – 1536 cells/Ring
2. Total Cells – 15360
3. ADC64 – 240
4. 16ch Amplifiers – 960
5. Power units – 24
6. Weight – 38.4 tonn

ENDCUP:

1. Cells – 5136 / per EndCup
2. Total cells – 10272
3. ADC64 – 160
4. 16ch Amplifiers – 642
5. Power units – 20
6. Total Weight – 256 tonn

ECAL composition with New Sizes in 2024



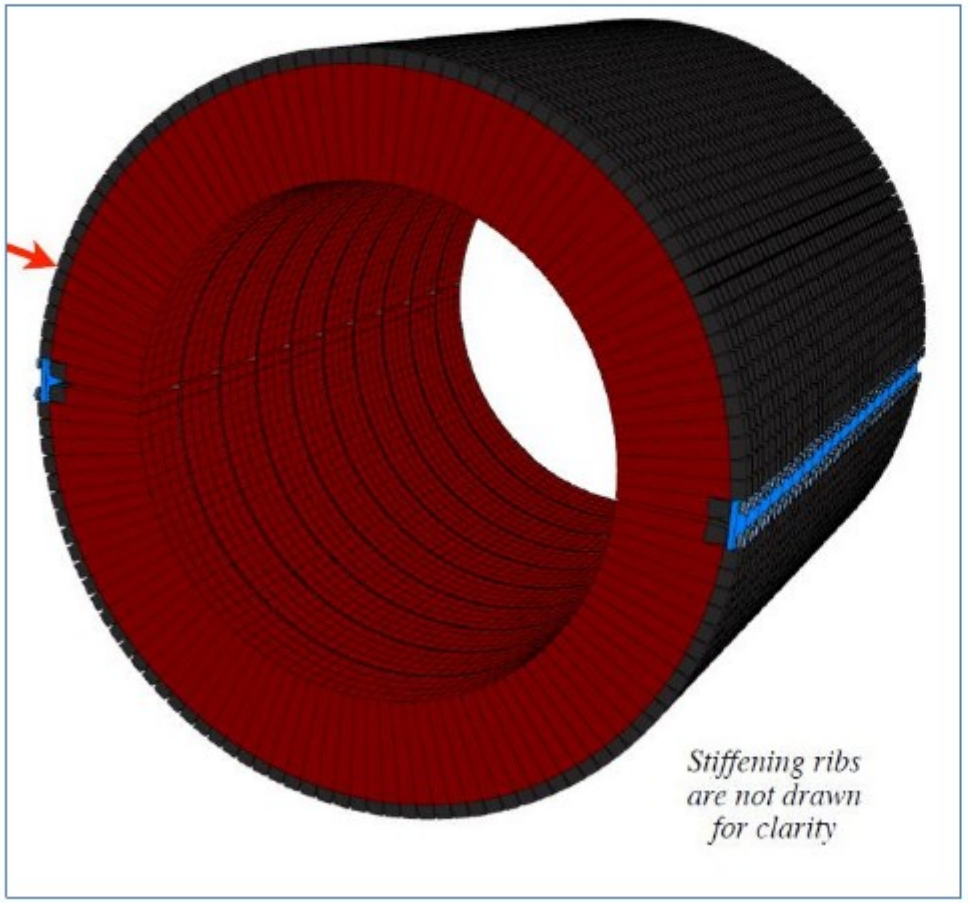
ENDCUP:

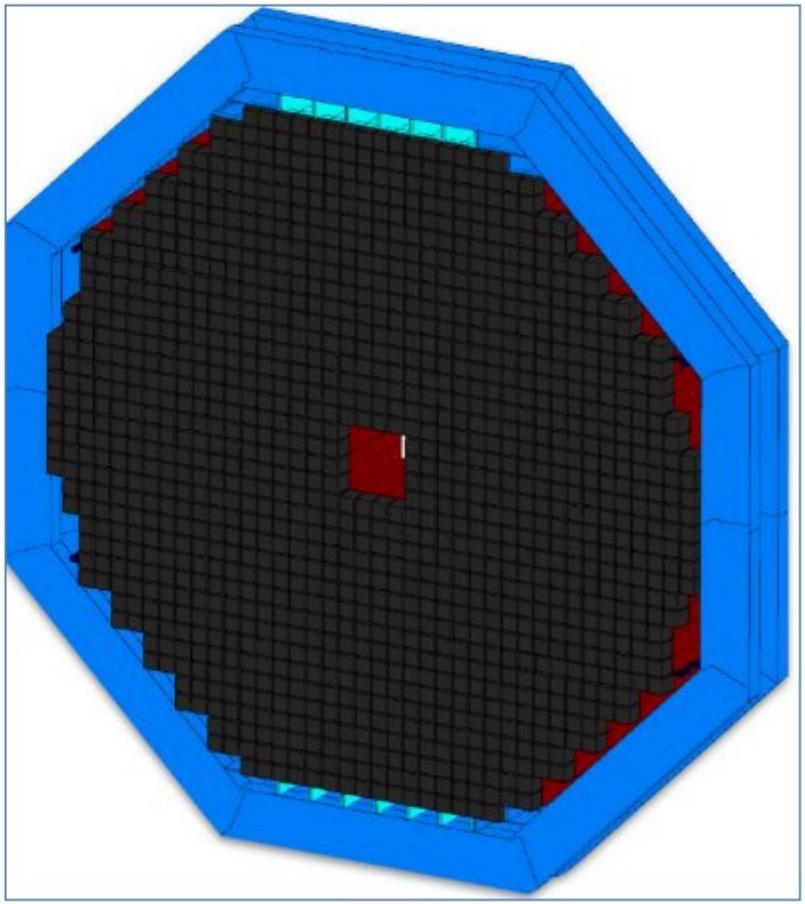
1. Cells per One = 5136
2. 2 End Cups Cells = 10272
3. ADC64 – 160
4. 16ch Amplifiers – 642
5. Power units – 20
6. Weight – 2x12.8 = 25.6 ton

NOT take in account

The Cells Wall Thickness (4 mm)

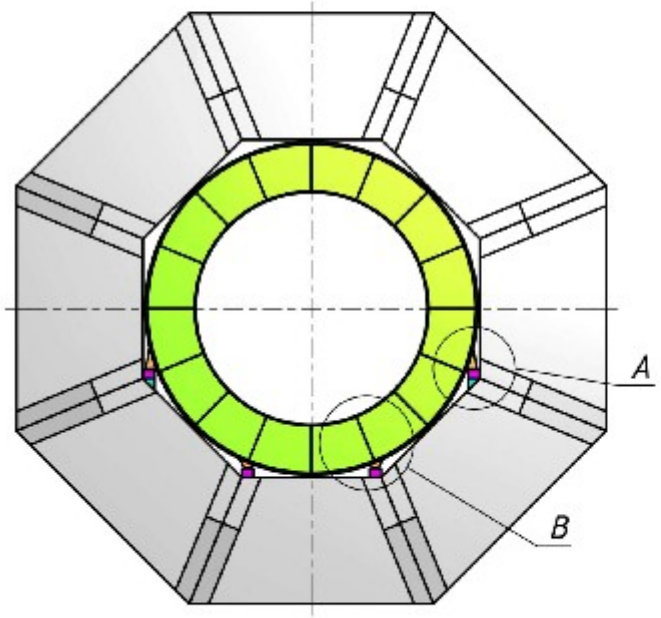
ECAL 3D View Barrel and Cup parts

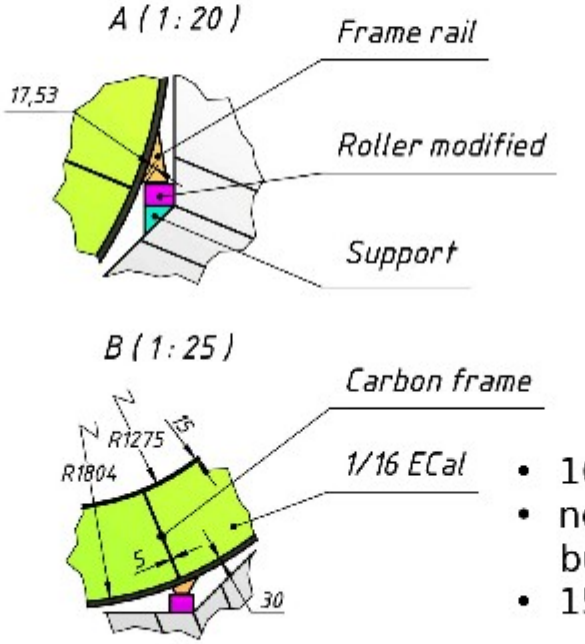




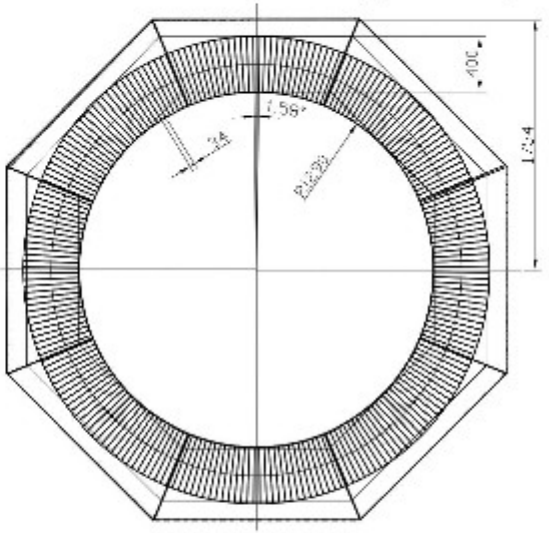
ECAL geometry

Proposed option (TDR)





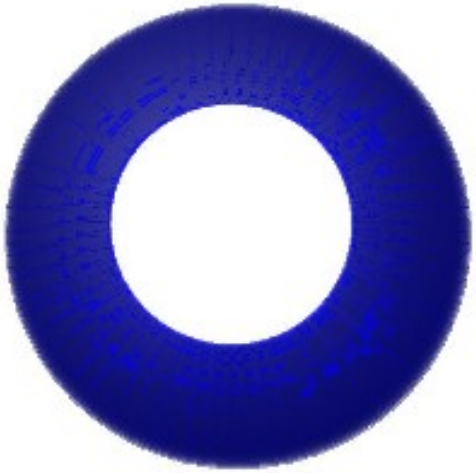
Differences to CDR geomery:



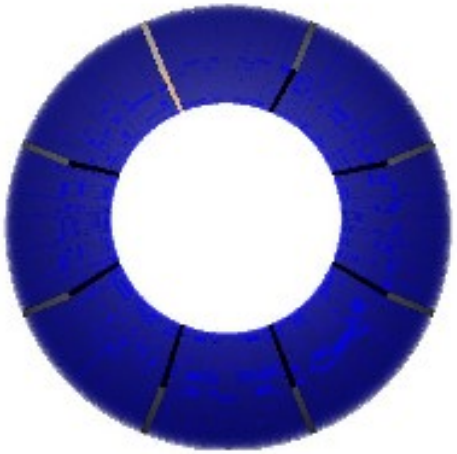
- 16 “baskets” instead of 8
- no gaps between “baskets”,
  but: 5 mm carbon frame in between
- 15 mm carbon frame in front

Will it impact the performance?

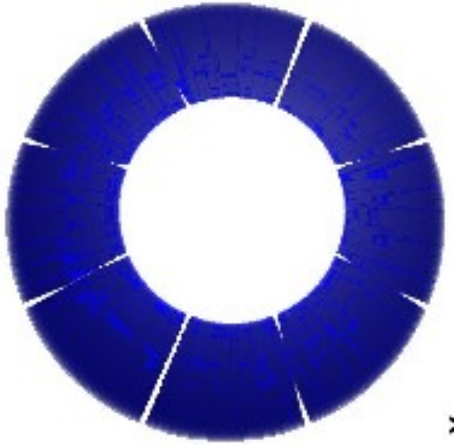
Tests



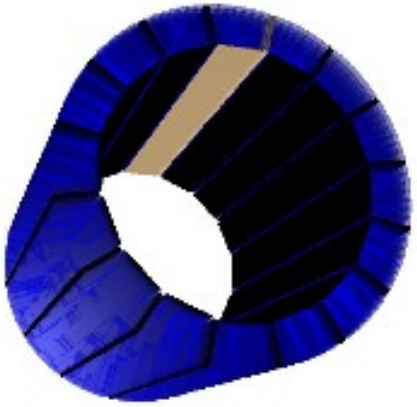
no gaps



gaps between sectors
(carbon frame)

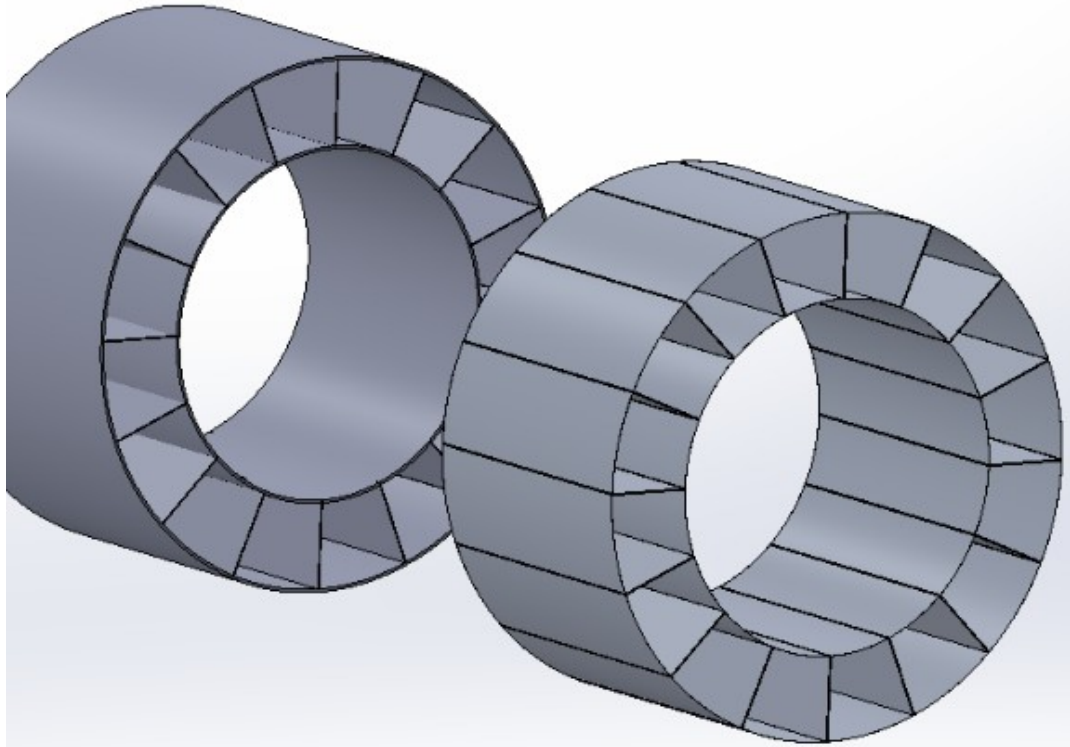


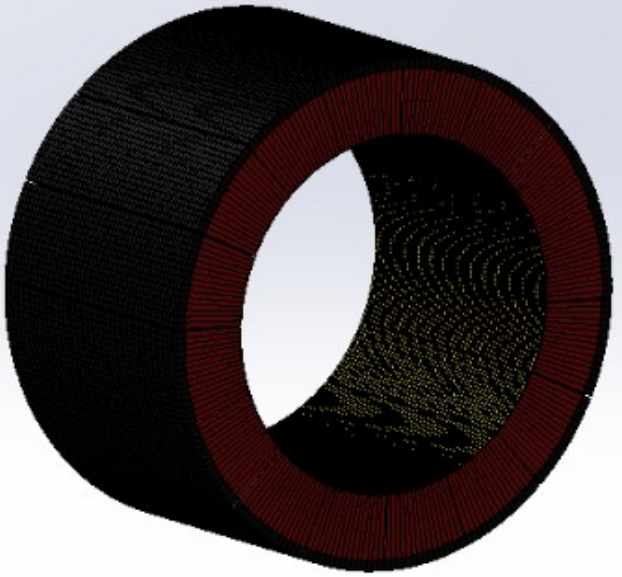
gaps between
sectors (air)



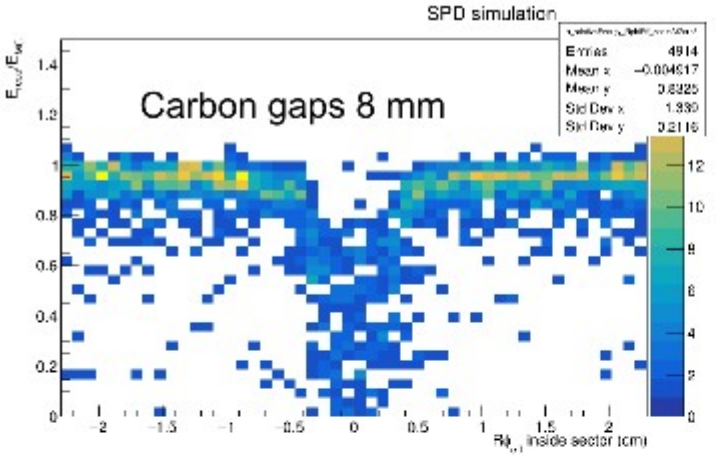
gaps between sectors
(carbon frame)
+ carbon in front

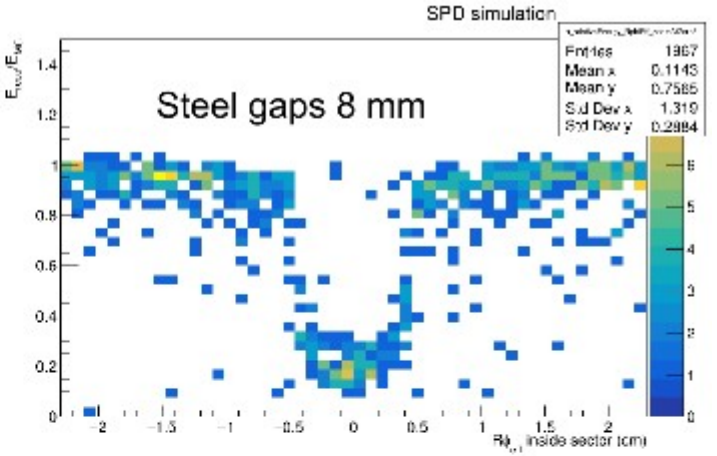
***gaps are enlarged in comparison to real life**

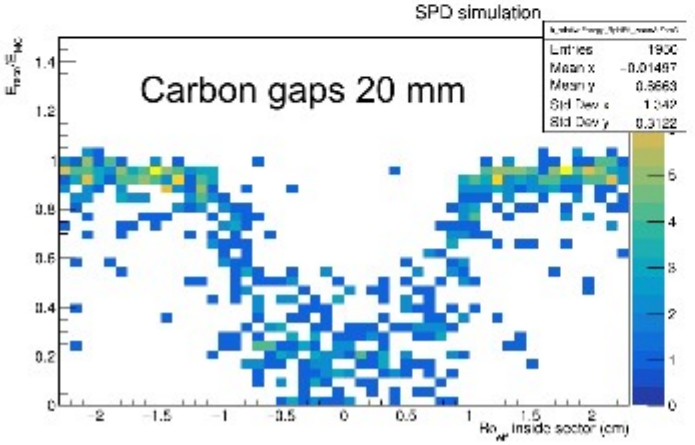


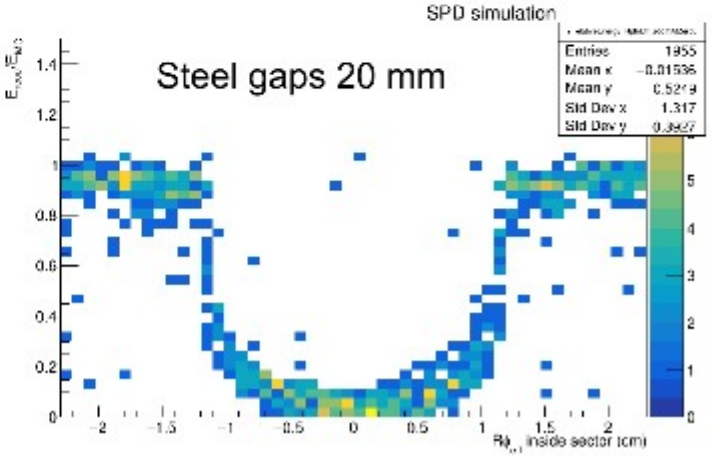


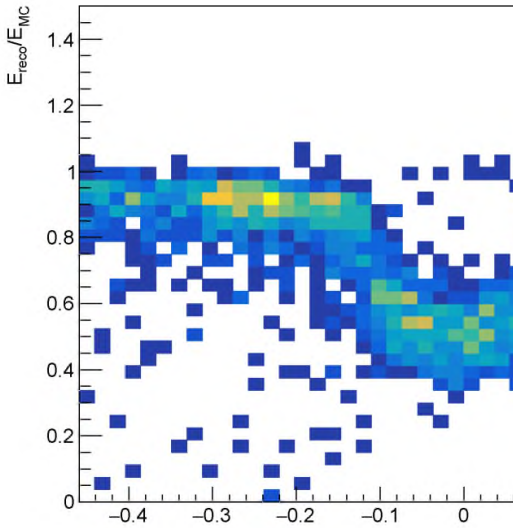
φ (azumuthal gaps): 5 GeV photons: ratio of reconstructed/simulated energy

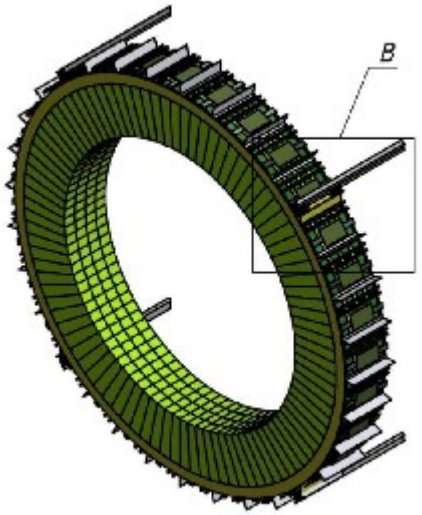









E_{reco}/E_{MC}
1.4
1.2
1
0.8
0.6
0.4
0.2
0
−0.4
−0.3
−0.2
−0.1
0


B