DUPASQUIER Thierry
Mechanical Dept

NEW REACTION CHAMBER FOR THE NEDA DIAMANT CAMPAIGN

Chamber design & integration

With target loader or plunger

AGATA Week – October 6th 2016 - Orsay

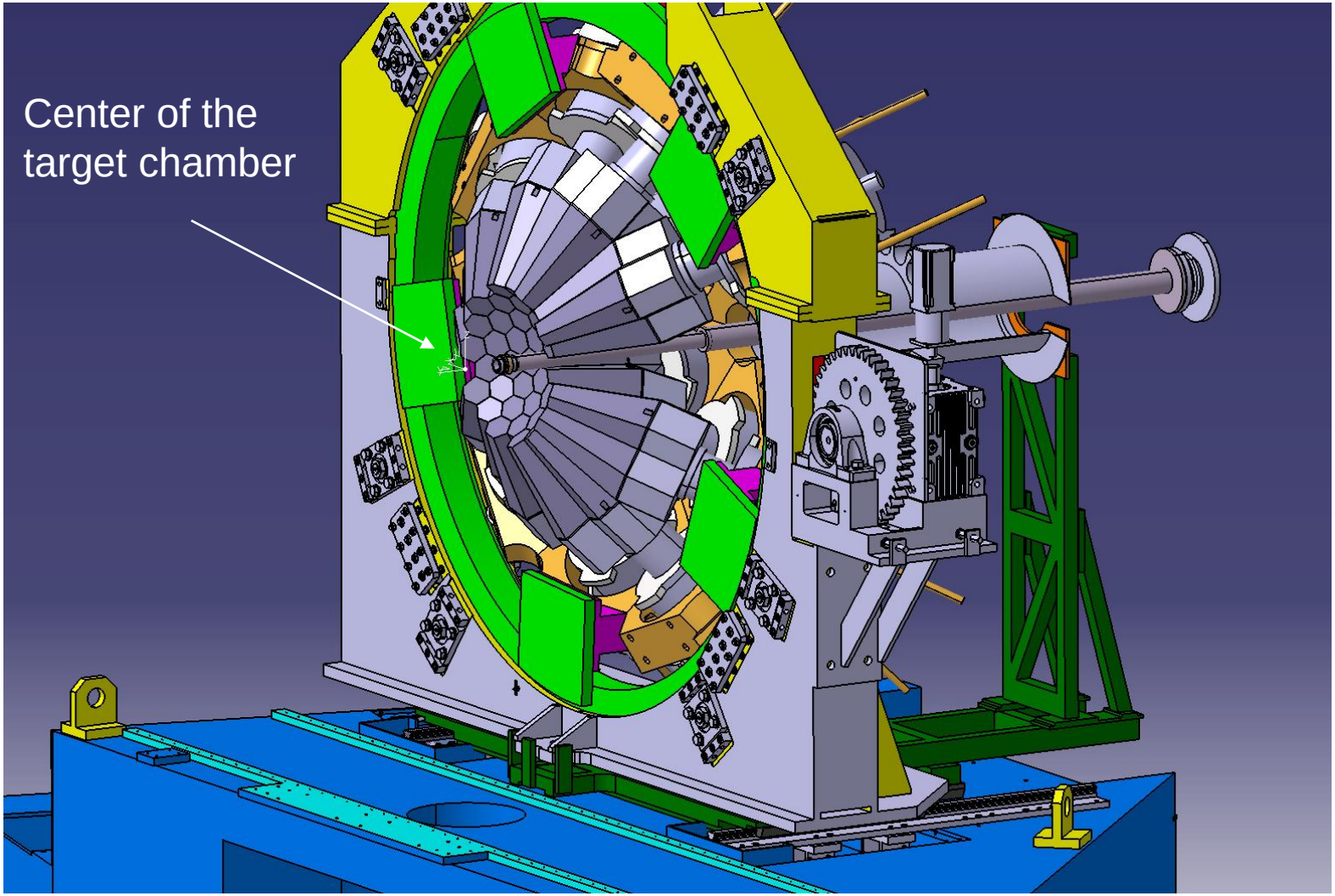
New reaction chamber

Plan

- **AGATA**
- **« LeBigMac »**
  - **Chamber design**
  - **Chamber Diamant & Target loader**
  - **Chamber Diamant & Plunger**
- **Chamber integration**
- **Chamber alignement**
- **WIP & Requirements**

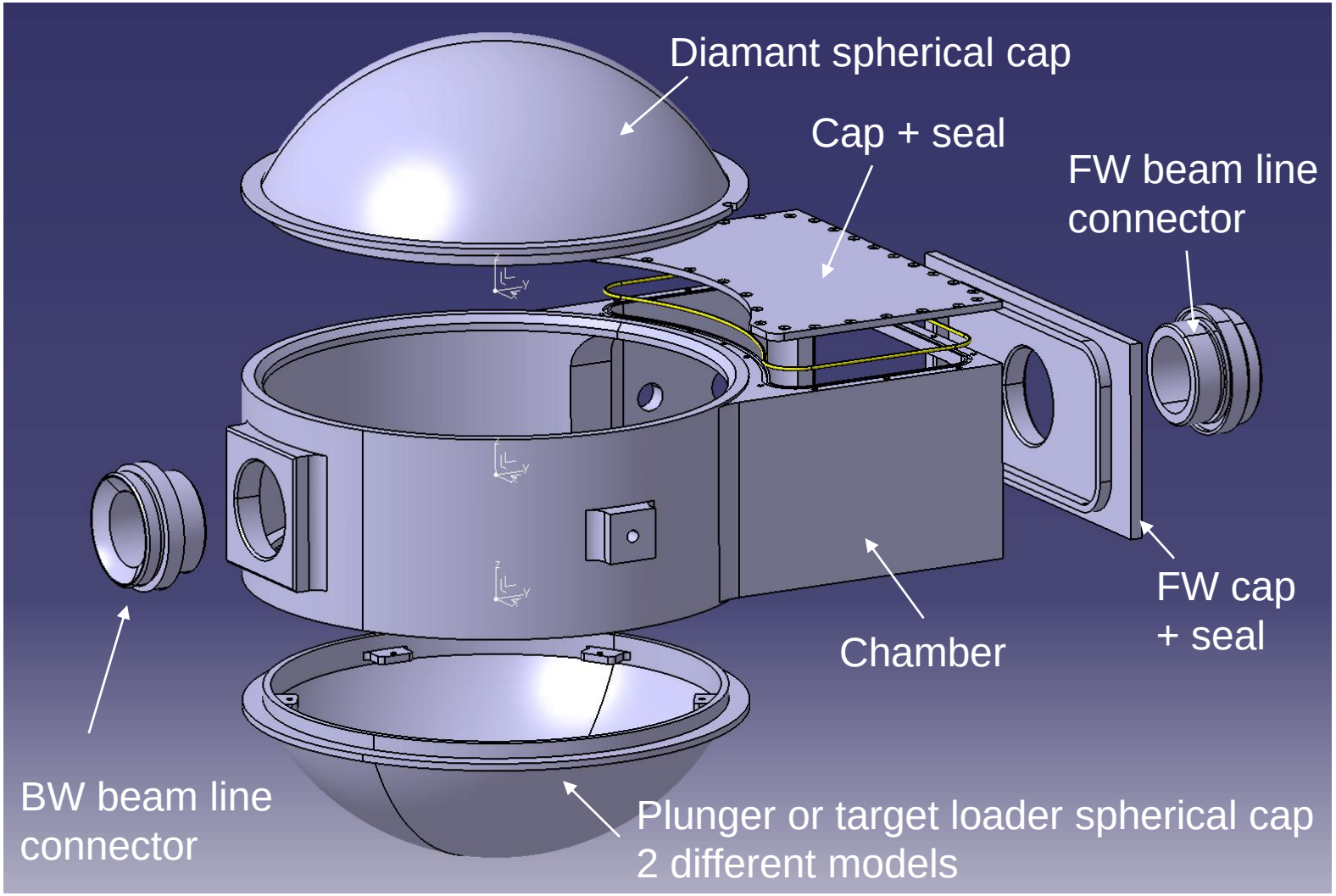
AGATA

Limited model



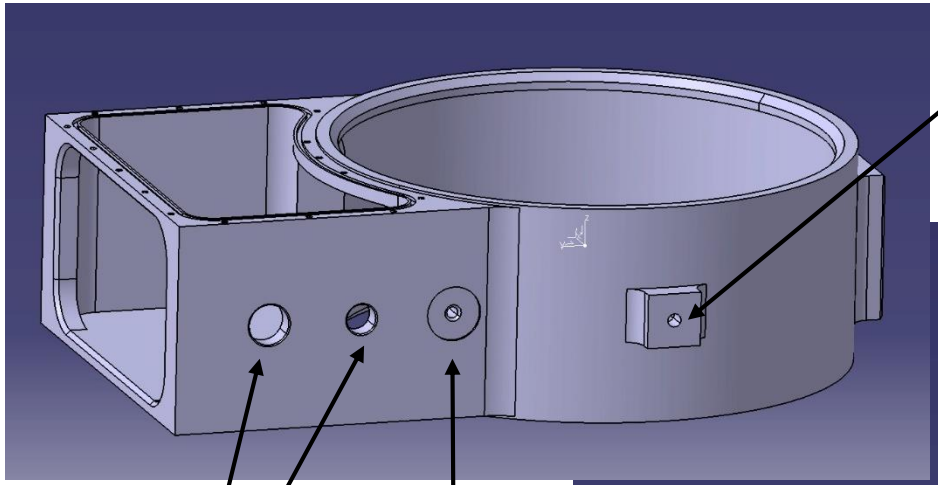
Chamber design

General concept



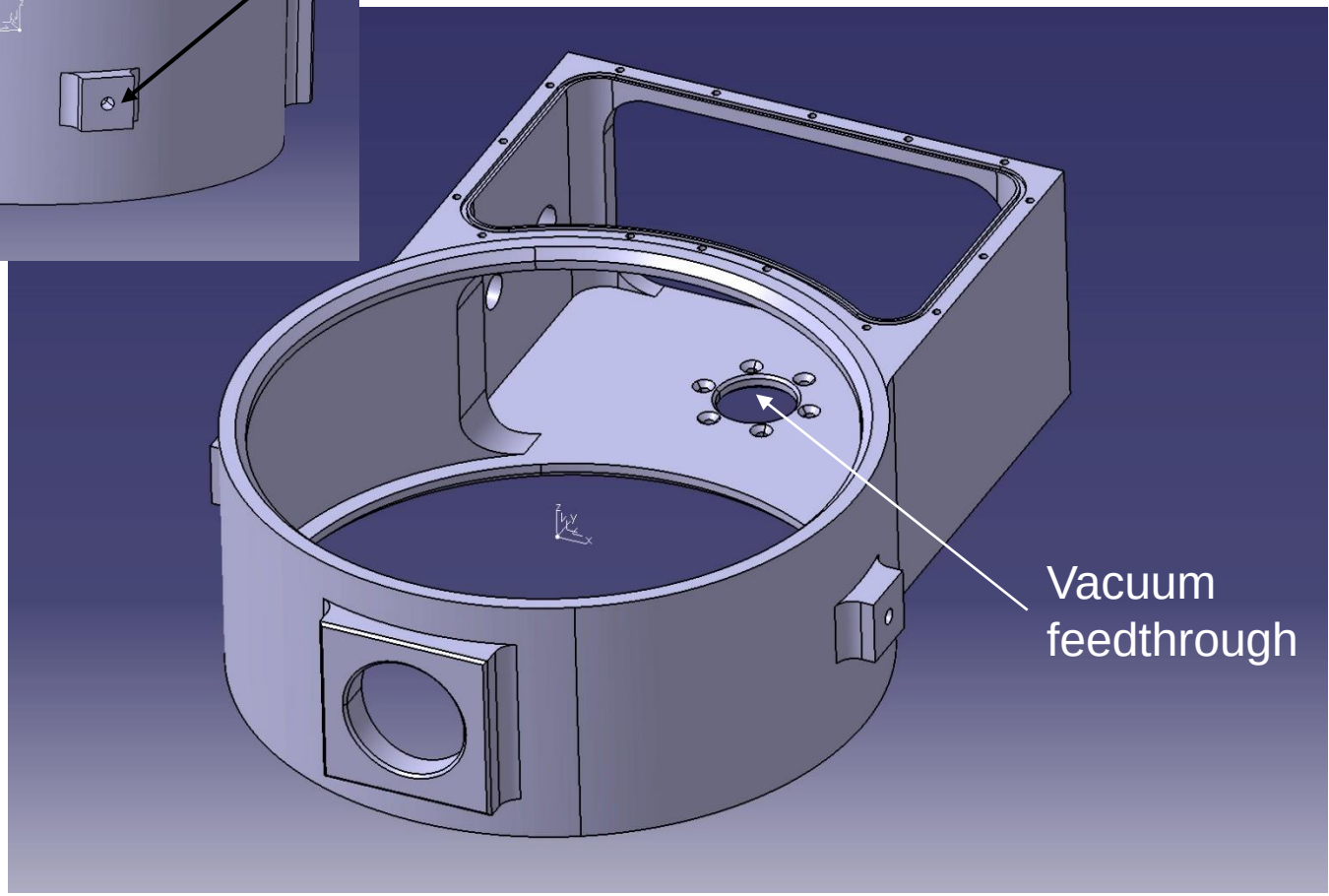
Chamber design

Chamber



Fixing tapped hole
Both sides

Material : Aluminium alloy



Tapped holes for
Lemo connectors
for plunger control

Spot facing for optical
target and alignement

Vacuum
feedthrough

Diamant

Diamant spherical cap

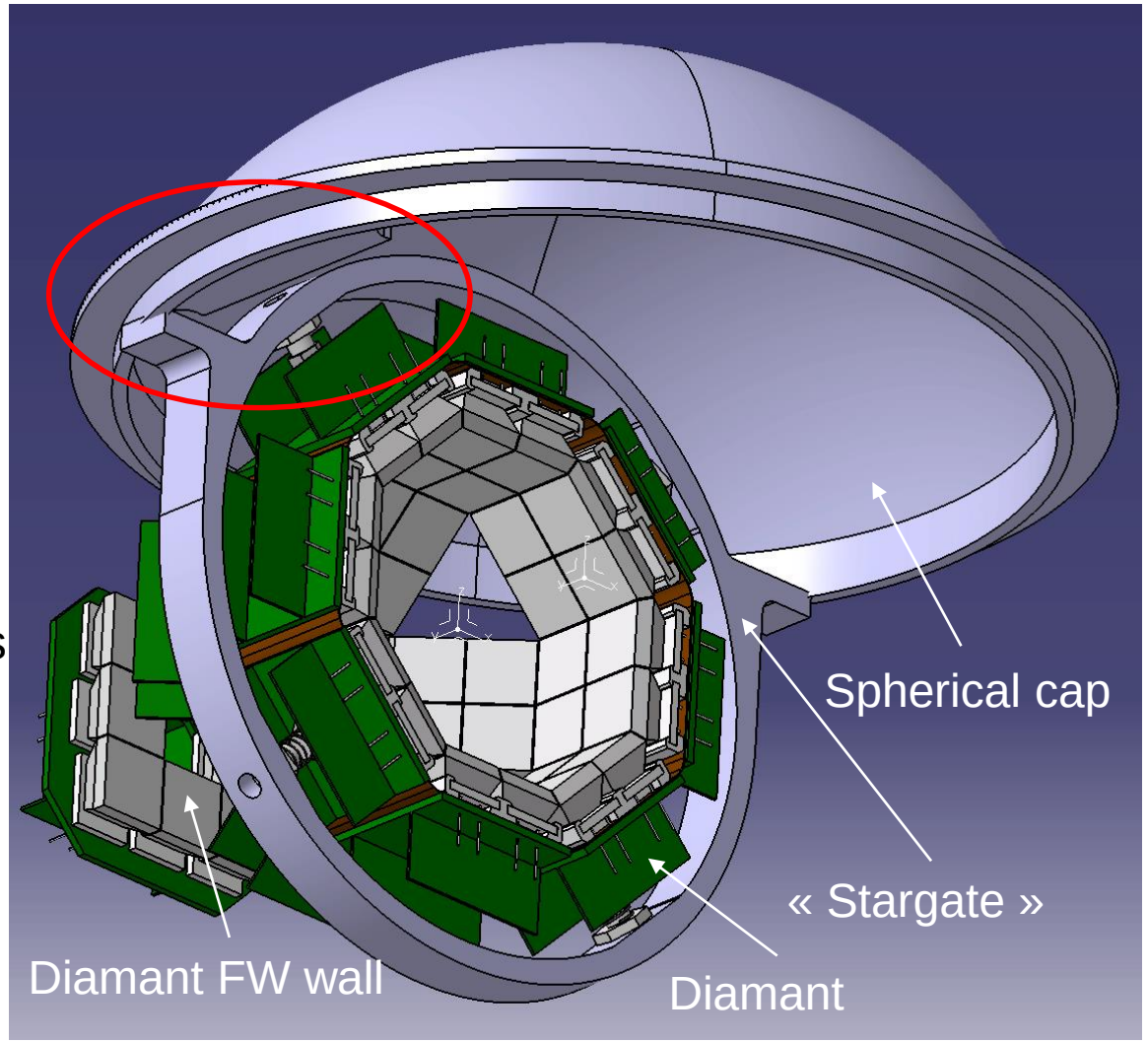
Diamant :
-has 2 positions depending on Target loader or Plunger
-must be changed just by removing the spherical upper cap

The FW wall must follow the Diamant positions

The cap must have handles to fix the stargate on these positions

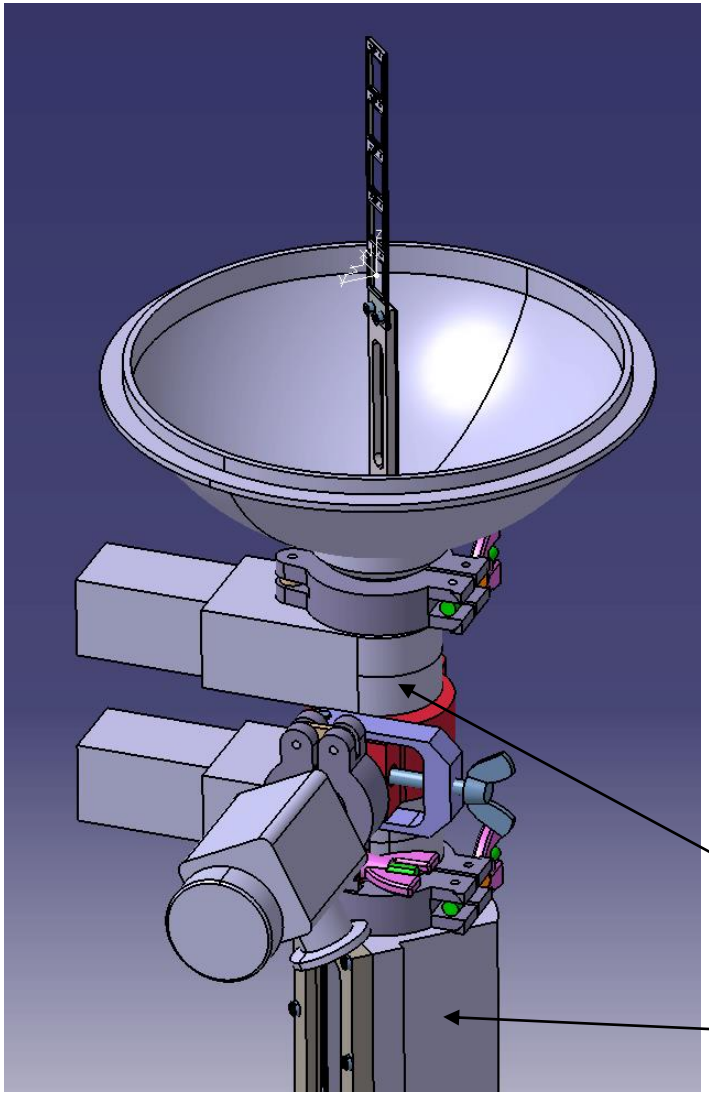
The FW wall will have his own support with 2 positions

New design of the stargate



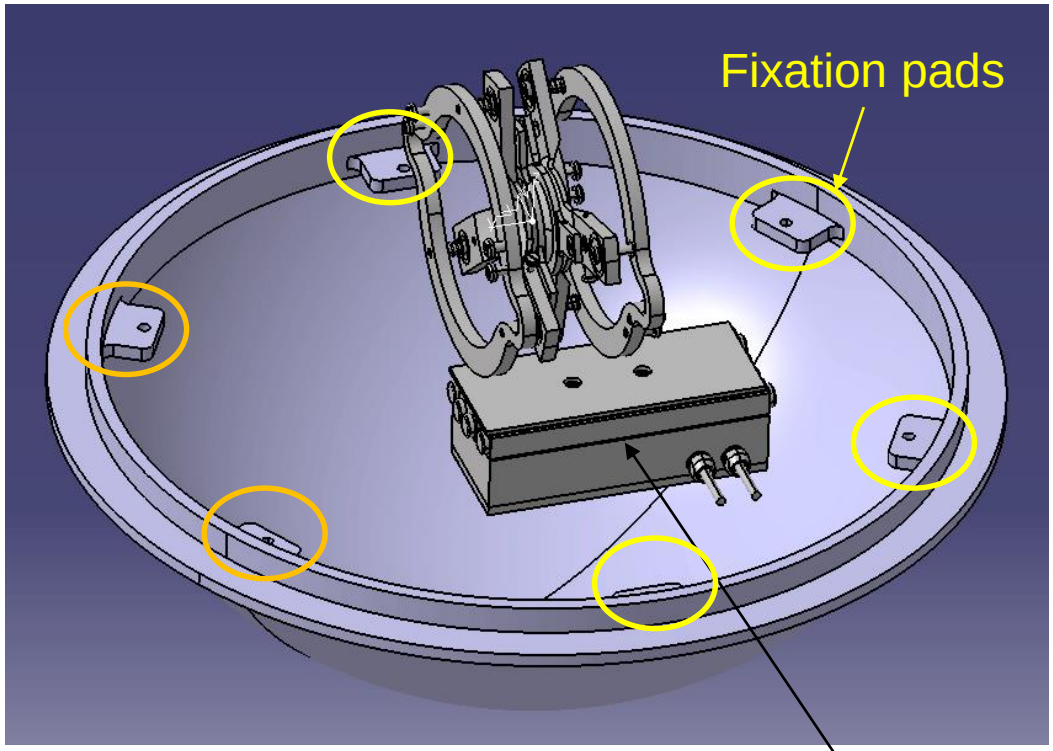
Chamber design

Target loader - Plunger



Vacuum feedthrough
by pass with valves (1)

Target loader (1)

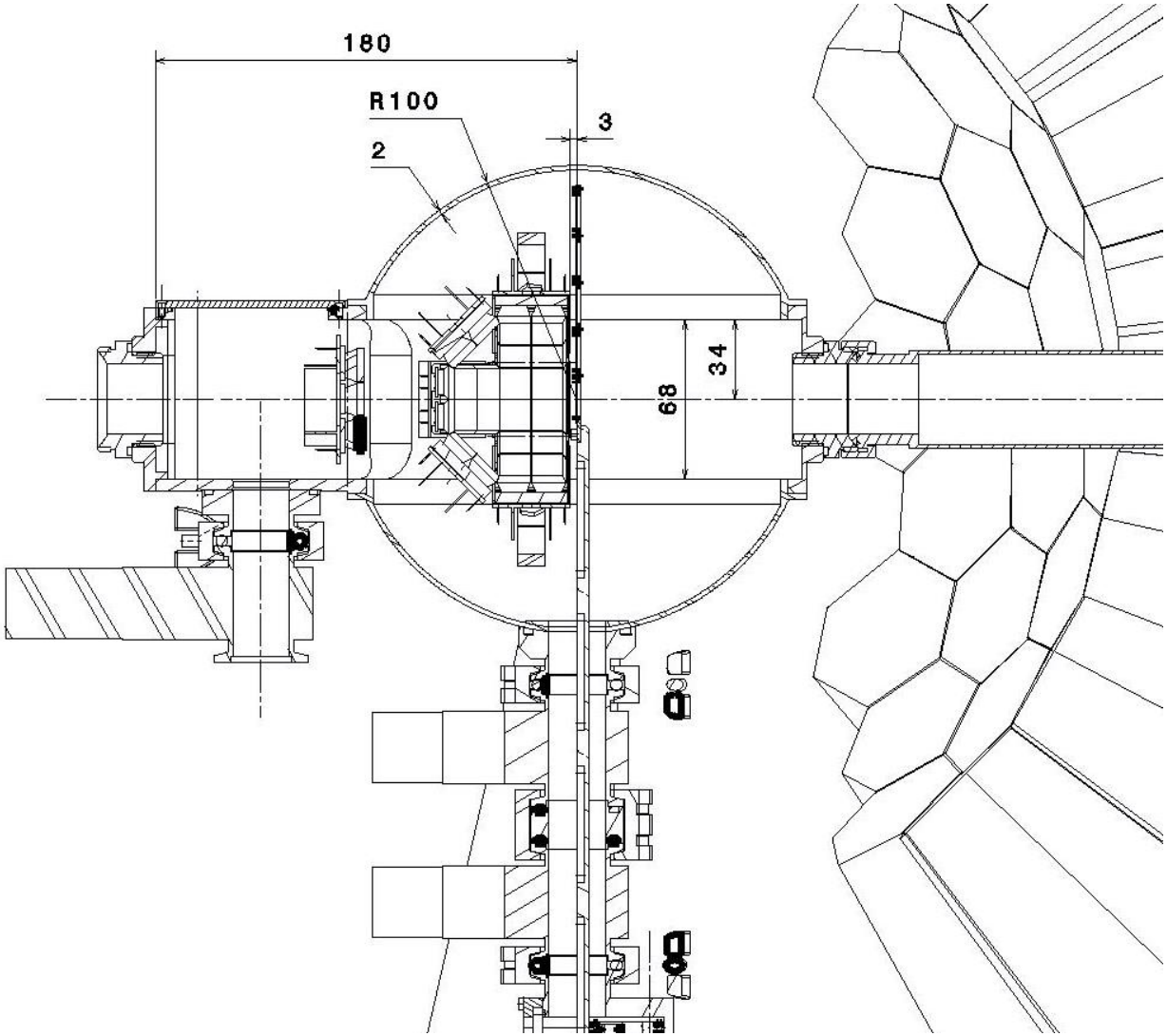


Plunger

(1) Already exists

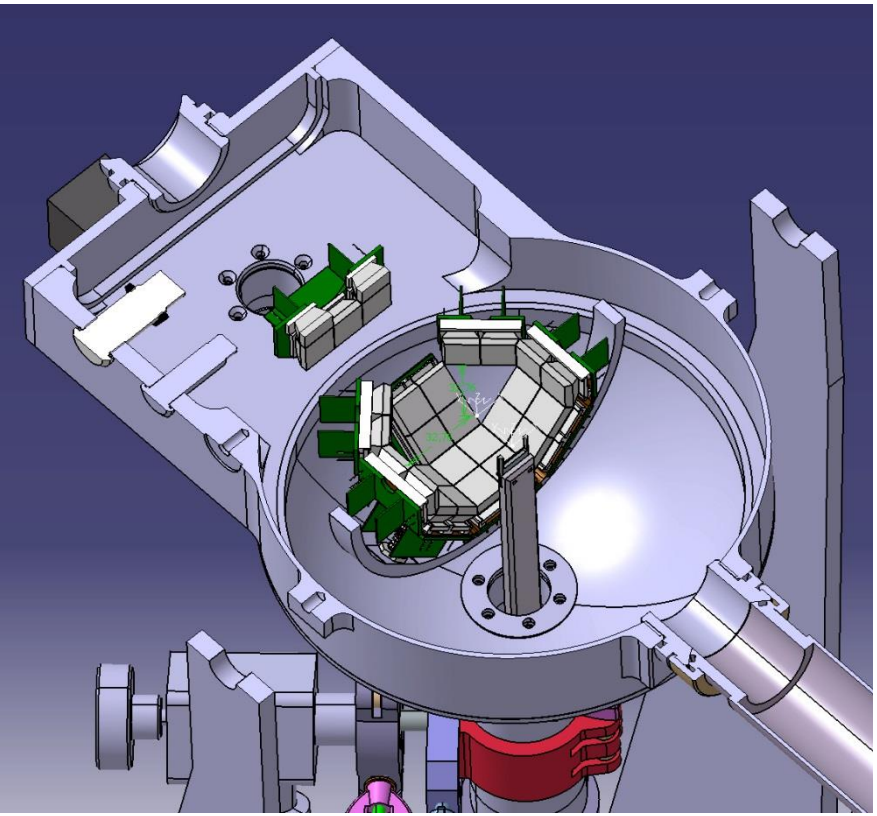
Diamant Target loader

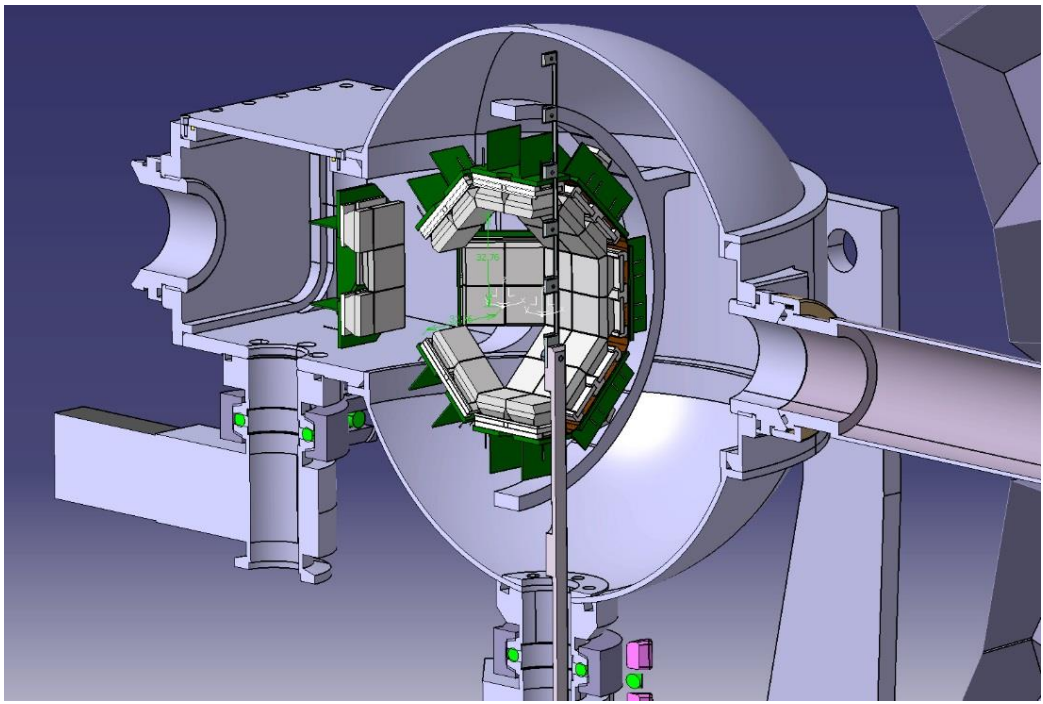
2D Cross section



Diamant Target loader

3D cross section

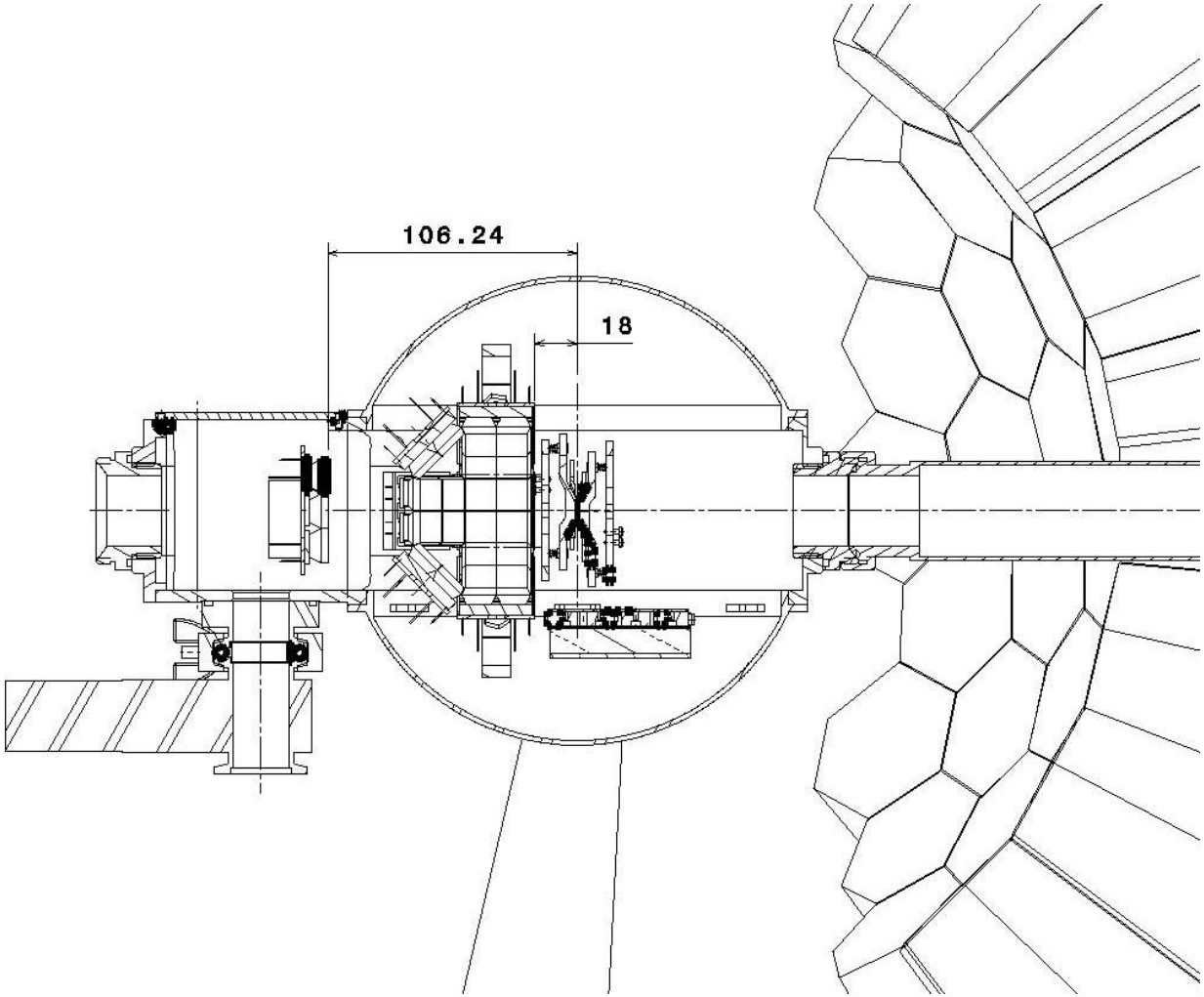




Diamant is 3 mm close the center of the chamber

Diamant Plunger

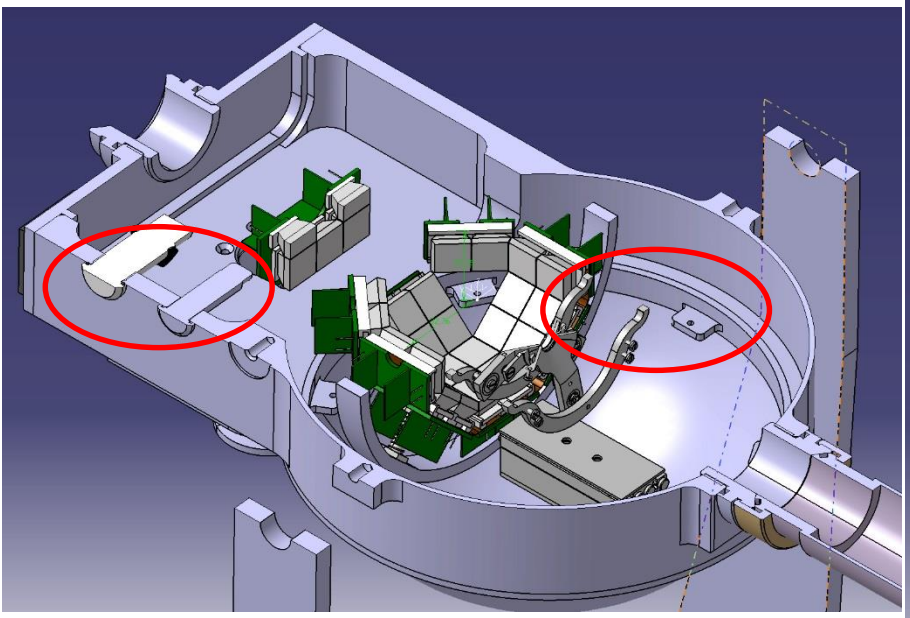
2D Cross section

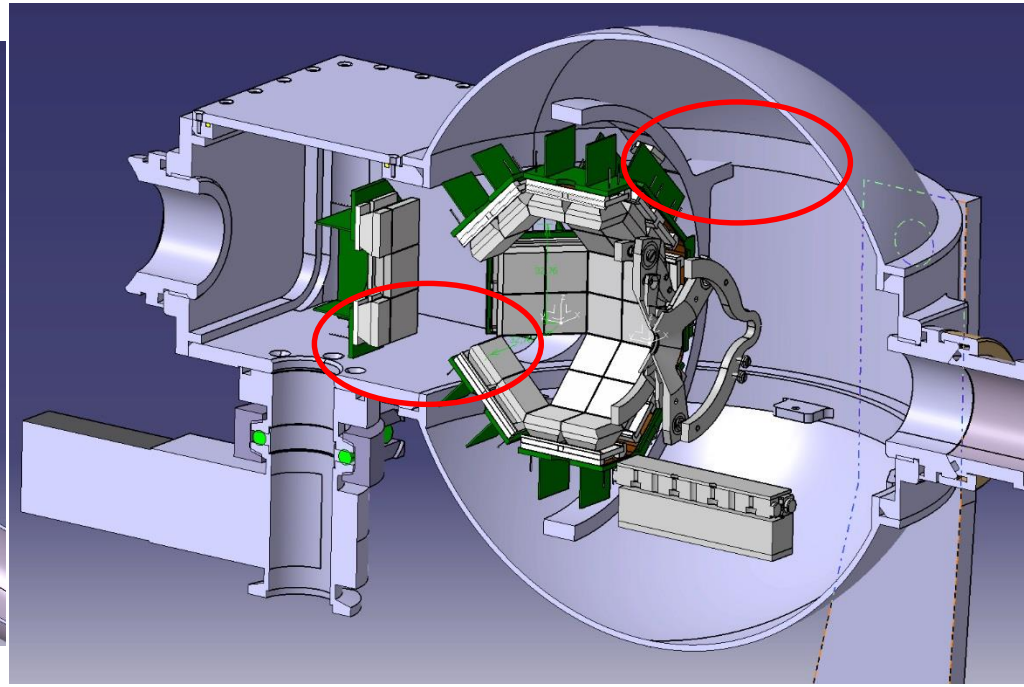


Diamant Plunger

3D cross section

Diamant is 18 mm close the center of the chamber





Details that must be checked:
- Pluger fixation on its spherical cap (see with Joa)
- Diamant « Stargate » fixation on its sperical cap (see with Istvan)
- Diamant FW wall fixation on the chamber (see with Istvan)
- LEMO Connectors are close the FW Wall
- Diamant connectors/kapton/wires feedthrough

Chamber integration

Chamber with support

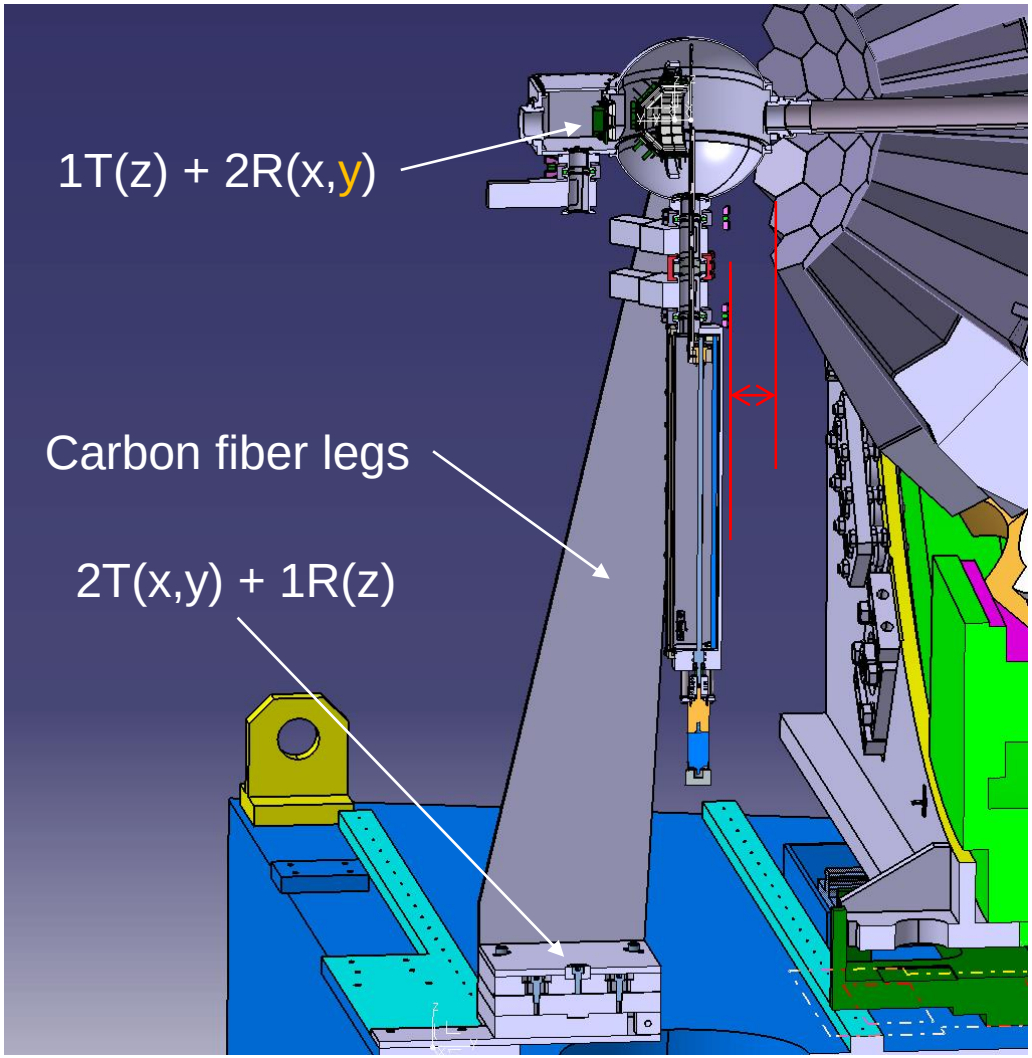
Worth case with target loader :
Distance between target loader and AGATA

Support is made of :
Plate on AGATA structure
Carbon fiber legs (expertise with a french company)
1system : 2T + 1R (base)
1system : 1T +2R (chamber)

Pb with the y rotation (beam axis)

Alignement procedure:
must be defined

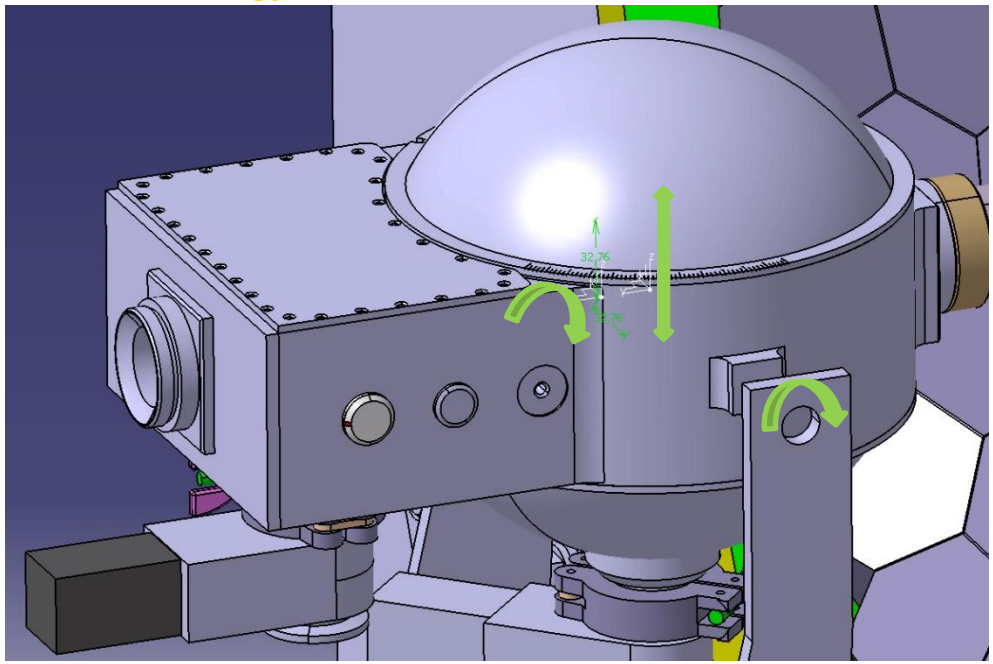
Do wee need 6 degrees of freedom (?)

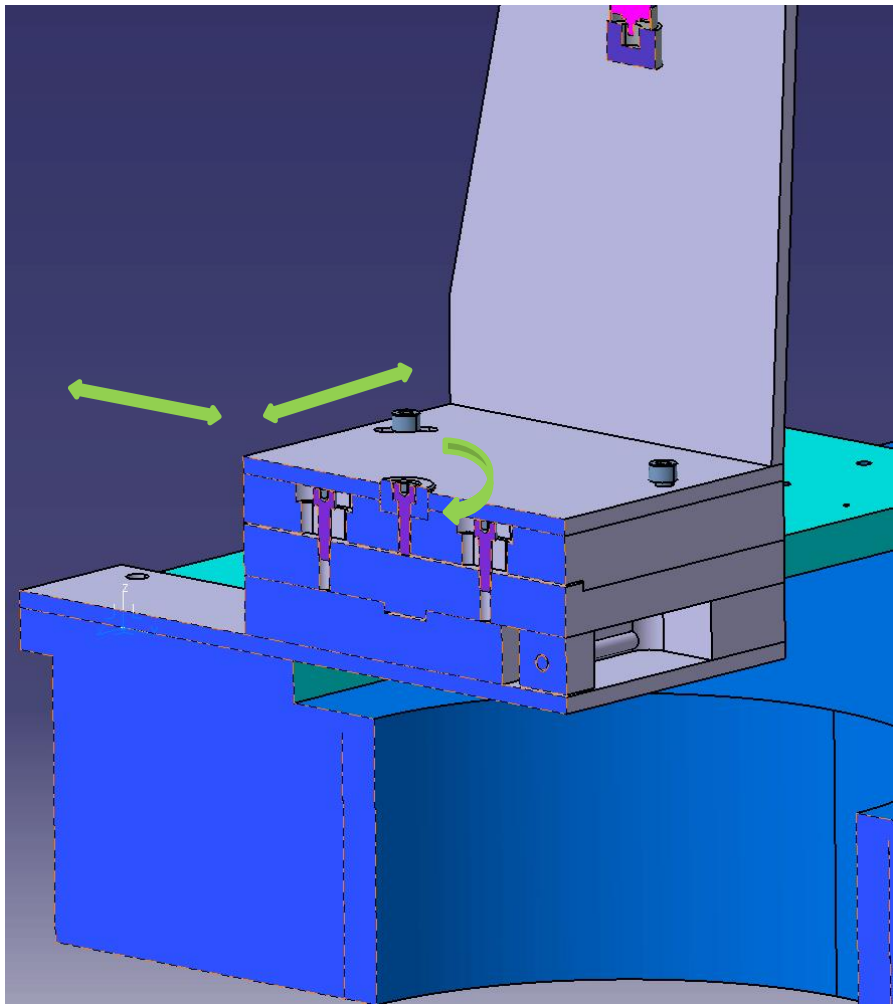


Chamber Alignement

6 degrees of freedom

1st system :
x,y translation box
z rotation centering pin
Blocking screws
2nd system on each leg:
z translation and x rotation box
y rotation (tilted device with z translation on each leg)





WIP + requirements

Design advancement

Parts	Design	Lab / Workshop	Points to checkout
Chamber	☒	IPNL/Sub-contractor	Final design for price check
Beam line connectors	☑	GANIL/IPNL	Already one on the actual beam line, have to make the same one for the chamber FW output
Spherical cap Diamant	☒	Istvan	Final design of stargate, and FW Wall support Connectors / kapton / wires feedthrough
Diamant's Stagate	☒		
FW Wall support	☒		
Spherical cap Plunger	☒☑	Joa	Need of the support of this new Plunger for the fixing pads and the position of the LEMO connectors
Plunger support	☒		
LEMO connectors	☑		
Spherical cap Target loader	☑	IPNL/Sub-contractor	Ready
Target loader	☑	GANIL	Ready
Chamber's valve & feedthrough	☑	IPNL/VAT	Ready
Chamber support	☒	IPNL/Sub-contractor	Have to checkout with GANIL (Emmanuel Clément) for integration with NEDA and neutrons wall, and the needs of all degres of freedom, or new concept
Carbon fiber legs	☒	IPNL/Workshape (France)	
Alignement system	☒	IPNL/Sub-contractor	

WIP + requirements

Design advancement

- Chamber meeting at 9am this morning

- We validate the concept
- New small resquests for the plunger
- Ian integrates the AGATA detector and its new chamber on his model and it works!