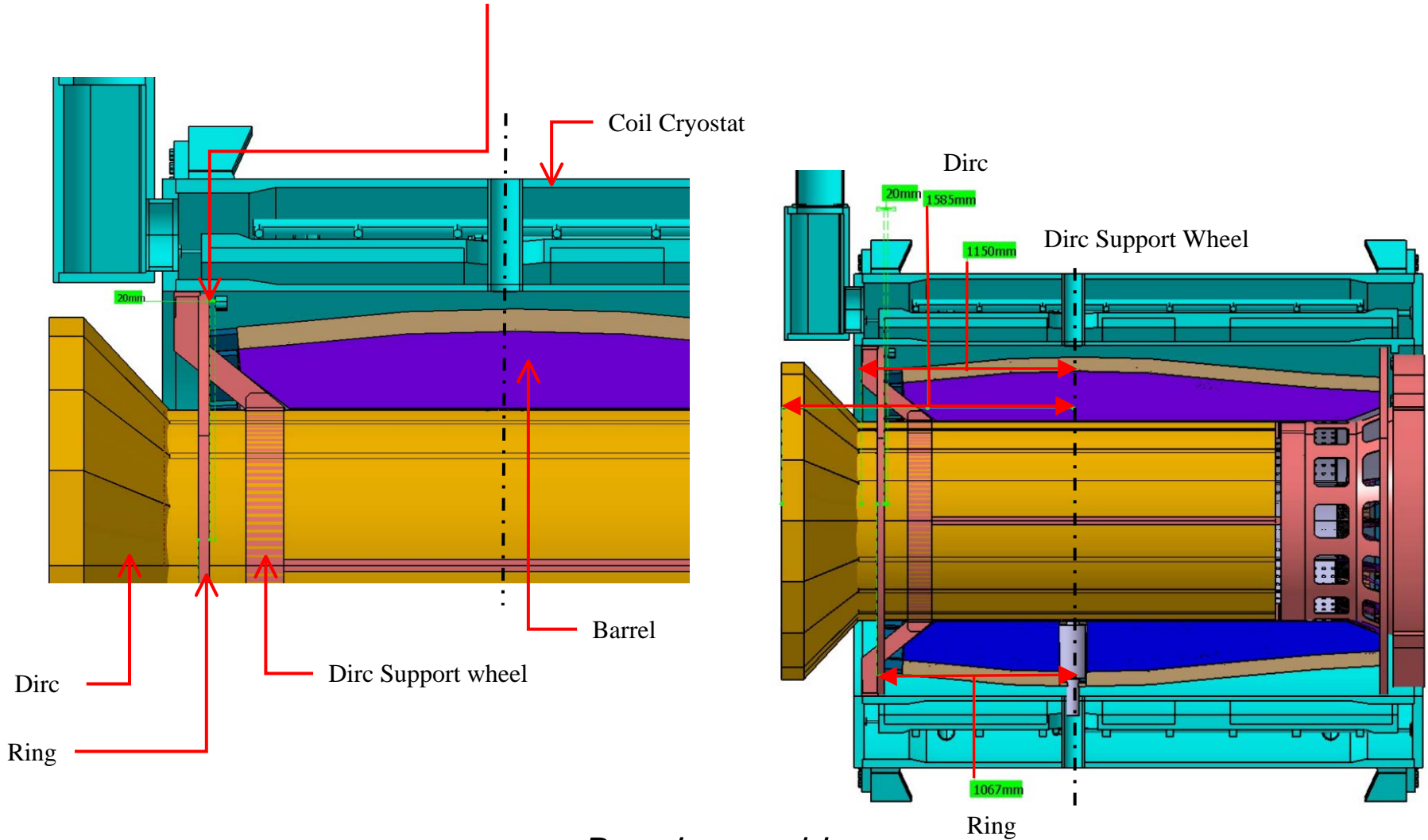


# Mechanical Status for the Barrel of Panda

- Introduction
- General Slice
- Vertical Slice type 1
- Cooling system for Panda
- 480 Crystals' Prototype
- Conclusion

Offset of 20 mm  
The position of the Dirc support must be adjusted



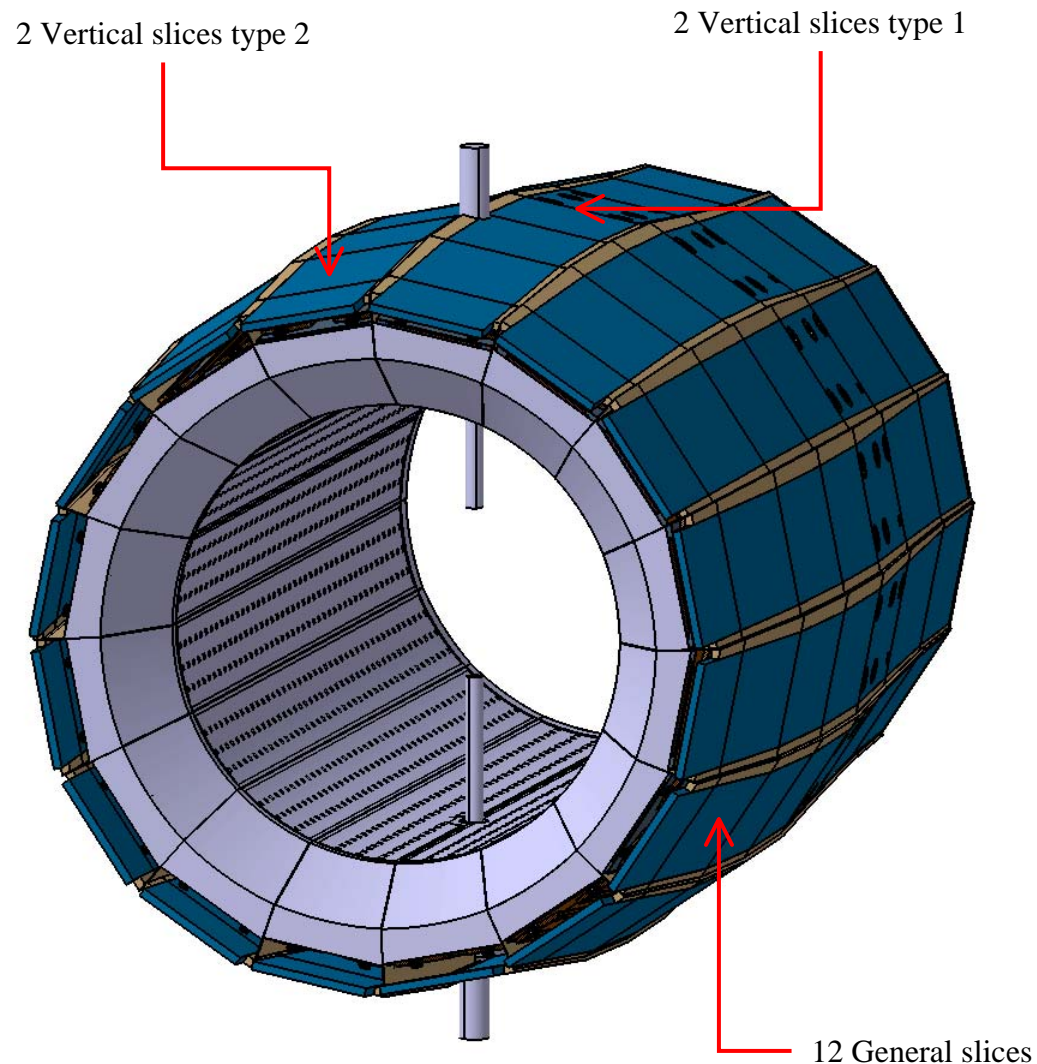
*Barrel assembly*

The Barrel is composed of 16 slices :

-12 same slices named “General Slices”

- 4 slices adapted to hole for the Target :

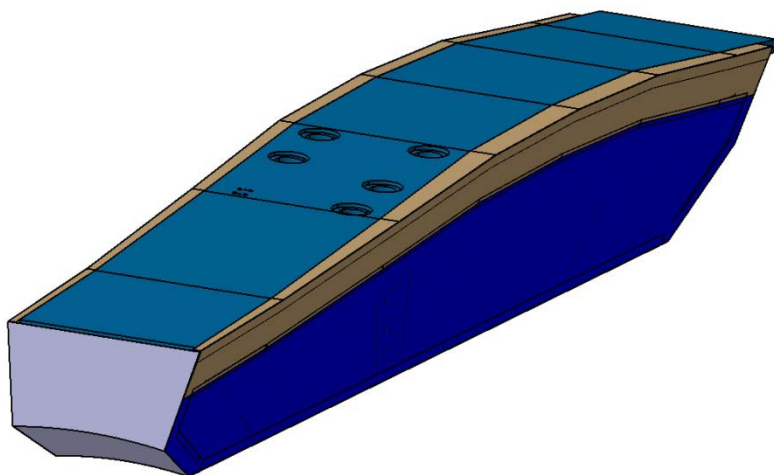
- 2 vertical slices named “Vertical slices type 1”
- 2 vertical slices named “Vertical slices type 2”



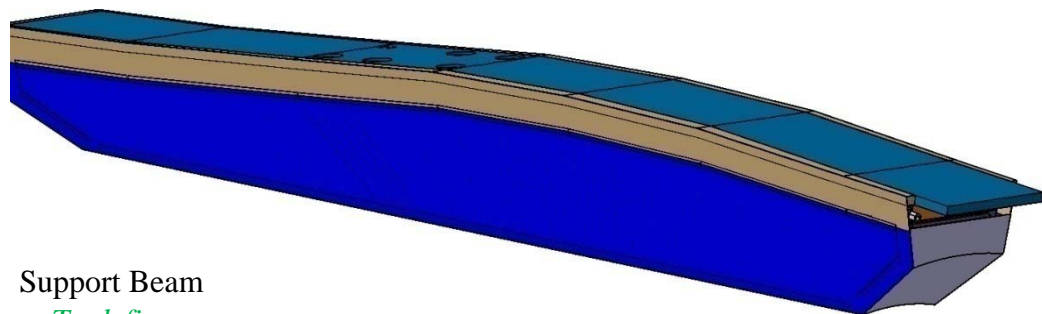
Barrel assembly

# General Slices

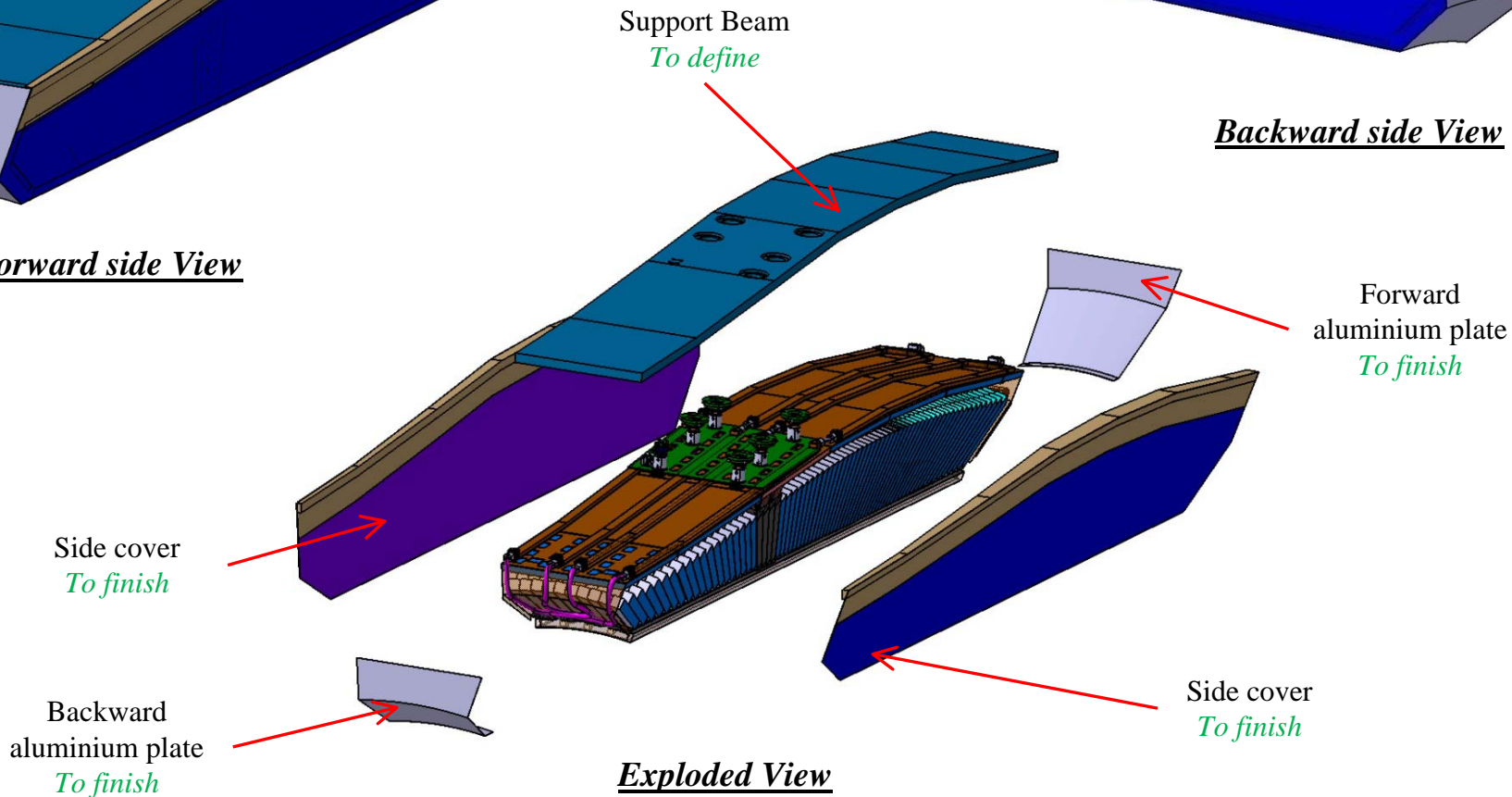
A slice = closed area cooled at  $-25^{\circ}\text{C}$



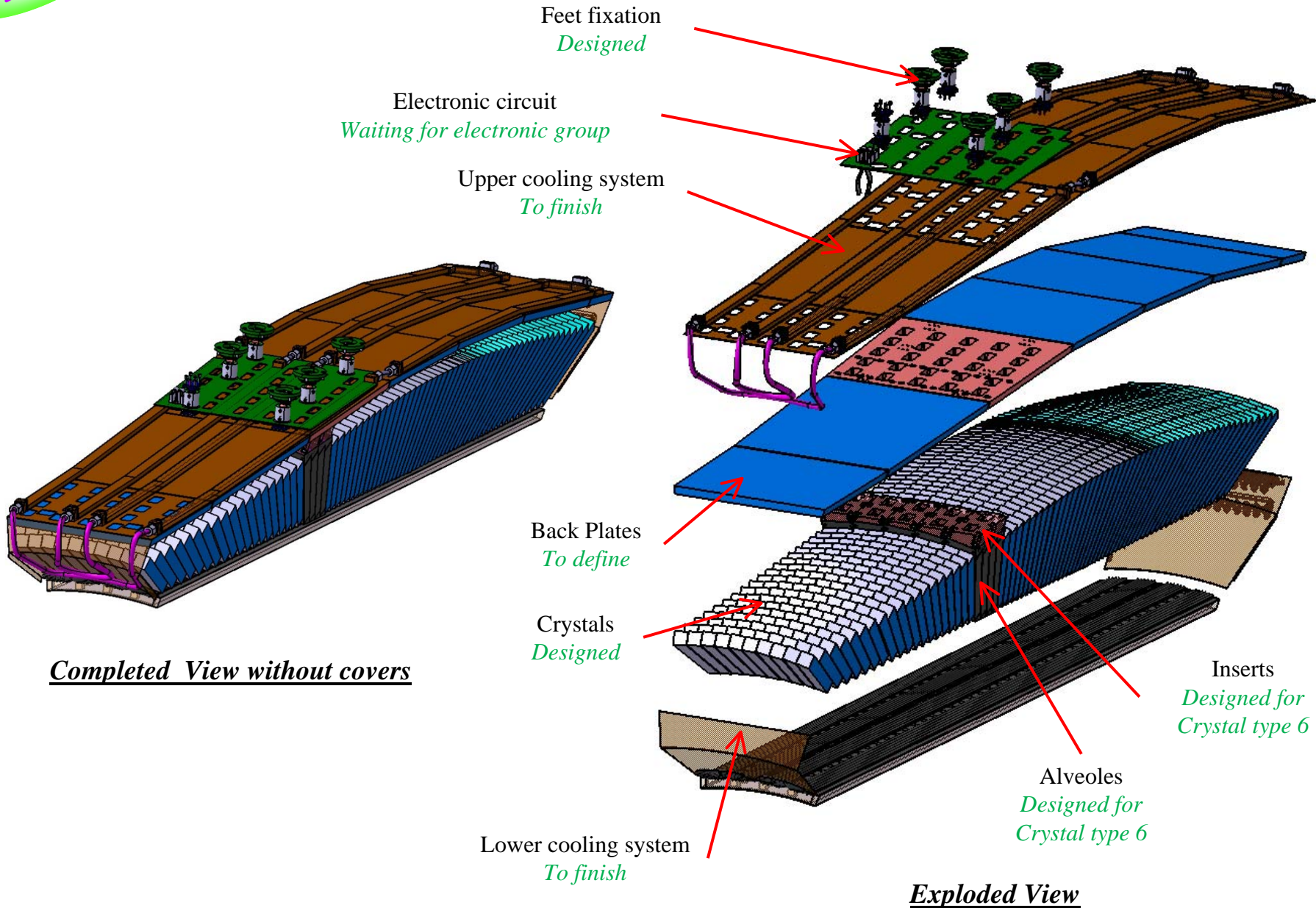
Forward side View

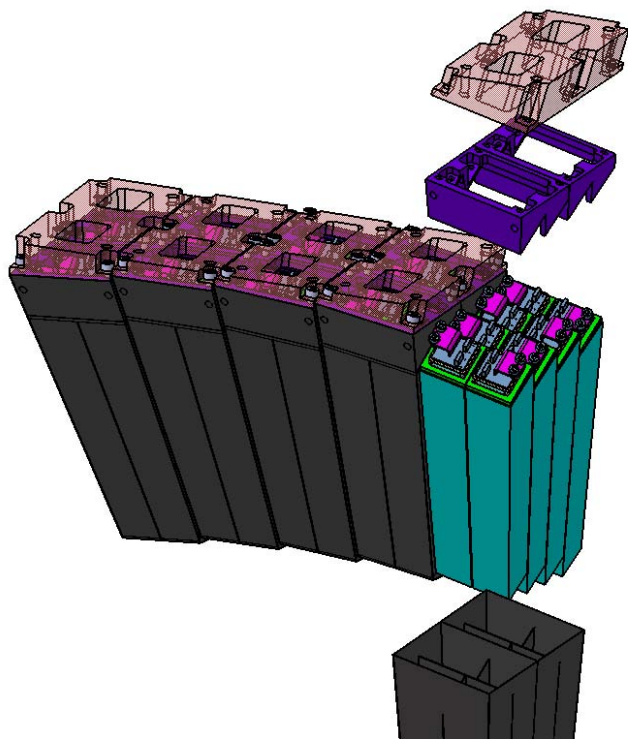


Backward side View

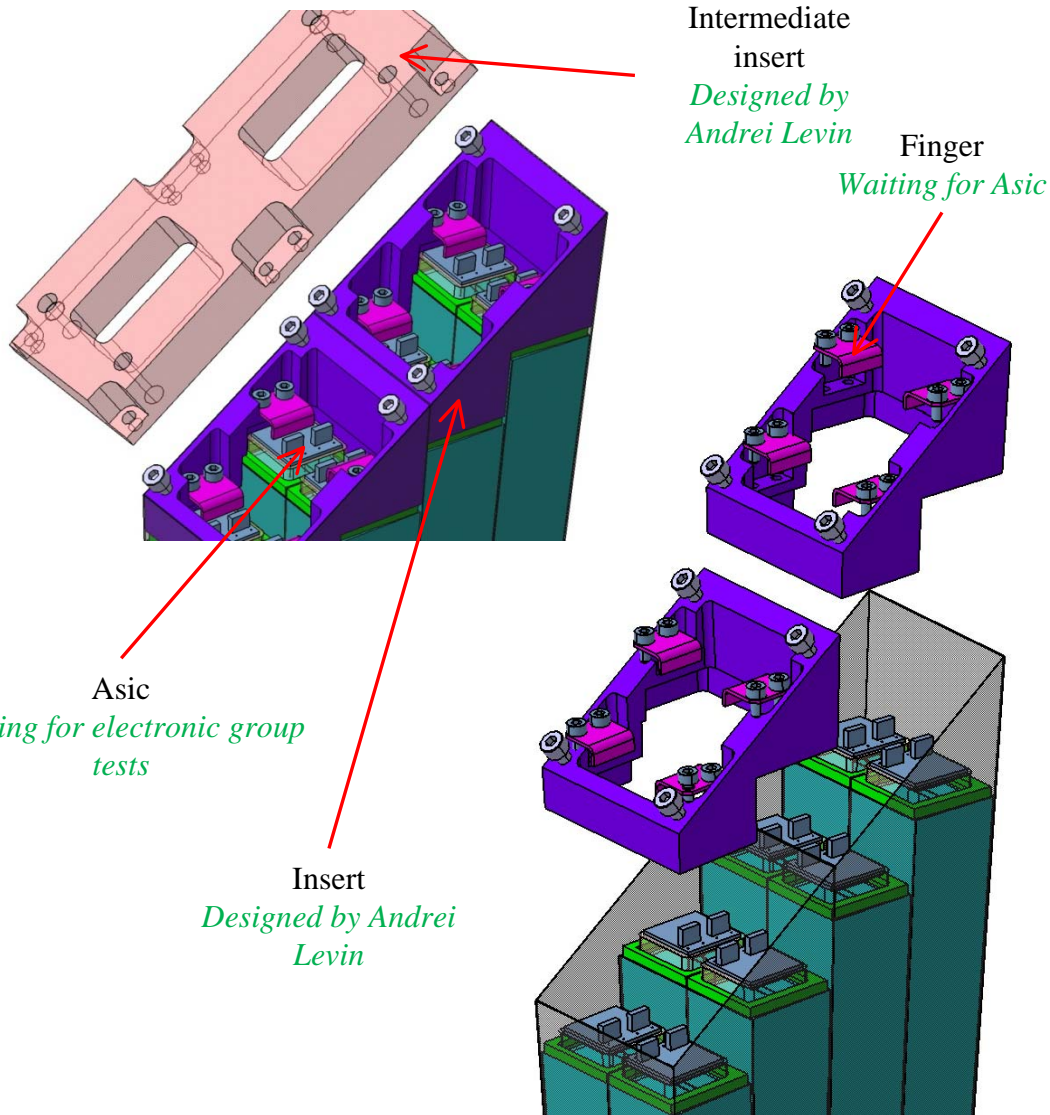


Exploded View





Detail view of Crystals fixation



Asic  
*Waiting for electronic group tests*

Insert  
*Designed by Andrei Levin*

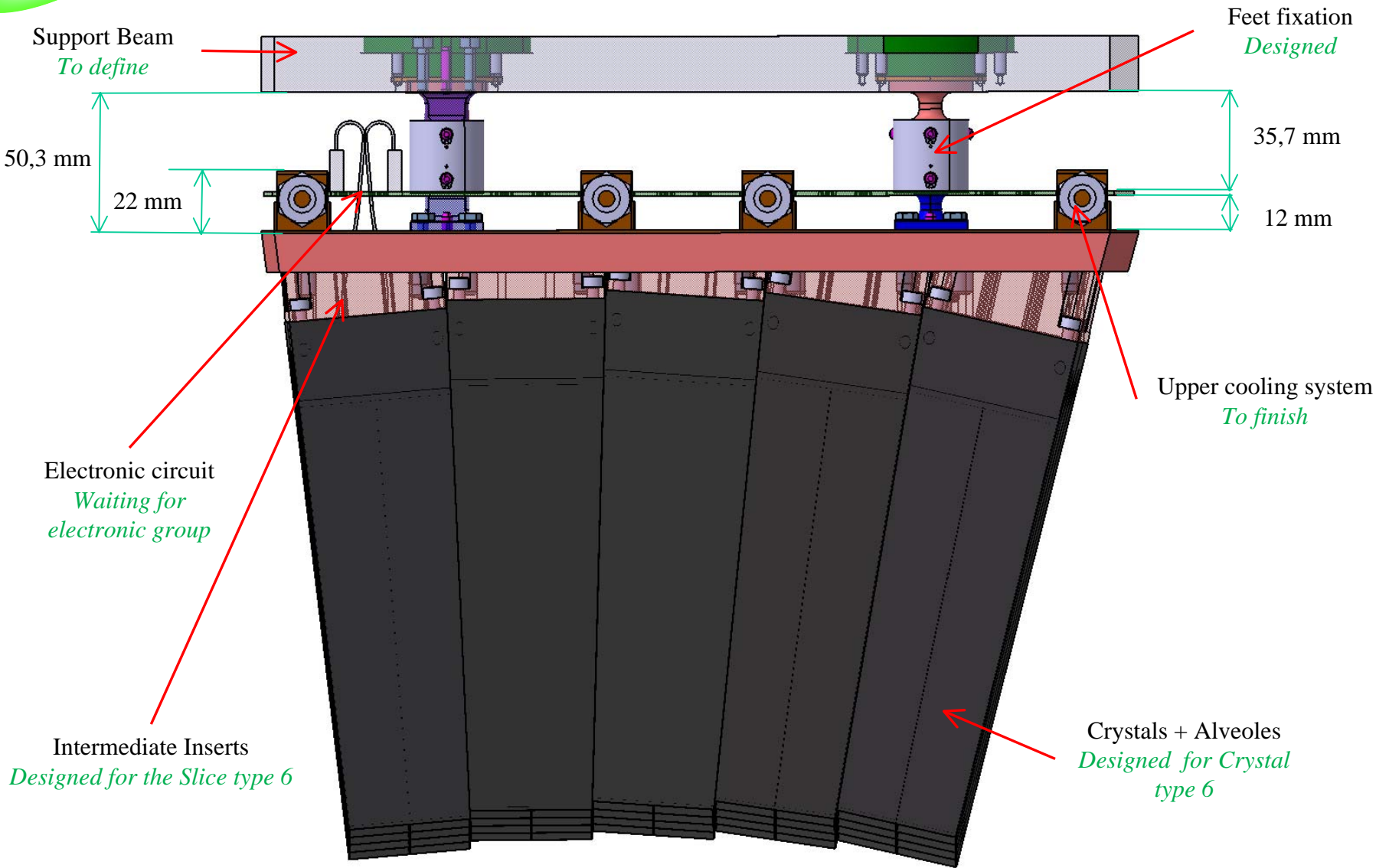
Intermediate insert  
*Designed by Andrei Levin*

Finger  
*Waiting for Asic*

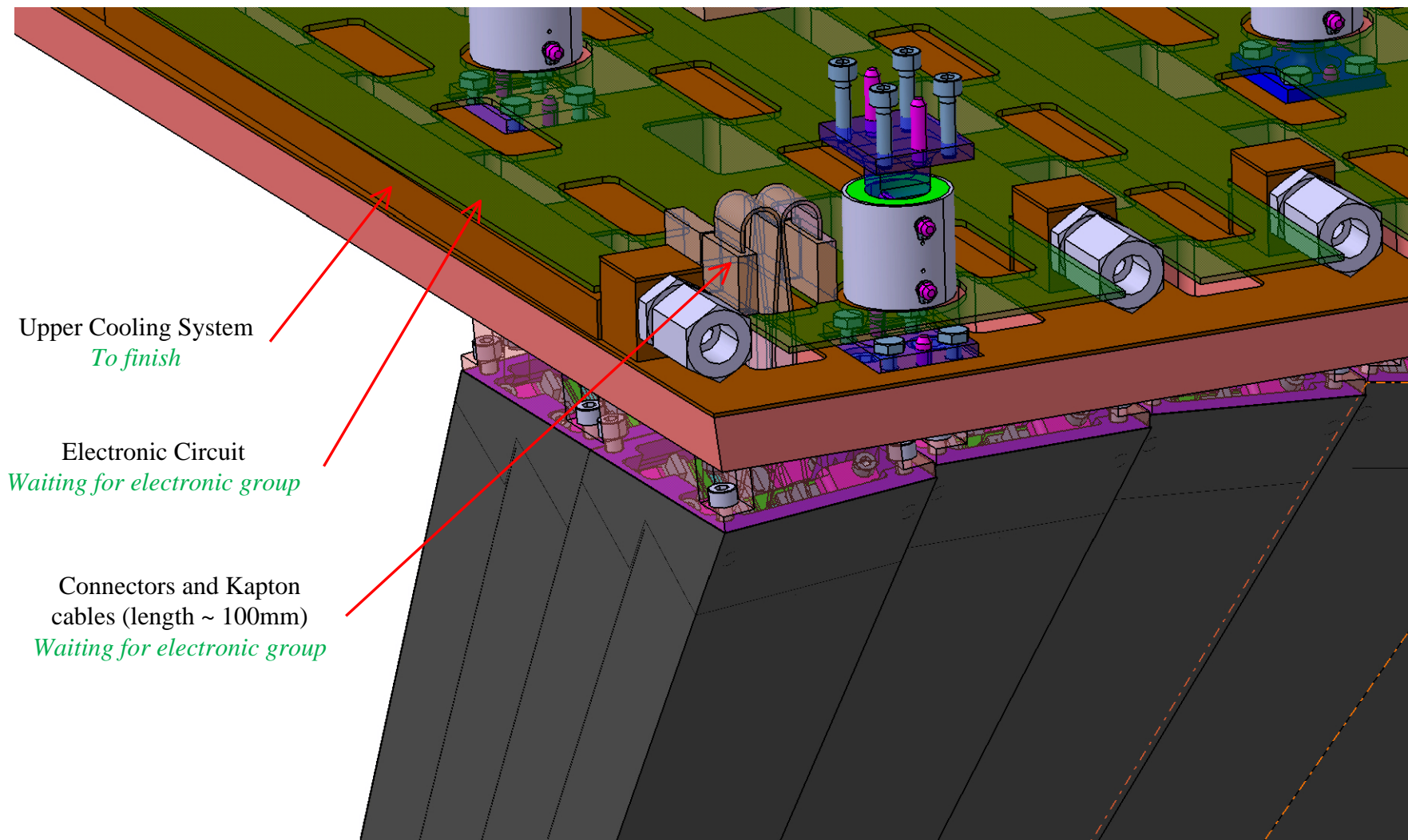
Inserts of the Slice type 6

Detail view of the Inserts

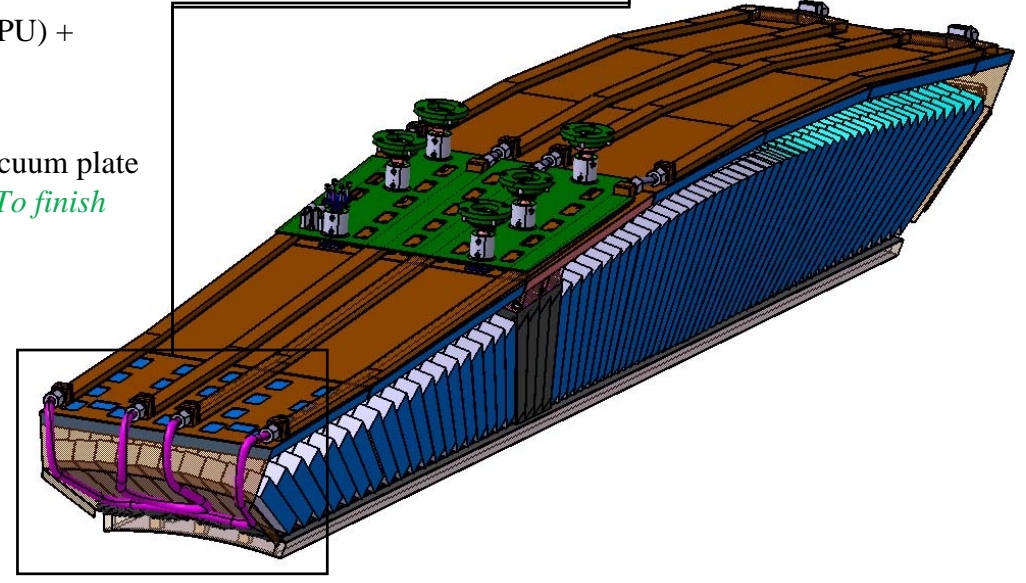
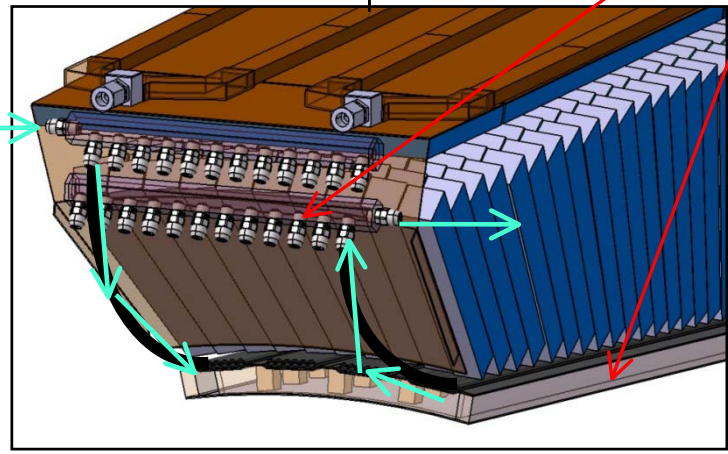
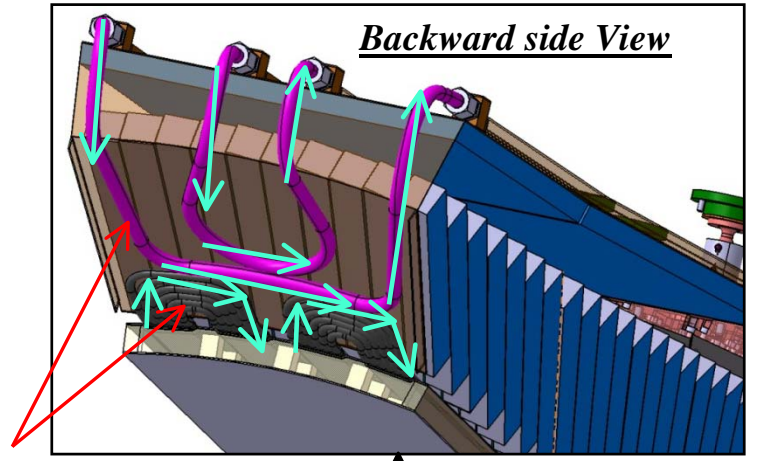
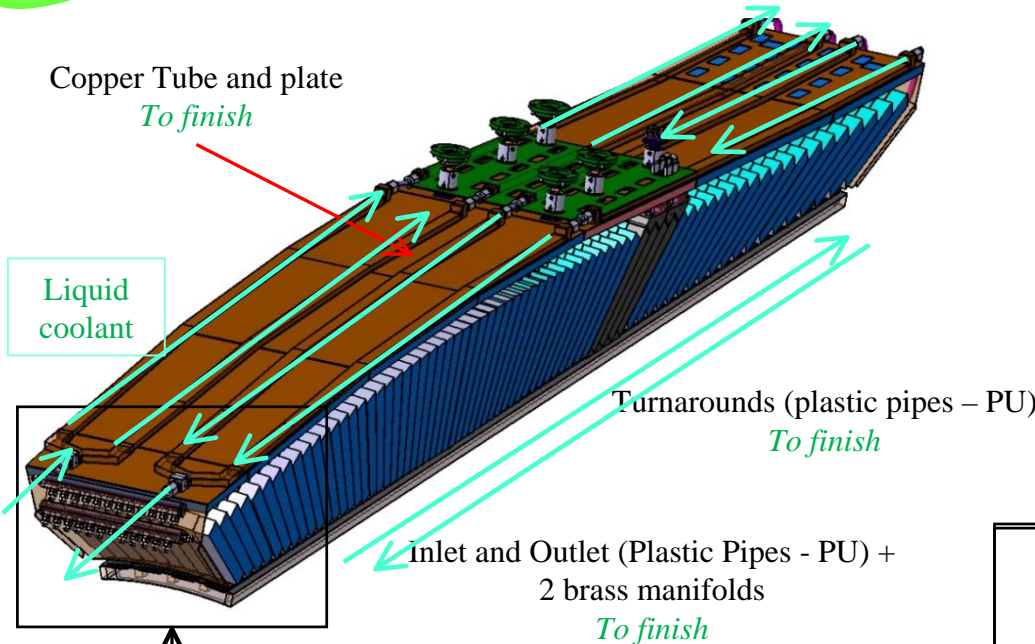




Front View of one Slice

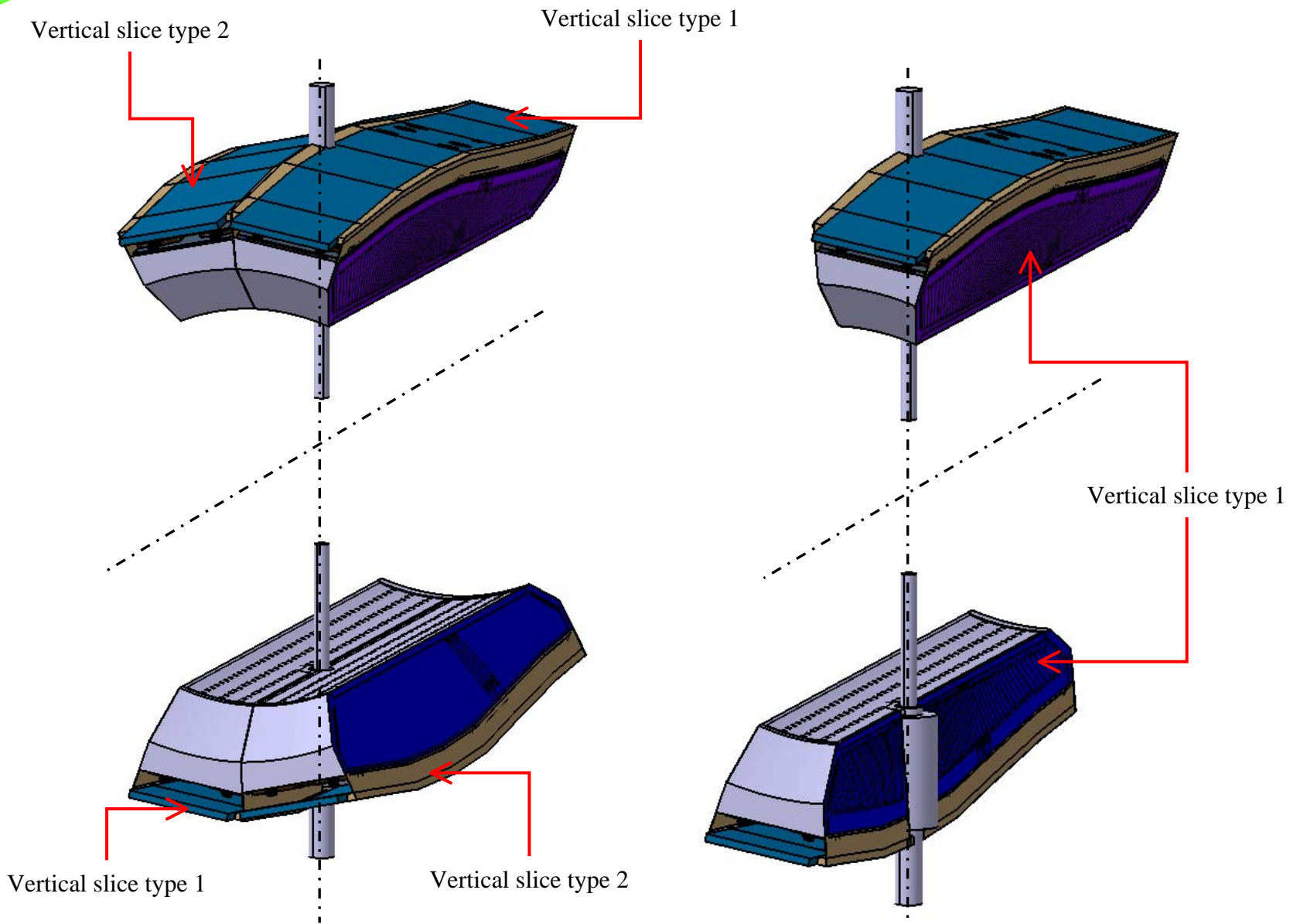


Detail View of the Electronic Circuit

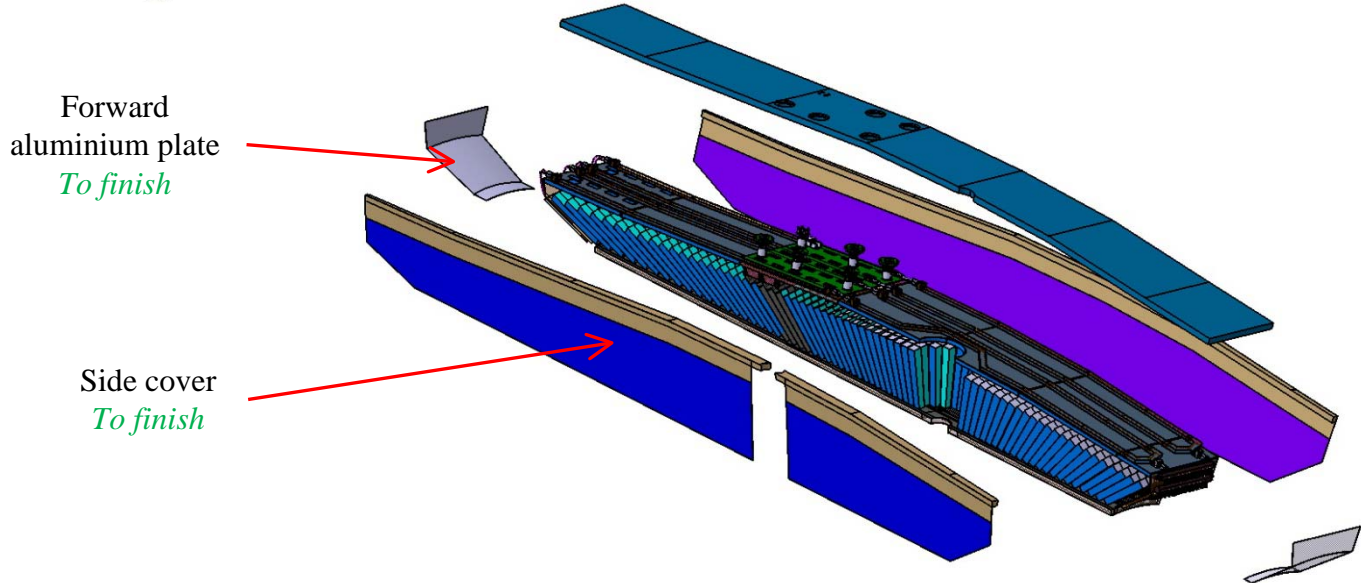
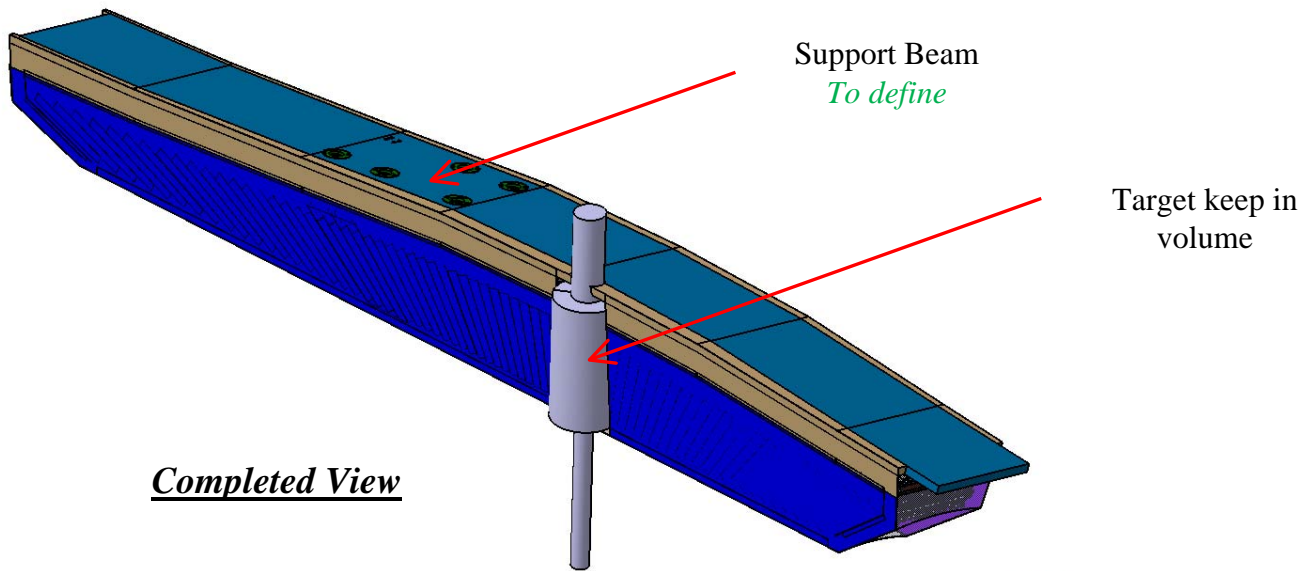


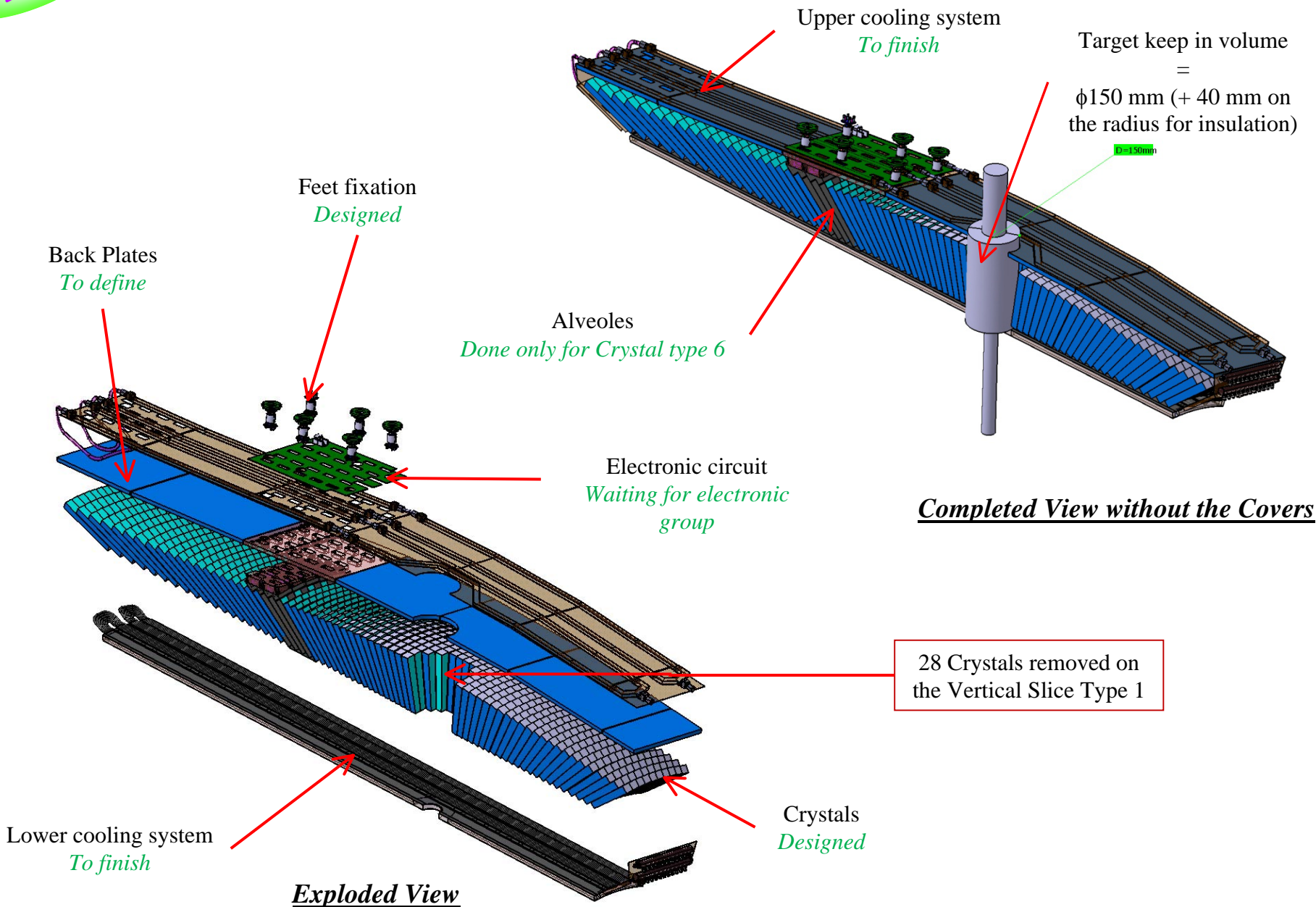
Upper and Lower cooling system

# Vertical Slices



*Detail view of the Barrel assembly*



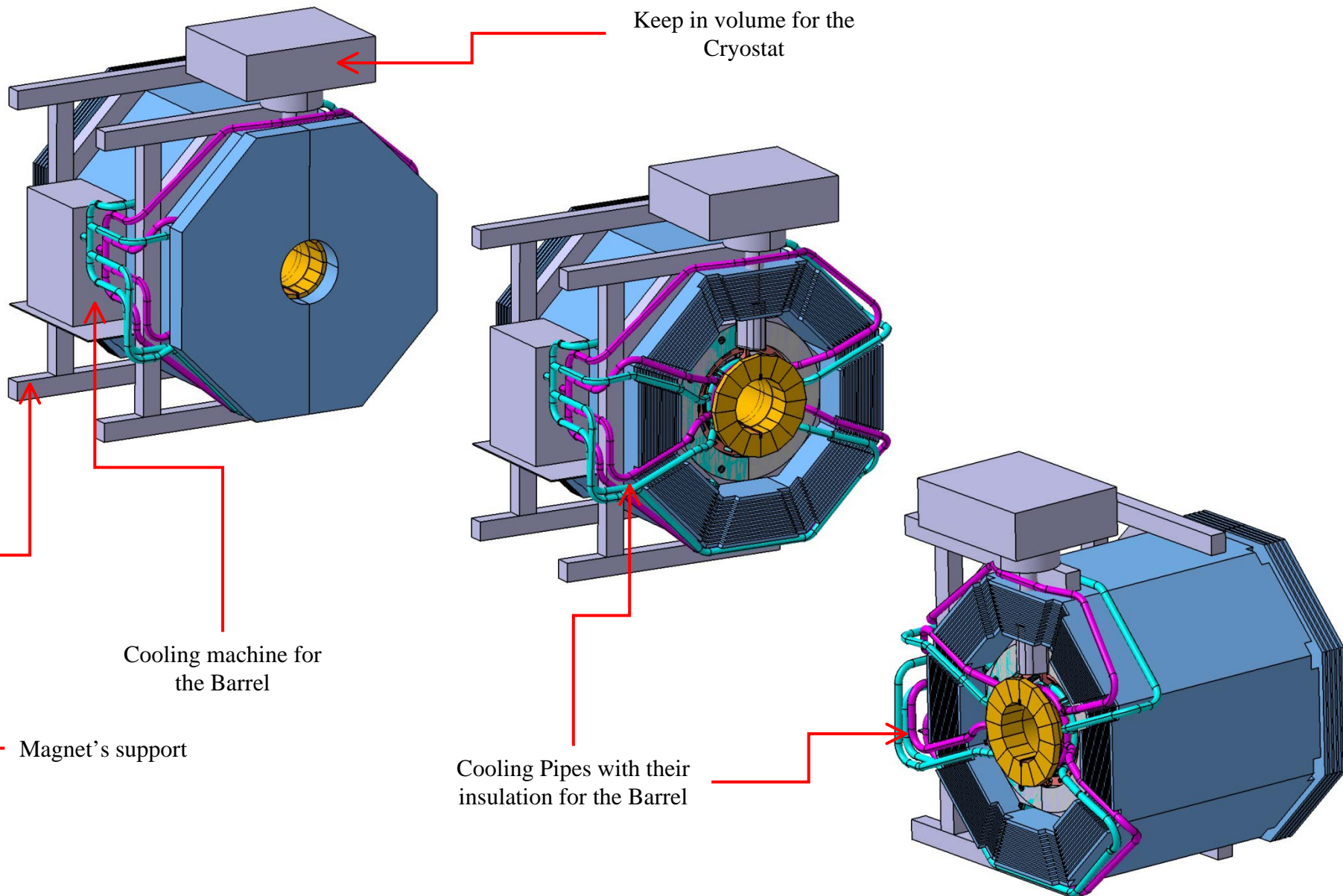


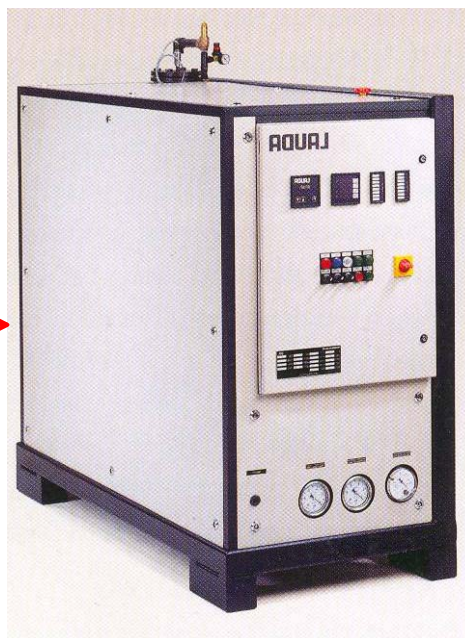
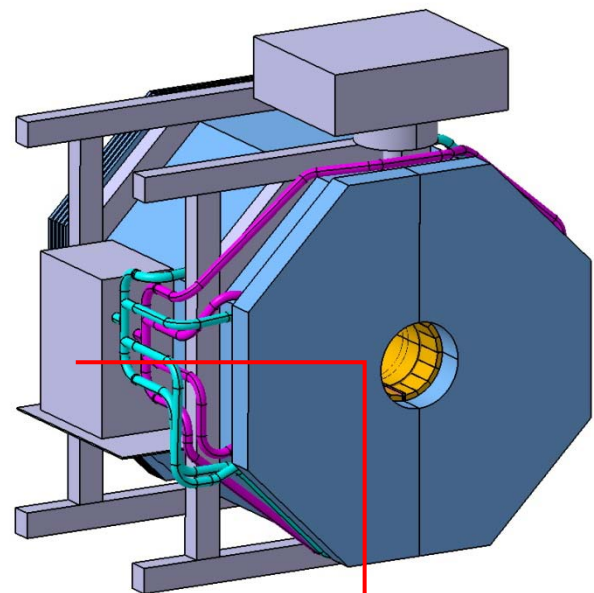
# Cooling system for Panda



Barrel

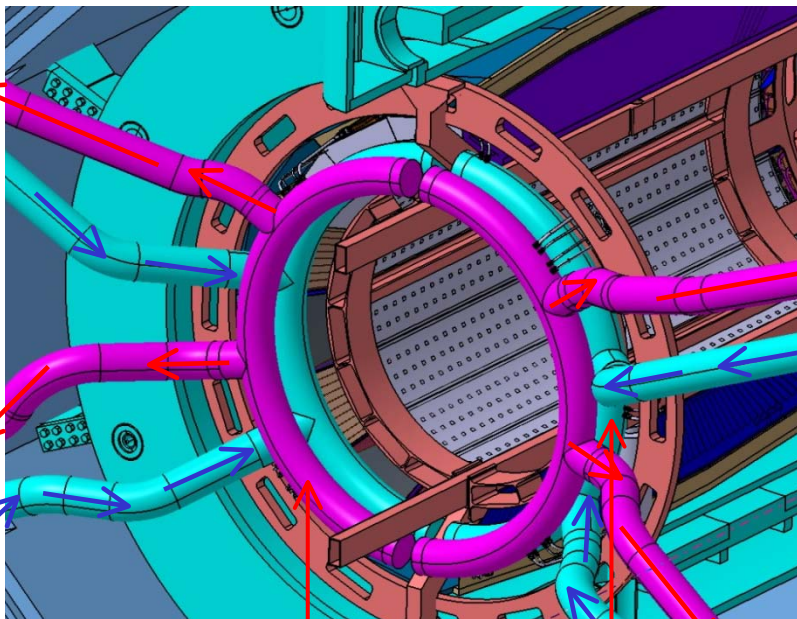
# Cooling system for PANDA





### Technical Data

- P = 10kW for -30 °C (60% Barrel + 40% Back and Forward Endcap)
- Heat carrier = Water / Methanol 60%
- Operating temperature = -30°C to +40°C
- Control deviation = +/- 0.1 K
- Flow Rate ~ 100 l/min against 2 bar
- Overall dimensions = 1x1.5x1.9 m<sup>3</sup>
- Weight (empty) ~ 1500kg
- Power consumption ~ 50kW
- Price ~ 80 – 90 k€



Liquid coolant

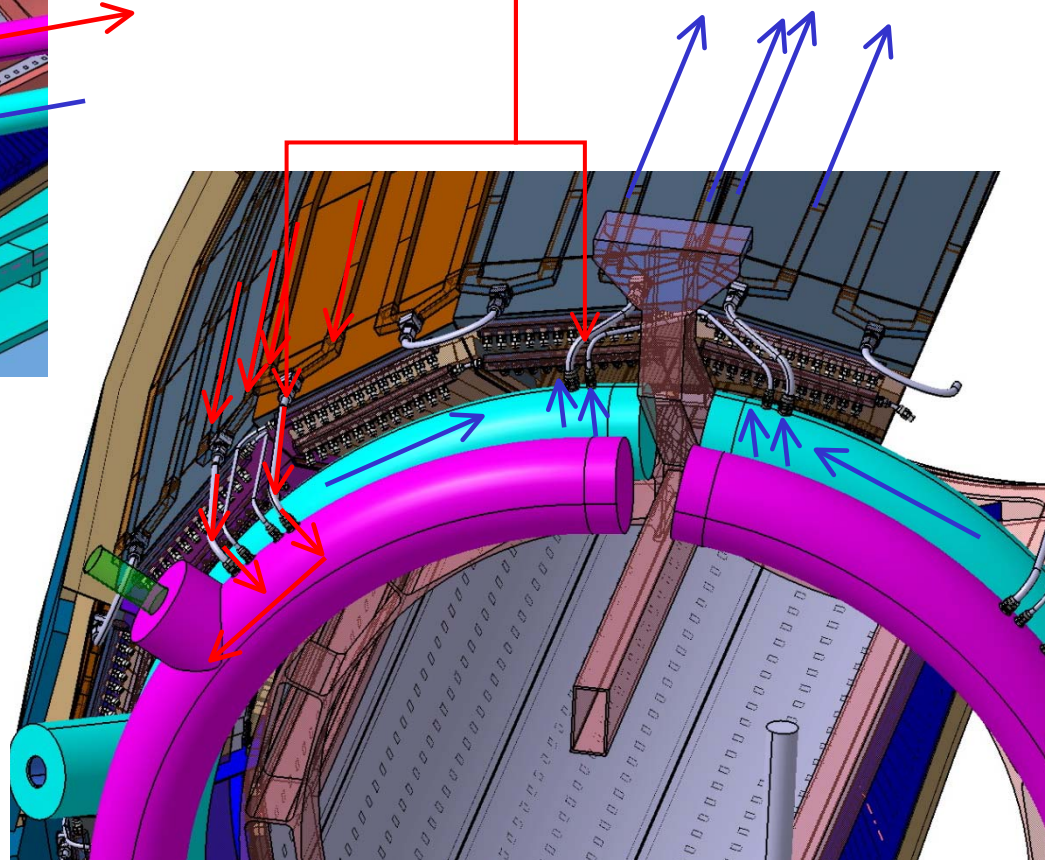
Cooling distribution divided in 4 systems (2 inlets + 2 outlets)

*To finish*

Fixation of the big pipes :  
*Not done*

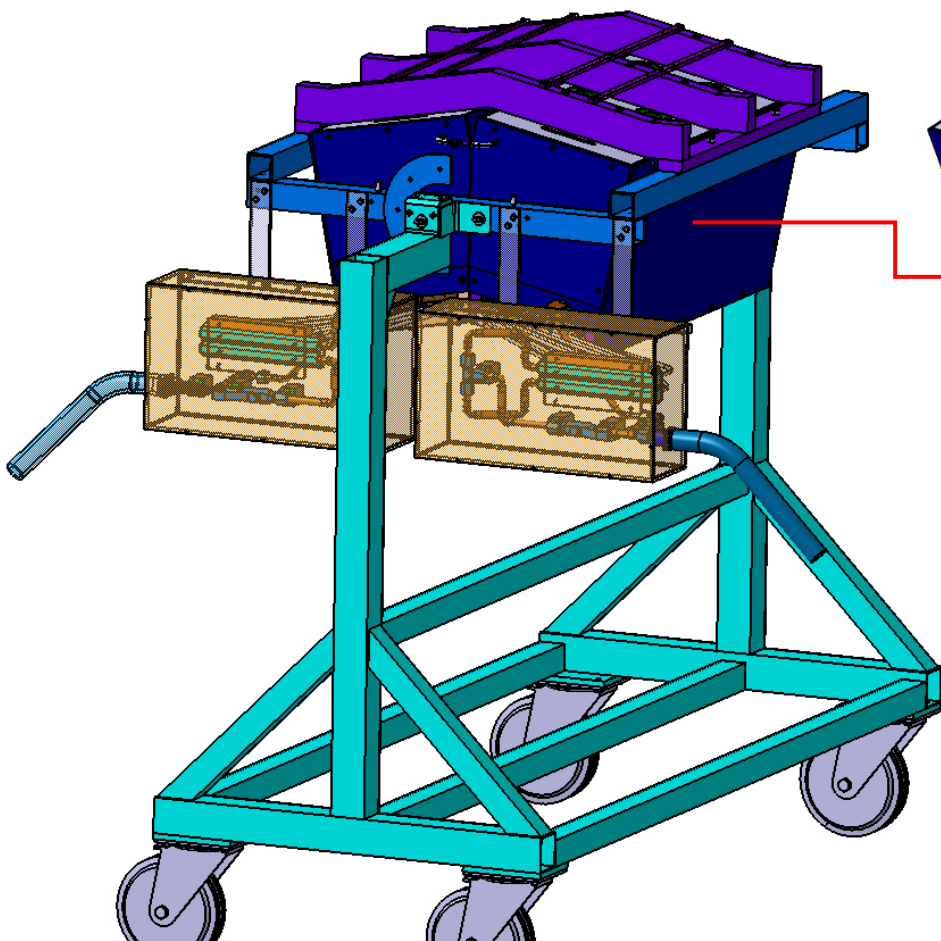
Inlets and Outlets for each slice without insulation !!

*To finish*

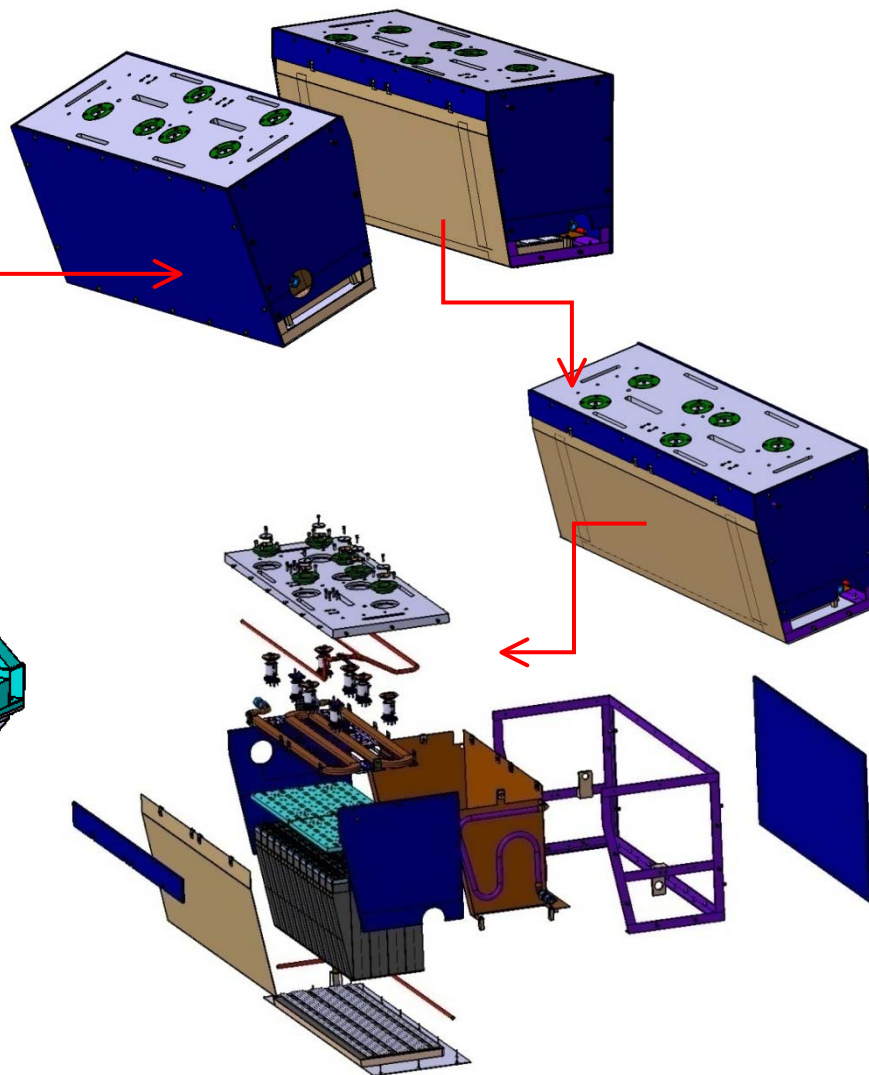


# 480 Crystals' Prototype

Completed View of 240 Crystals Prototype



Completed View of 480 Crystals Prototype  
with its support



Exploded View of 240 Crystals Prototype

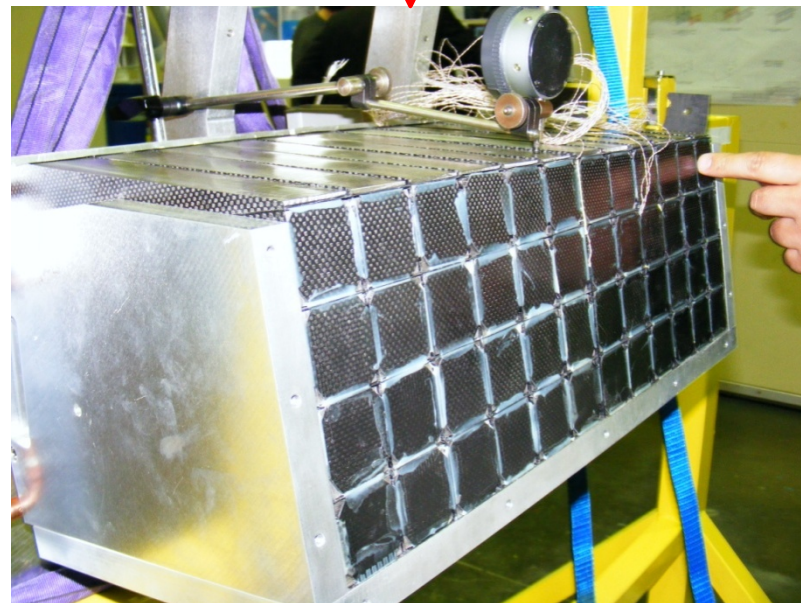
Completed View of 240 Crystals Prototype with its support



Gluing of 240 carbon alveoles

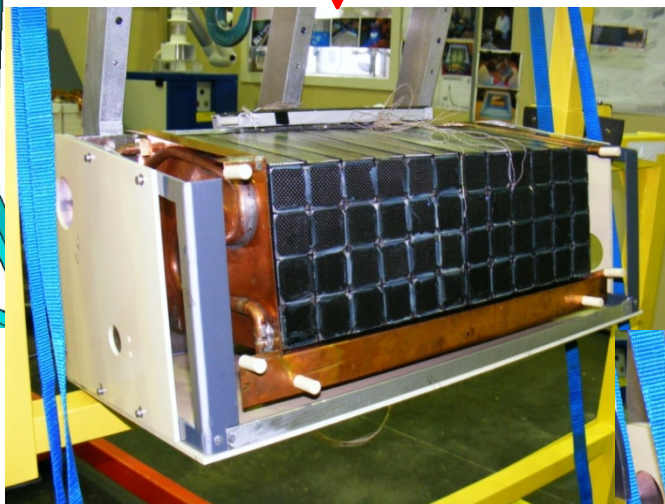
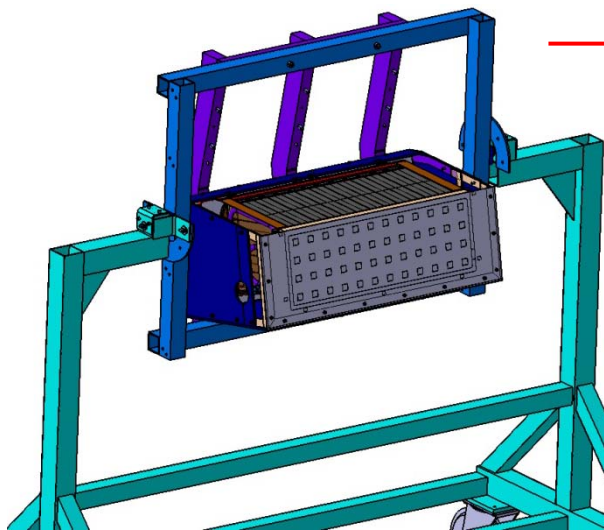


Gluing of 240 Stainless Steel Crystals

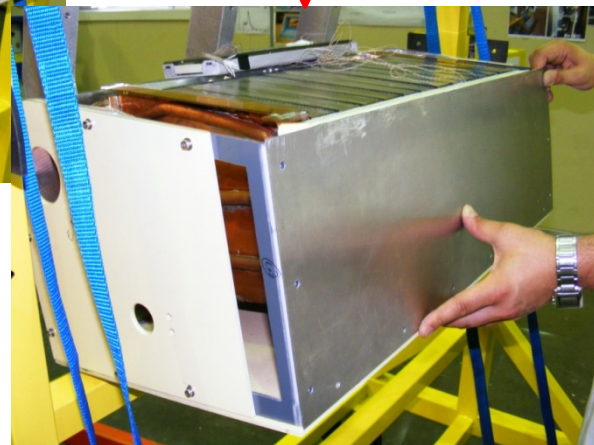


Gluing of temperature sensors

Mounting process of 240 Crystals Prototype

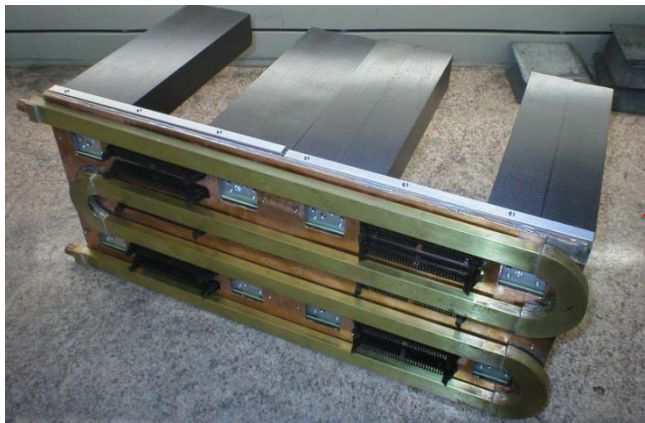


*240 crystals assembly with the side cooling system*



*240 crystals assembly with the lower cooling system (vacuum system)*

*Mounting process of 240 Crystals Prototype*



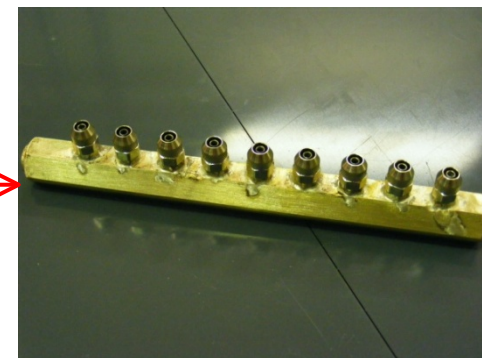
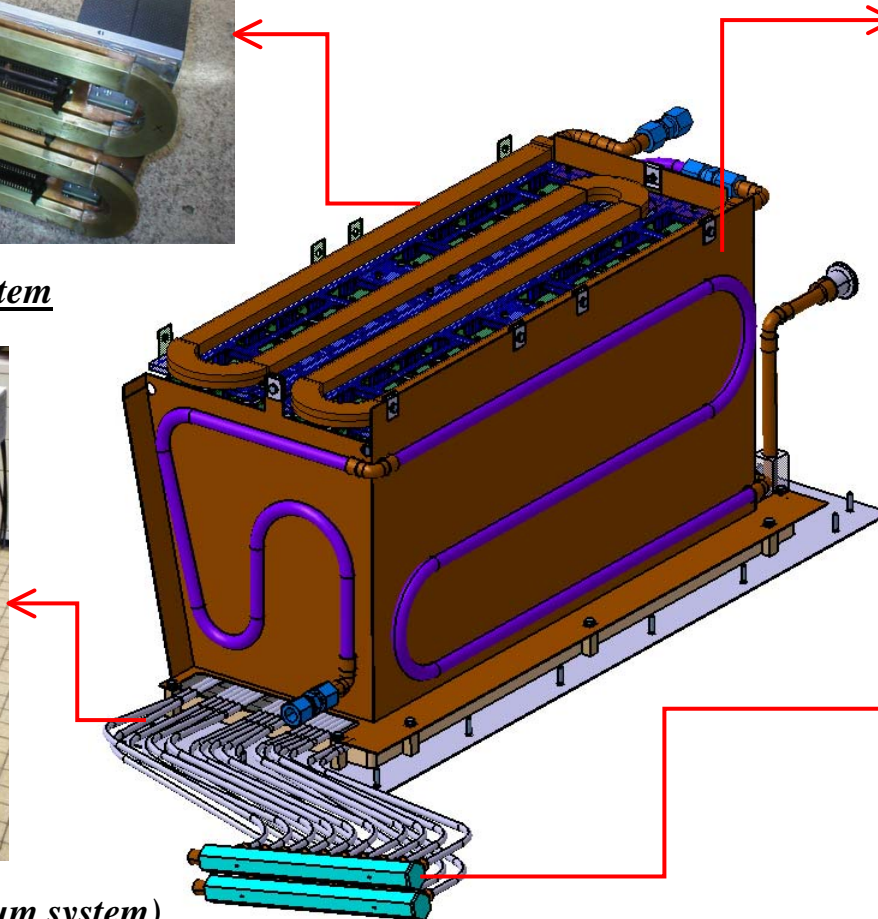
Upper Cooling System



Side Cooling System



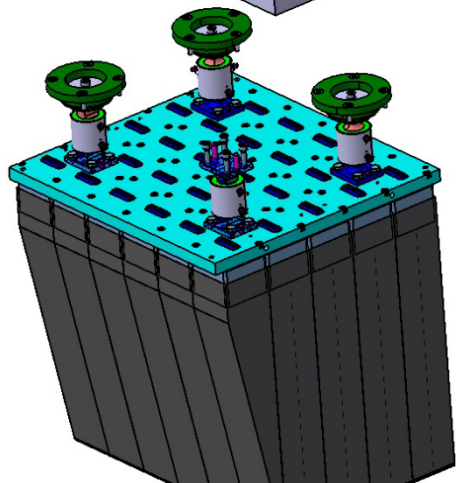
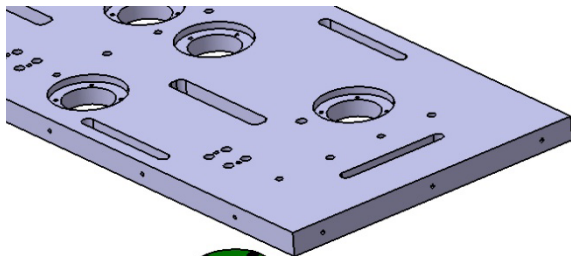
Lower Cooling System (Vacuum system)



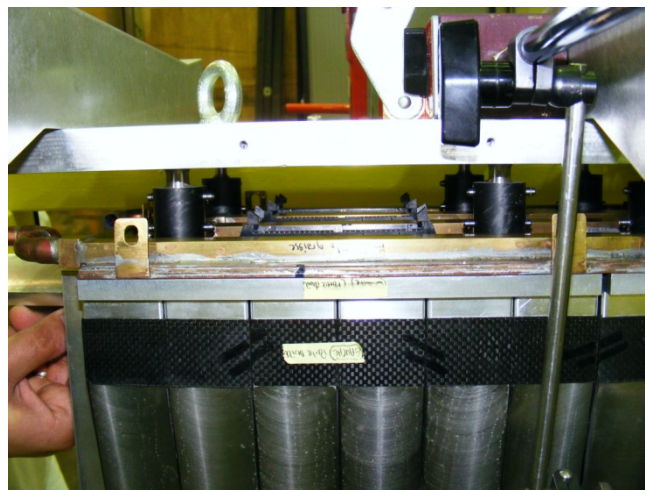
Manifold for the vacuum system

Mounting process of 240 Crystals Prototype

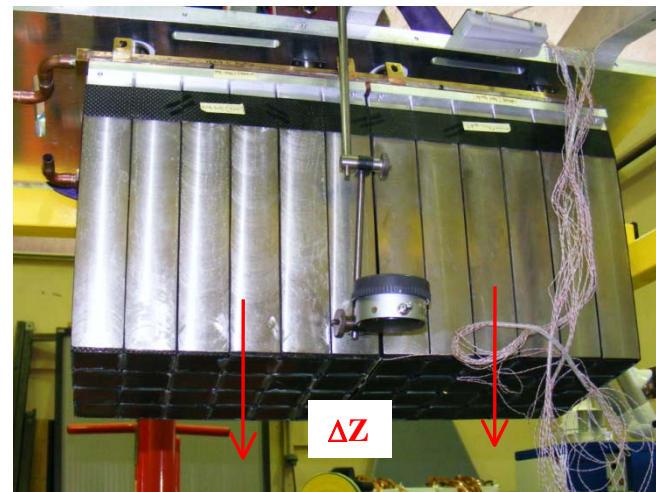




Feet Fixation  
Drawing



Feet Fixation  
Picture



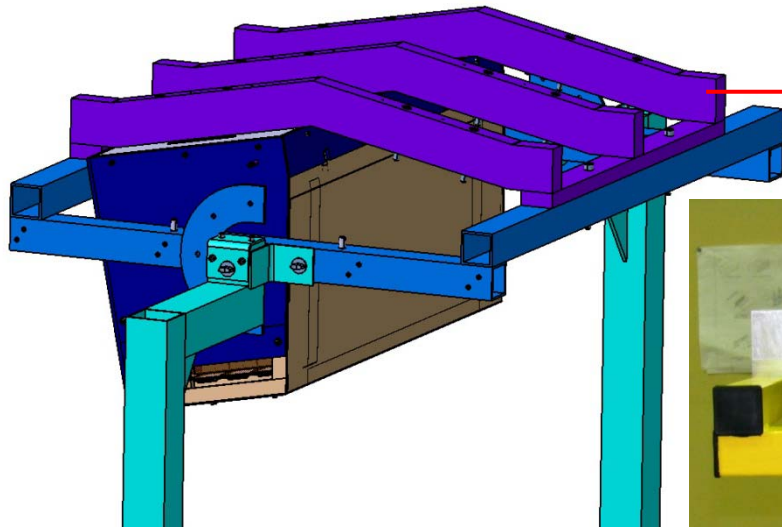
Resistance test with 4  
fixation feet

$\Delta Z \sim 0.43 \text{ mm}$

Mounting process of 240 Crystals Prototype

Barrel

# 480 Crystals' prototype



240 crystals assembly completed  
Orientation = 0°



240 crystals assembly completed  
Orientation = 90°

Completed View of 240 Crystals Prototype with its support

## Conclusion :

- For the Barrel :
  - The design of the Back Plates and the Support Beam must be done for all the slices (depend on the design of the Inserts)
- Cooling system for the slices :
  - The design of Upper Cooling System must be adapted on the final design of the Back Plate, the Support Beam and the passage of the cables
  - Insulation of the little pipes must be done
  - The Vertical slice type 2 must be designed
  - 480 Crystals' prototype must be finished
- Cooling system for the Barrel :
  - Fixations of the pipes must be designed
  - Calculation of the pressure leakage must be finished
  - The study of the cooling machine for the Barrel must be finished