

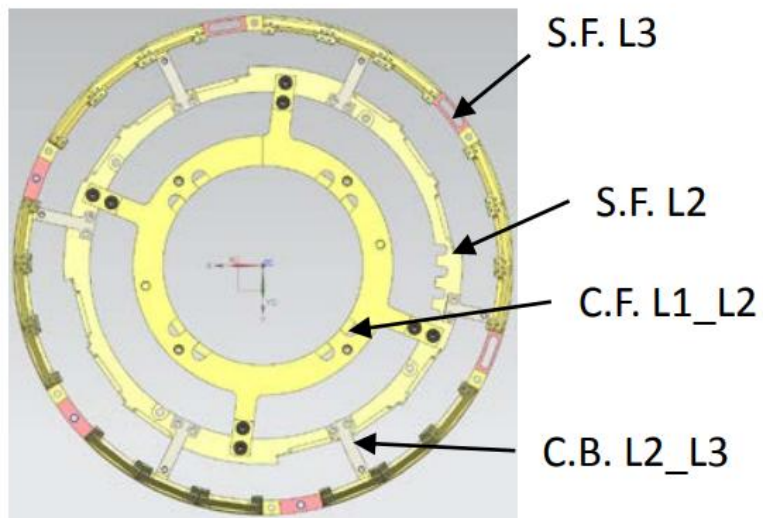
# GEOMETRY OF THE PASSIVE ELEMENTS

L. Lavezzi

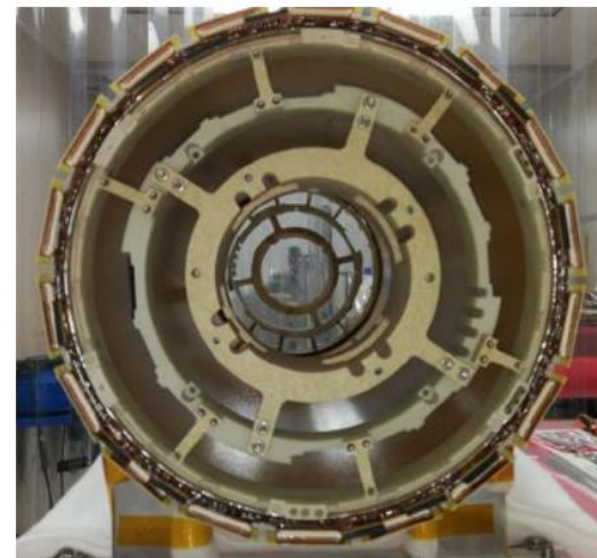
from the design by M. Melchiorri

IHEP, 2019-03-21

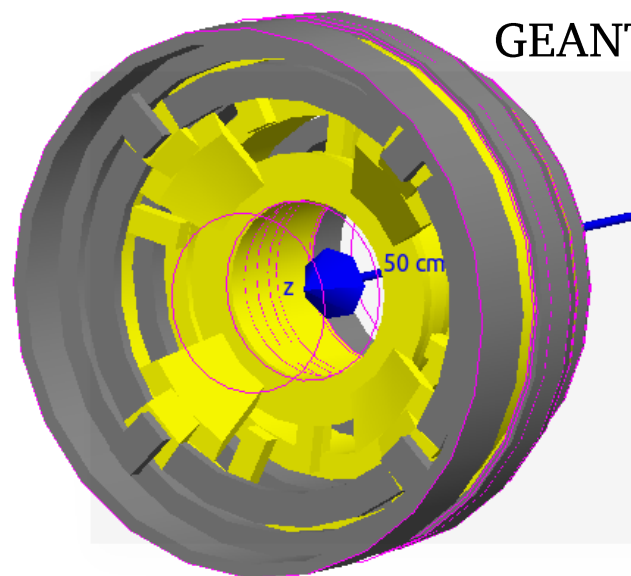
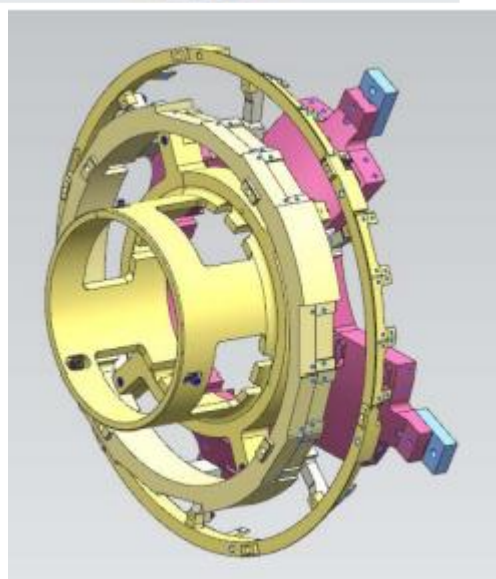
- simplification of the CAD design (by Michele)
- implementation in standalone, for visualization
- porting to CgemBoss completed



EAST

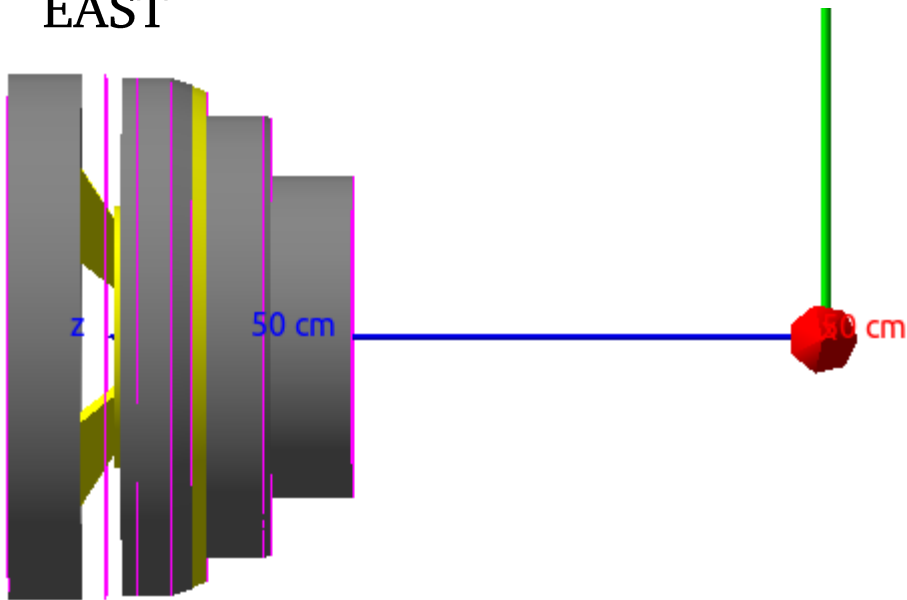


real

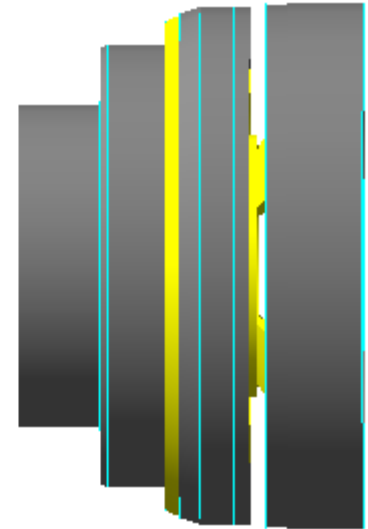


GEANT4

EAST



WEST



**MATERIALS:**

Grey → Aluminum

Yellow → Permaglas

(*i.e.* 60% fiberglass + 40% epoxy)

Cables → copper + polyethylene

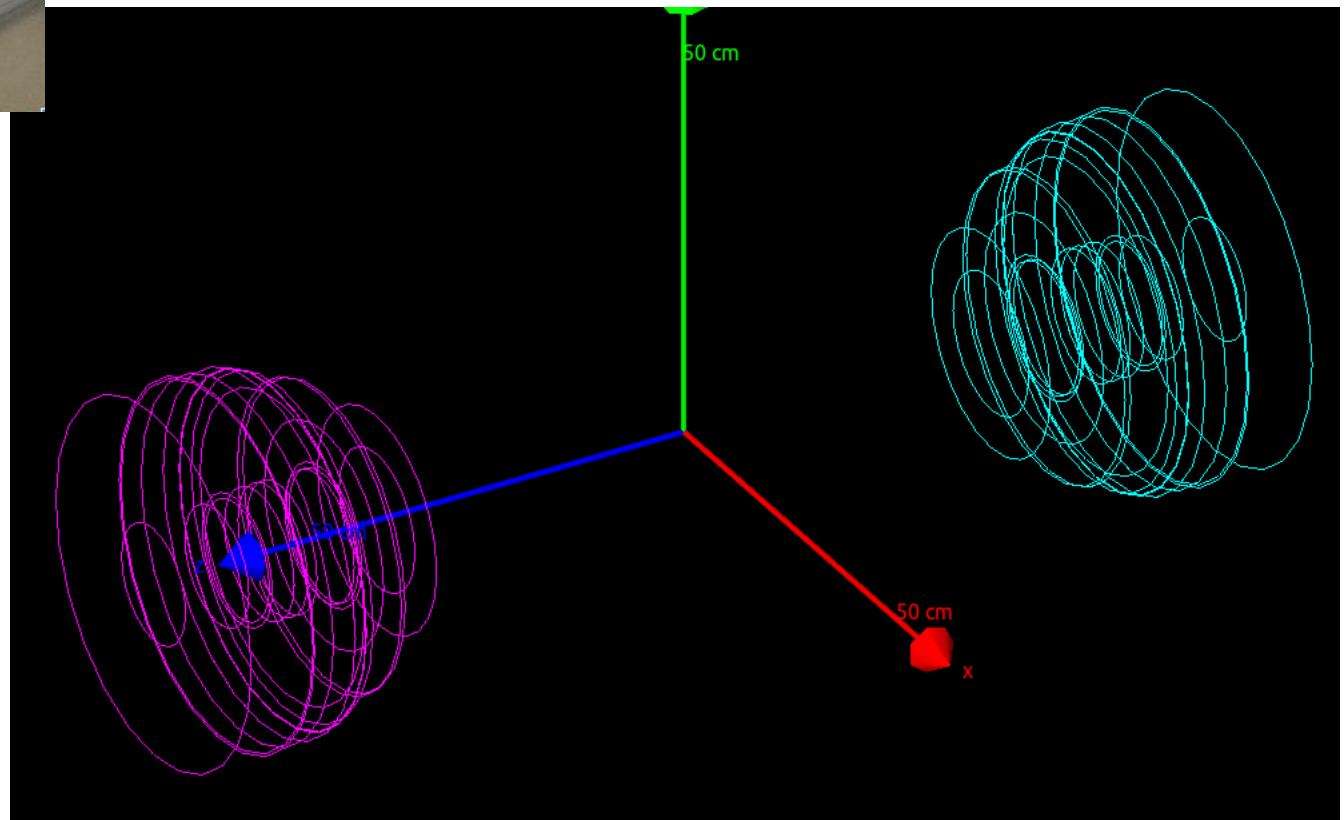
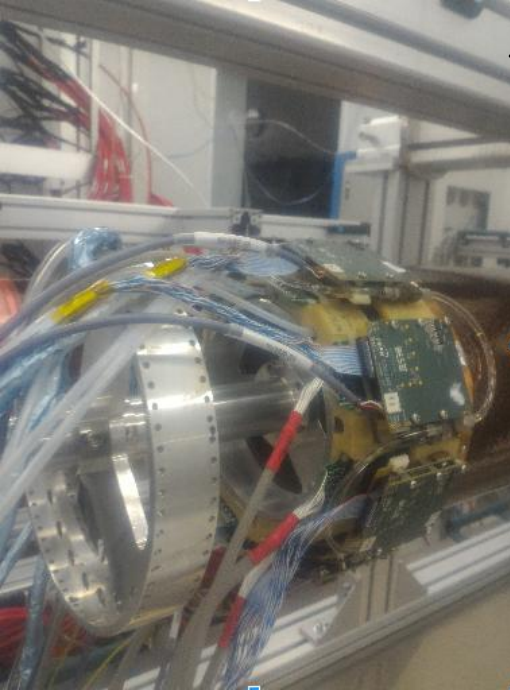
## Example of the cables

- HV cables
- LV cables
- Signal cables

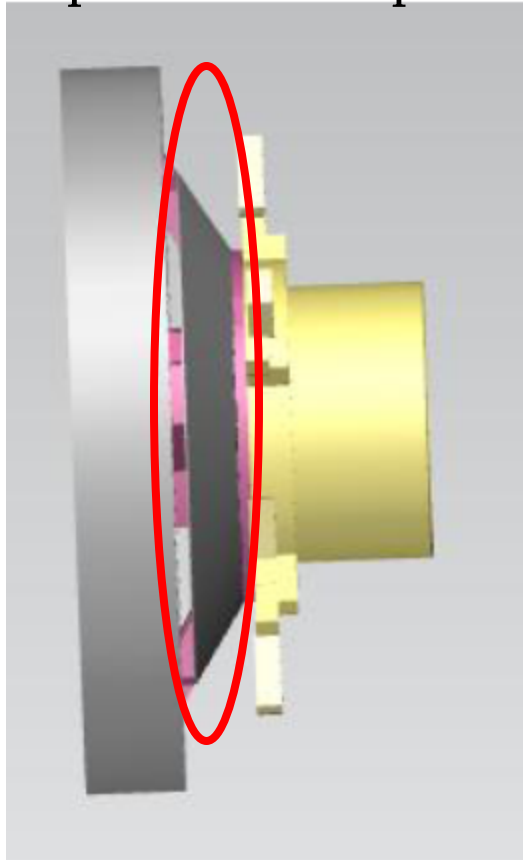
### APPROXIMATION

a container with an *ad hoc* density, considering:

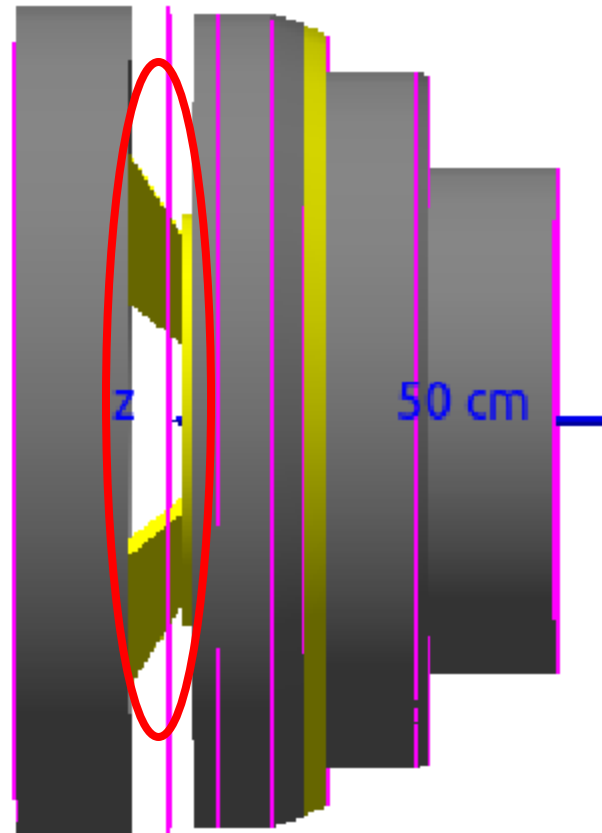
- $R_{\text{copper}}/R_{\text{cable}} = 0.7$
- Fill factor = 0.7



Simplified CAD (partial)

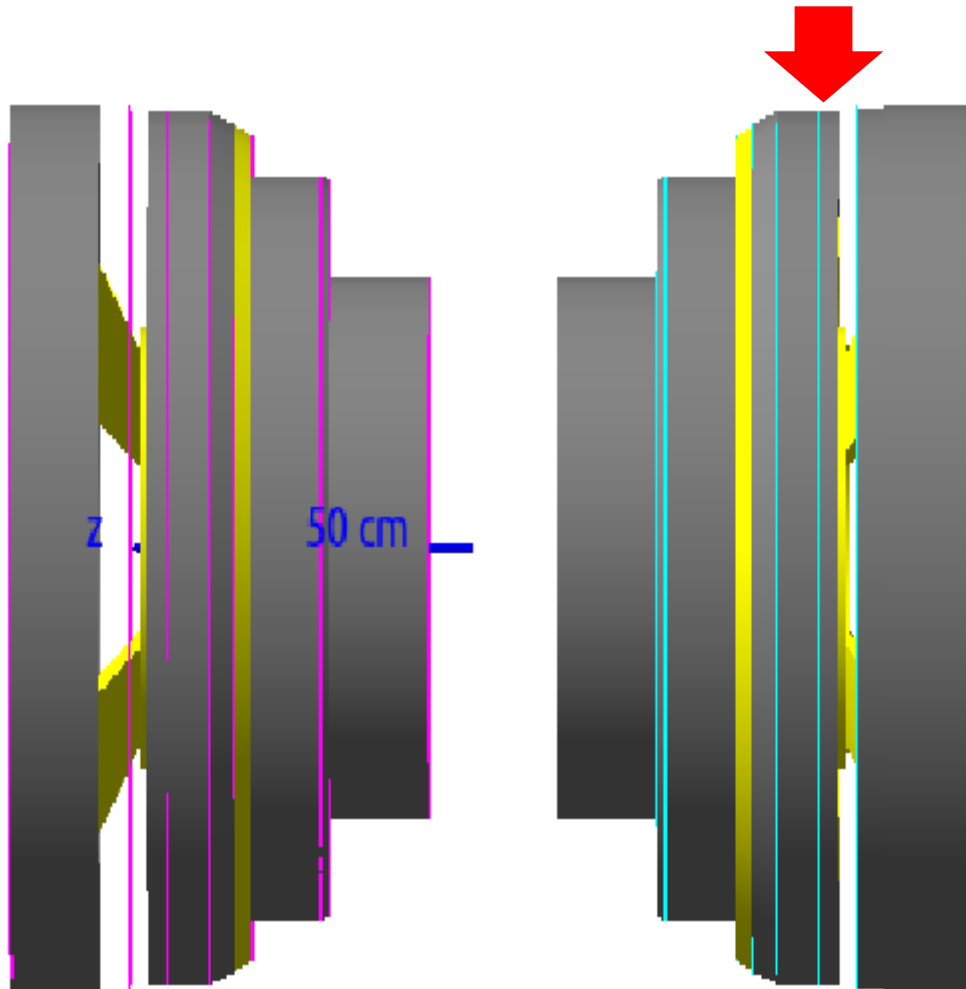


GEANT4 (full)

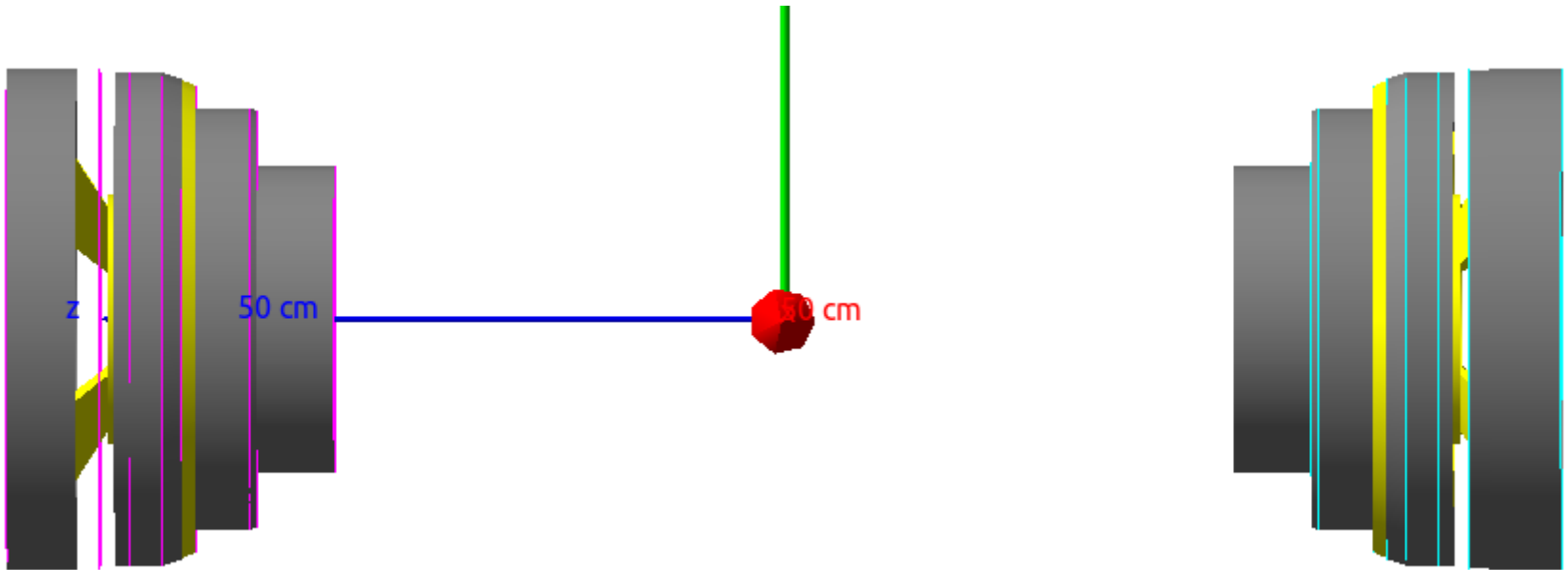


Covering cone removed according to last decisions

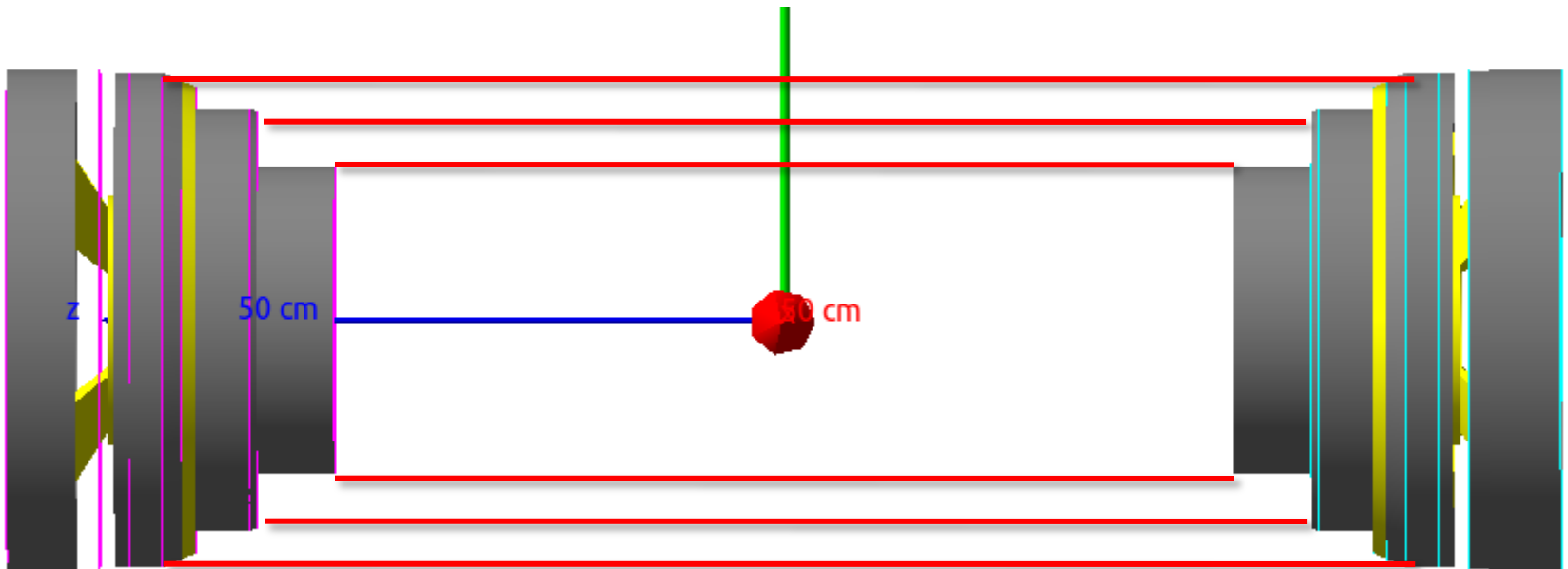
east and west are identical, beside the  
“new west ring”



- Uploaded to CgemBoss: Simulation/BOOST/CgemSim-01-00-19
- Modified also the parameter file



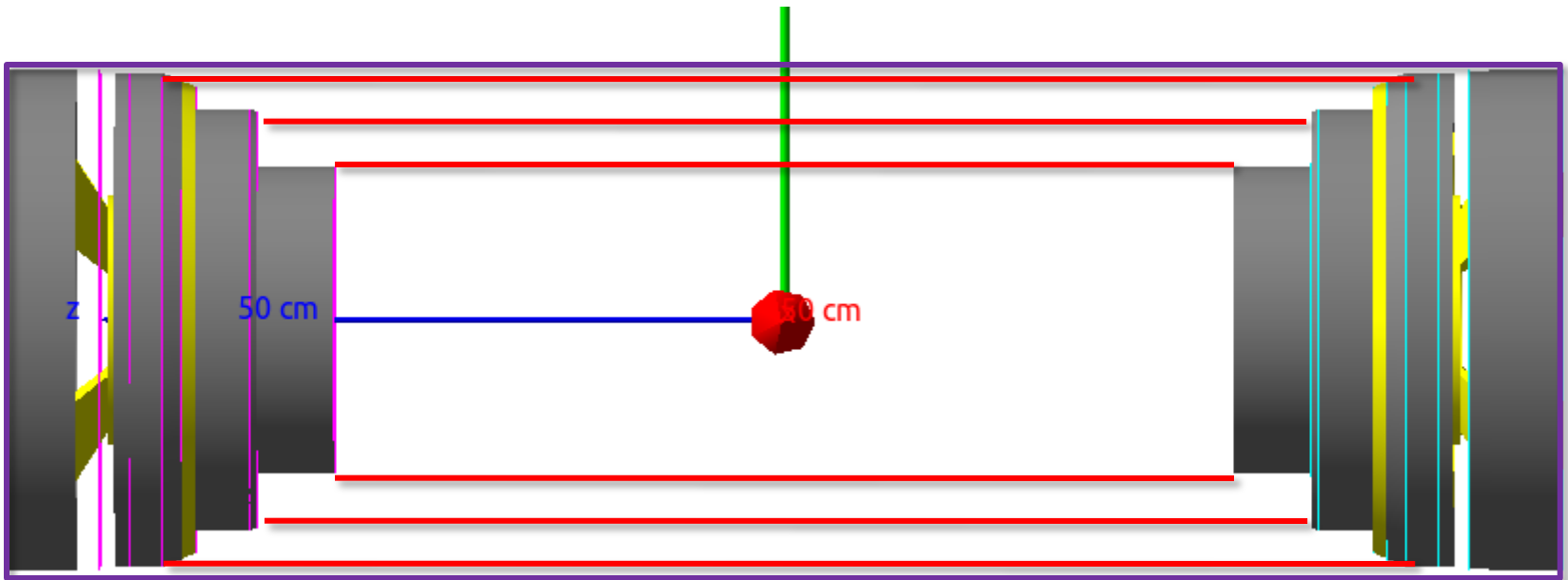
- Uploaded to CgemBoss: Simulation/BOOST/CgemSim-01-00-19
- Modified also the parameter file





- Uploaded to CgemBoss: Simulation/BOOST/CgemSim-01-00-19
- Modified also the parameter file

```
***** CGEM simulation volume (active + passive) (mm)*****  
R_in_cgem (inner radius of passive)      R_out_cgem (outer radius of passive)    L_cgem (full length of passive)  
60.                                       183.5                                  1156
```



# OVERLAP MDC - CGEM

WARNING - G4PVPlacement::CheckOverlaps()  
Overlap is detected for volume Cgem\_physi  
with physicalMdc volume's  
local point (-181.67318,23.602906,138.99831), overlapping by  
at least: 8.2 mm

TEMPORARY FIX removing the passives of the MDC (as suggested by Yuan Ye)

Diff for /CgemBossCvs/Simulation/BOOST/MdcSim/dat/Mdc\_cgem.txt between version 1.1 and 1.2

version 1.1, 2015/10/23 06:20:27

version 1.2, 2019/03/20 07:09:53

Line 98

Line 98

```
67
Length InnerR OutR Z Name
mm mm mm mm mm
2632 175 809 0 Mdc
2206 790 801.5 0 OutCylinder
774 176 177.2 0 InnerCylinder
20 790 809 1113 MiddleClip
```

```
67
Length InnerR OutR Z Name
mm mm mm mm mm
2632 184 809 0 Mdc
2206 790 801.5 0 OutCylinder
774 176 177.2 0 InnerCylinder
20 790 809 1113 MiddleClip
```

Diff for /CgemBossCvs/Simulation/BOOST/MdcSim/src/BesMdcConstruction.cc between version 1.3 and 1.4

version 1.3, 2015/10/23 06:20:27

version 1.4, 2019/03/20 07:09:53

Line 239

Line 239

//=====Tube and Endplane

```
G4double colorShift=0., shift=1./(mdc->SegmentNo()-1);
G4double gap=0.5*micrometer;
for(i=1; i<mdc->SegmentNo(); i++){
```

//=====Tube and Endplane

```
/**
G4double colorShift=0., shift=1./(mdc->SegmentNo()-1);
G4double gap=0.5*micrometer;
for(i=1; i<mdc->SegmentNo(); i++){
```

Line 641

```
G4VPhysicalVolume* shieldPlate1m_phys=new G4PVPlacement(0,G4ThreeVector(posX ,posY ,-posZ),
shieldPlate1_log,"physicalShieldPalte1m",mdc_log,false,0);
```

Line 641

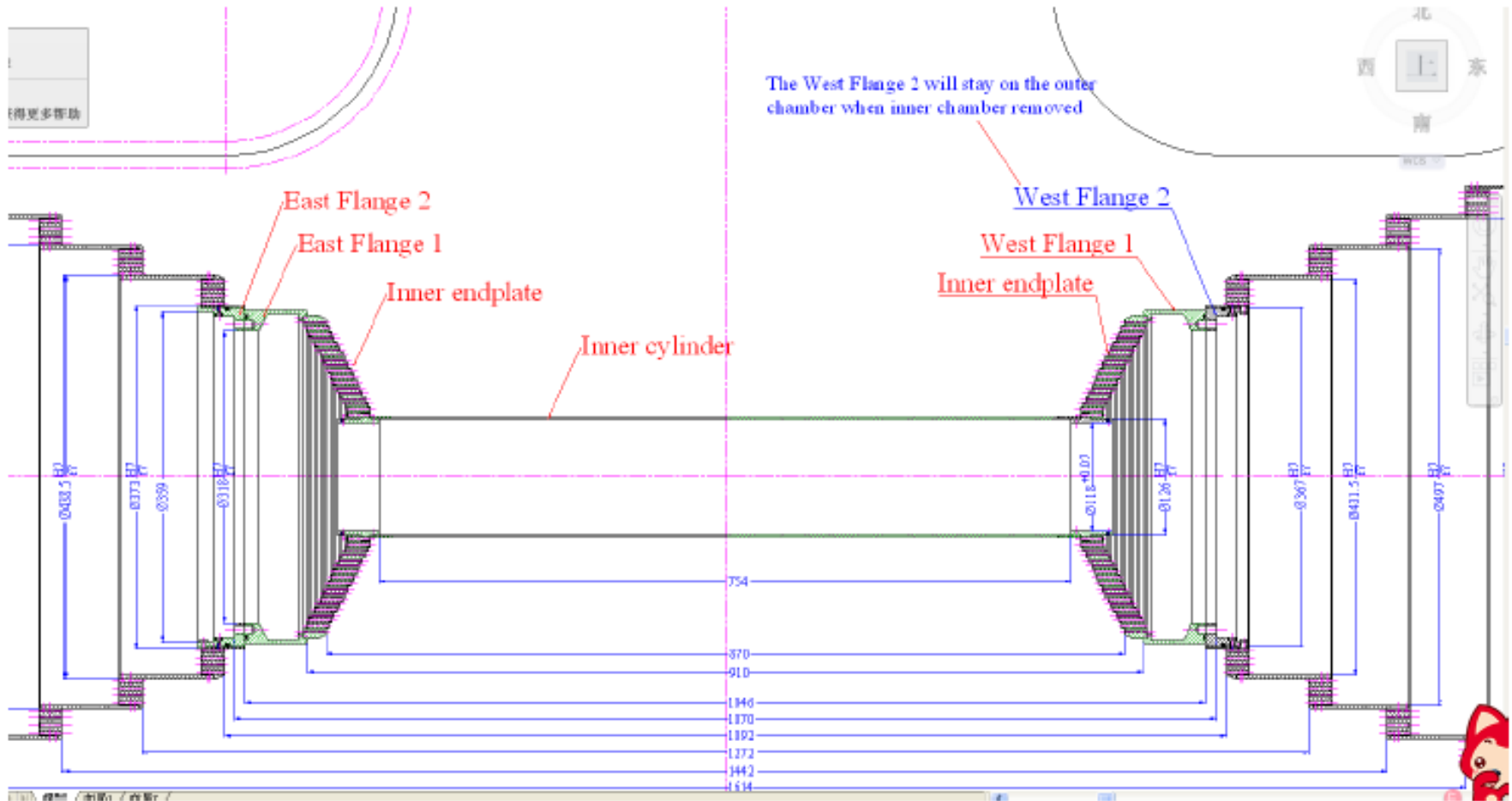
```
G4VPhysicalVolume* shieldPlate1m_phys=new G4PVPlacement(0,G4ThreeVector(posX ,posY ,-posZ),
shieldPlate1_log,"physicalShieldPalte1m",mdc_log,false,0);
```

\*\*/

//=====Layer
G4int signalLayer,firstWire;

//=====Layer
G4int signalLayer,firstWire;

# BEFORE AND AFTER IDC REMOVED



Before inner chamber removed

# MDC WITH NEW IDC

