# ILD-0 overall dimensions and assembly

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Drawings from Mathieu Jore,   LAL

ILD Main dimensions			ILD 0	Weight
TPC	Rin(sensitive/mechanical)		395(330)	
	Rout(sensitive/mechanical)		1743(1808)	
	Zmax (endplate out)		2350	
Barrel CAL	ECAL	Rin / Rout	1843/ 2028	W/Si, 24 X0 P= 75 t
		Z max	2350	
	HCAL	Rin / Rout	2058 / 3410	SS/Scinti, 5.3 l, max 48 layers barrel P= 600 t
		Z max	2350	
Endcaps CAL	ECAL	Zmin / Z max	2450 / 2635	P=2x15.5 t
	HCAL	Zmin / Z max	2650 / 3937	P= 2x269 t
Coil Cryostat	Rin / Rout		3440 / 4190	
	Z max		3872	
Yoke, barrel	Rin / Rout		4340 / 7110	P= 6145 t
	Z max		3992	
Yoke, endcaps overall	Rin / Rout		350 / 7110	P=2x3836t
	Z max		7190	

Total weight = 15060 t

9 layers of muons chambers+ 1 between cryo and Barrel yoke

5510

4340

5510

5610

7110

4022
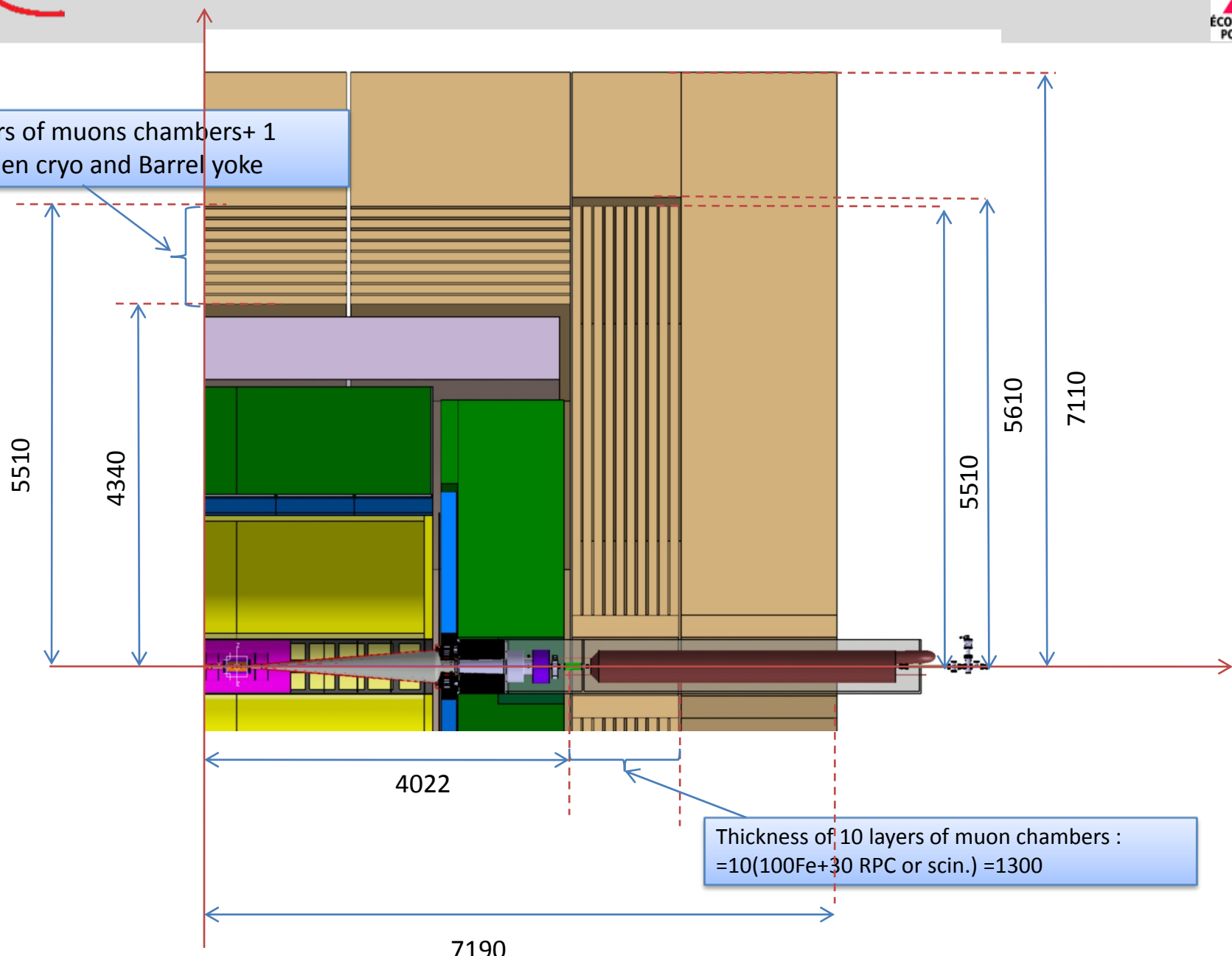
Thickness of 10 layers of muon chambers :
=10(100Fe+30 RPC or scin.) =1300

7190

ÉCOLE POLYTECHNIQUE

C.Clerc   *21/01/2009*

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 ?

Fragility??? Integration in hall

- ➢ Barrel yoke in 3 rings of about 2.65m
- ➢ Central part of Barrel yoke + coil + Calorimeters barrels (...about 3000t)
- ➢ TPC
- ➢ Inners detectors in one
(Tubes +VTX+ FTD+ SIT)

- ➢ QD0 in its support + beamcal+pump
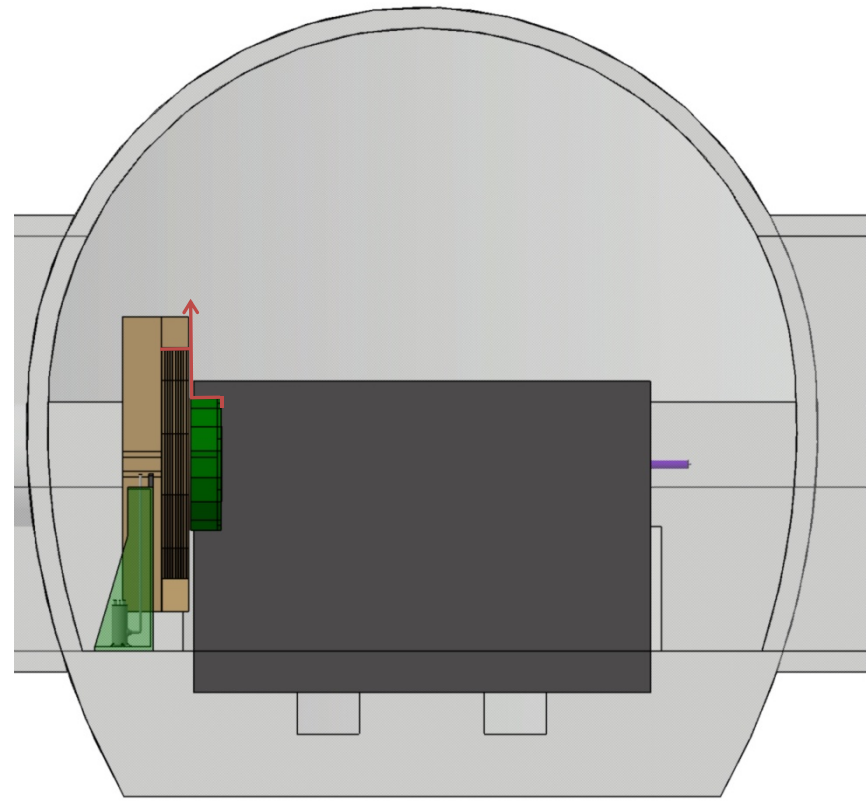+vacuum pipe +....up to lumical position
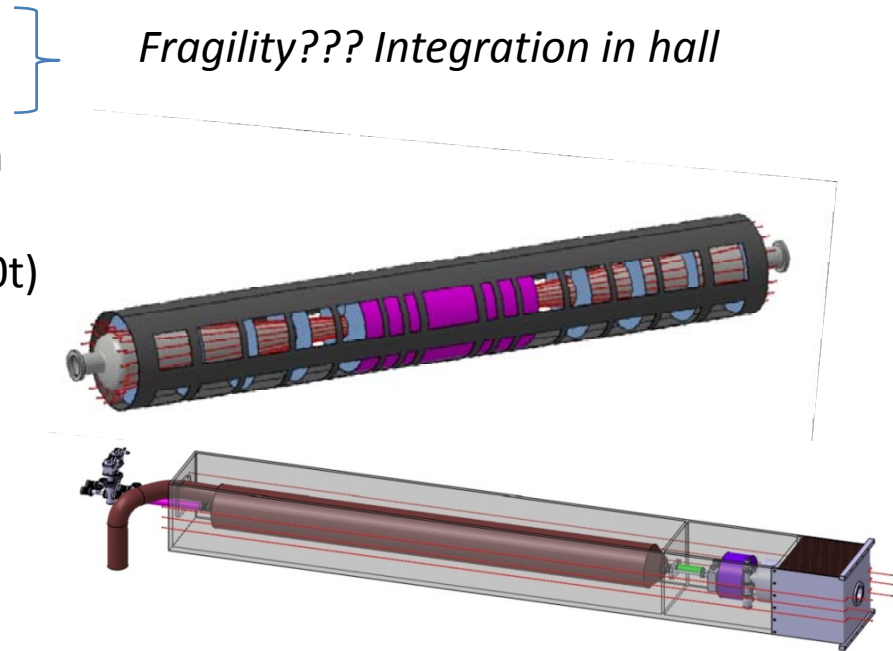
1. 1st pillar (QD0 support) *(Pillar has to be moveable on garage position but fixed on beam position)*
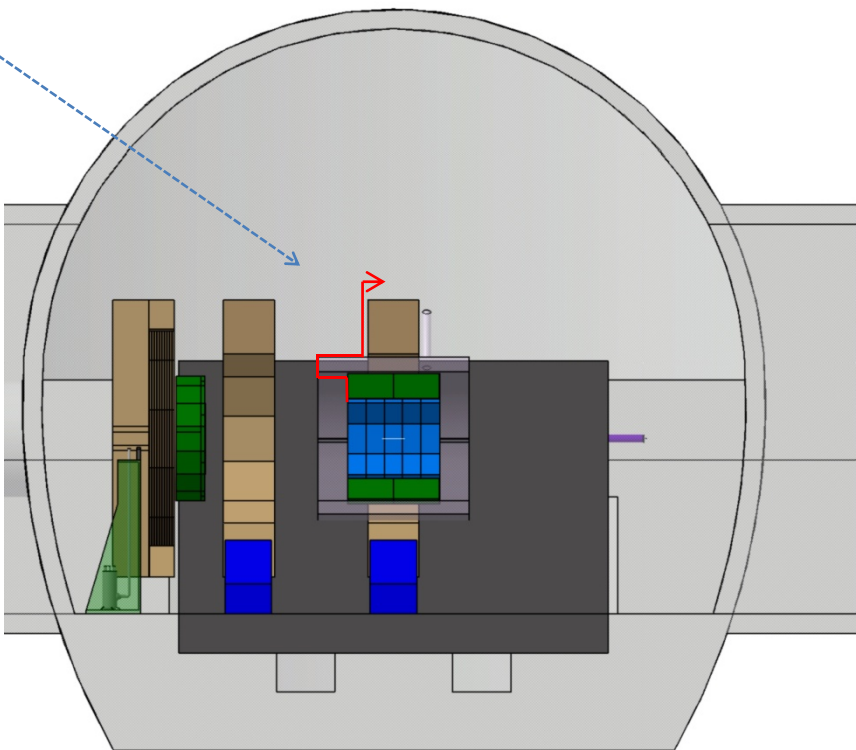2. QD0 + support
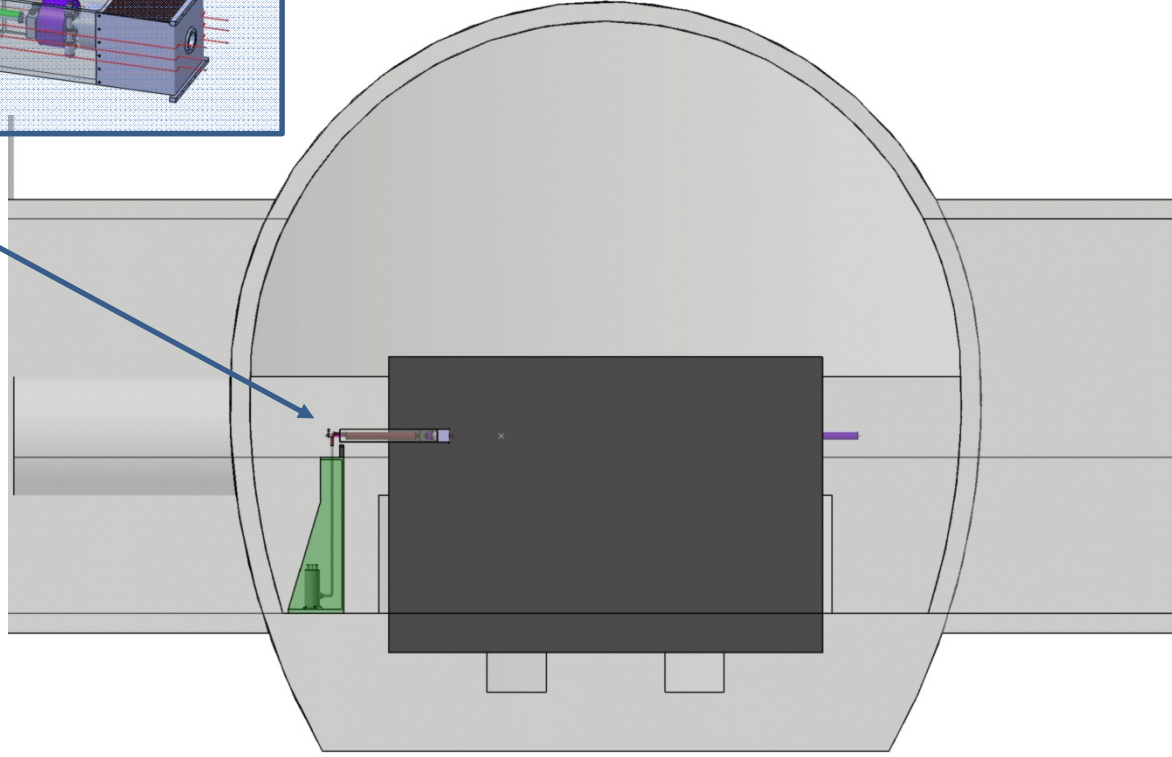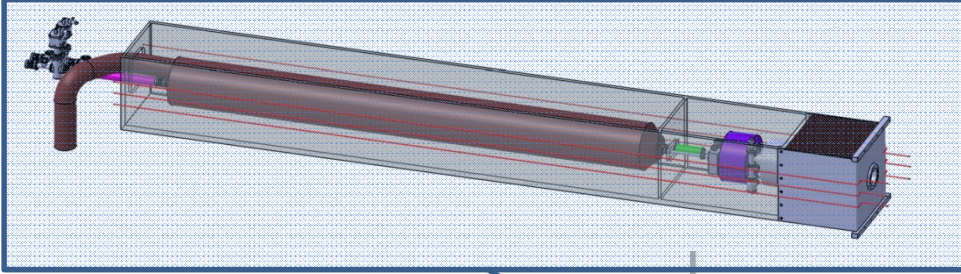
1. 1st pillar (QD0 support)
2. QD0 + support
3. Back part of endcap yoke
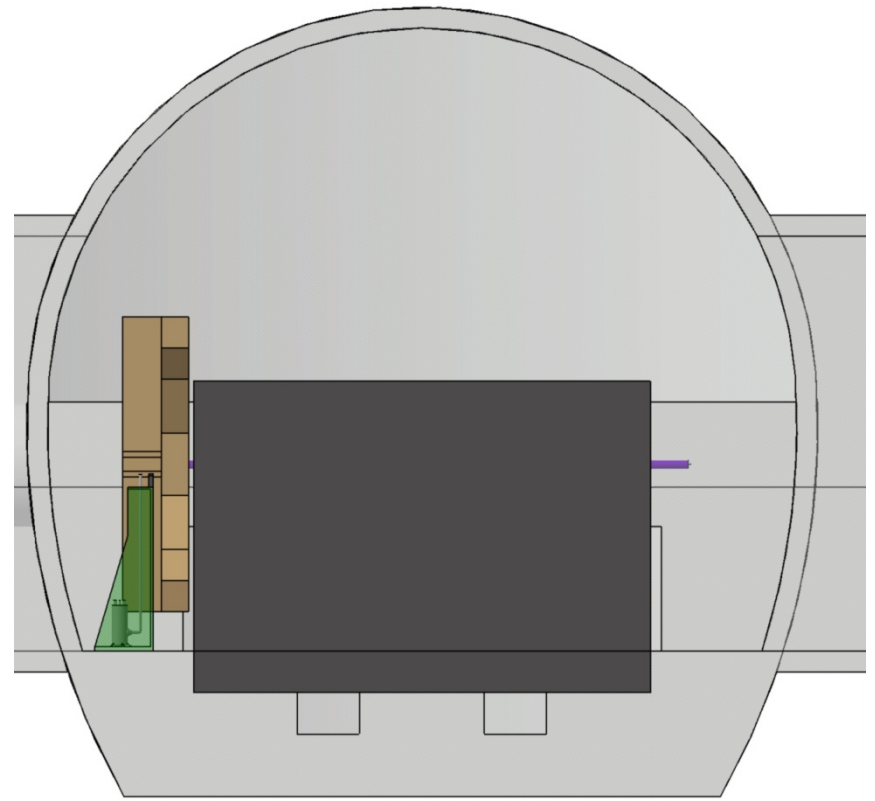
1. 1st pillar (QD0 support)
2. QD0 + support
3. Back part of endcap yoke
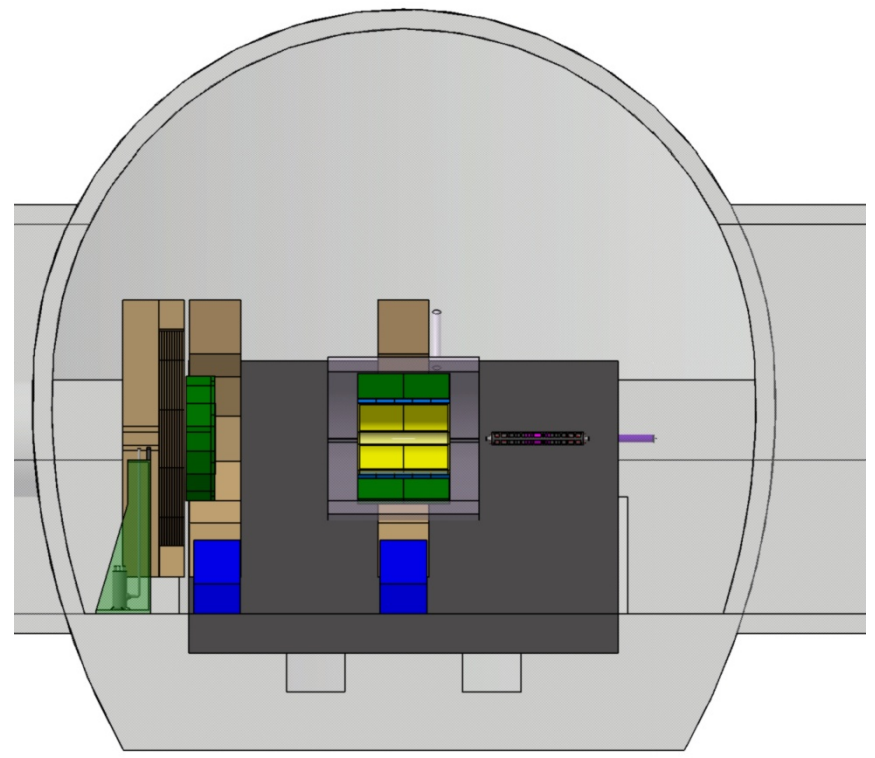4. Second part of the endcap yoke + Calorimeters endcaps (with cabling)

1. 1st pillar (QD0 support)
2. QD0 + support
3. Back part of endcap yoke
4. Second part of the endcaps yoke + Calo
5. 1st ring of barrel yoke on his support
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. Second part of the endcaps yoke + Calo
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. Second part of the endcaps yoke + Calo
5. 1st ring of Barrel yoke
6. Yoke central part
7. TPC
8. Inner part
9. Barrel yoke assembly
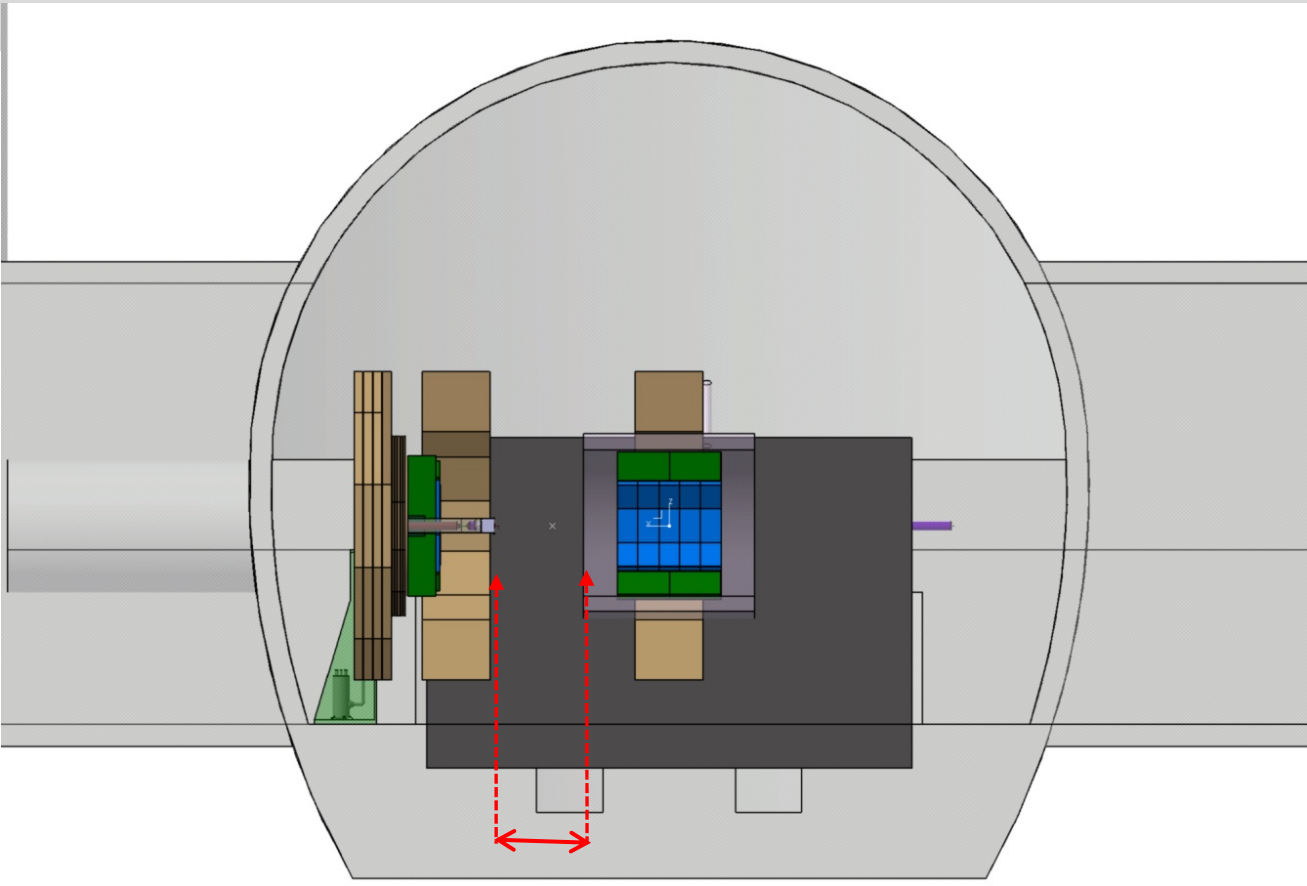
Completion with second endcaps and QD0
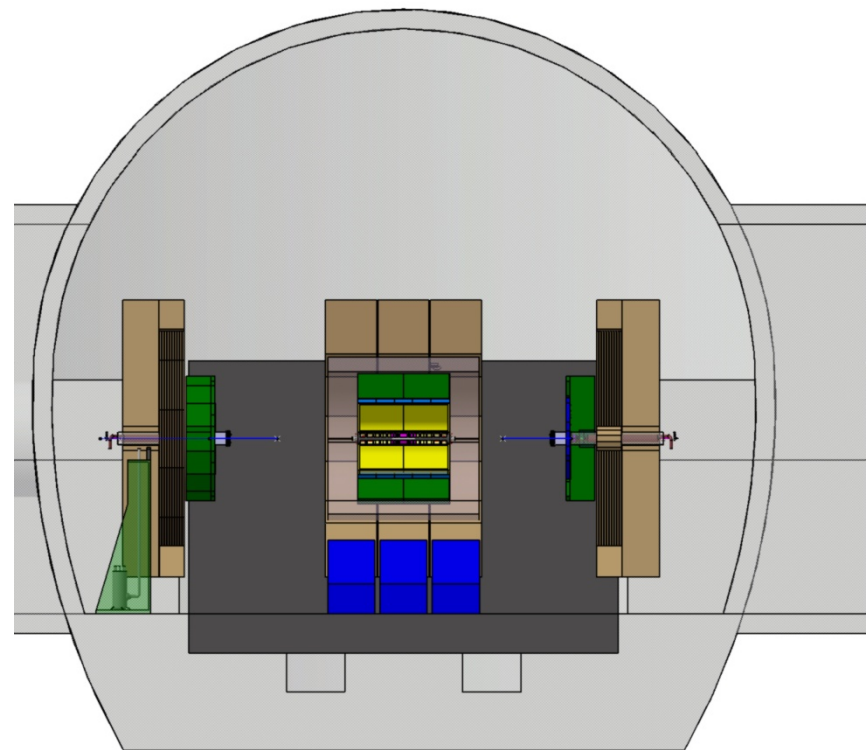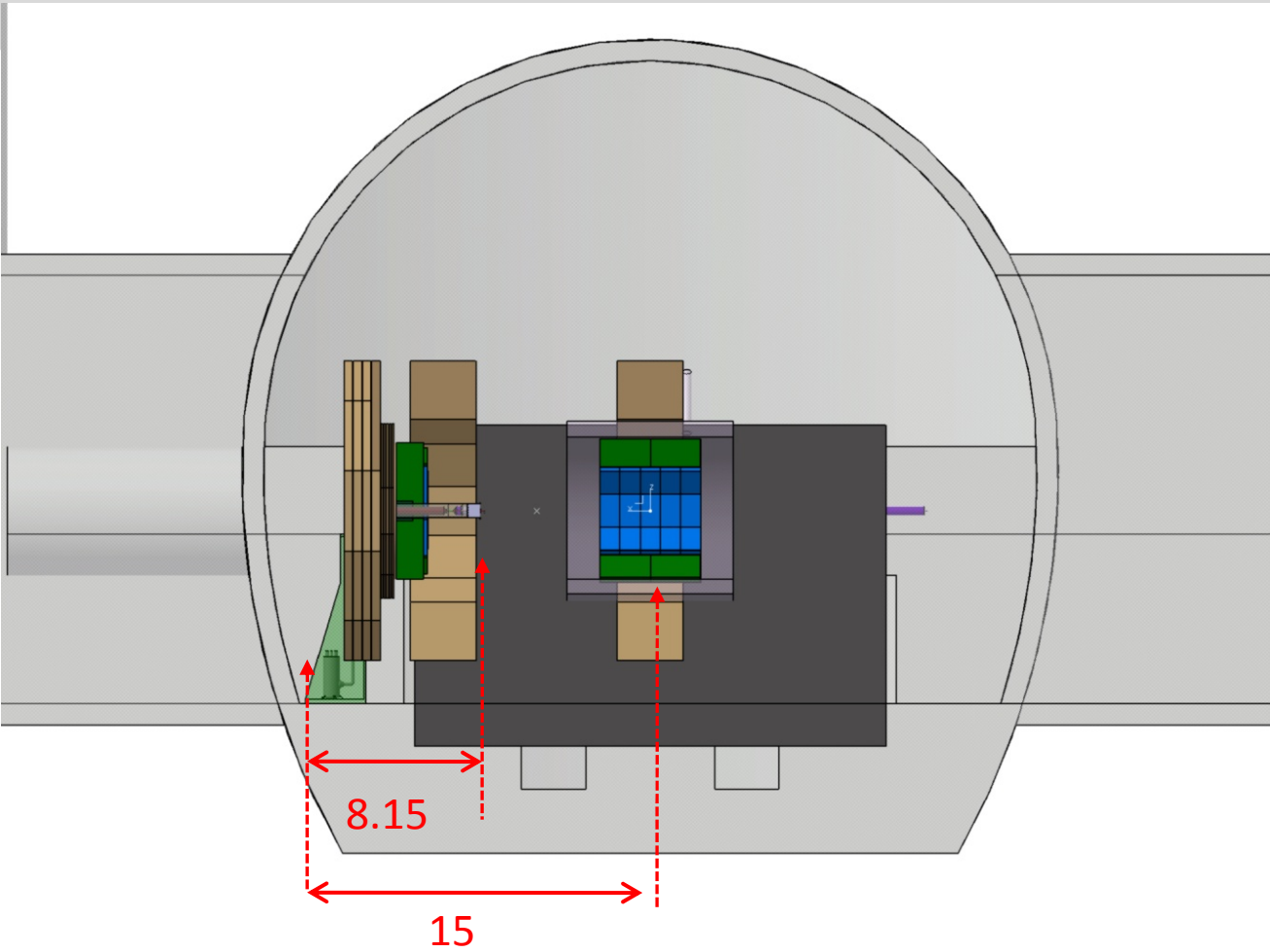
8.15

15

Give the minimum floor width of the hall :
=2*[(Pillar+QD0 support)+ space for work around barrel+ ½ coil length)]
=2[8,15+3m+3.9m]   *=30m*

Give the minimum floor width of the hall :
=2*[(Pillar+QD0 support)+ space for work around barrel+ ½ coil length)]
=2[8,15+3m+3.9m]   *=30m*
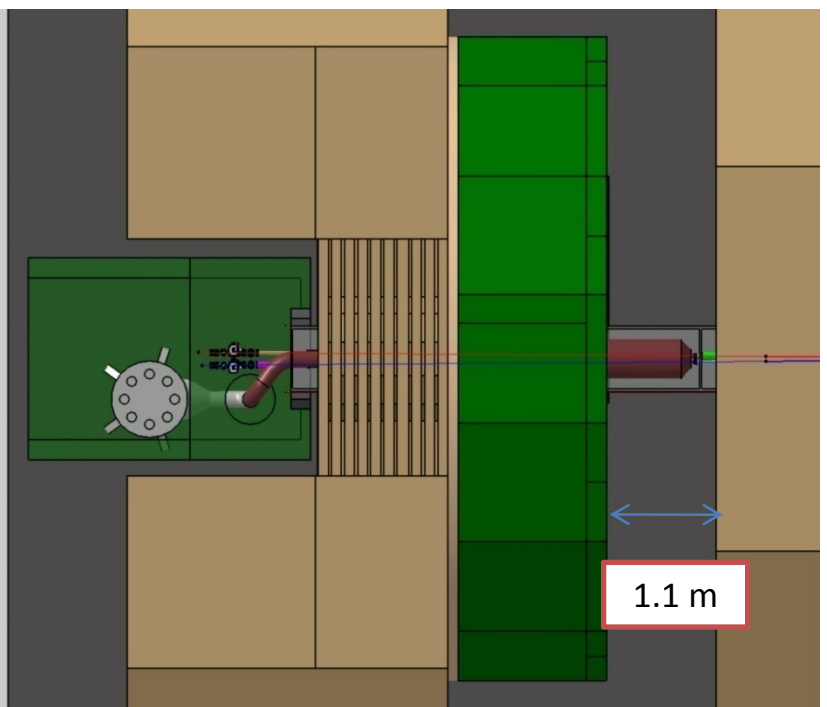
But___ **we also have to consider the place for maintenance of the barrel modules of the calorimeters in the case a partial extraction is needed (tooling)**

But... to be able to close (i.e. connect the forwards to inners) : no place due to thickness of endcaps yoke versus pillar....
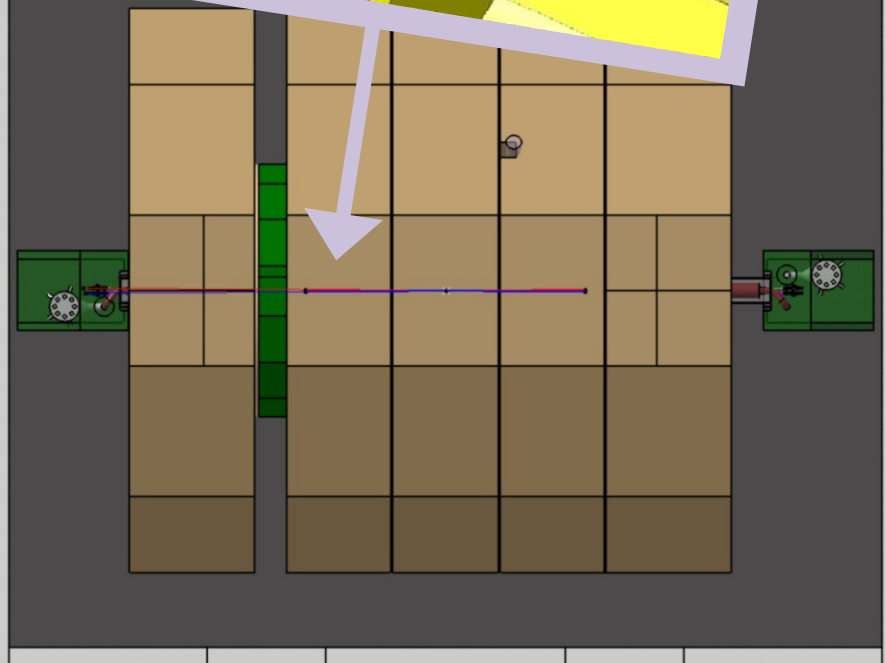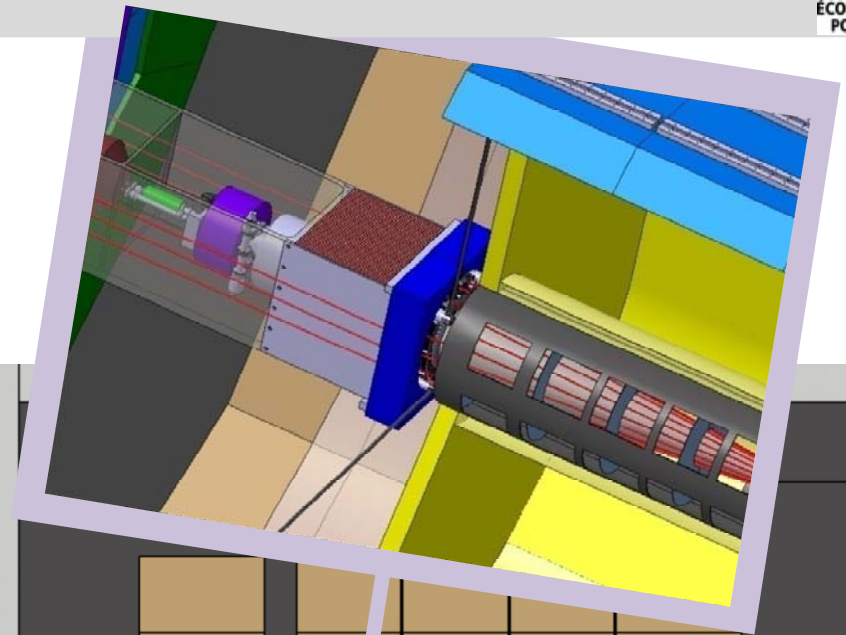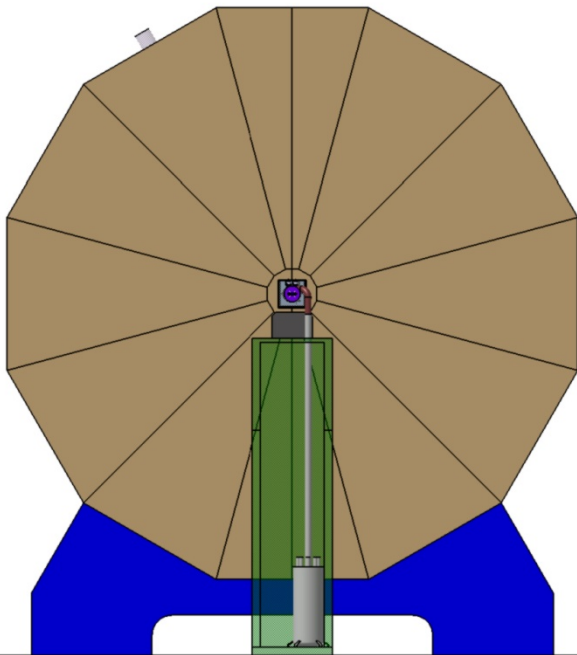
Split the back part of the endcap and move it along the pillar.
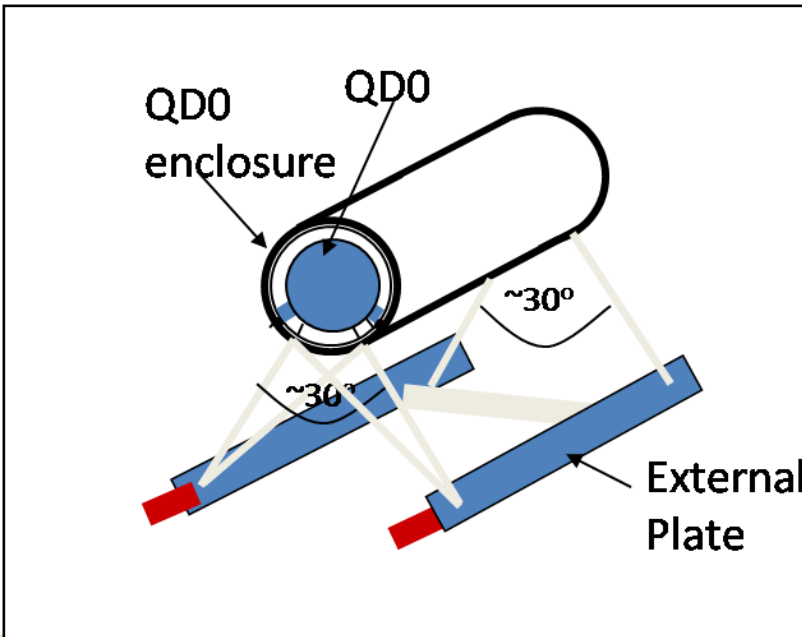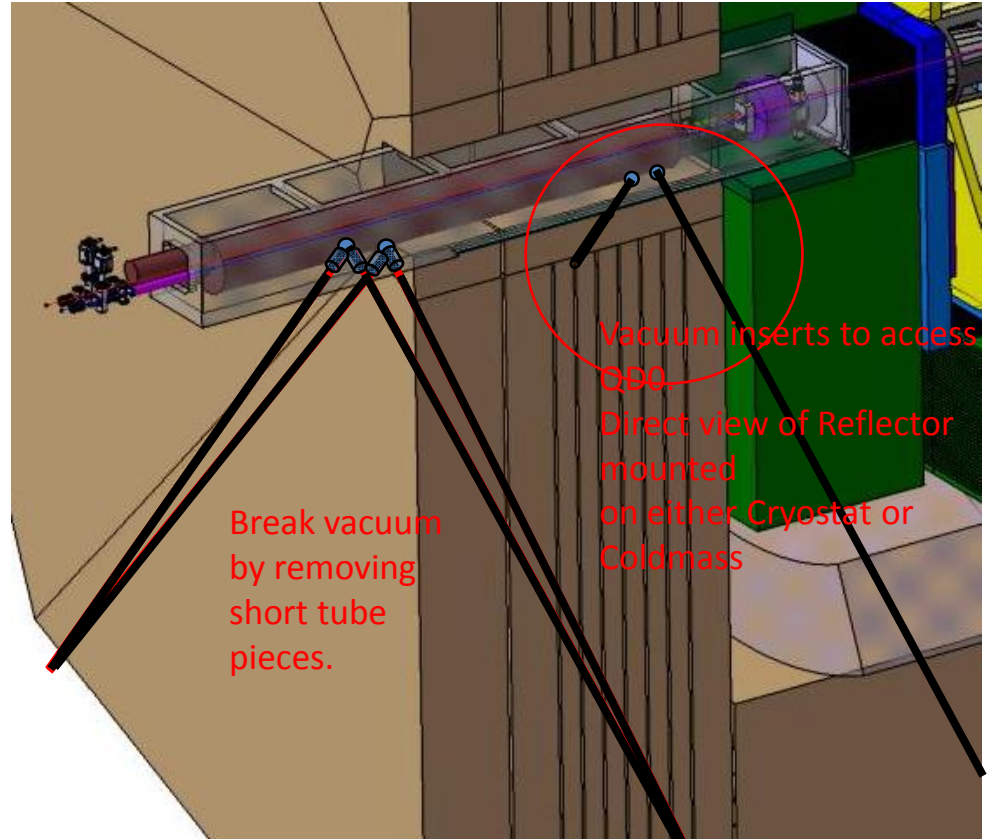Even then the access is very small

1.1 m
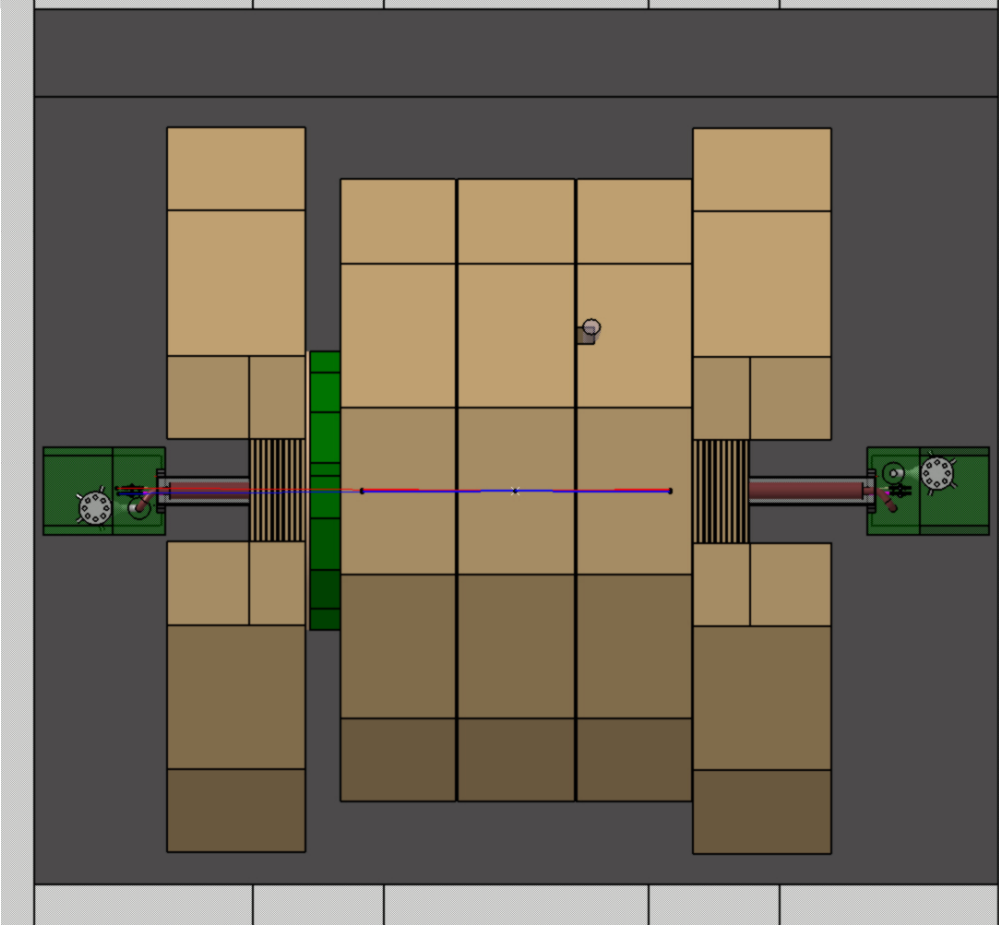
The opening possibilty depends on the thickness of the inner part of the endcap.

Case of Monalisa :

Final Doublet Stability and in-detector Interferometry
- 4 entries on one side,
- 2 on the other side,
- Lines going under the detector

Vacuum inserts to access QD0
Direct view of Reflector mounted
on either Cryostat or Coldmass

Break vacuum by removing short tube pieces.

QD0 enclosure

QD0

~30°

~30°

External Plate

- It is an interferometric metrology system for continuous monitoring of position critical accelerator components
- Consists of a fixed network of evacuated interferometric distance meters with nanometre type resolutions over O(10m)

See David Urner's talk at LCSW08