

# ILD-0 assembly

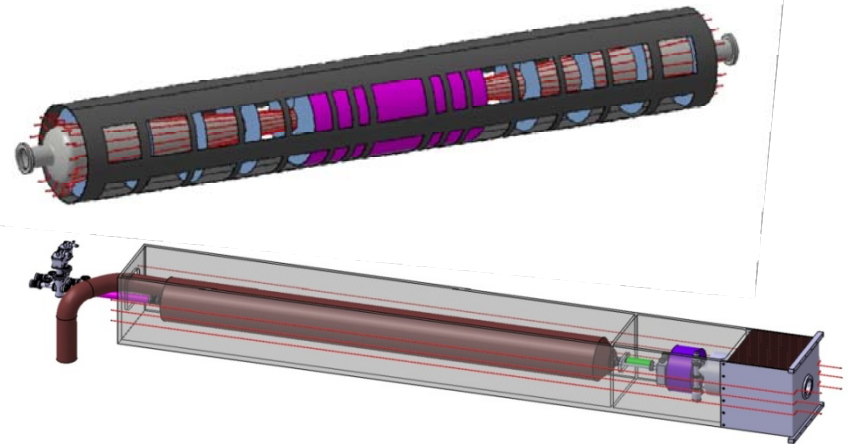
- Catherine Clerc, LLR-école polytechnique
- Mathieu Jore, LAL

# ILD integration steps :

## Pre-assembly on surface :

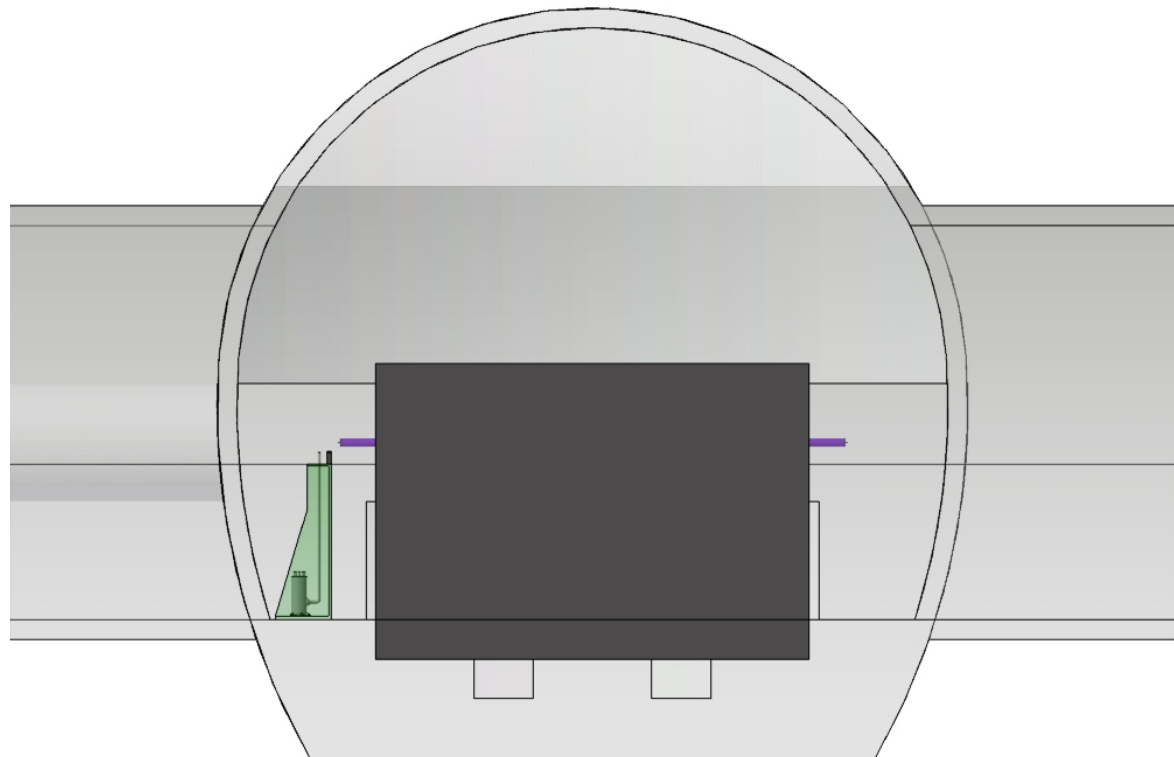
- Endcaps
  - Back part ( splitted in two) of yoke endcap:
  - Fixed part :
    - Iron
    - Muons chambers
    - + *Endcaps Ecal & Hcal ?*
    - *ETD ?*
- Barrel yoke in 3 rings of about 3.1 m
- Central part of Barrel yoke + coil
- TPC
- Inners detectors in one  
( Tubes +VTX+ FTD+ SIT)
- QD0 in its support + beamcal+pump +vacuum pipe +....up to lumical position

*Fragility??? Integration in hall*

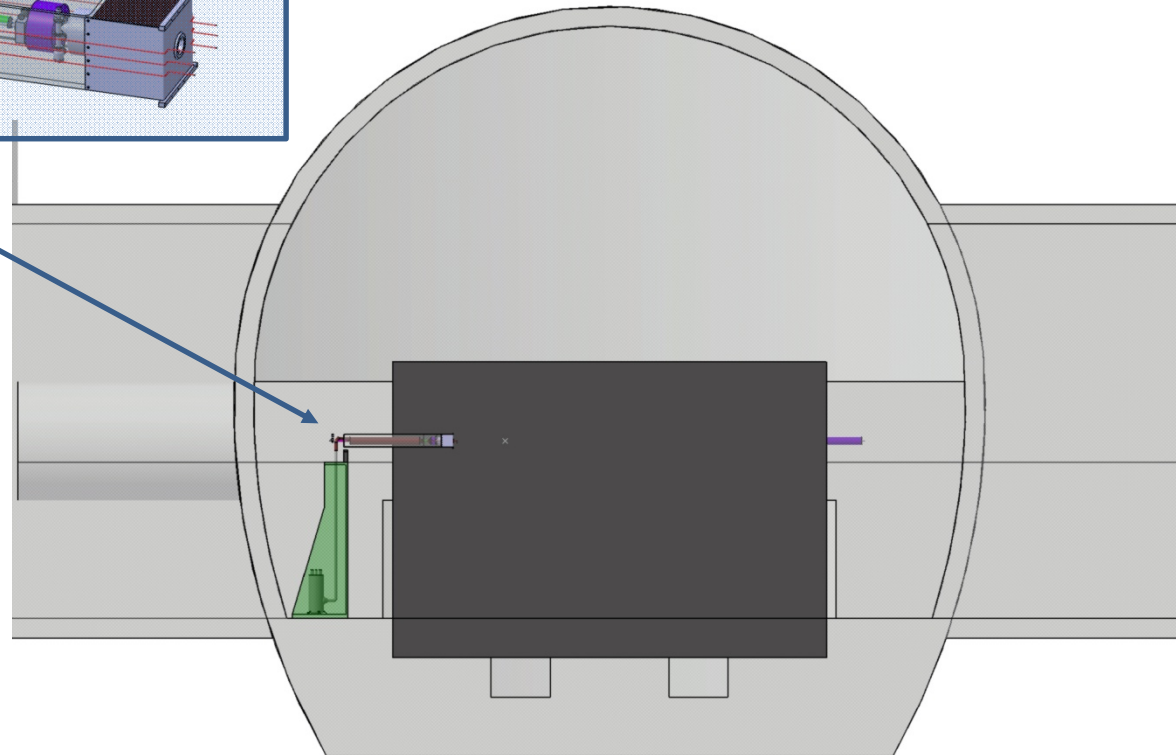
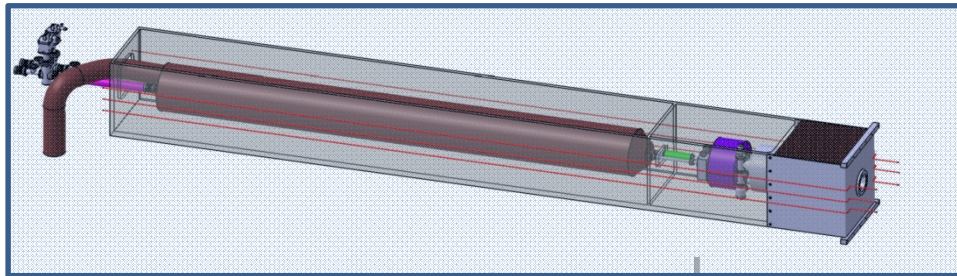


***Then , lowering in the hall, garage position***

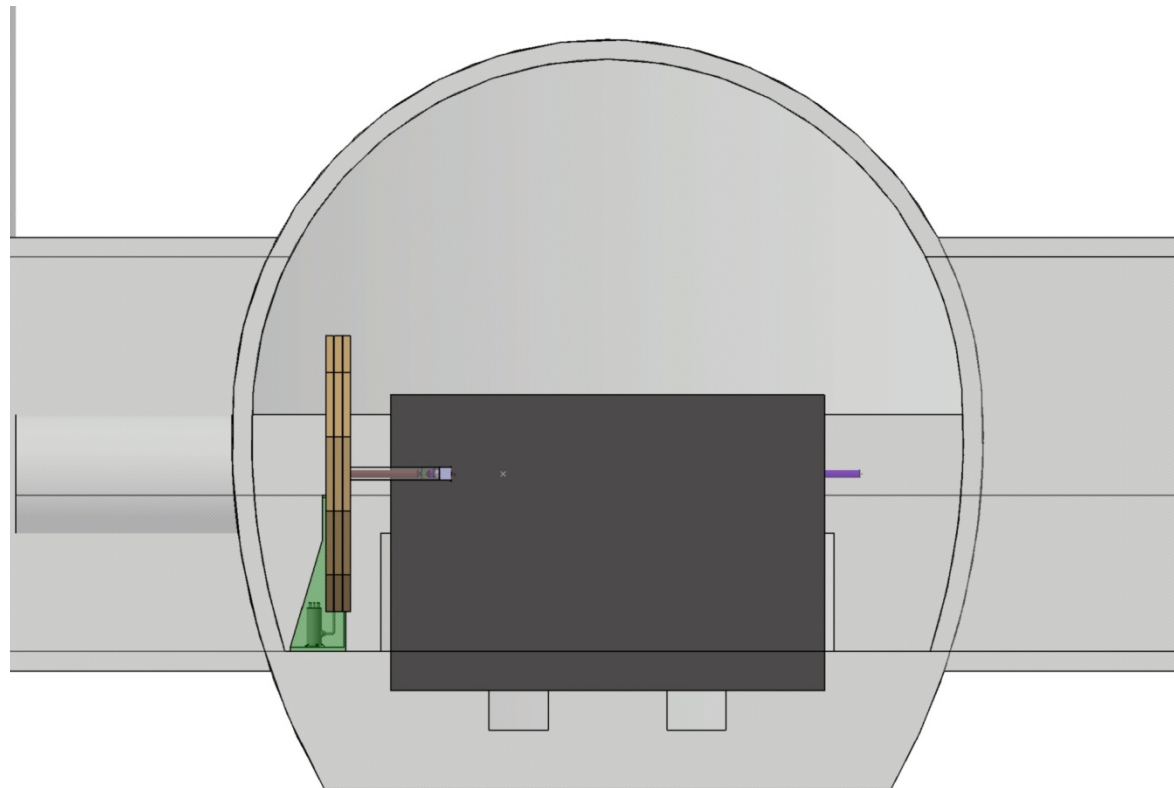
1. 1st pillar ( QD0 support) (*Pillar has to be moveable on garage position but fixed on beam position*)



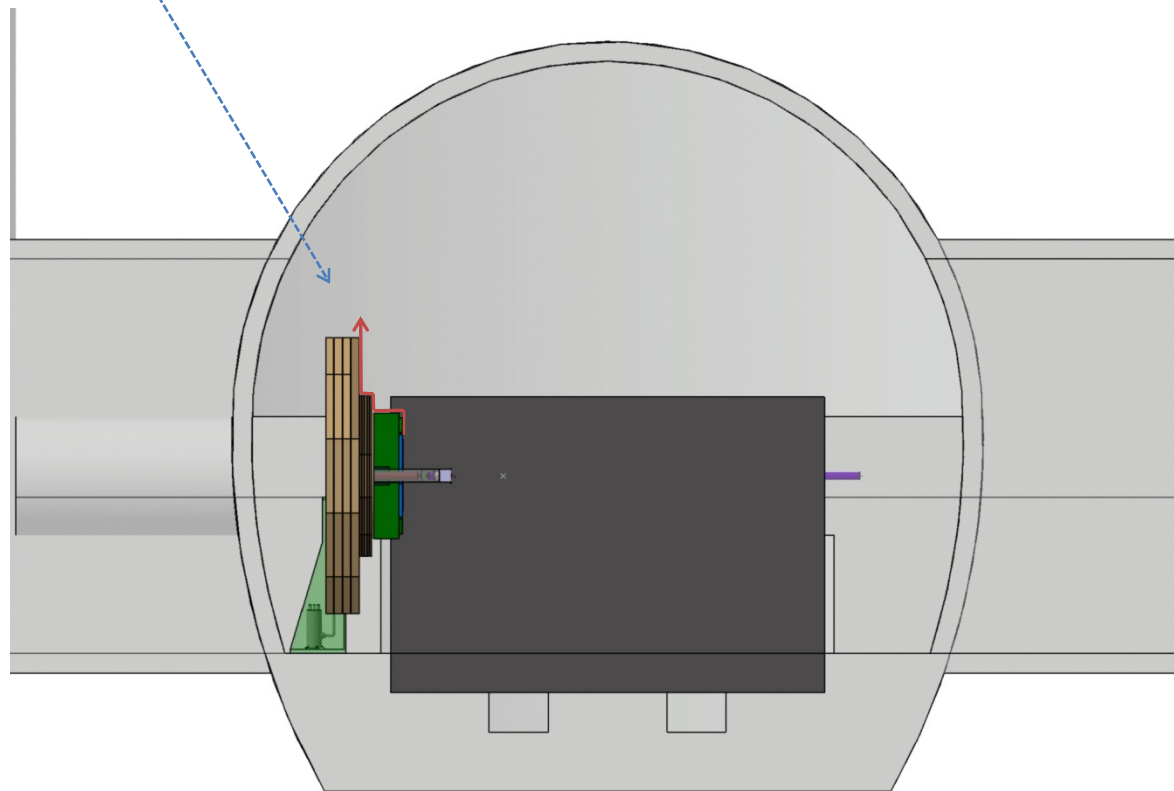
1. 1st pillar ( QD0 support)
2. QD0 + support



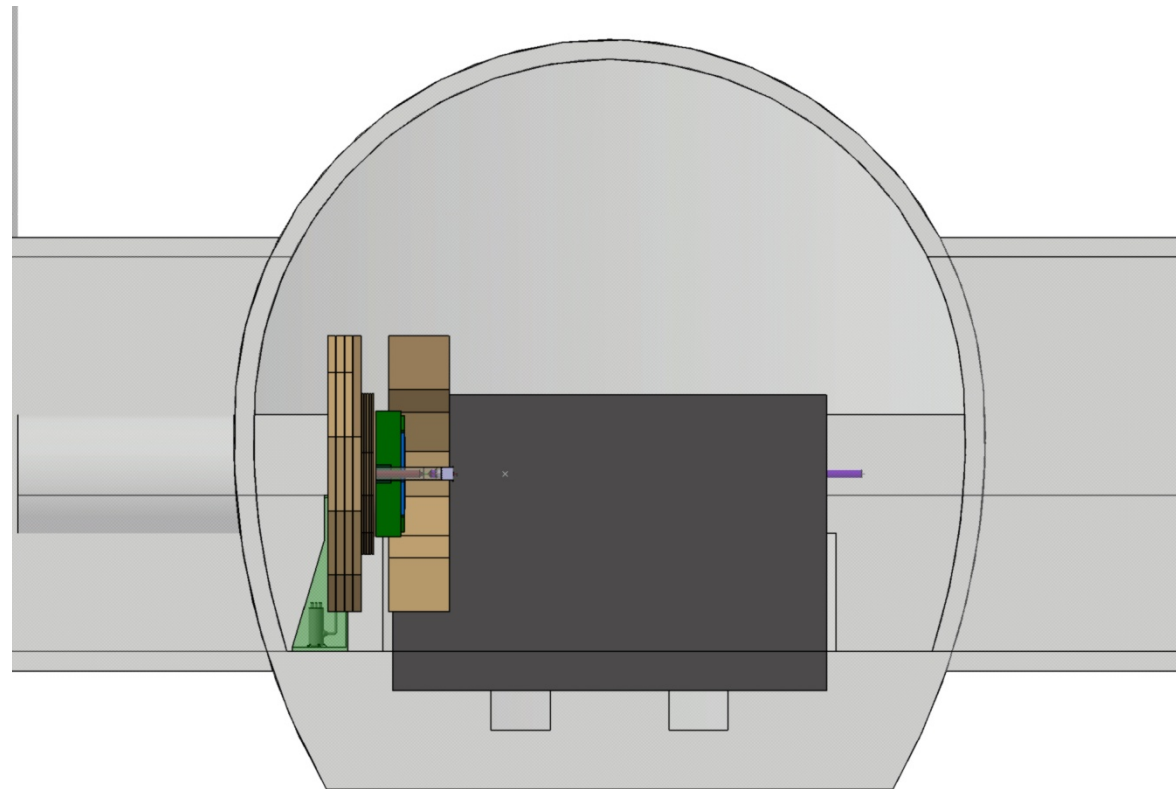
1. 1st pillar ( QD0 support)
2. QD0 + support
3. Back part of endcap yoke



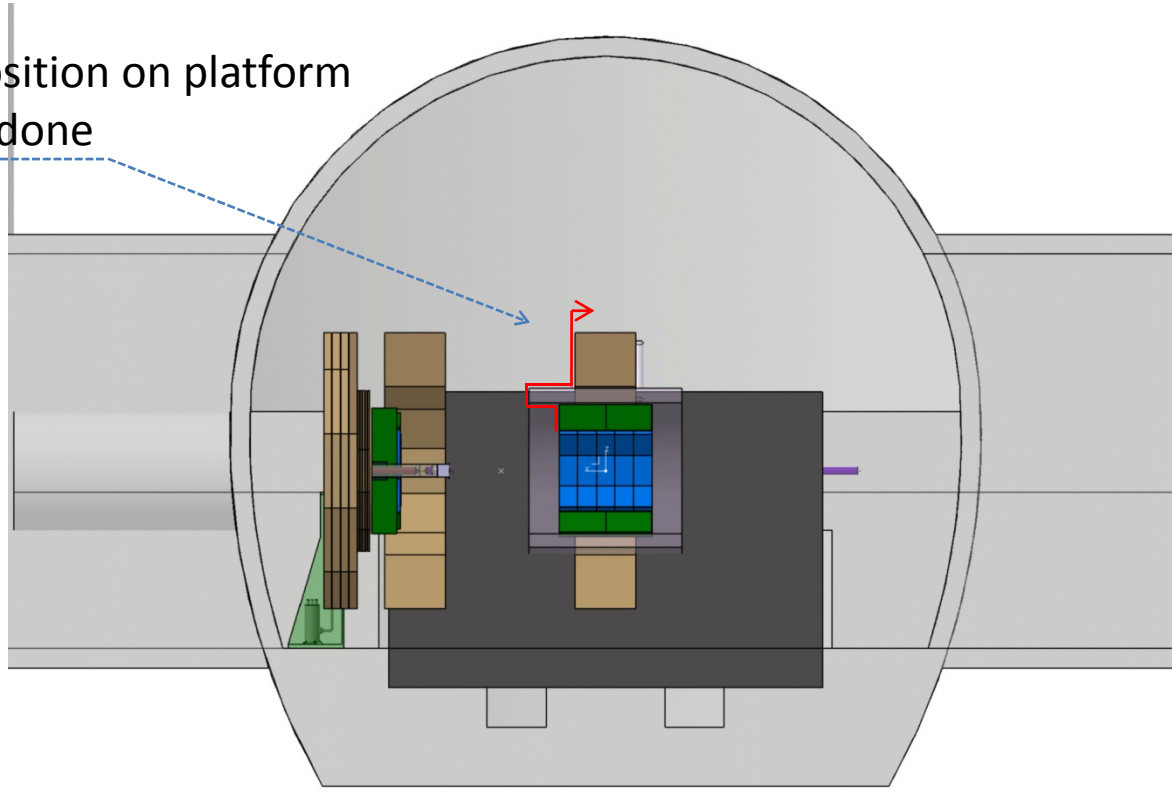
1. 1st pillar ( QD0 support)
2. QD0 + support
3. Back part of endcap yoke
4. Fixed part of endcaps ( with cabling done )



1. 1st pillar ( QD0 support)
2. QD0 + support
3. Back part of endcap yoke
4. Fixed part of endcaps
5. 1st ring of Barrel yoke

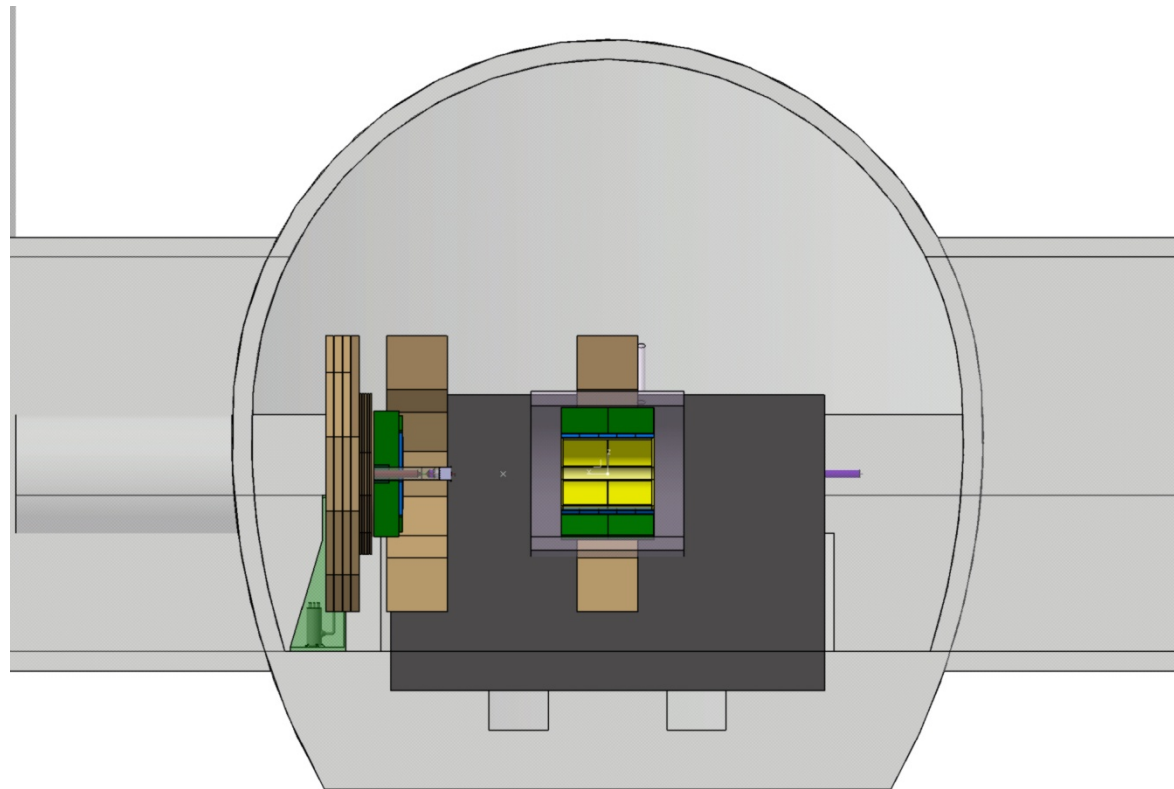


1. 1st pillar ( QD0 support)
  2. QD0 + support
  3. Back part of endcap yoke
  4. Fixed part of endcaps
  5. 1st ring of Barrel yoke
  6. Yoke central part, on its final position on platform
- Cabling of Barrels calorimeters done

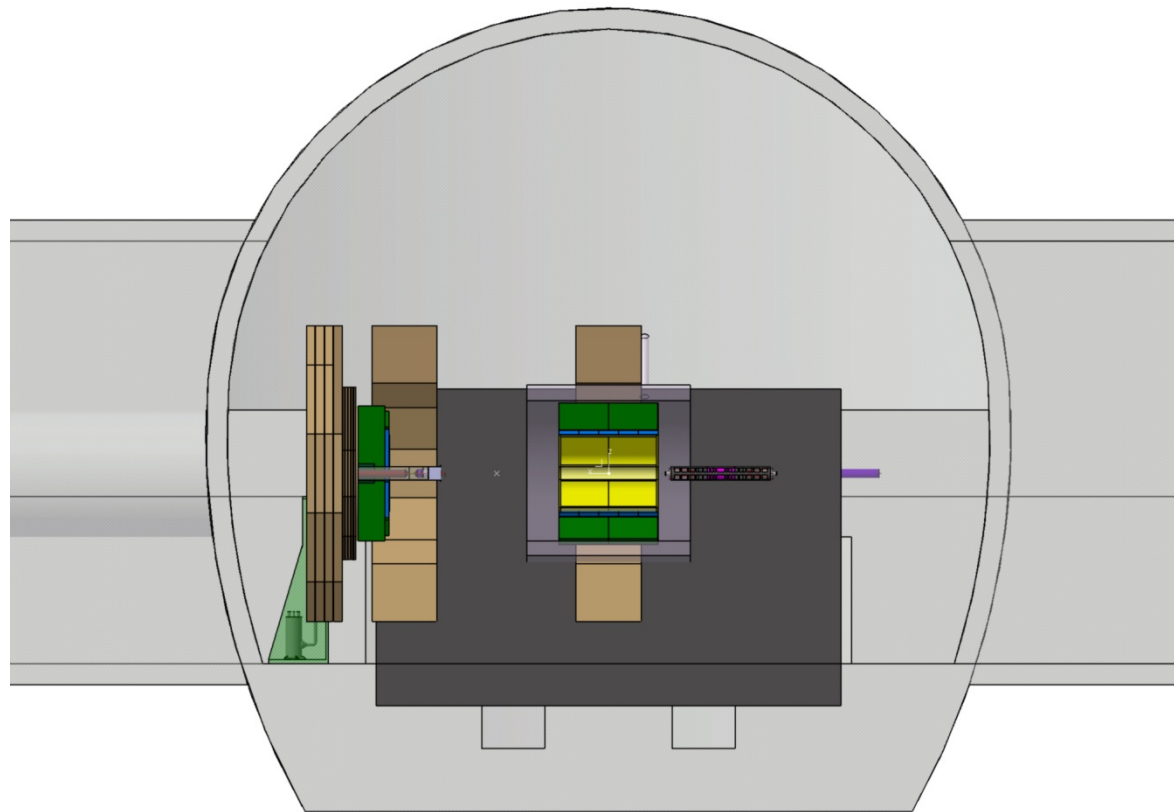




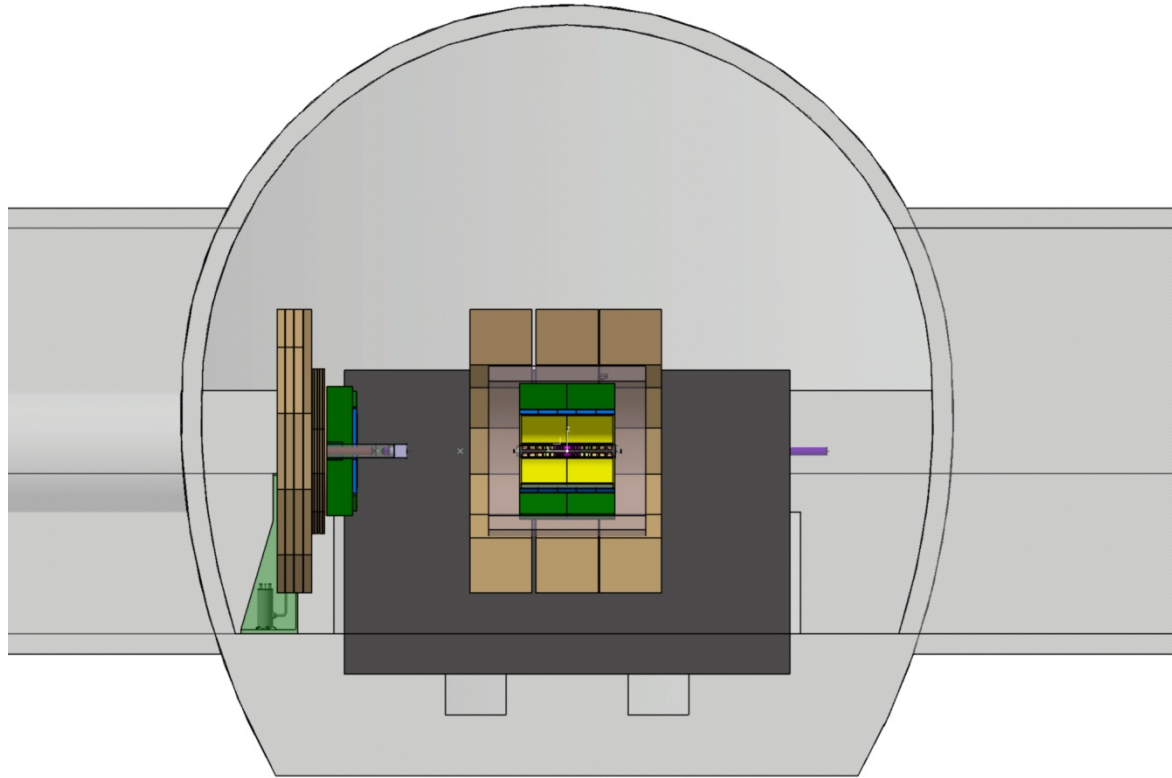
1. 1st pillar ( QD0 support)
2. QD0 + support
3. Back part of endcap yoke
4. Fixed part of endcaps
5. 1st ring of Barrel yoke
6. Yoke central part
7. TPC, cabling



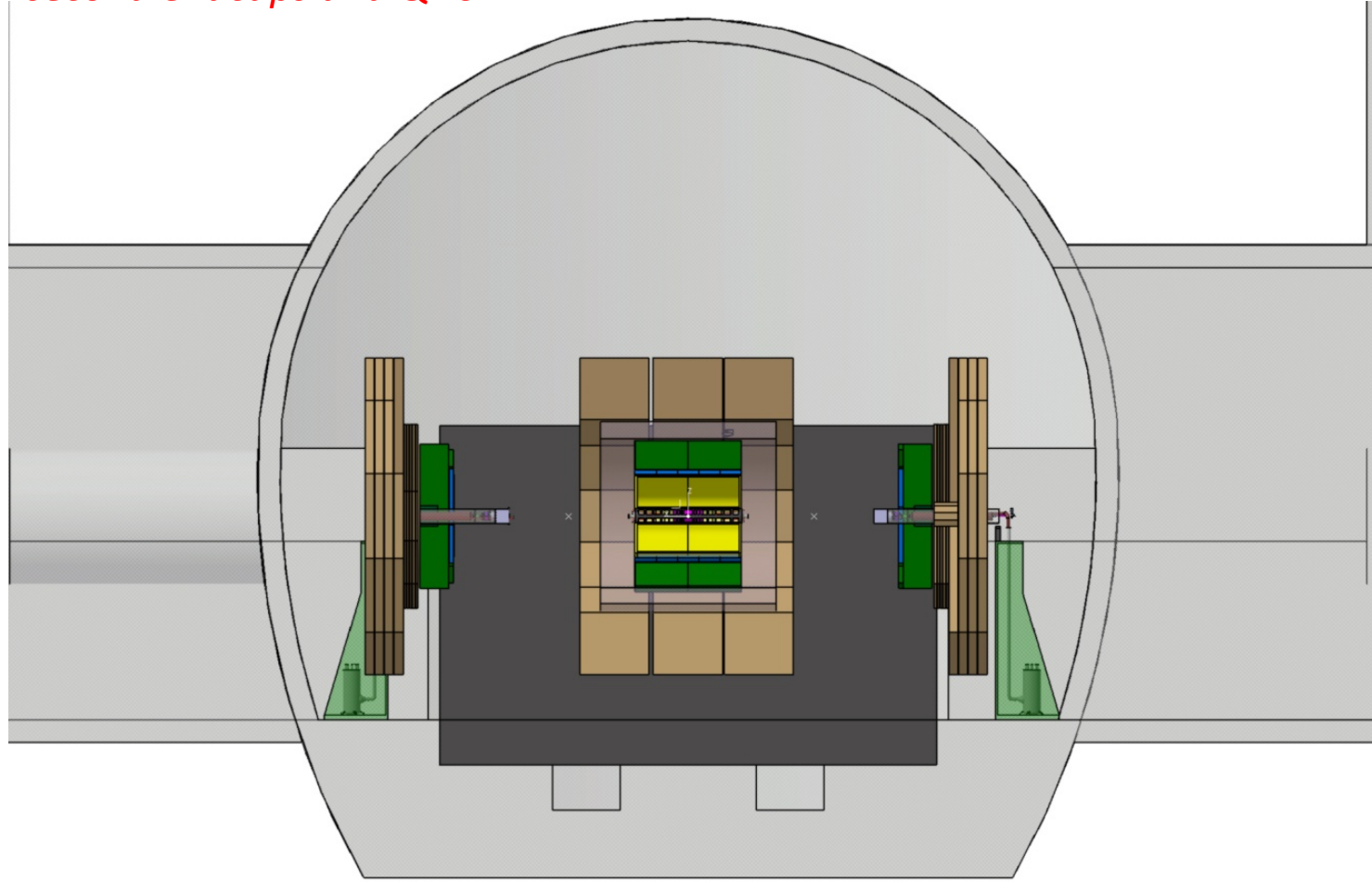
1. 1st pillar ( QD0 support)
2. QD0 + support
3. Back part of endcap yoke
4. Fixed part of endcaps
5. 1st ring of Barrel yoke
6. Yoke central part
7. TPC
8. Inner part

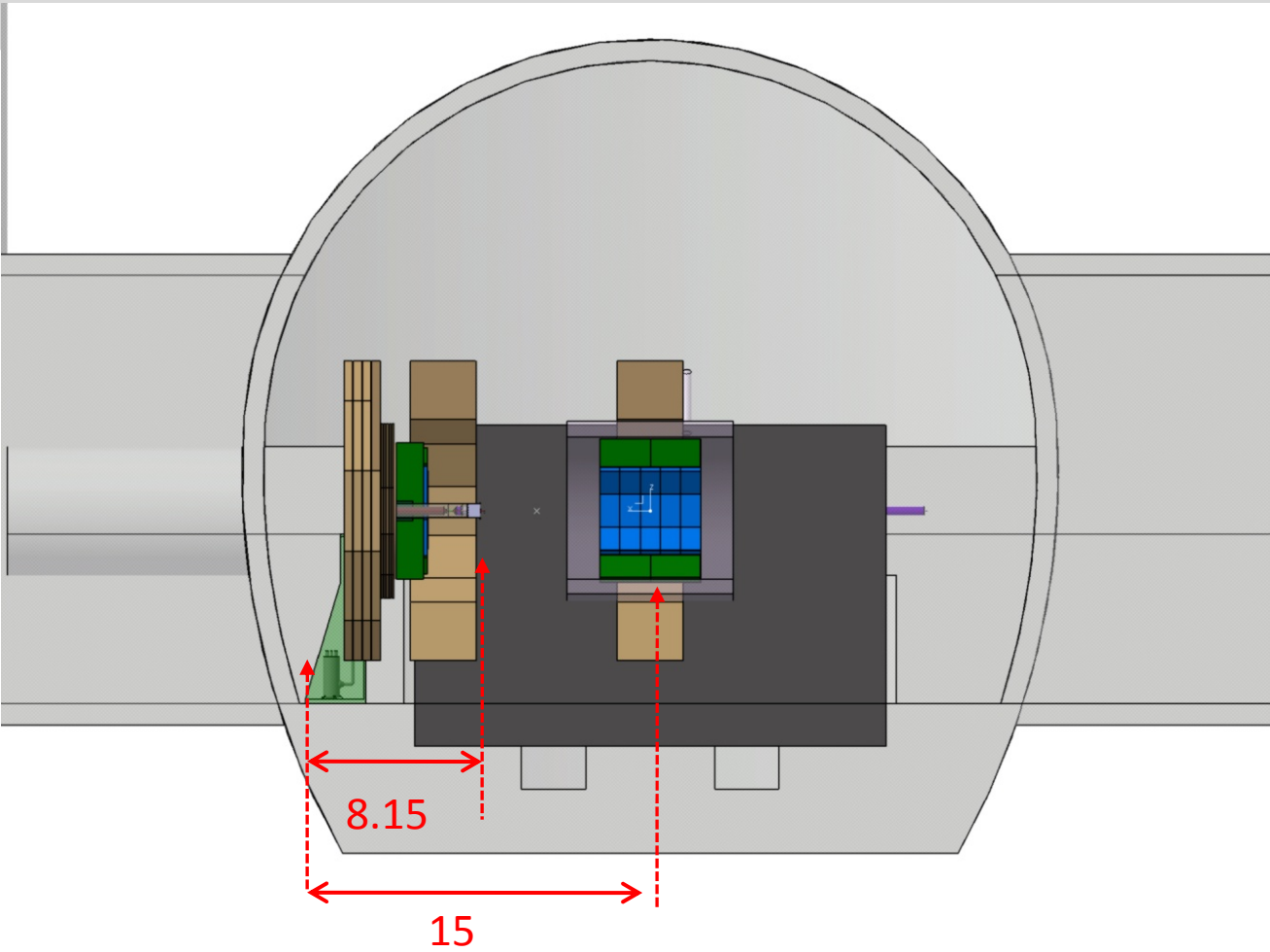


1. 1st pillar ( QD0 support)
2. QD0 + support
3. Back part of endcap yoke
4. Fixed part of endcaps
5. 1st ring of Barrel yoke
6. Yoke central part
7. TPC
8. Inner part
9. Barrel yoke assembly



*Completion with second endcaps and QDO*



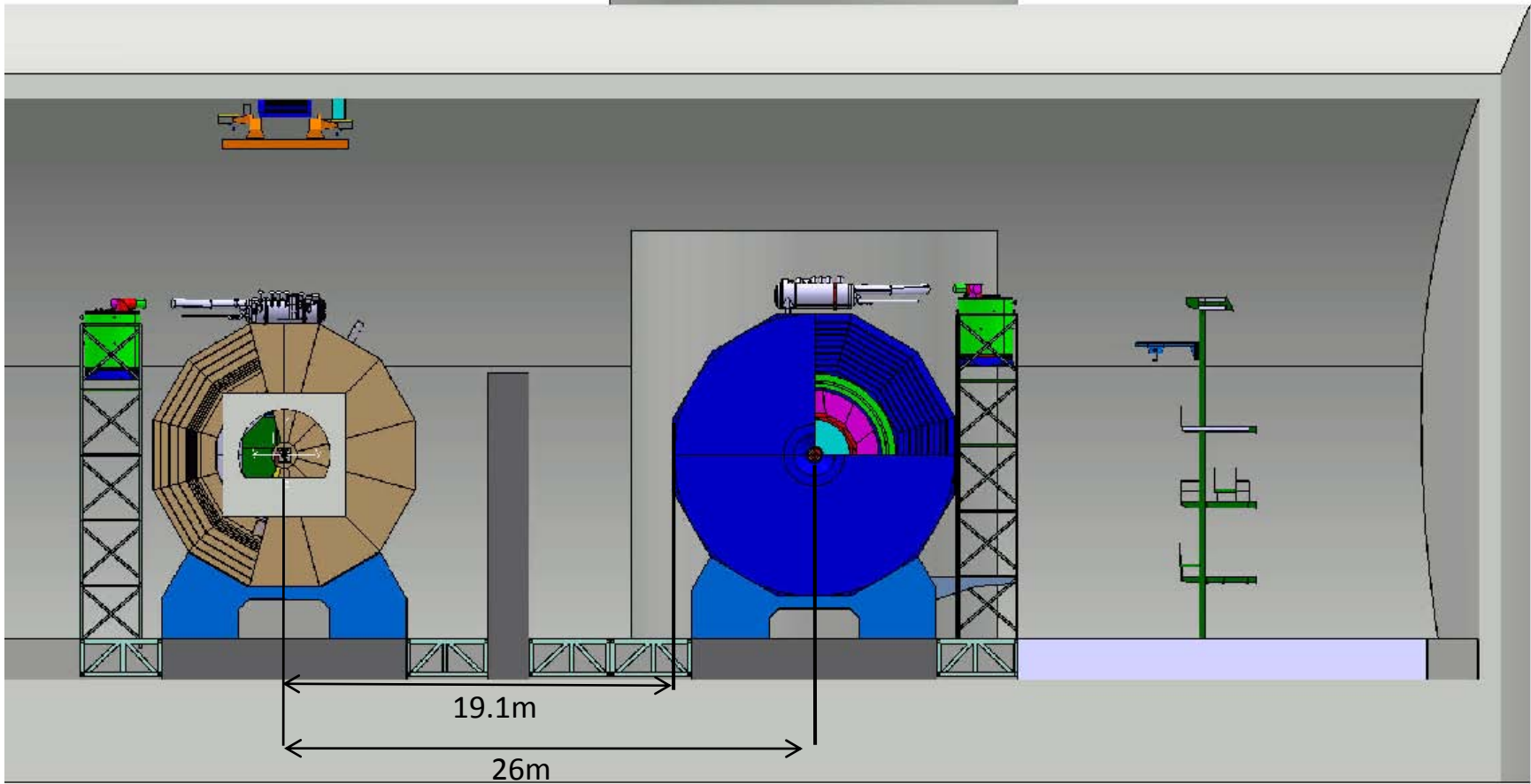


Give the minimum floor width of the hall :

$$= 2 * [(Pillar + QD0 support) + \text{space for work around barrel} + \frac{1}{2} \text{ coil length}]$$

$$= 2 [8,15 + 3m + 3.9m]$$

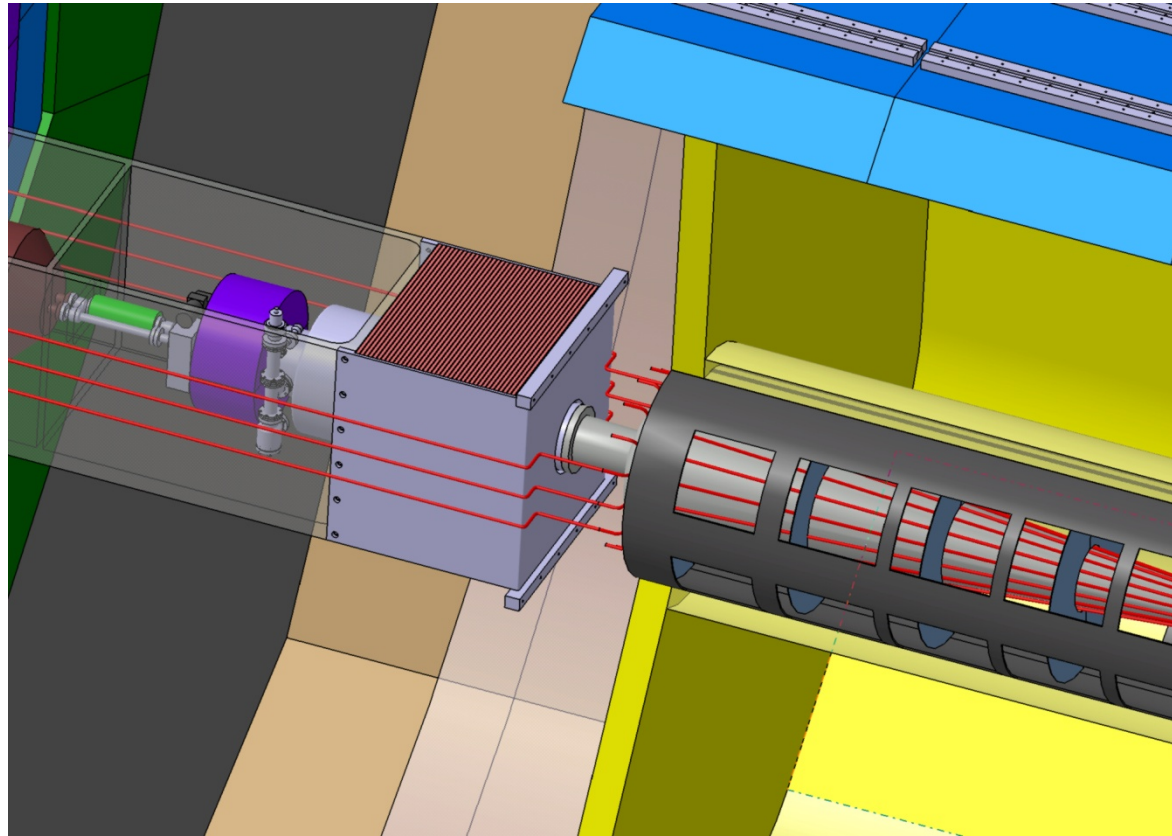
$$= \underline{\underline{30m}}$$



*From A.Hervé & N.Smiljkovic  
(1st draft, depend on stray field limits)*

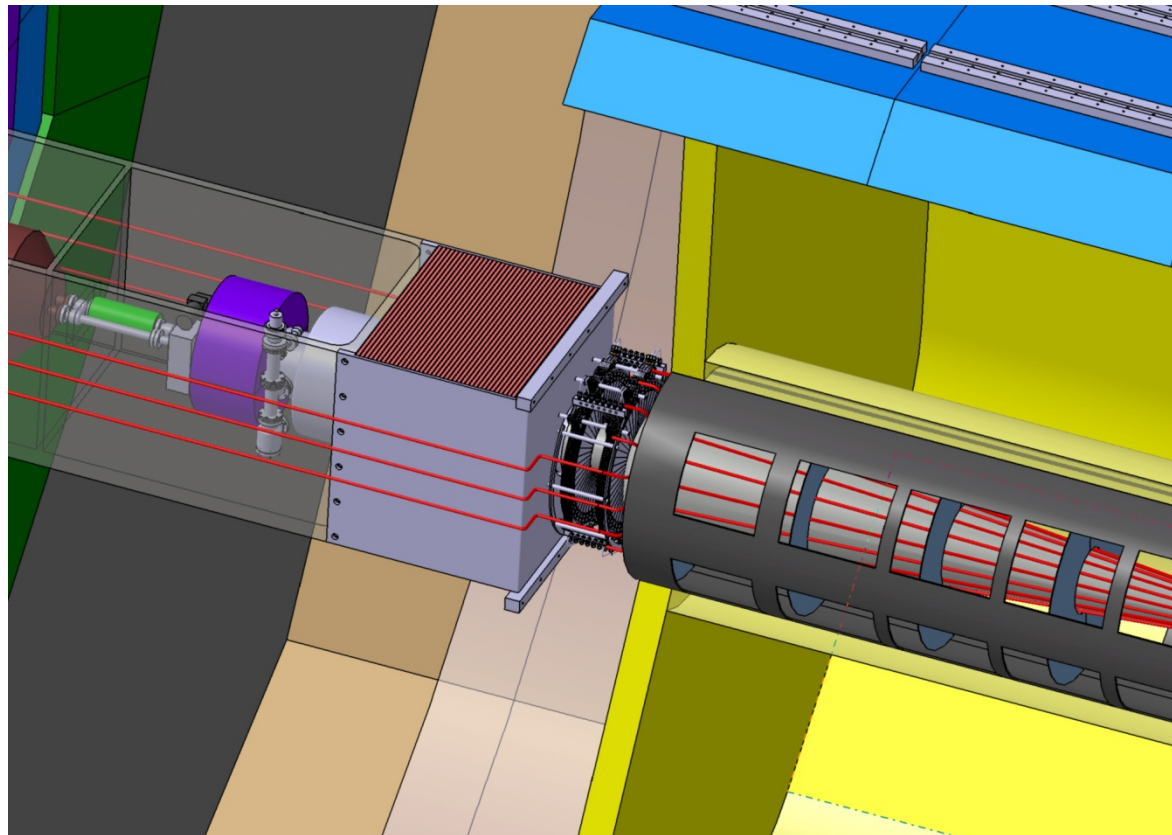
Assembly of forwards calorimeters:

- a) Connection of beam pipe ( inner part )to the flange of vacuum tube ( forwards ), the cable of inners detectors should be pass around LHCAL



Assembly of forwards calorimeters:

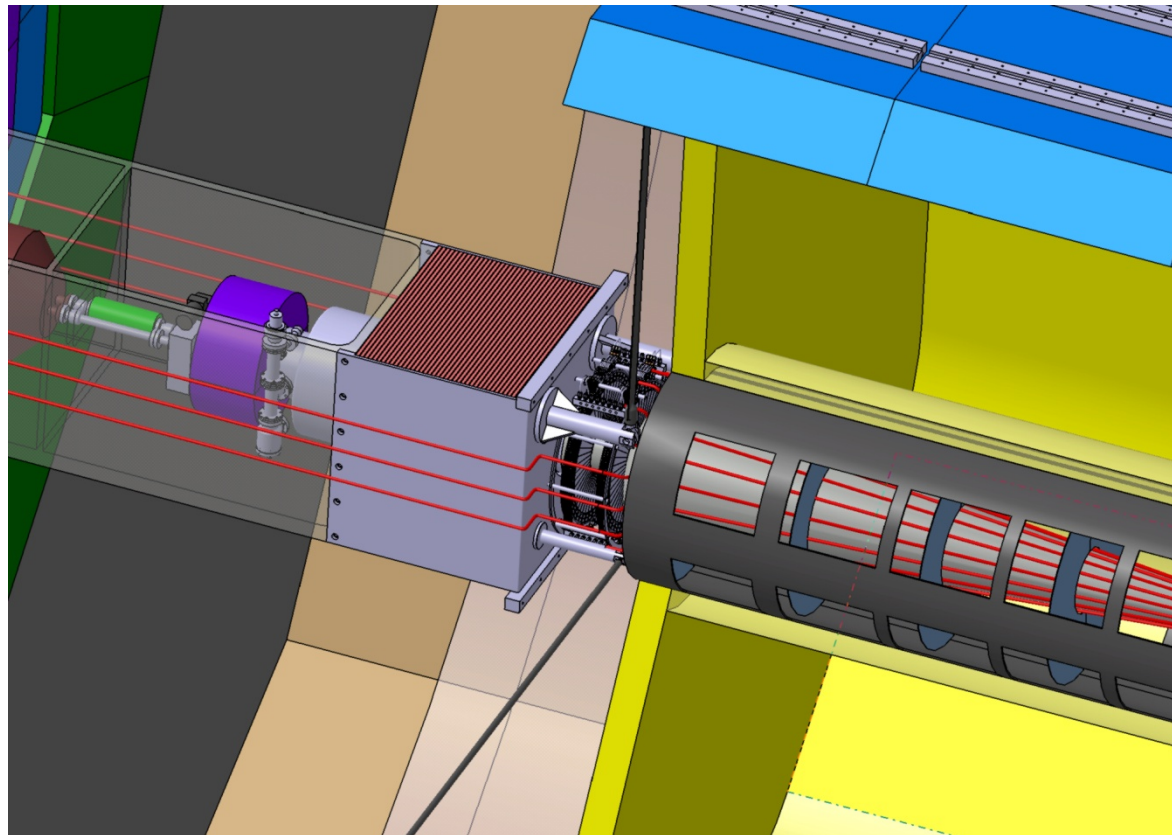
- a) Connection of beam pipe ( inner part ) to the flange of vacuum tube ( forwards ), the cable of inners detectors should be pass around LHCAL
- b) Lumical





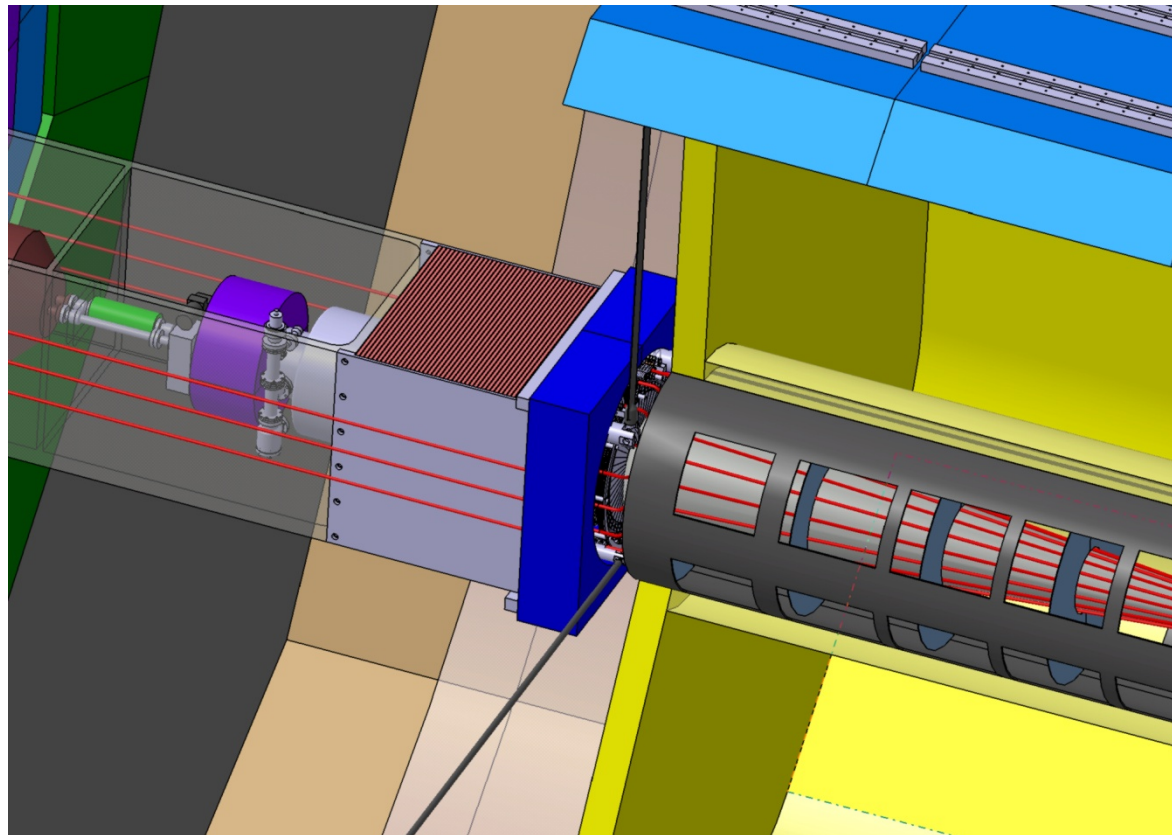
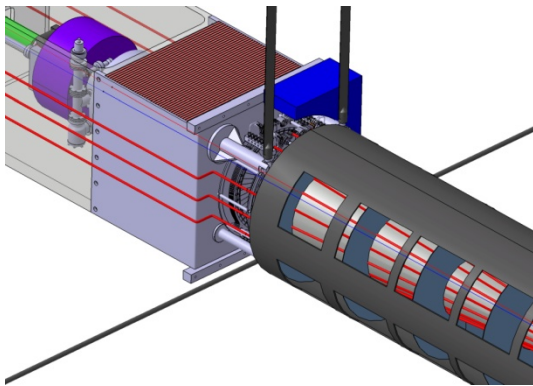
Assembly of forwards calorimeters:

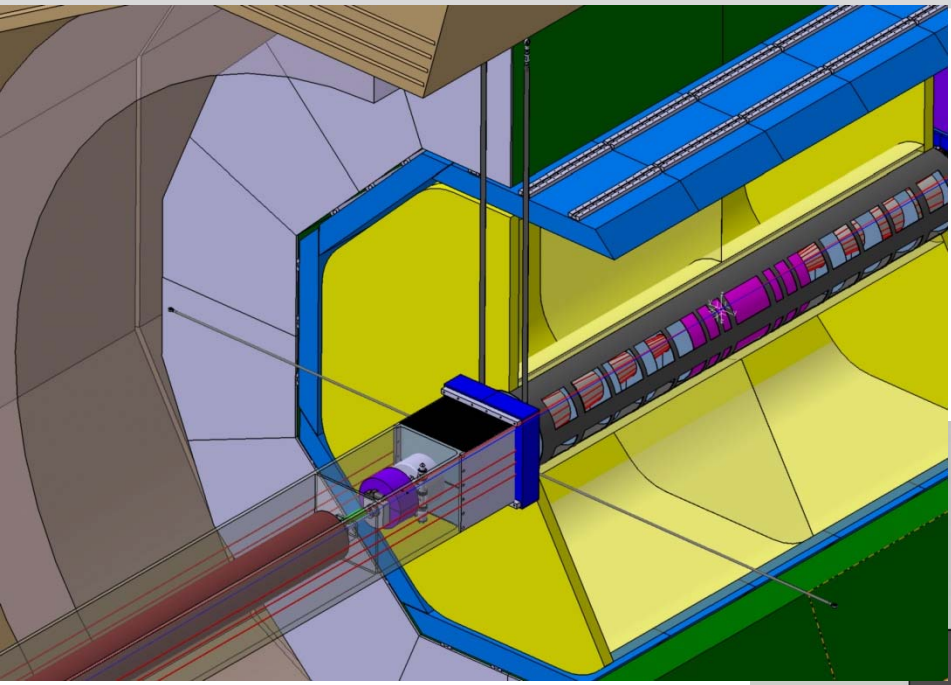
- a) Connection of beam pipe ( inner part )to the flange of vacuum tube ( forwards ), the cable of inners detectors should be pass around LHCAL
- b) Lumical
- c) Tension rods ( or plates)



Assembly of forwards calorimeters:

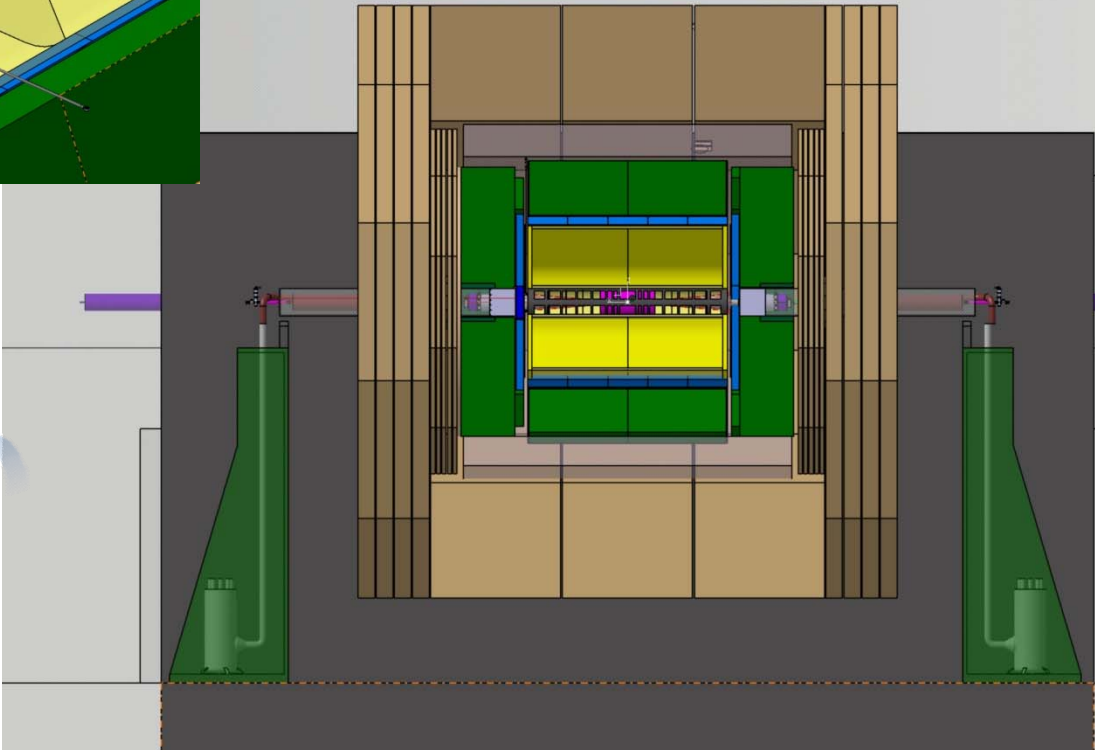
- a) Connection of beam pipe ( inner part )to the flange of vacuum tube ( forwards ), the cable of inners detectors should be pass around LHCAL
- b) Lumical
- c) Tension rods ( or plates)
- d) Ecal ring





larger view of tension rods

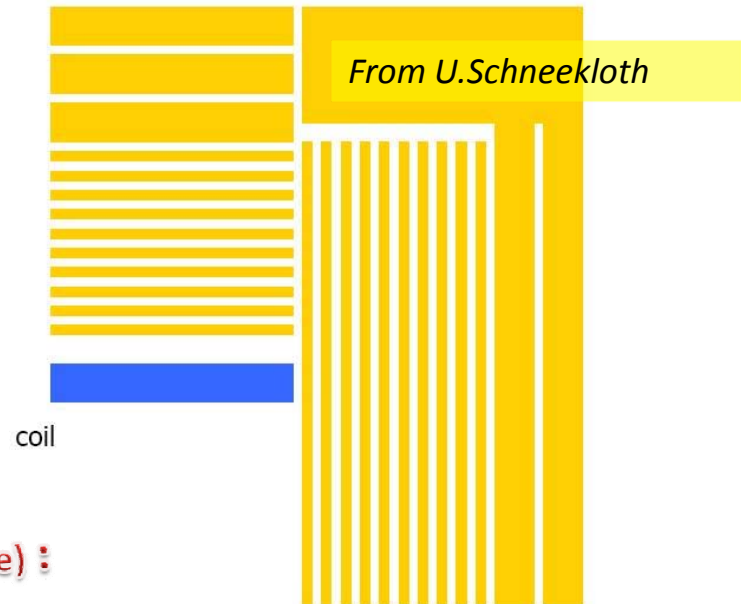
CLOSED ILL  
CLOSED ILL



**But.....** In the actual configuration of endcaps, there is a problem of access for inners to forwards connection :



- \*The access is defined by the distance between Barrel yoke and the face of Hcal ring = 1.2m in diagonal, but only 0.53m straight....
- \*It might imply to return to a previous study of endcaps with shorter barrel yoke:



**Then we gain 0.65 m ( thickness of the nose endcap yoke) : straight distance of 1.2 m , still short.....**