

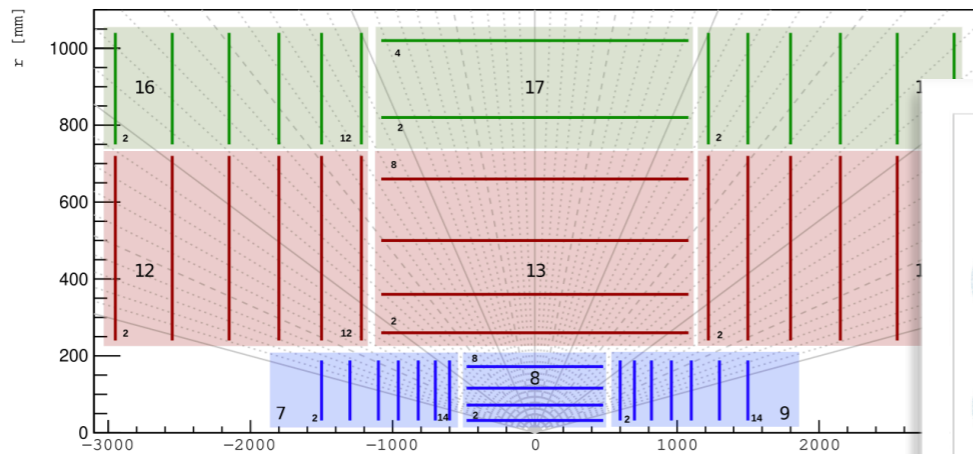
# Open Data Detector - Status & Release



A. Salzburger (CERN)

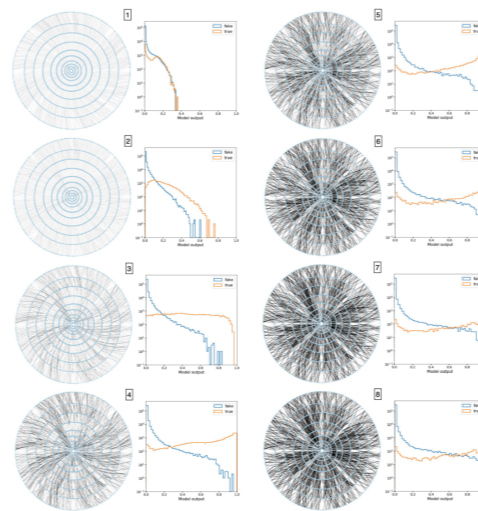
# From this workshop only

## A virtual detector



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## Information Flow

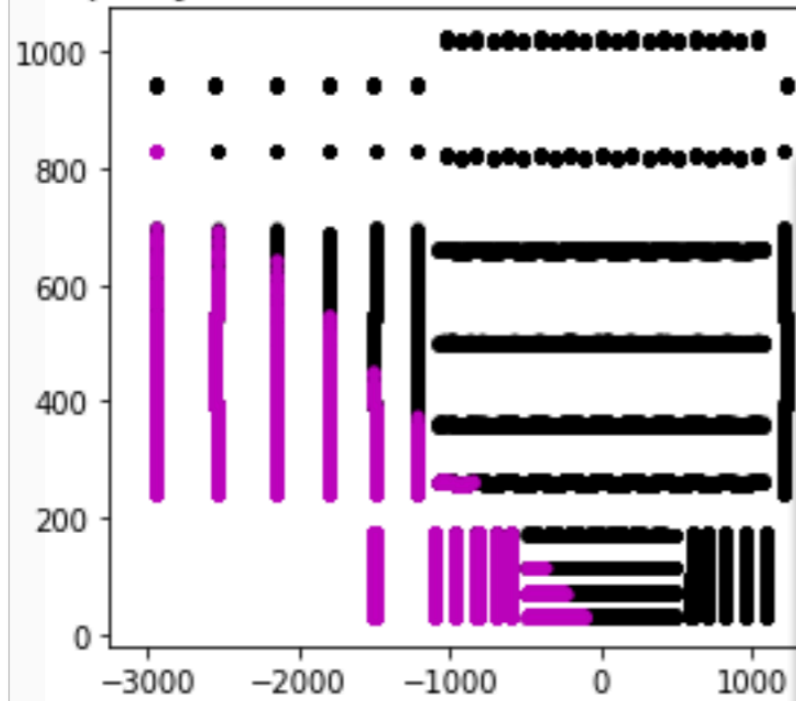


- Checking edge score after each step of graph network.
- Effective output of the model is in step 8.
- Full track hit assignment learned in last stages of the model.
- Tracklets learned in intermediate stages.

Graph Networks - Learning to Discover: Advanced Pattern Recognition, IFA Workshop 2019 | M.Kunze

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query restricted to volume : 7, avg quality: 6.18



## Results

dataset size: ~20%  
1,637 particles, 11,030 hits

plotting error: too many  
doublets 392529

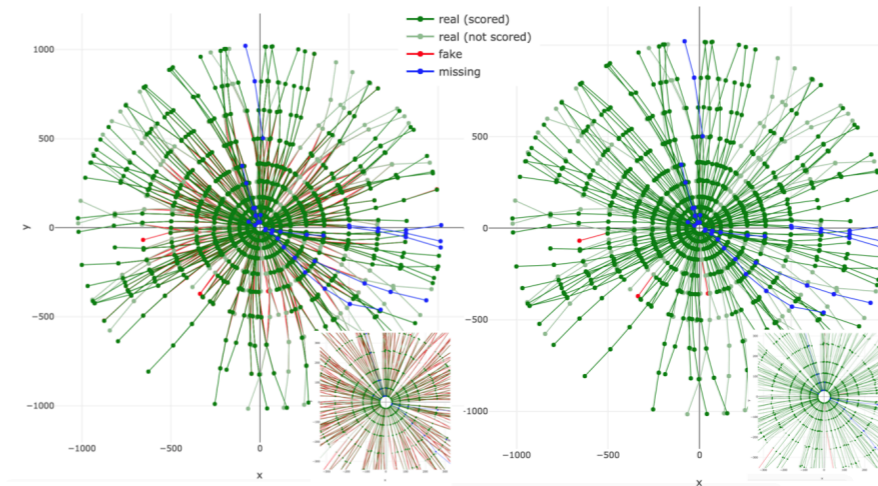
392,529 doublets  
 $p=0.26\%$ ,  $r=99.15\%$

57.3s  
build  
QUBO

2,546 doublets  
(2,964 triplets)  
QUBO size: 14,345

17.1s  
sample  
QUBO  
running on CPU

1,512 doublets  
 $p=99.13\%$ ,  $r=97.06\%$   
trackml score **97.55%**



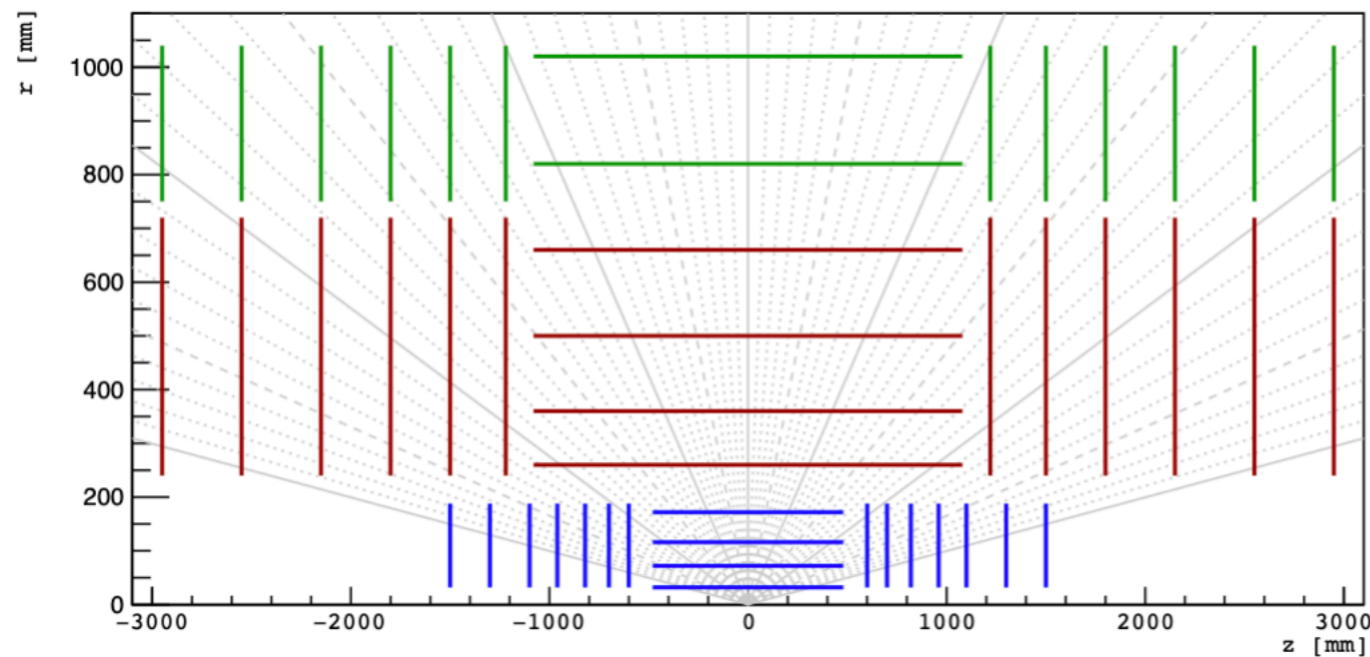
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# CHEP2018 - announcement

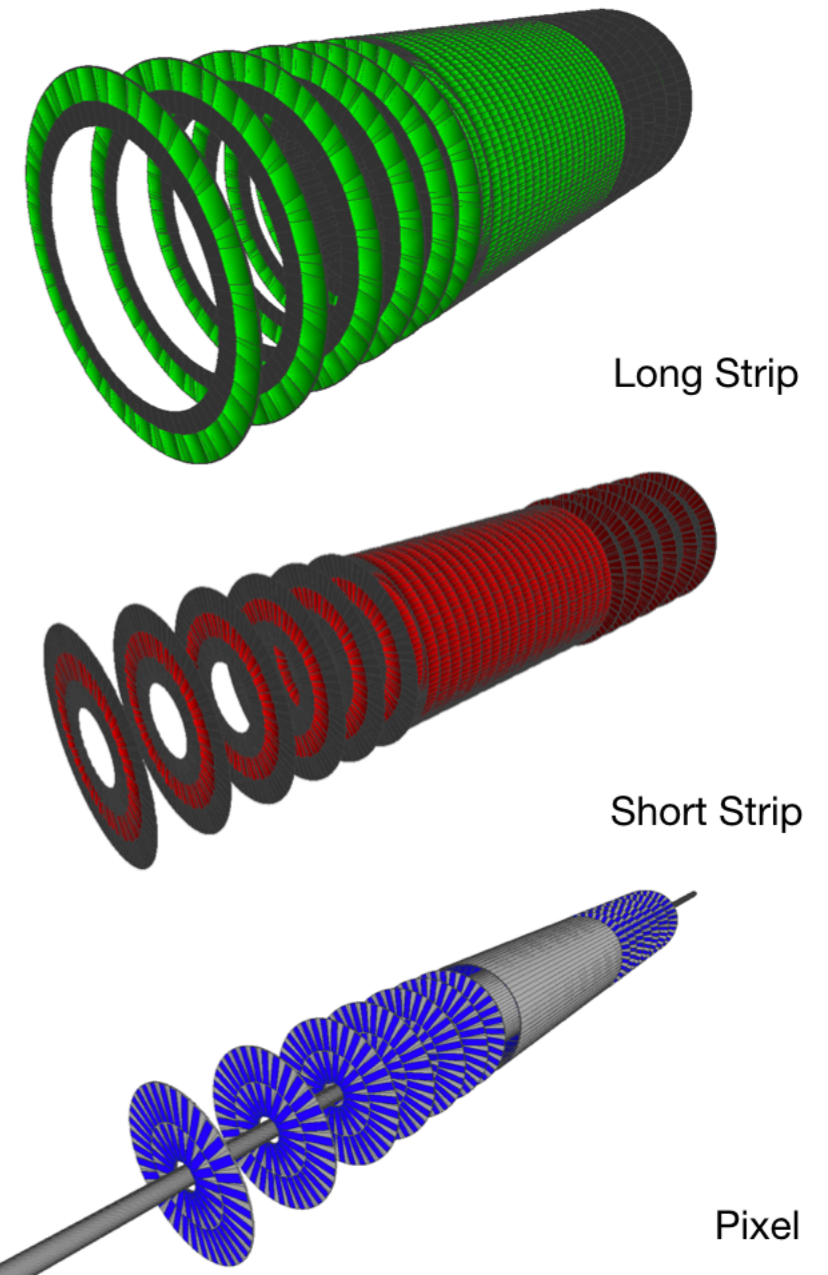
## Reference detector & dataset

Common dataset for development within the community

- detector used for ~~TrackML~~
- dataset produced with ACTS fast simulation
- **proposal:** iron out the few features we discovered & dataset (LHC/HL-LHC), publish on [opendata](#)  
CERN



A. Salzburger - CHEP2018



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Resynchronising master, add open data detector

!164 · opened 2 weeks ago by Andreas Salzburger

Improvement

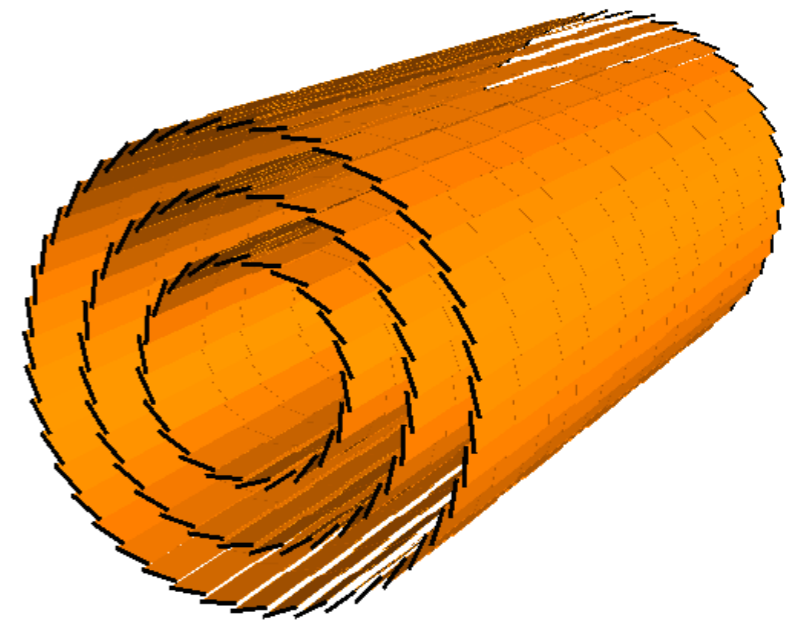
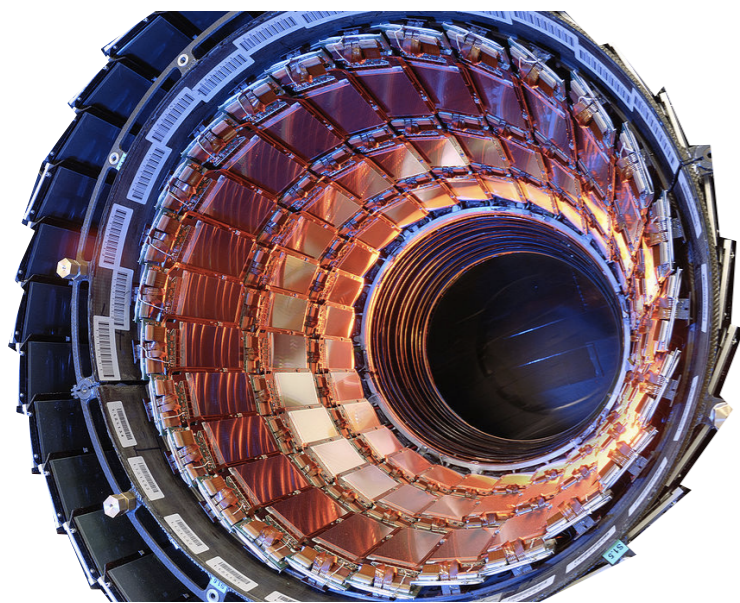
New Feature

MERGED 1 of 2 1 18

updated 3 days ago



# Where's the right working point?



real

ideal

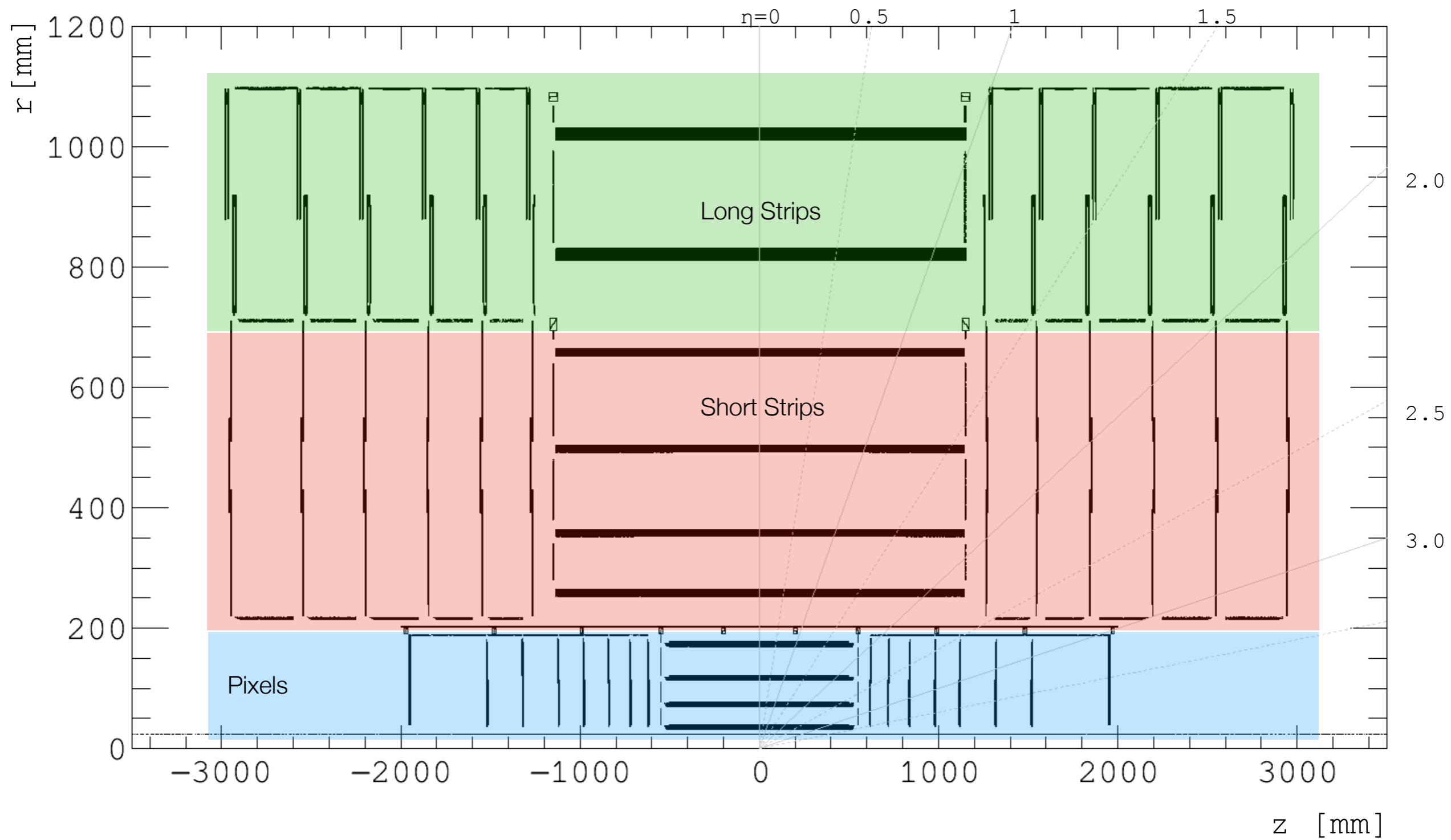


Simulation

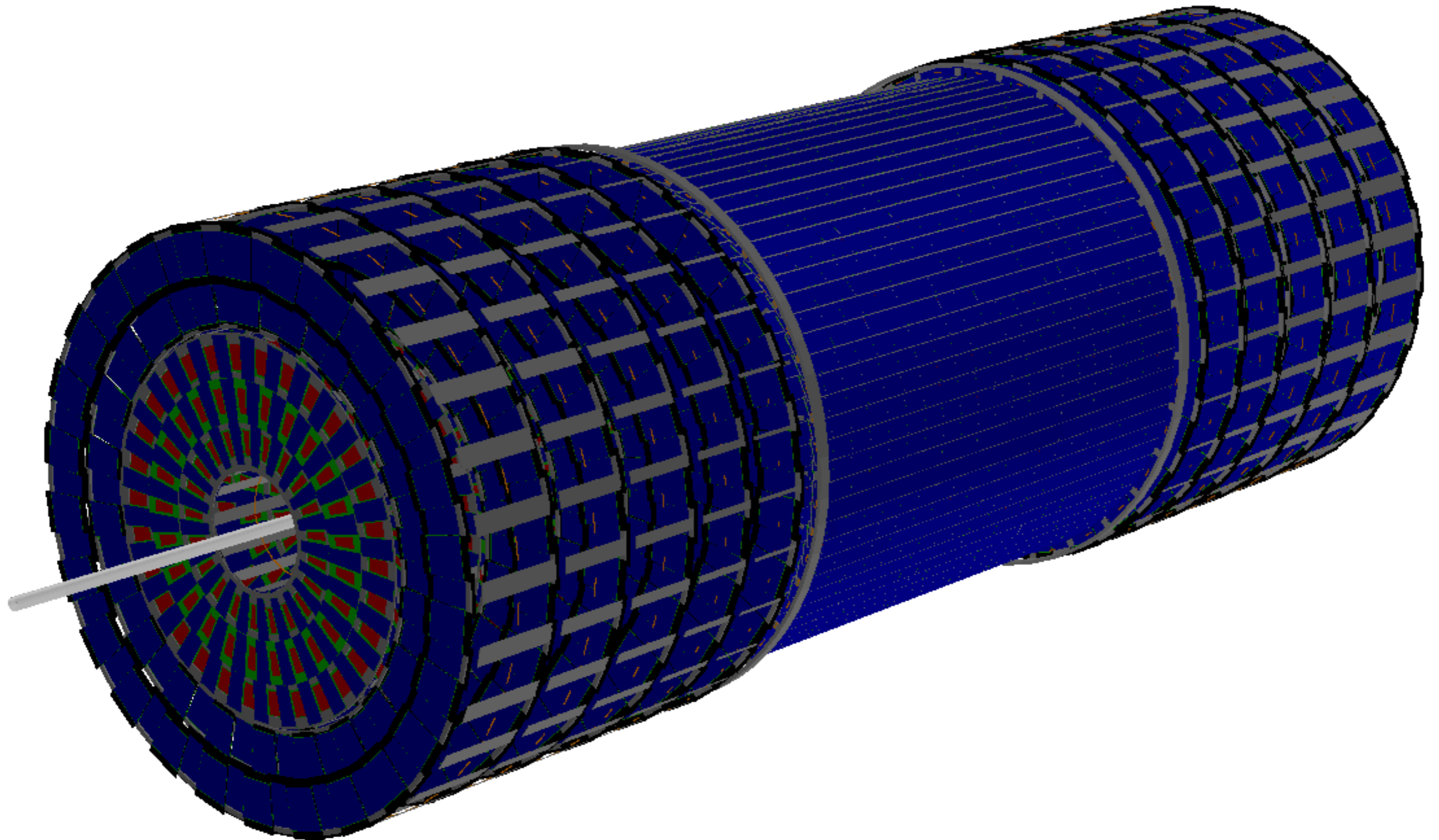


Reconstruction

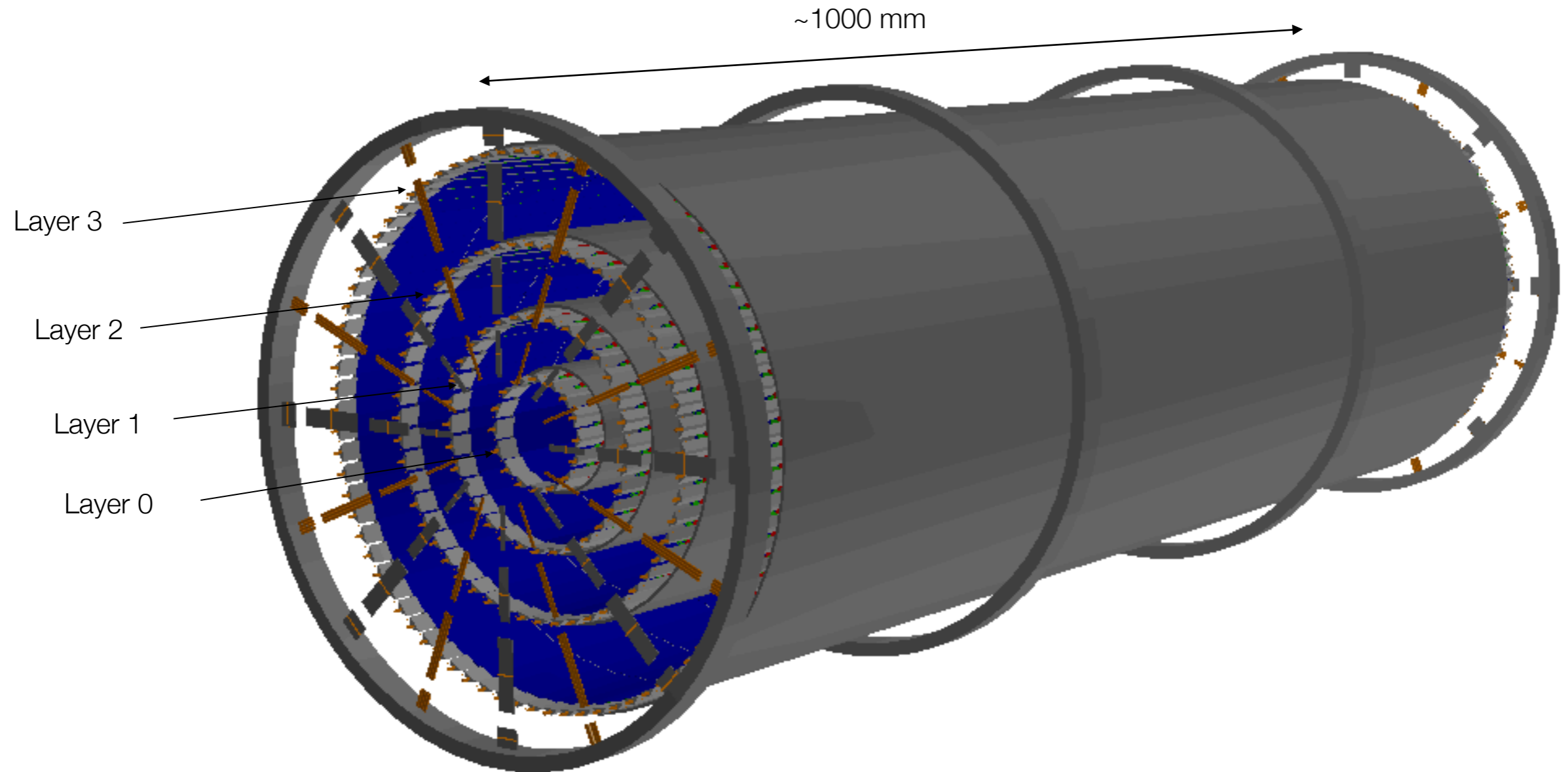




# Full tracker view

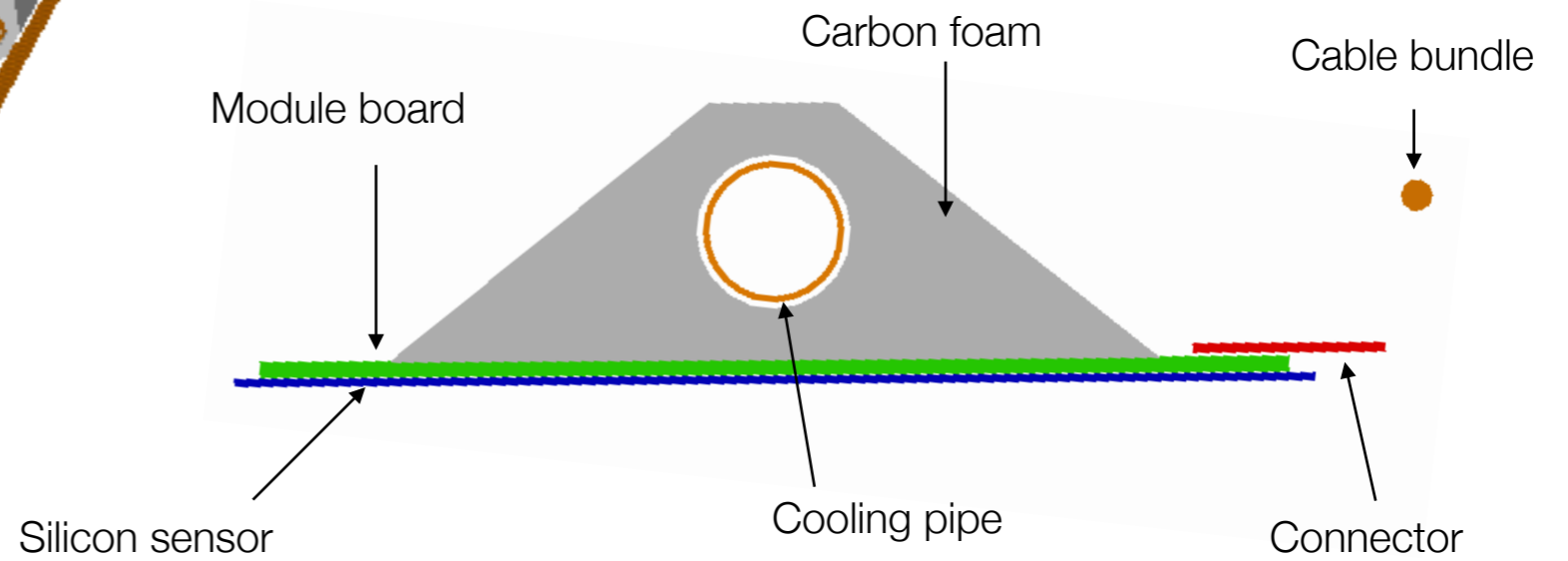
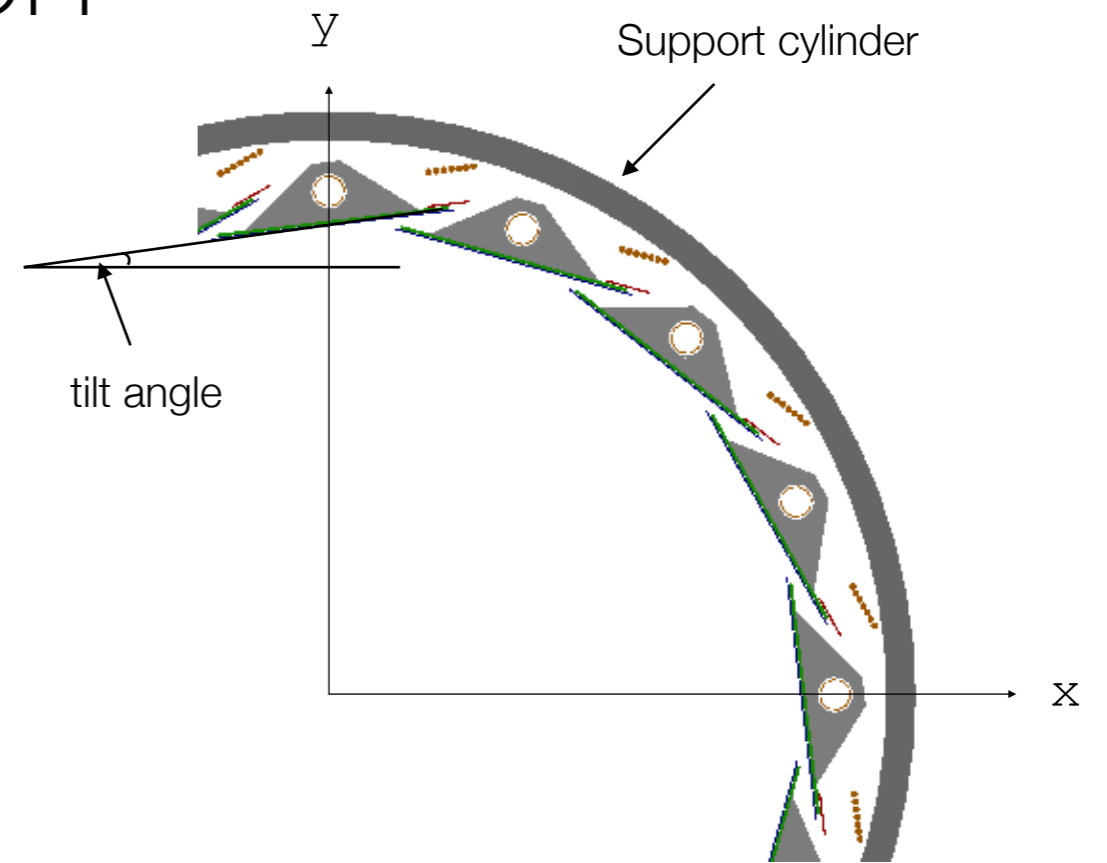
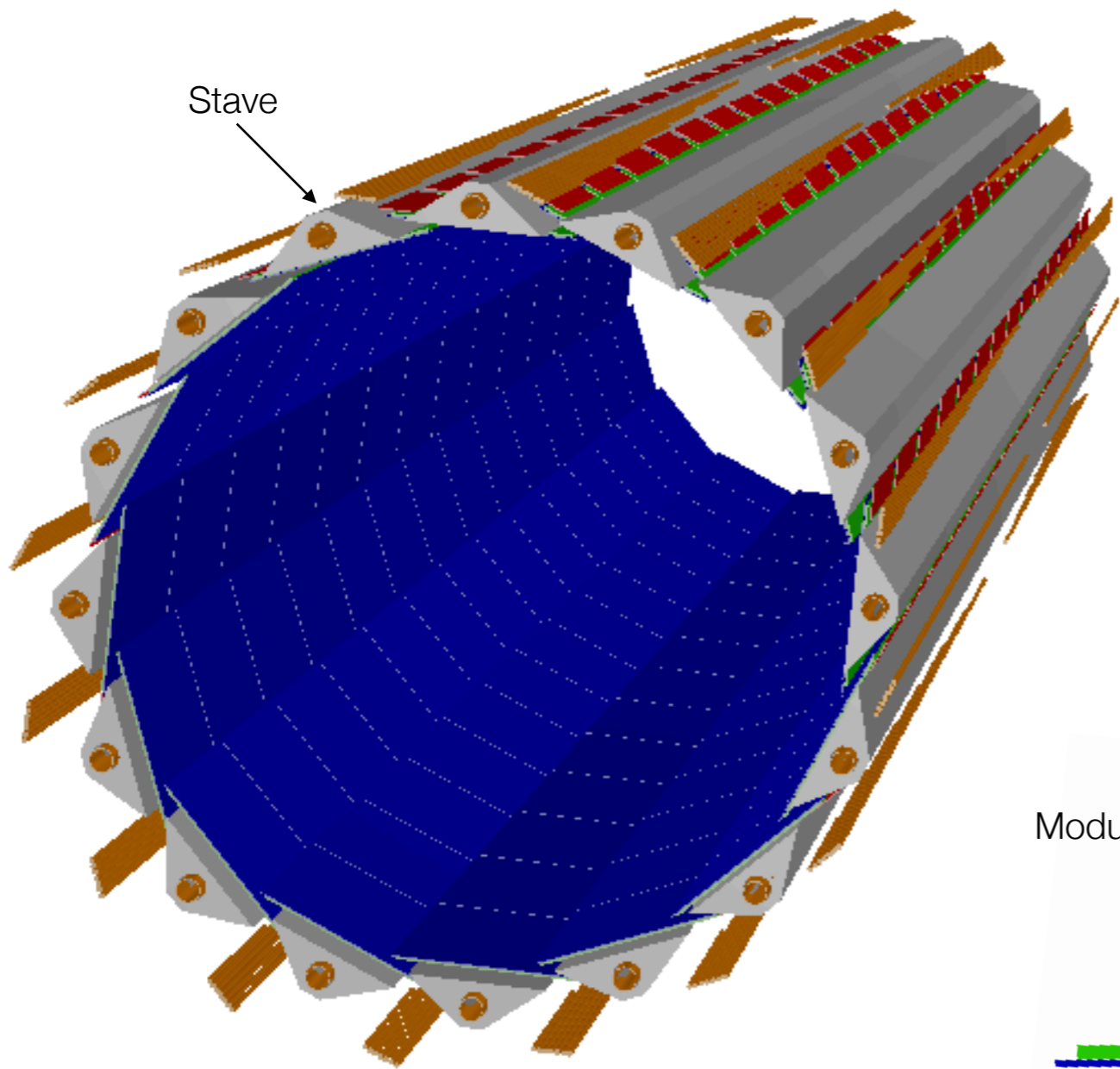


# Pixel barrel system

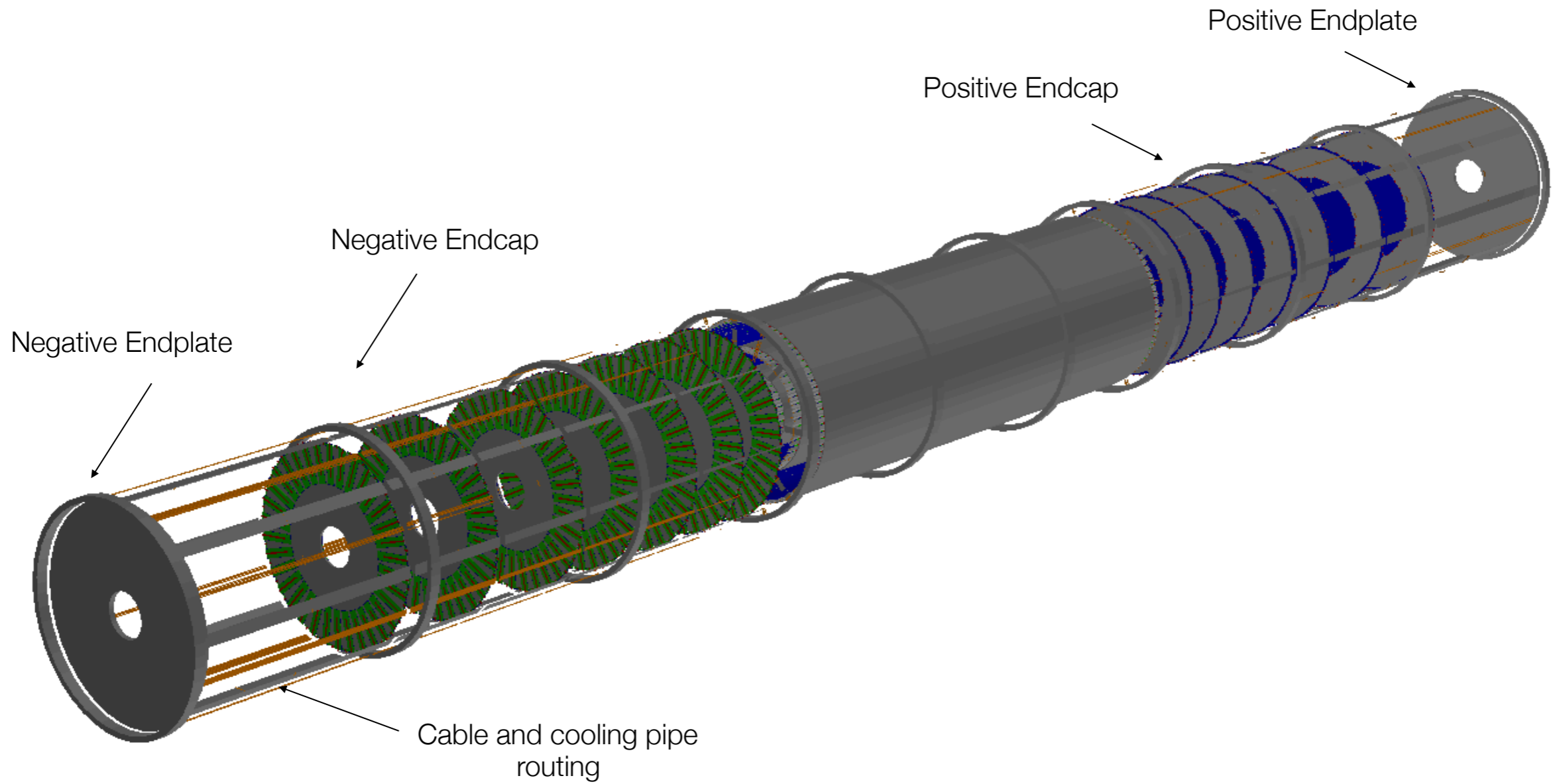




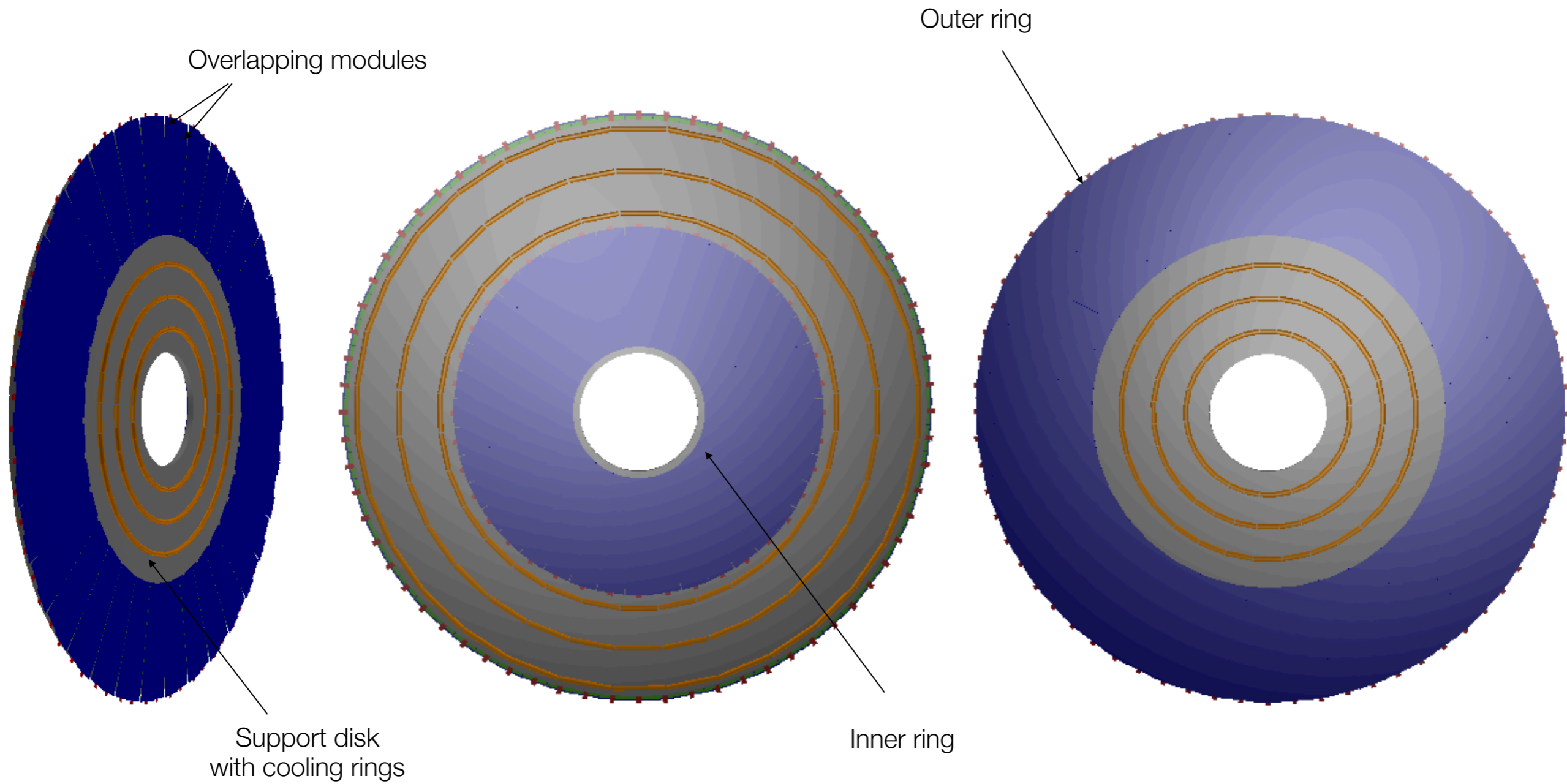
# Innermost layer definition



# Full pixel system

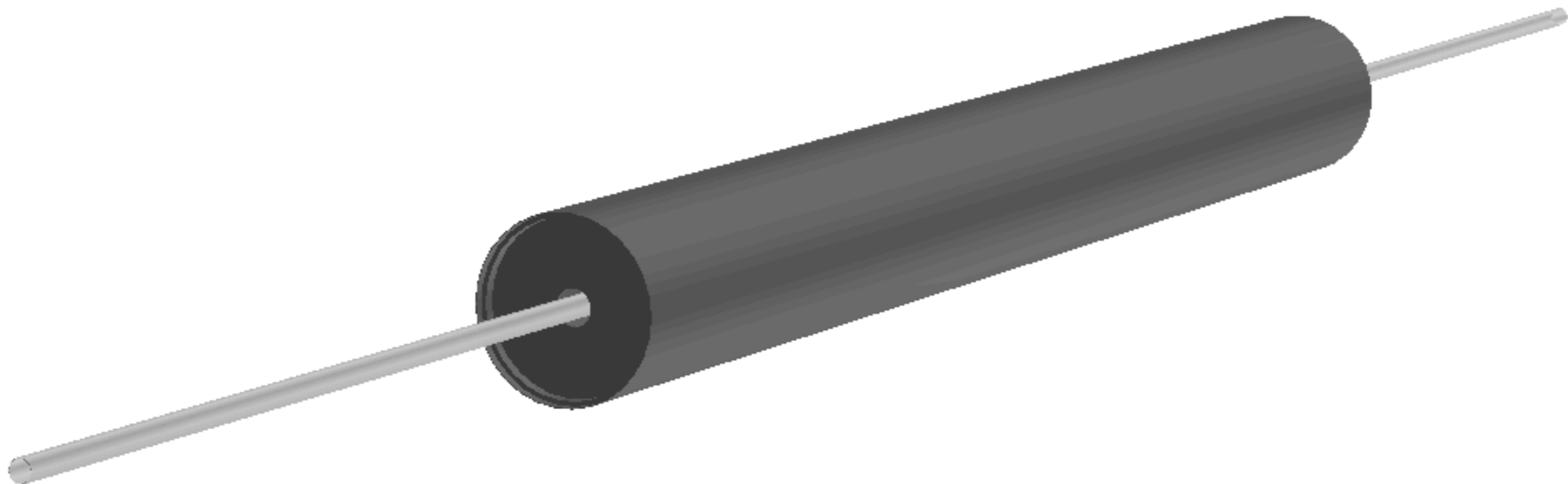


# Pixel end cap example

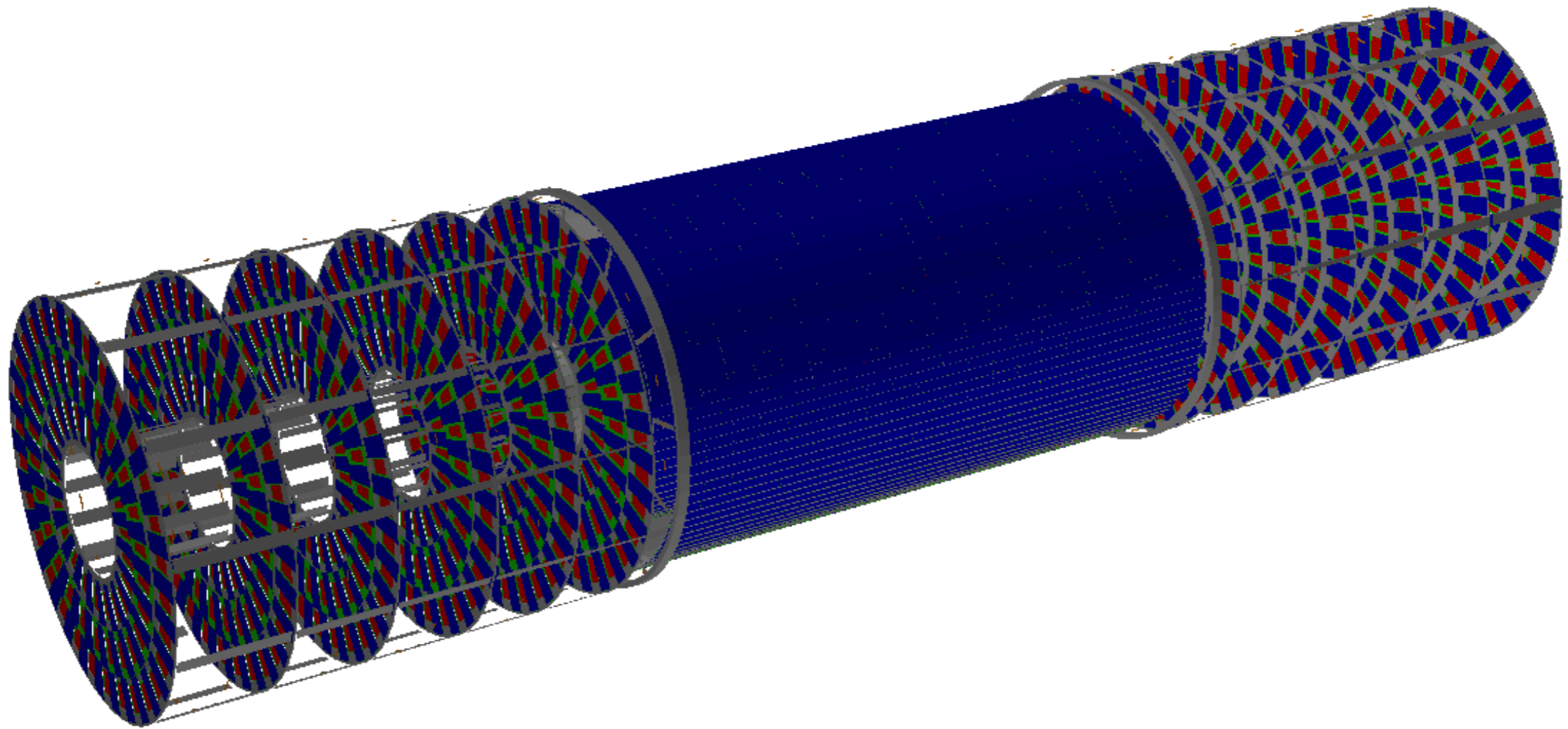




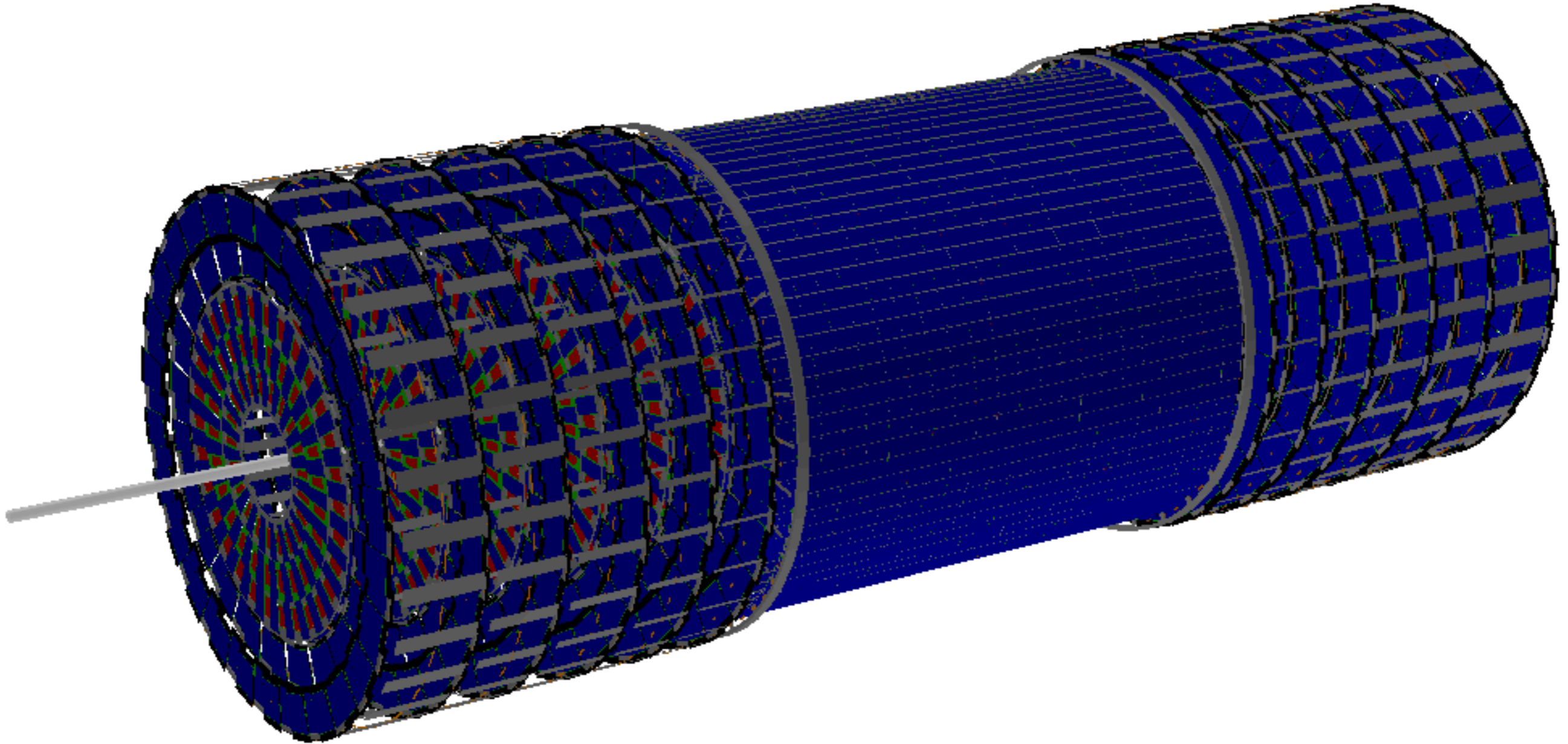
# Pixel support tube



# Short strip system



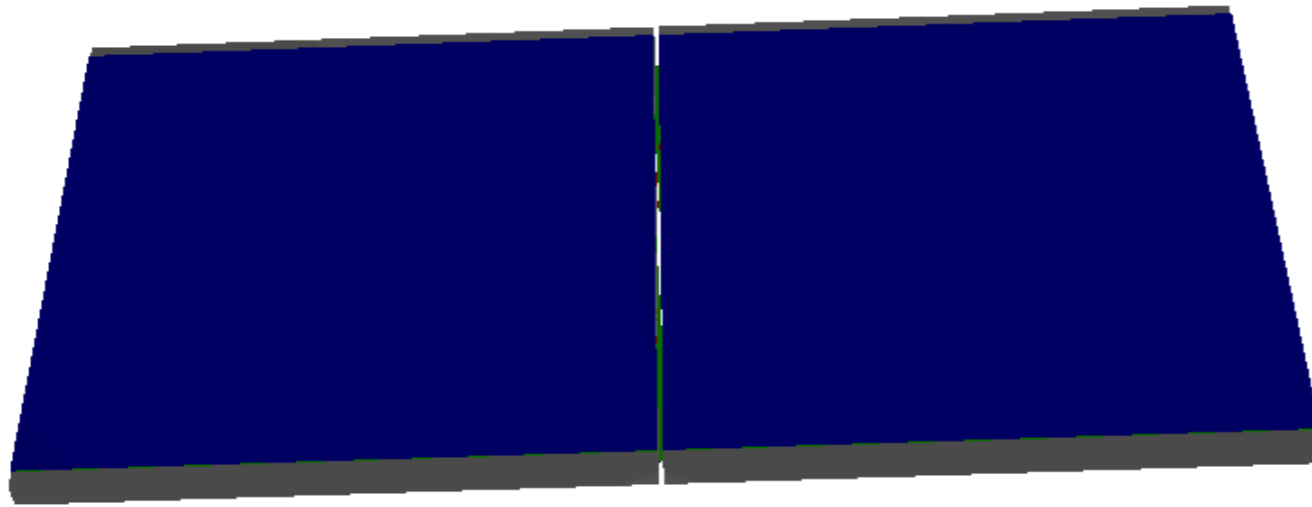
# Long strip system



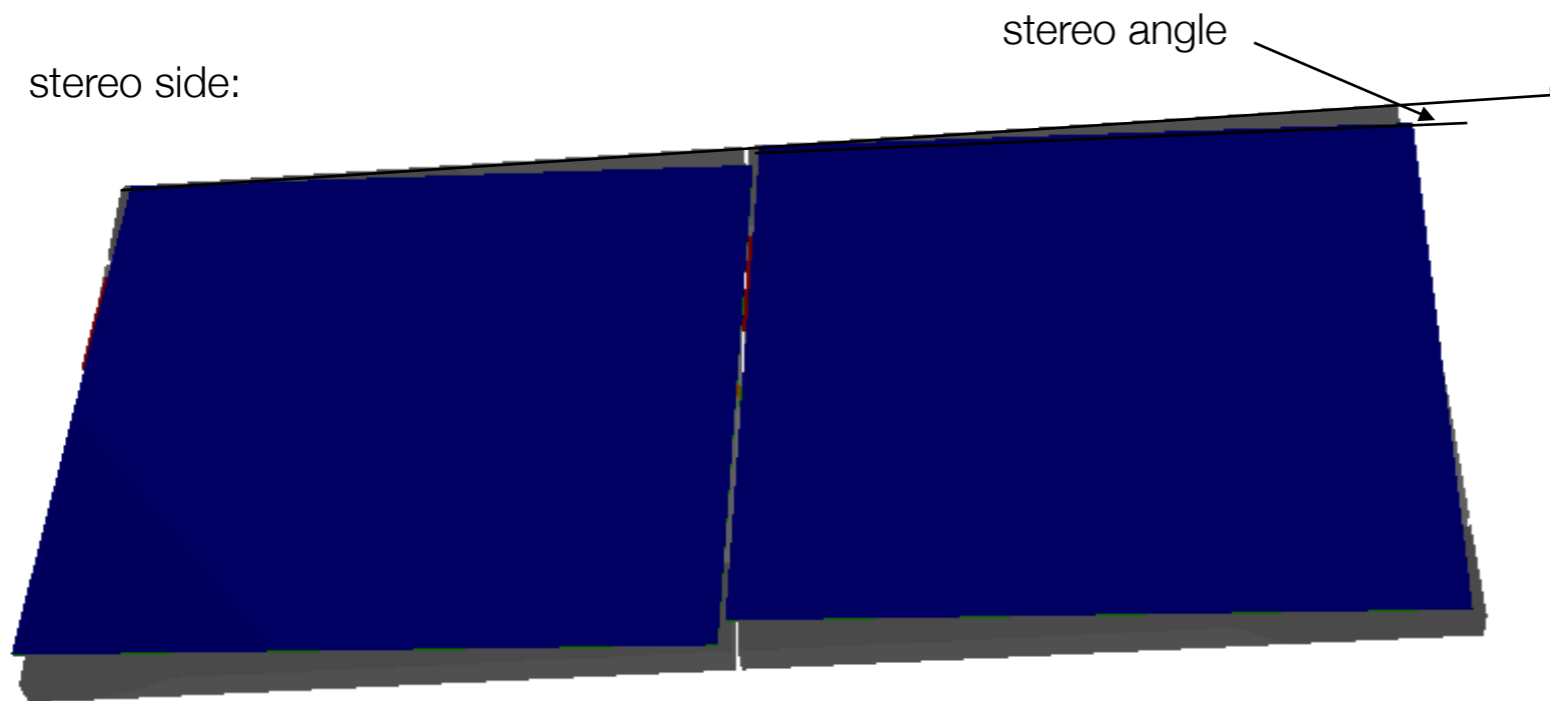


# Stereo angle in outermost strip system

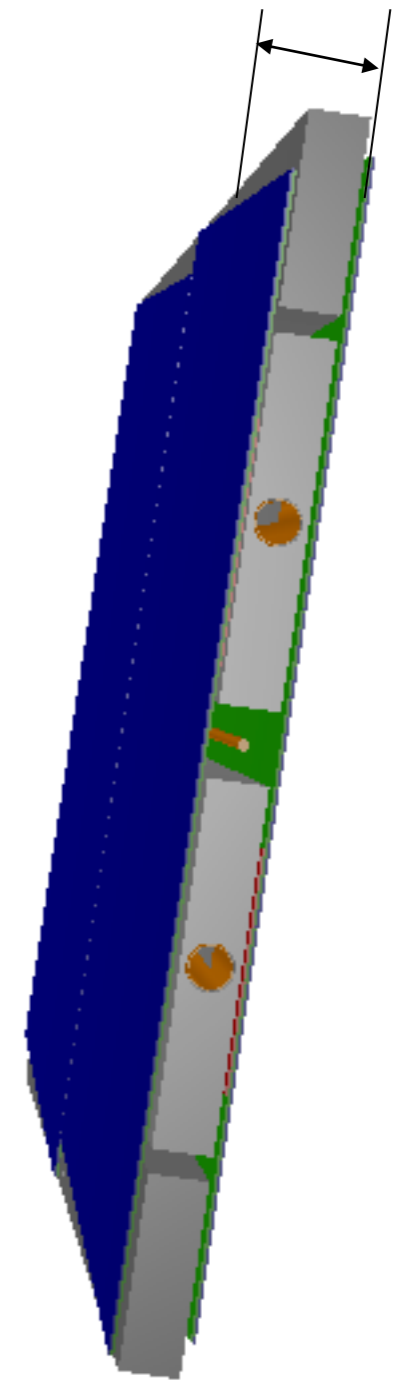
axial side:



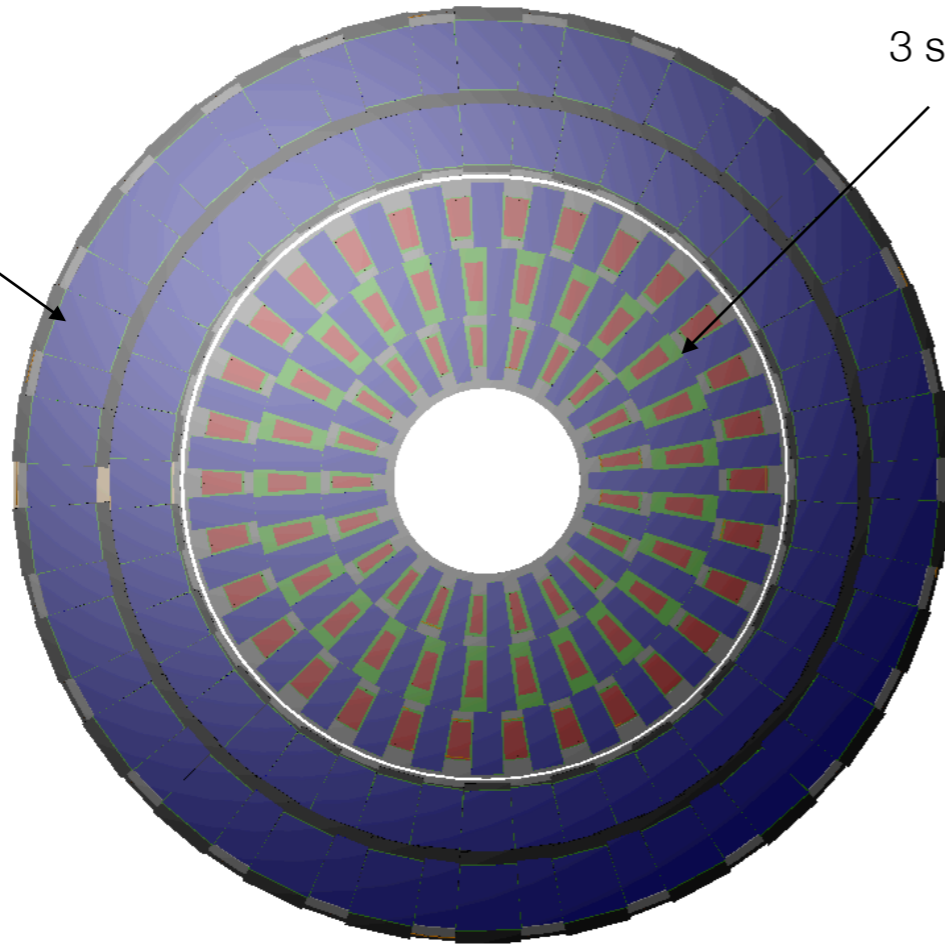
stereo side:



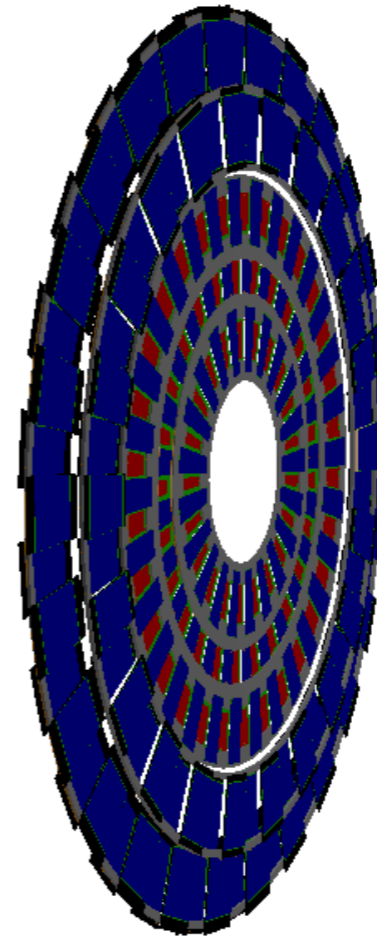
module gap



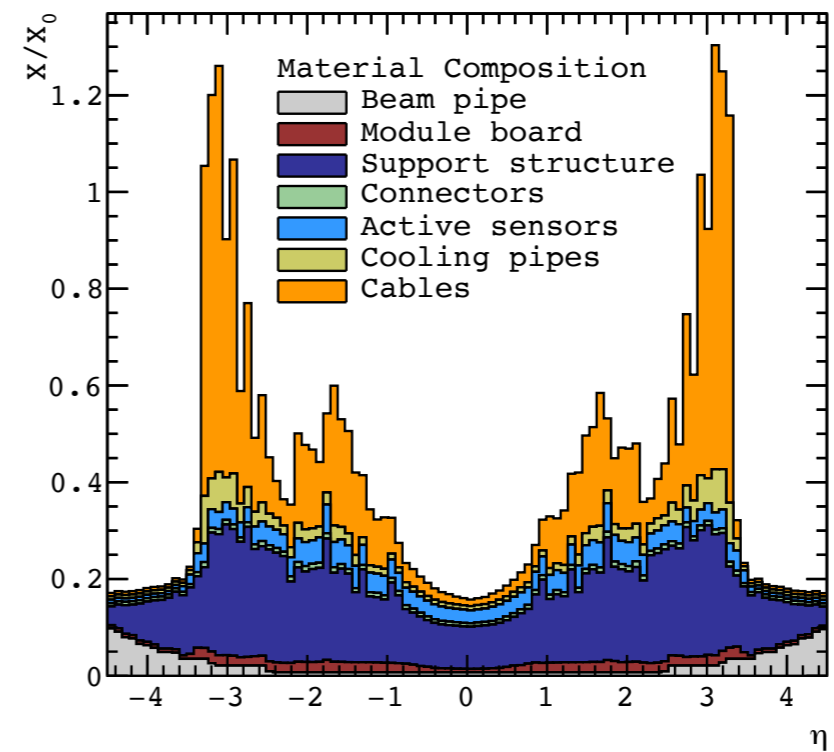
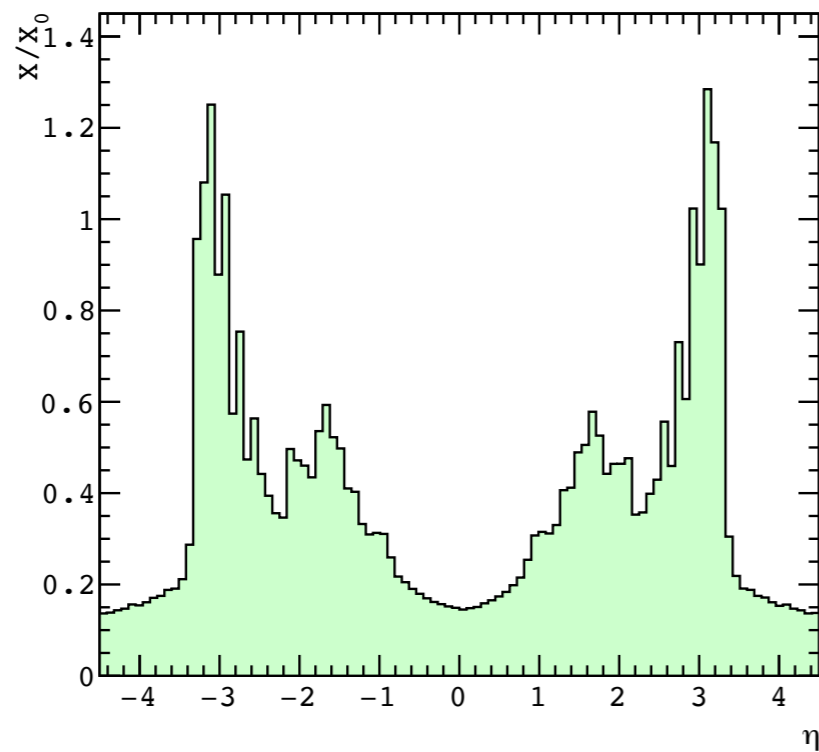
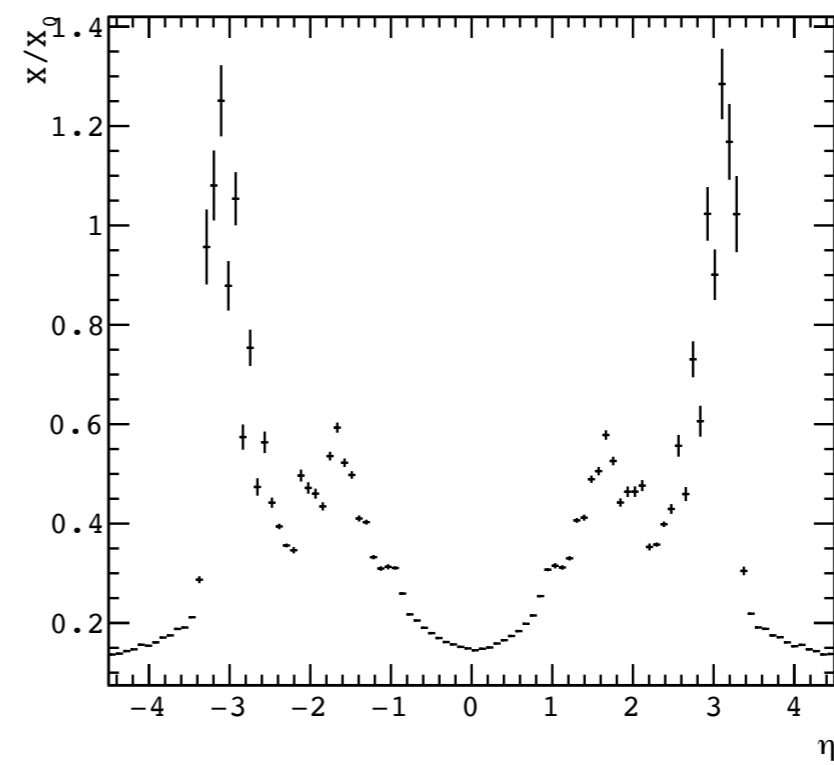
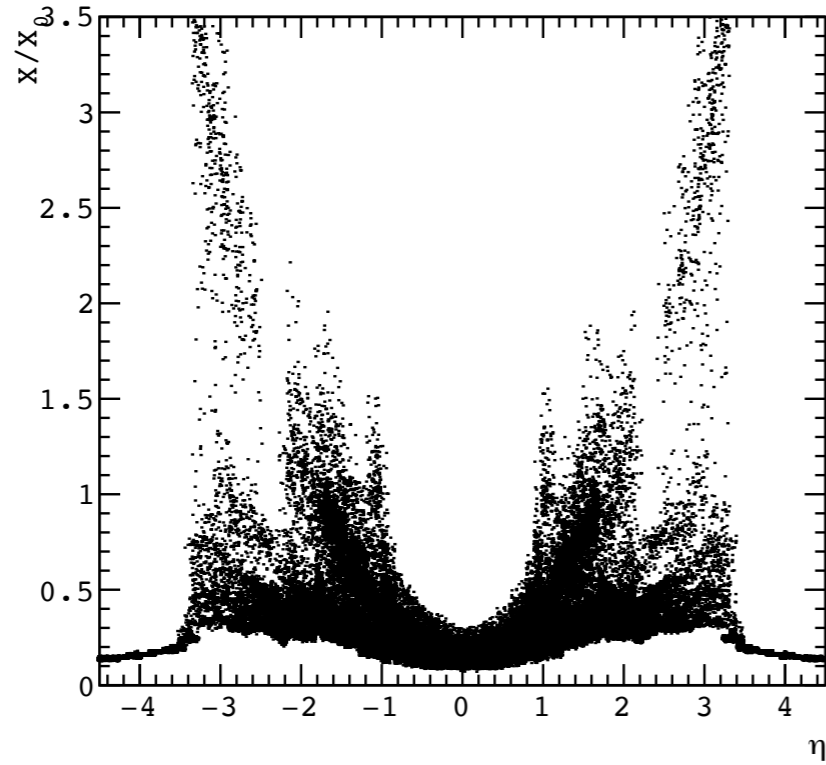
2 Long strip rings



3 short strip rings



# Current material model



# Reconstruction geometry

