



# **ITS3 activities in Bari**

## **BBM6**

# BBM6 TTA - SUMMARY TABLE

## Last WP5 meeting

COMPONENT	PRODUCTION
L0, L1, L2 mandrels	@Gigotti, expected by 1 month
Bending/bonding setup	
Half-rings and longerons alignment/gluing tools	@Bari, expected by 1 month
Layer-to-layer alignment/gluing tools	@Bari, expected by 1 month
L0, L1, L2 carbon foam half-rings	@CERN, expected by 1 month
L0, L1, L2 carbon foam longerons	@CERN, expected by 1 month
L0, L1, L2 3d printed half-rings for FPC	@Bari, soon printed
L0, L1, L2 heaters + powering cables	under production by Rui
L0, L1, L2 air ducts	@INITIAL, to be discussed
Beam pipe simulator + extensions	AVAILABLE @CERN + @Bari, soon printed
C-side air collector	
CYSS	@Gigotti, material under definition
Conical shell	@INITIAL, to be discussed
Patch-panel	??
PT1000 sensors + cables	
Covering plexiglass	@Bari
Assembly support	@Bari

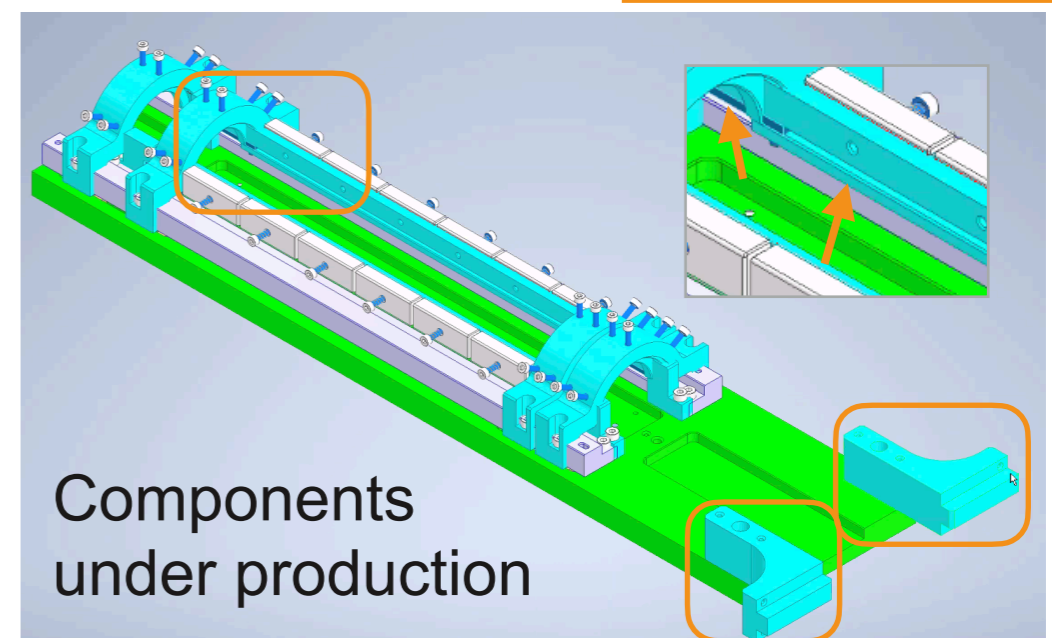
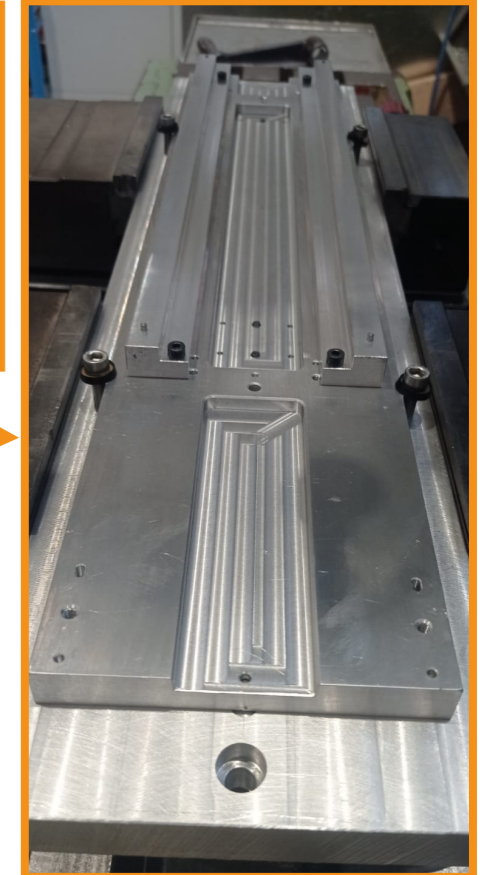
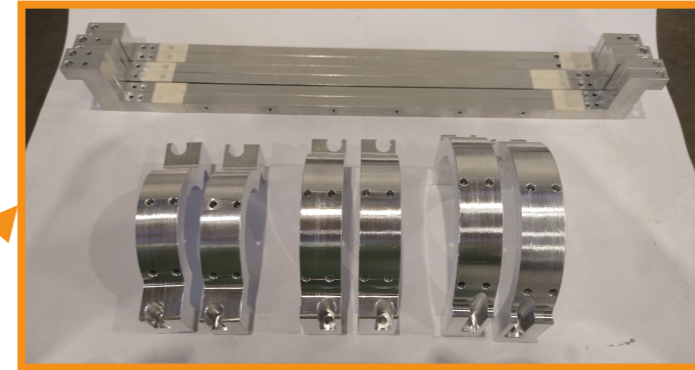
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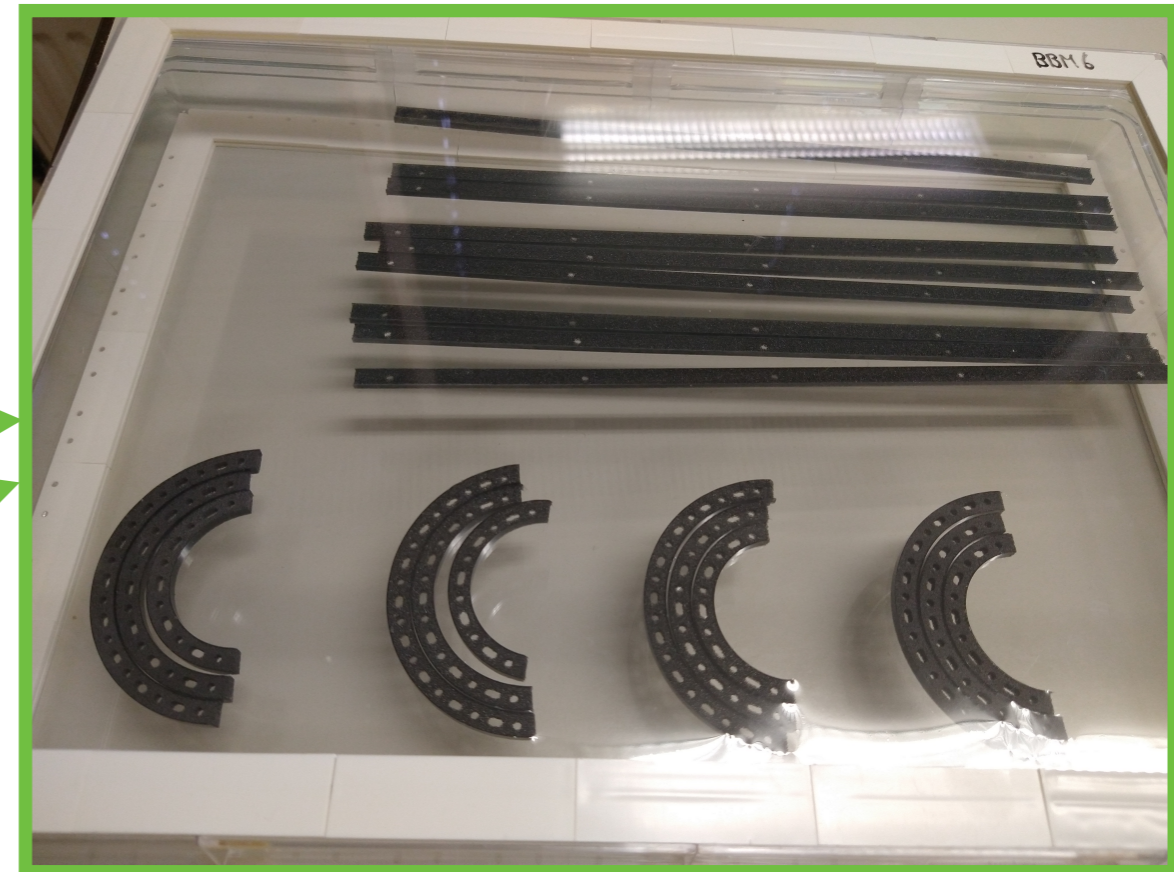
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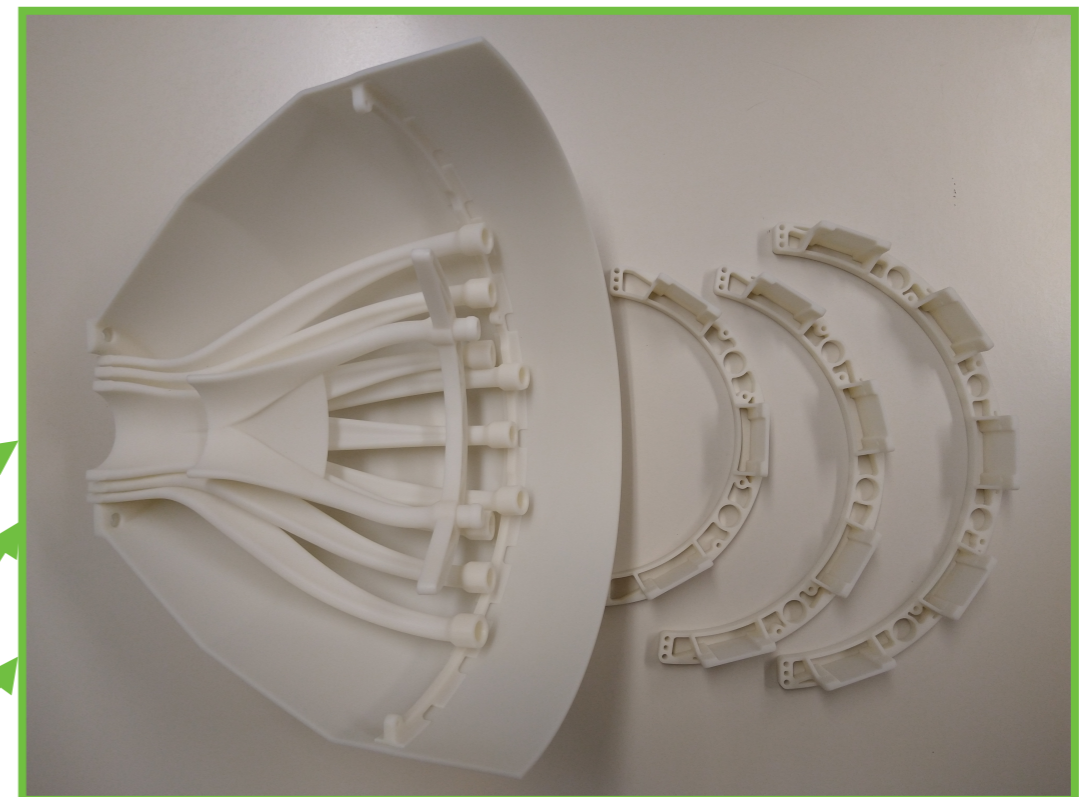
Pieces delivered (2 x layer).  
Not the best quality.  
L2 need to be reproduced.

Mail exchange between Massimo and Rui:  
“Regarding the quality of the heaters, I confirm that we can integrate the heaters for Layer 0 and Layer 1. However, for Layer 2, I kindly ask if you could please reproduce 2 new heaters.

If yes, I can bring you two new Layer 2 silicon pieces on Wednesday or Thursday.”

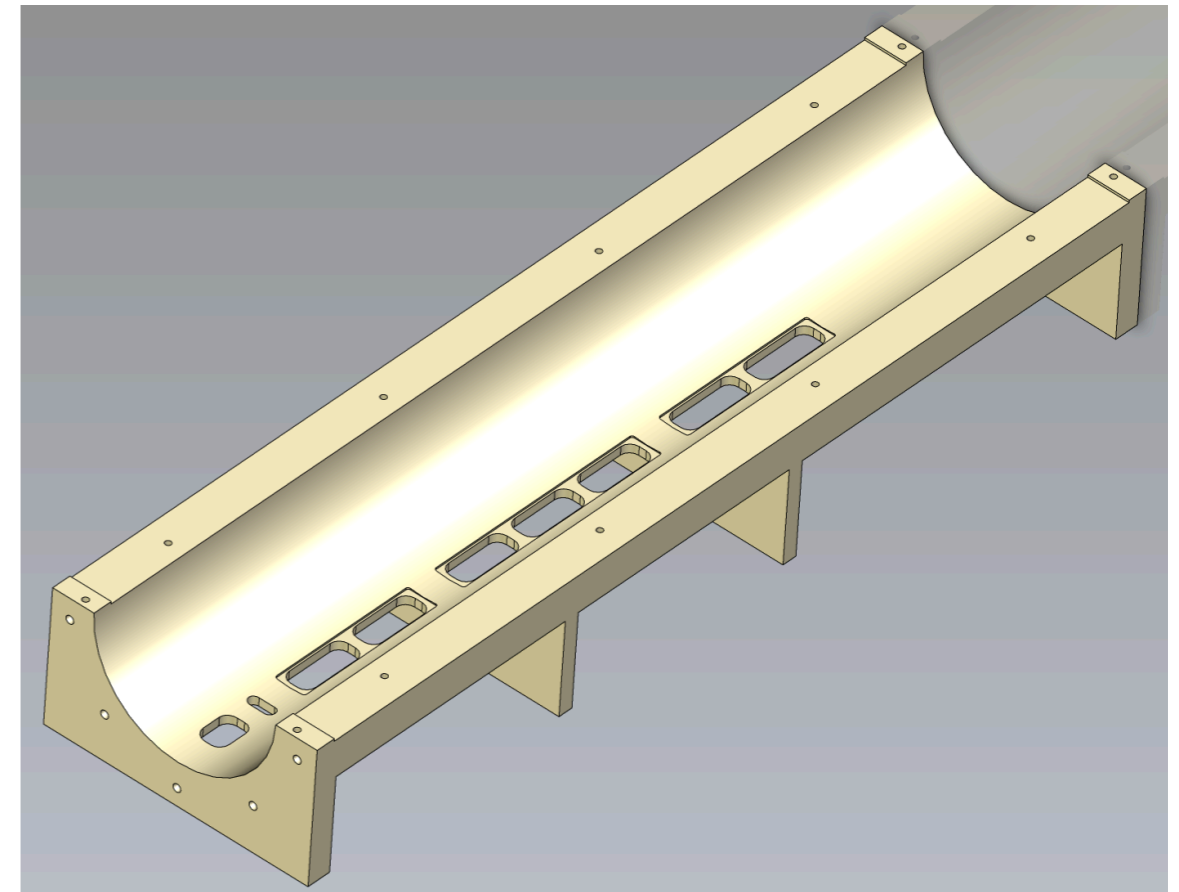
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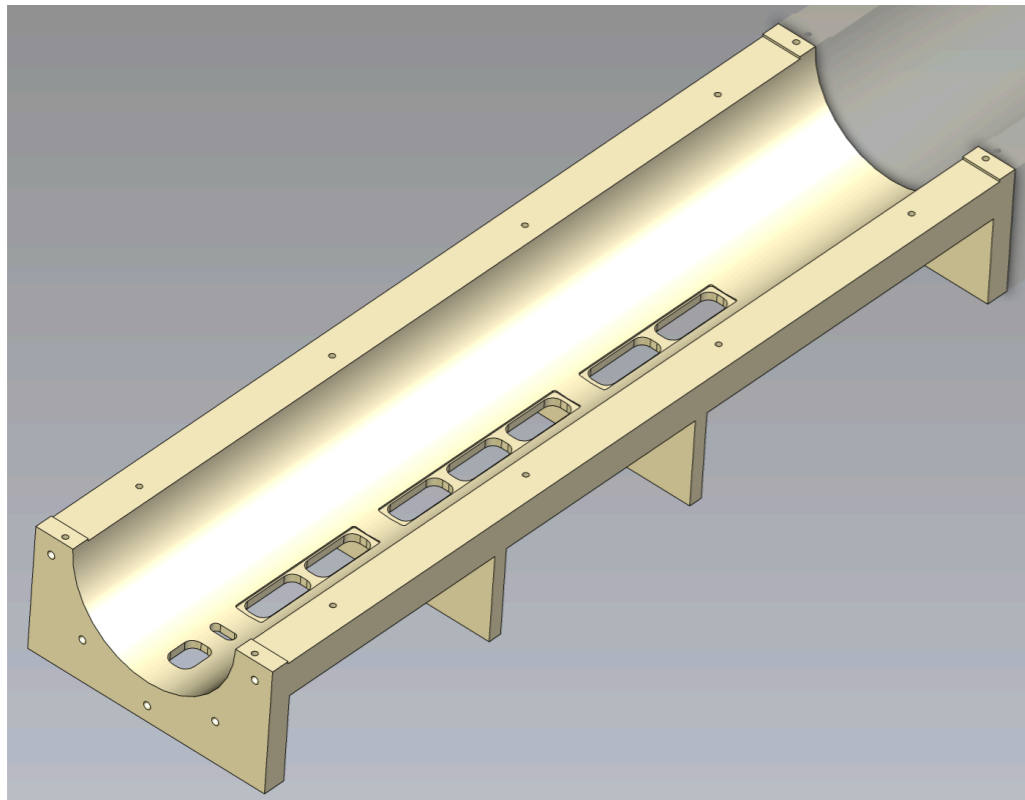
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C-side air collector	
CYSS	@Gigotti in bakelite + carbon fibre
Conical shell	
Patch-panel	
PT1000 sensors + cables	
Covering plexiglass	@Bari
Assembly support	@Bari



← Next slide

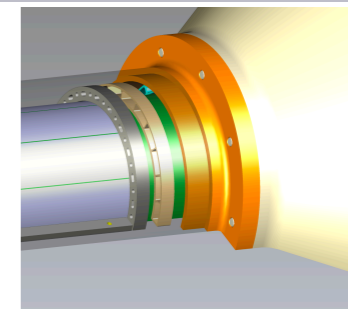
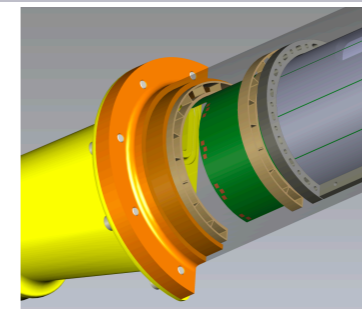
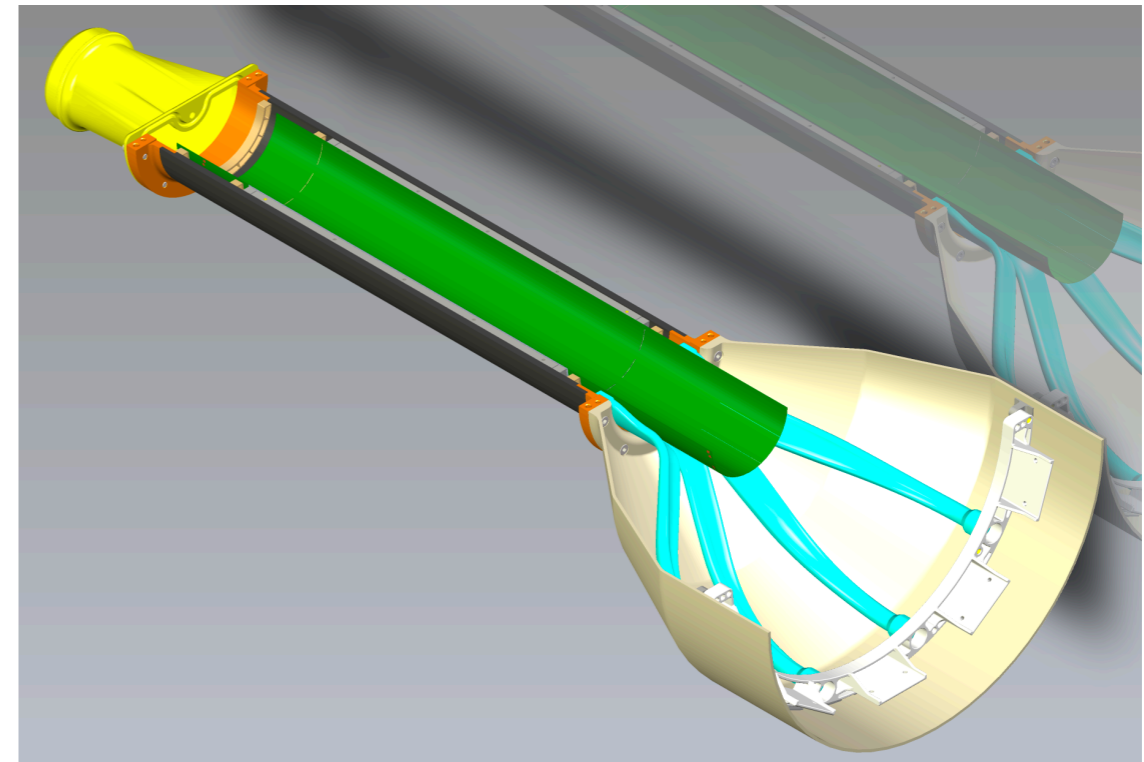


## BBM6 TTA - CYSS



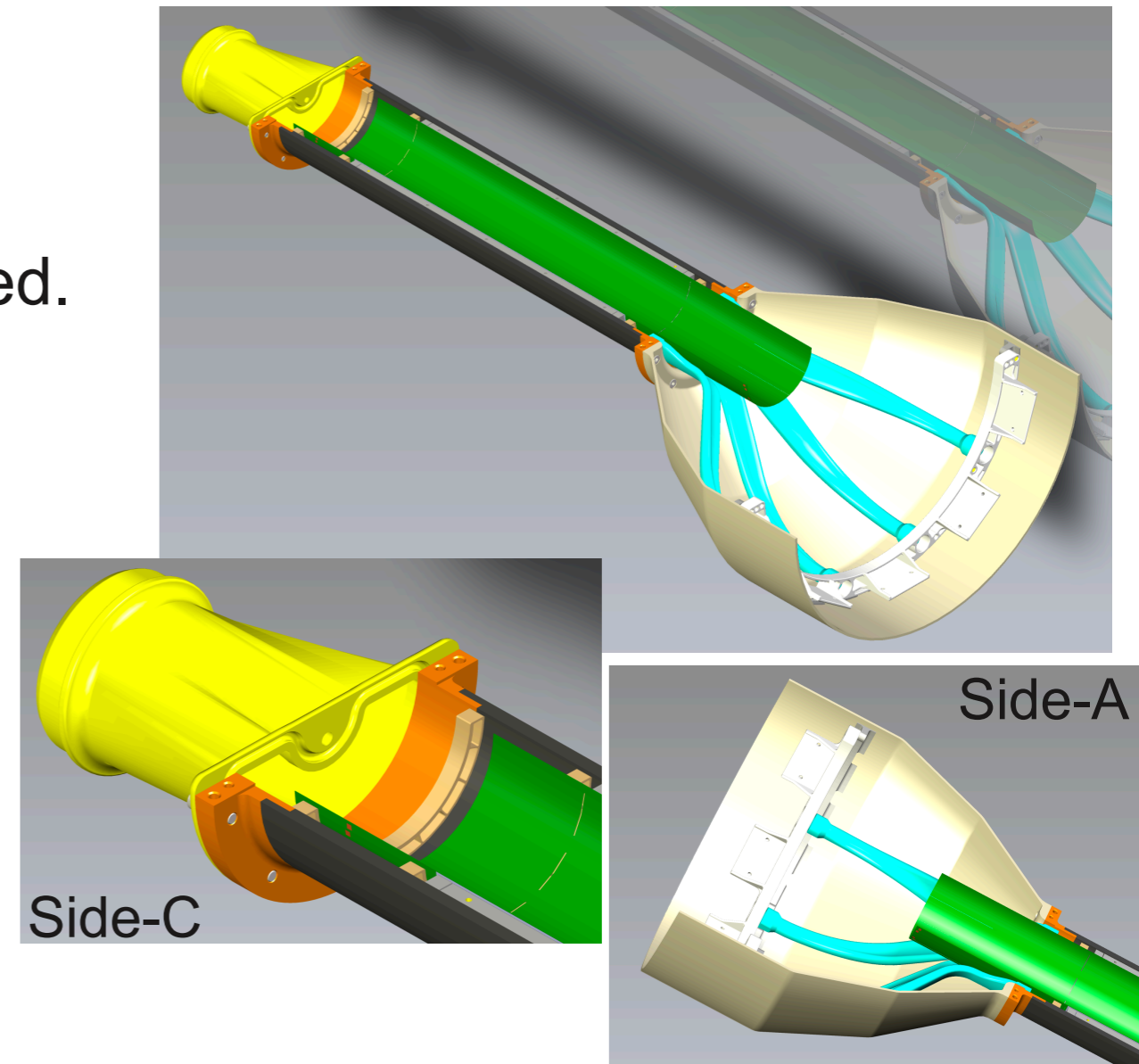
As agreed, the CYSS will be produced in plastic material. We choose the bakelite for the higher precision.

As an alternative, working on the production of a CYSS in carbon fibre.



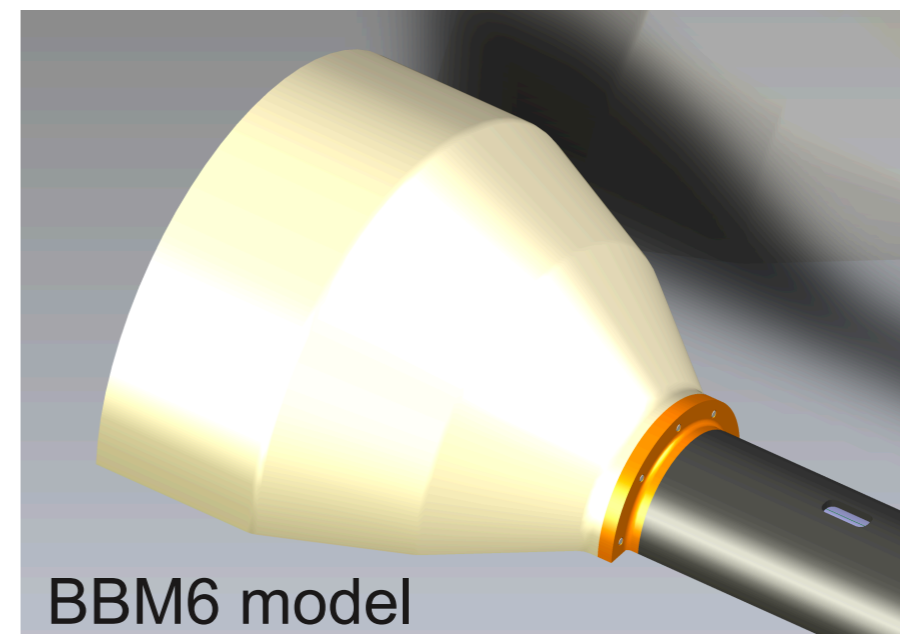
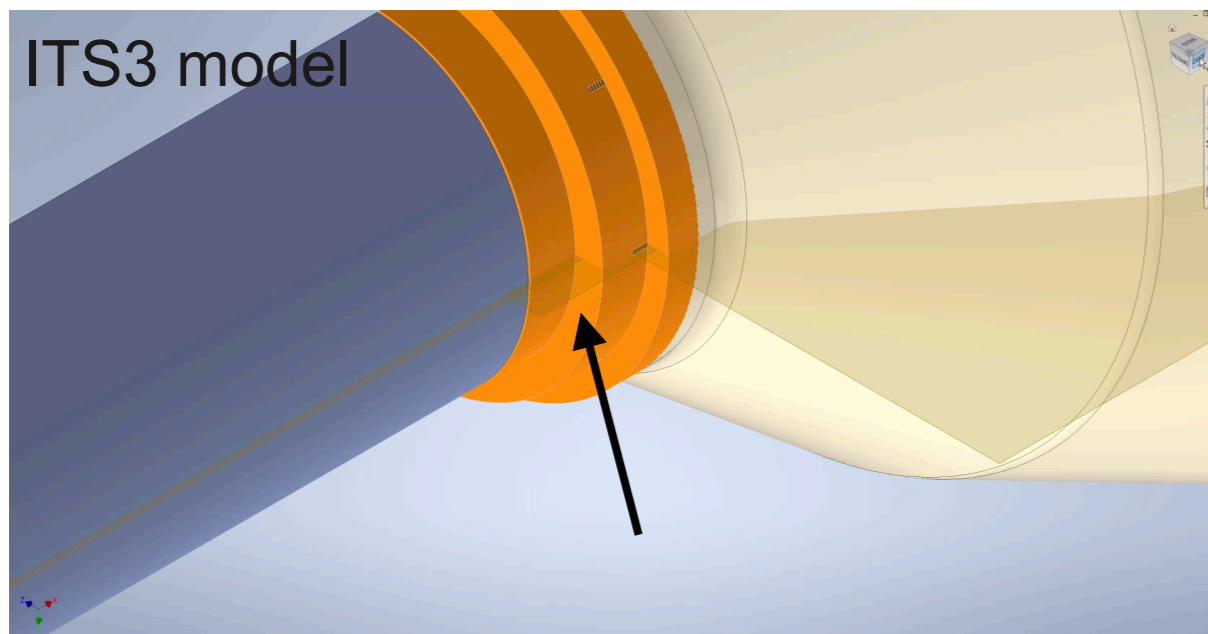
## BBM6 TTA - CYSS

- Identified a potential producer, very close to Bari and already working with INFN for other projects (CMS and ATLAS): CETMA
- The shell will be made at the best dimensions to fit BBM6
  - Internal skin removed and CYSS internal radius consequently adapted. Total thickness  $\sim 4.7$  mm.
  - Half-rings adaptors: re-designed to adapt the already produced components (conical shell and air collector side-C)



## BBM6 TTA - CYSS

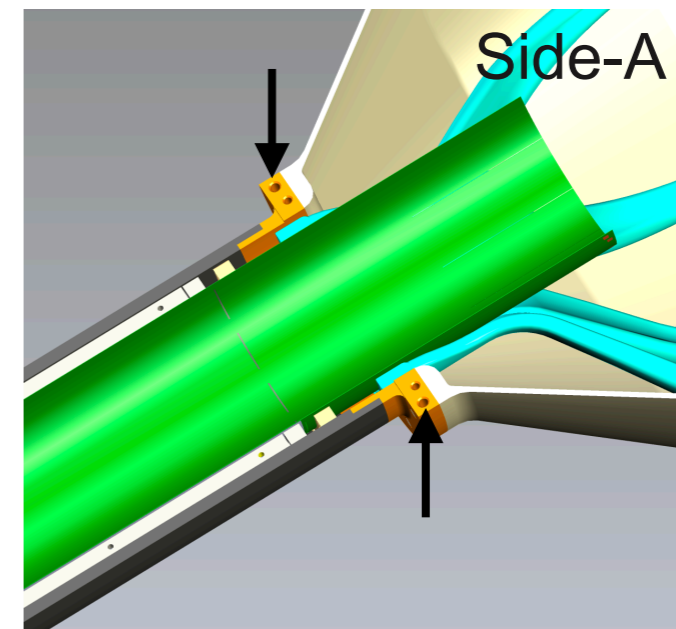
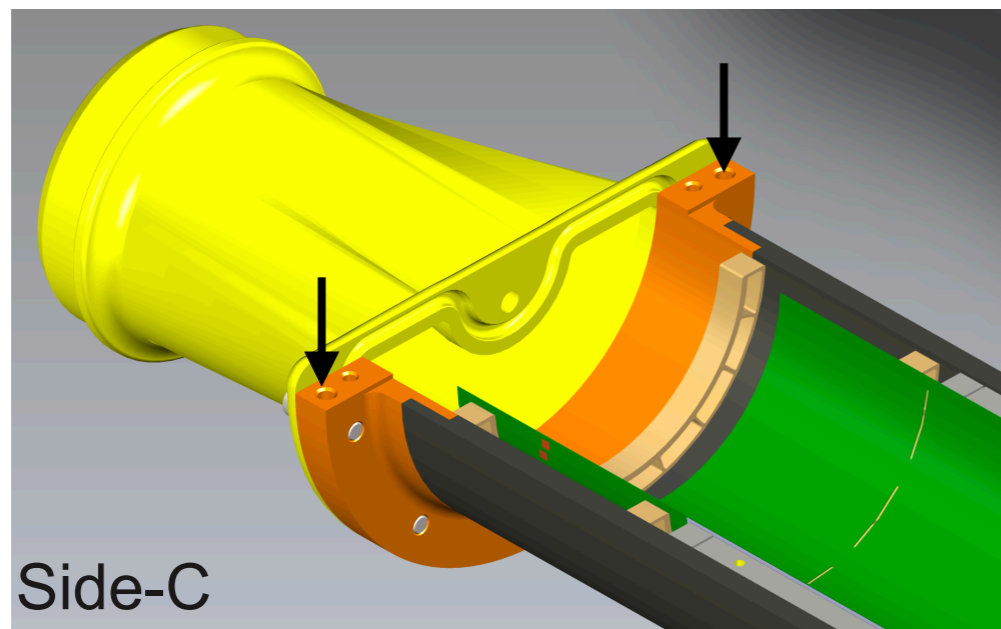
- Identified a potential producer, very close to Bari and already working with INFN for other projects (CMS and ATLAS): CETMA



- Step in the half-ring adaptor side-A removed. Was that needed?

## BBM6 TTA - CYSS

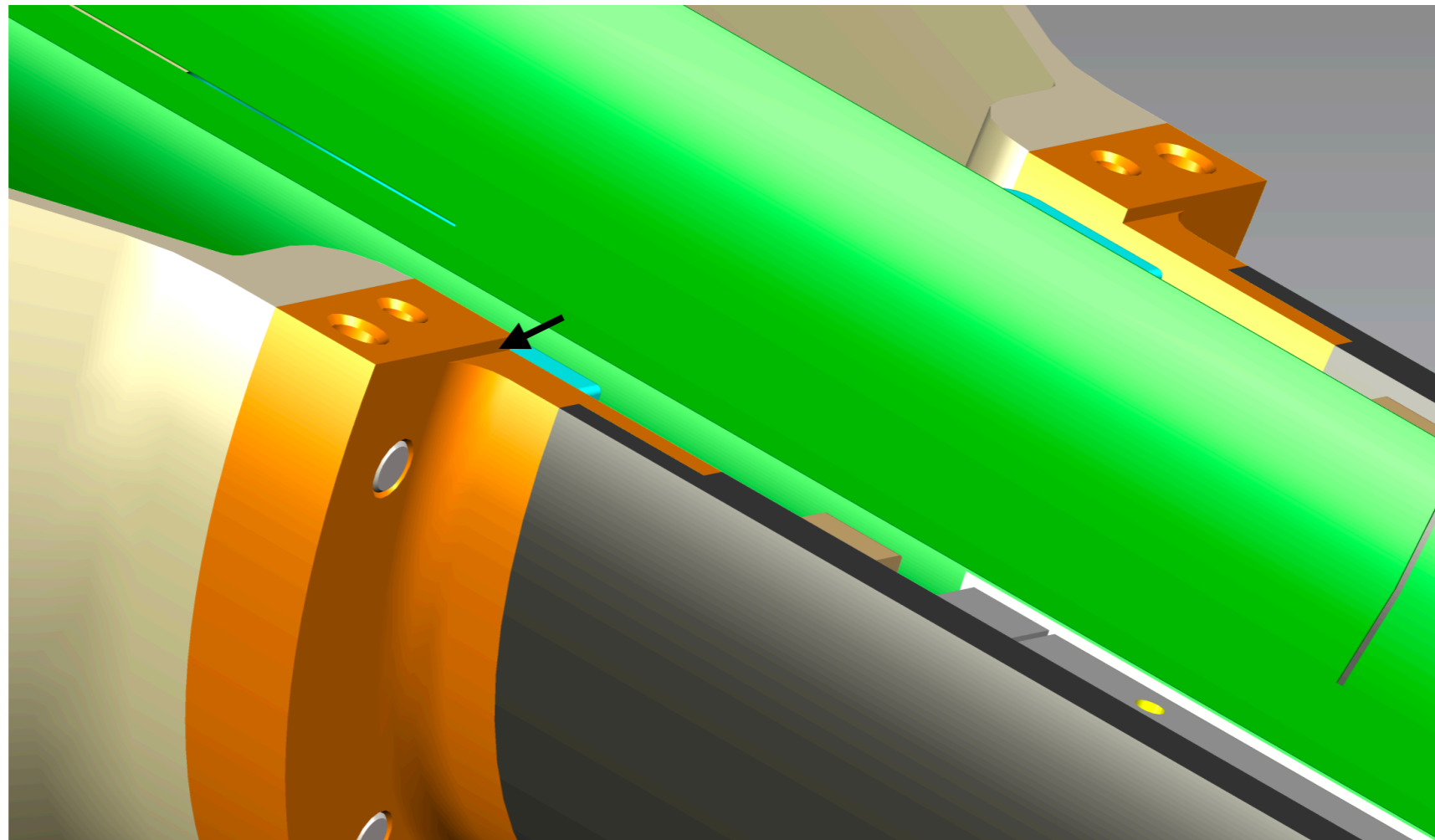
- Identified a potential producer, very close to Bari and already working with INFN for other projects (CMS and ATLAS): CETMA



- Screw holes for plexiglass plate added close to the pin hole.

## BBM6 TTA - CYSS

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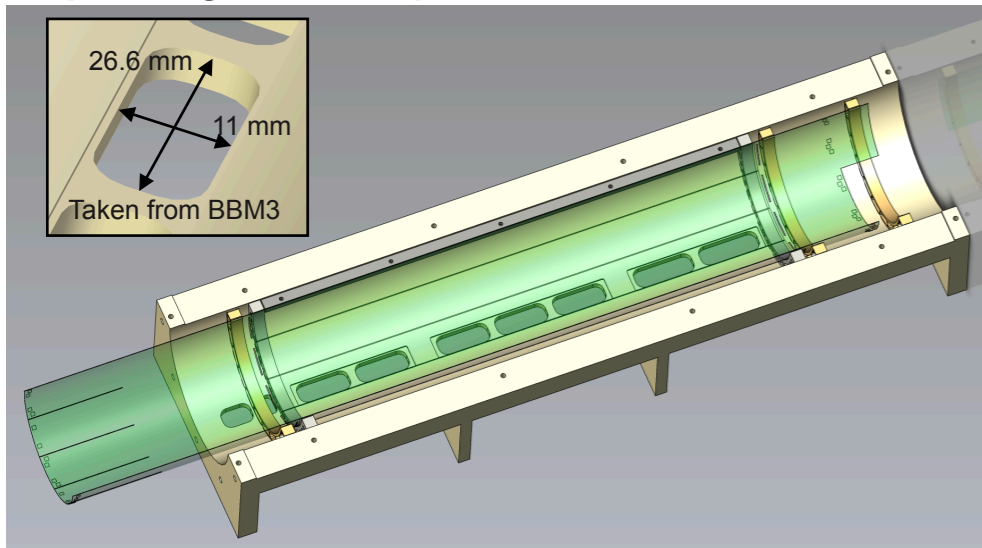


- Distance between internal plexiglass plate face and edge of the CYSS 1 mm (for a total 2 mm gap between top and bottom HBs).
- Adhesive sponge on the plexiglass to close the gap.

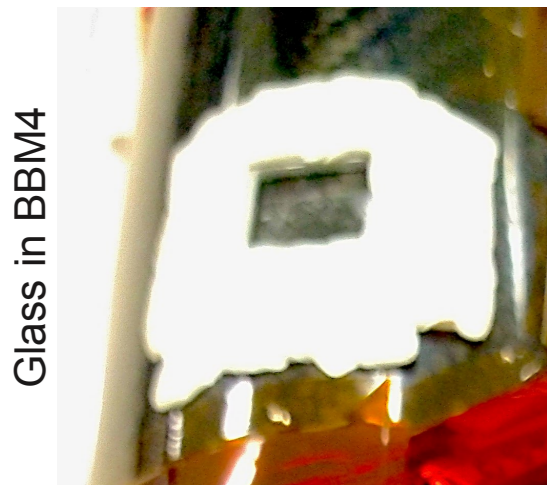
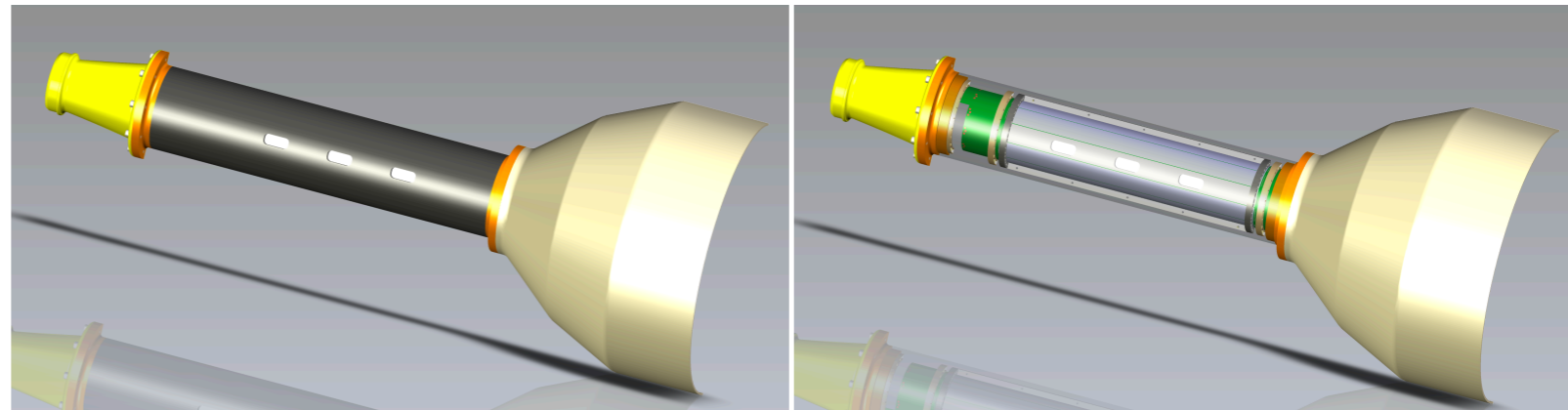
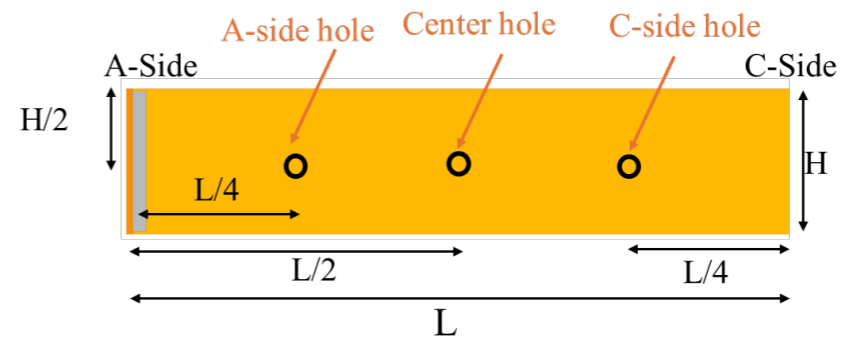
# BBM6 TTA - CYSS

- Identified a potential producer, very close to Bari and already working with INFN for other projects (CMS and ATLAS): CETMA

## Openings in the plastic material version



## Openings in the carbon fibre version

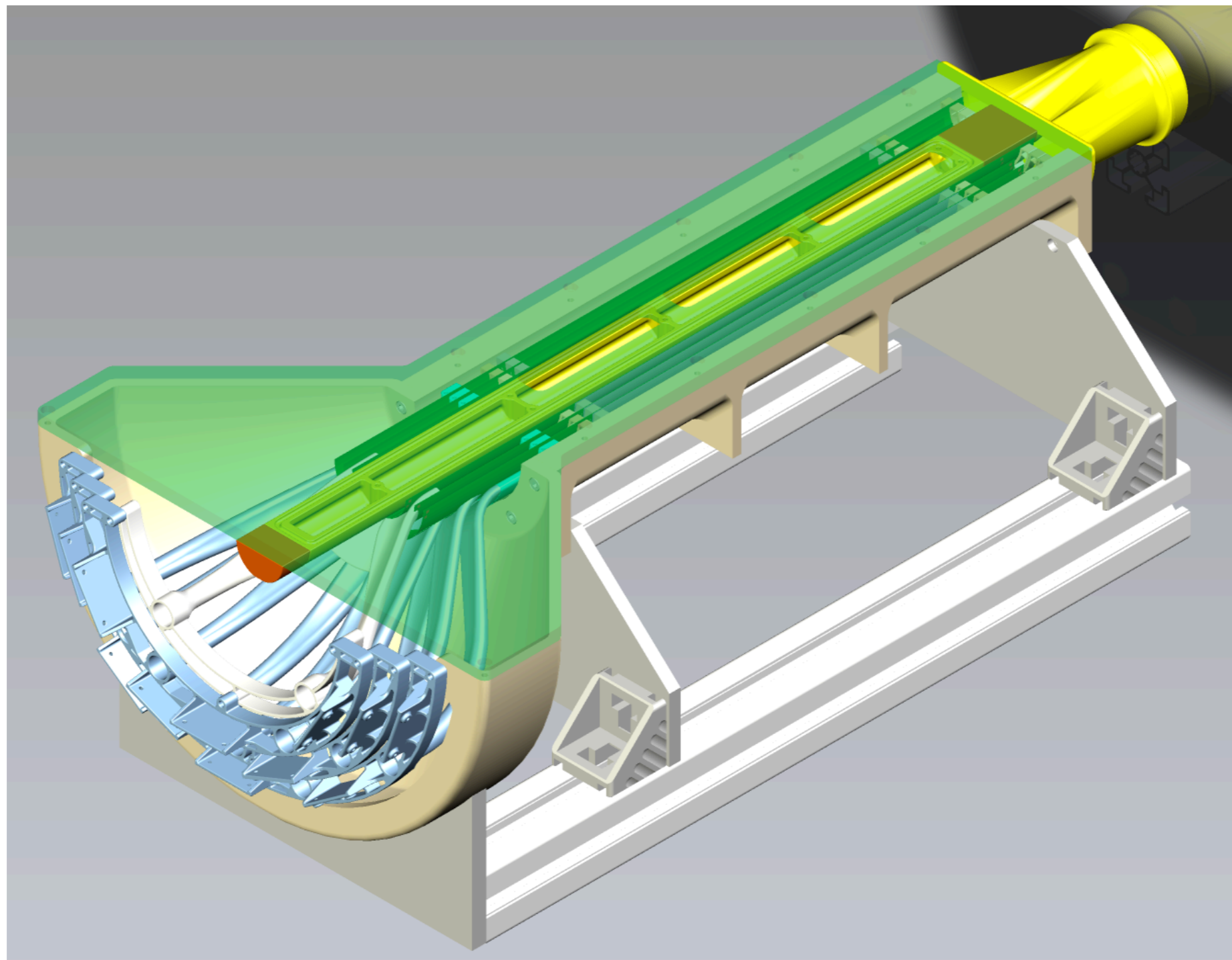


- Are the dimensions of the openings in the plastic version fine?
- Site for glass gluing in the external side of the CYSS. Is this fine?
- What about glasses? Are you going to produce them? Otherwise we need specifications.

# BACKUP



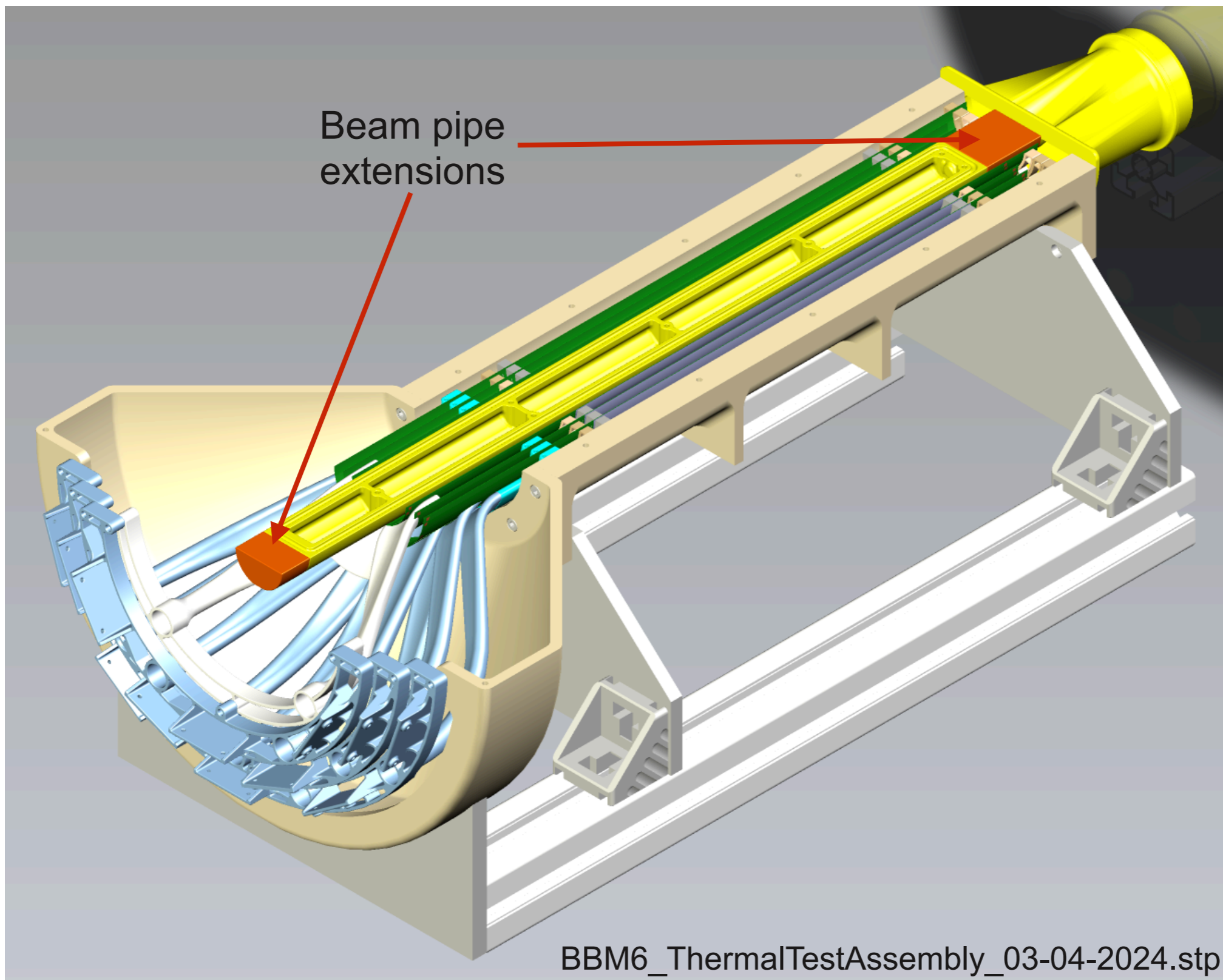
# BBM6\_ThermalTestAssembly\_03-04-2024.stp





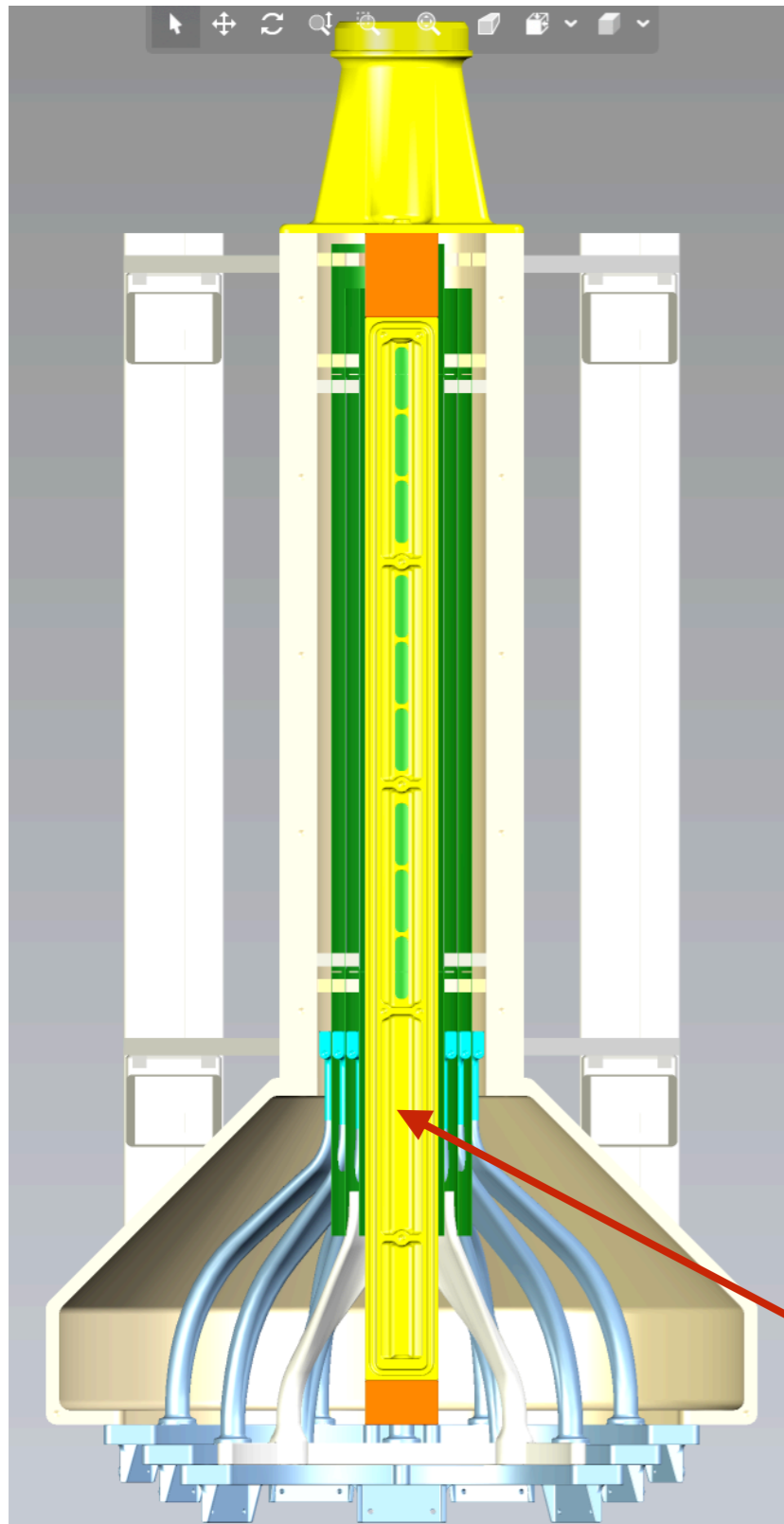


# 1) BEAM PIPE POSITION



BBM6\_ThermalTestAssembly\_03-04-2024.stp

# 1) BEAM PIPE POSITION



Is the positioning of the beam pipe (and particularly of the windows) fine with you?  
Present position is entering windows in the sensor area.

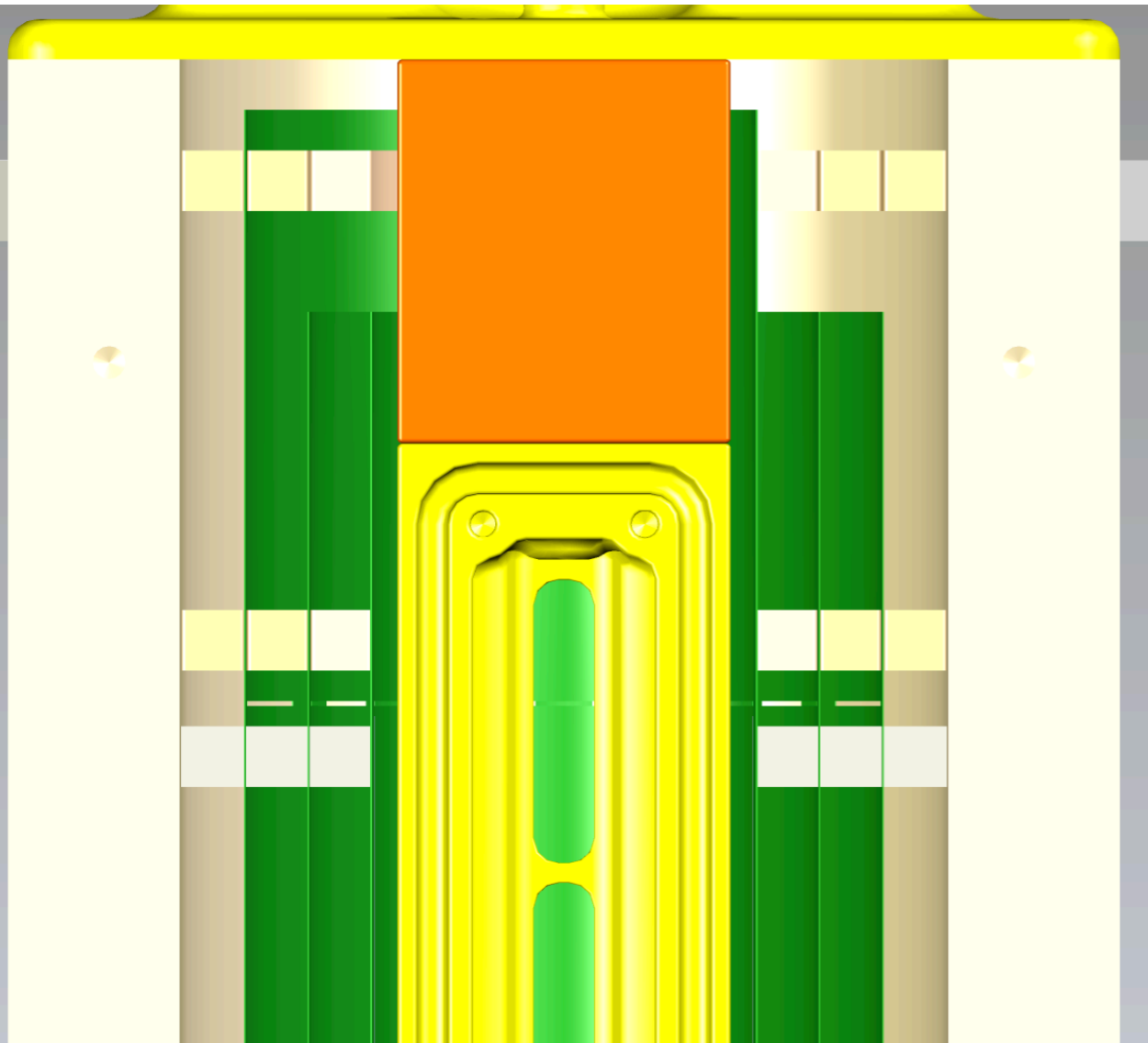
Alternative solution, if you need to have windows also in the FPC are, is to shift everything on the C-side and open windows in the last beam-pipe section.

Fixing of the extensions to the beam-pipe not yet defined in the CAD.

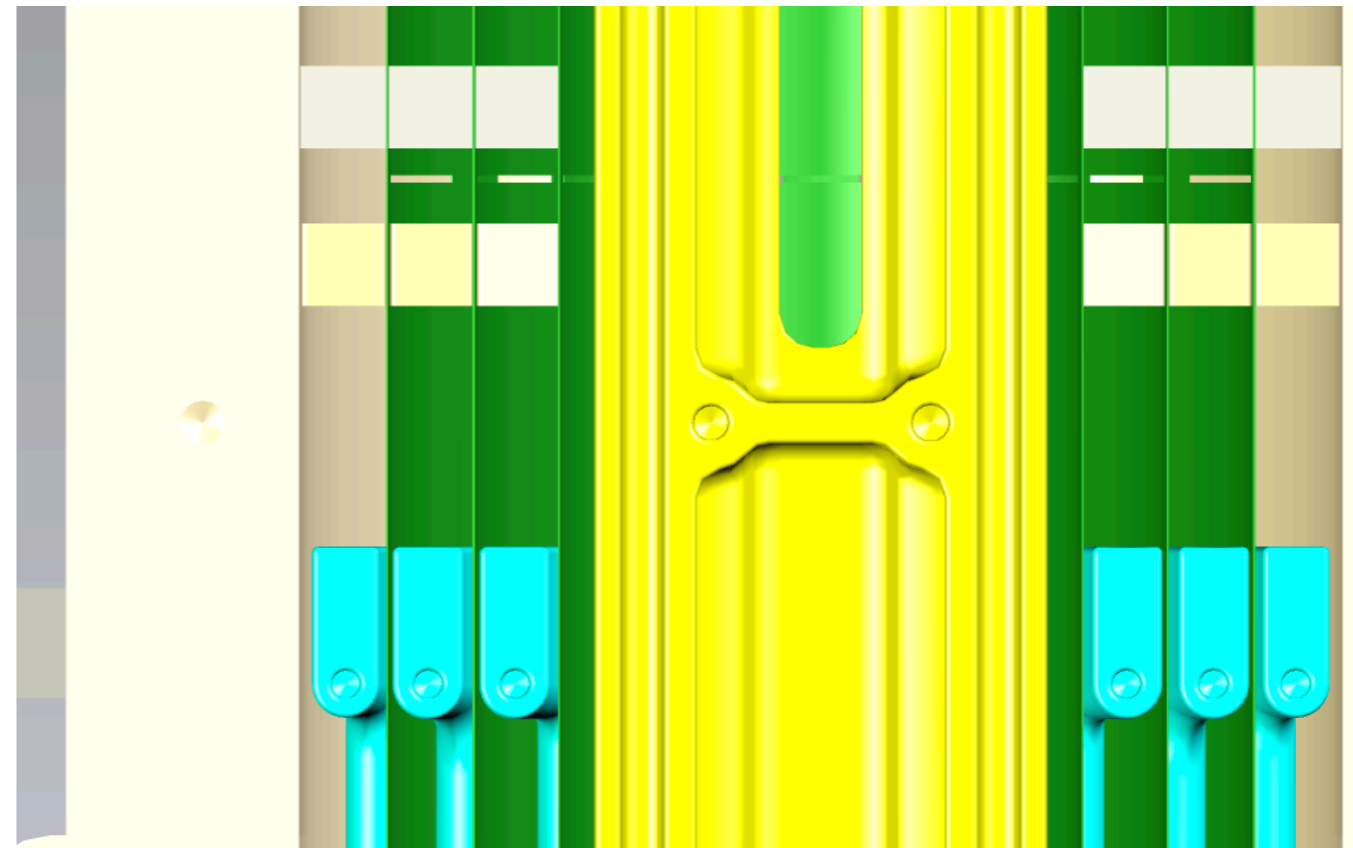
Potentially, open new windows here

# 1) BEAM PIPE POSITION

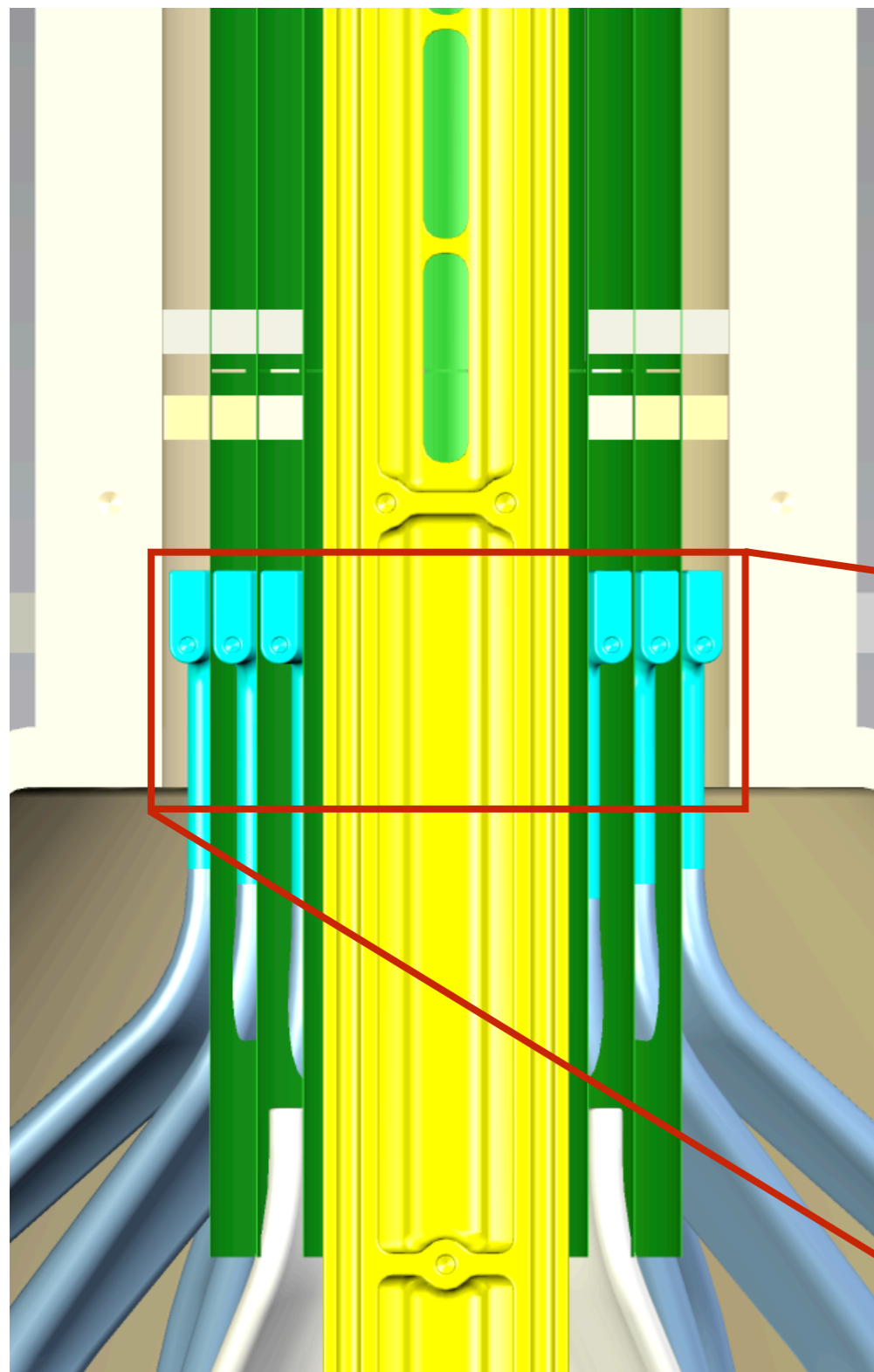
C-side



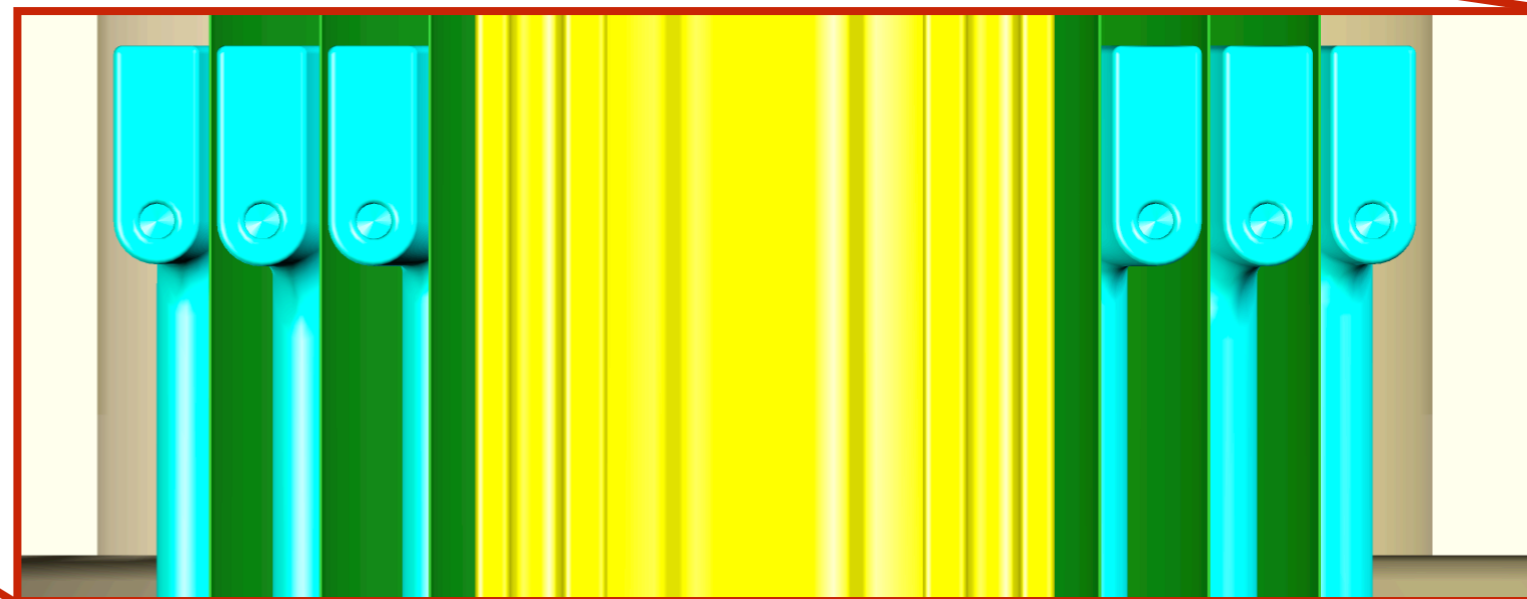
A-side



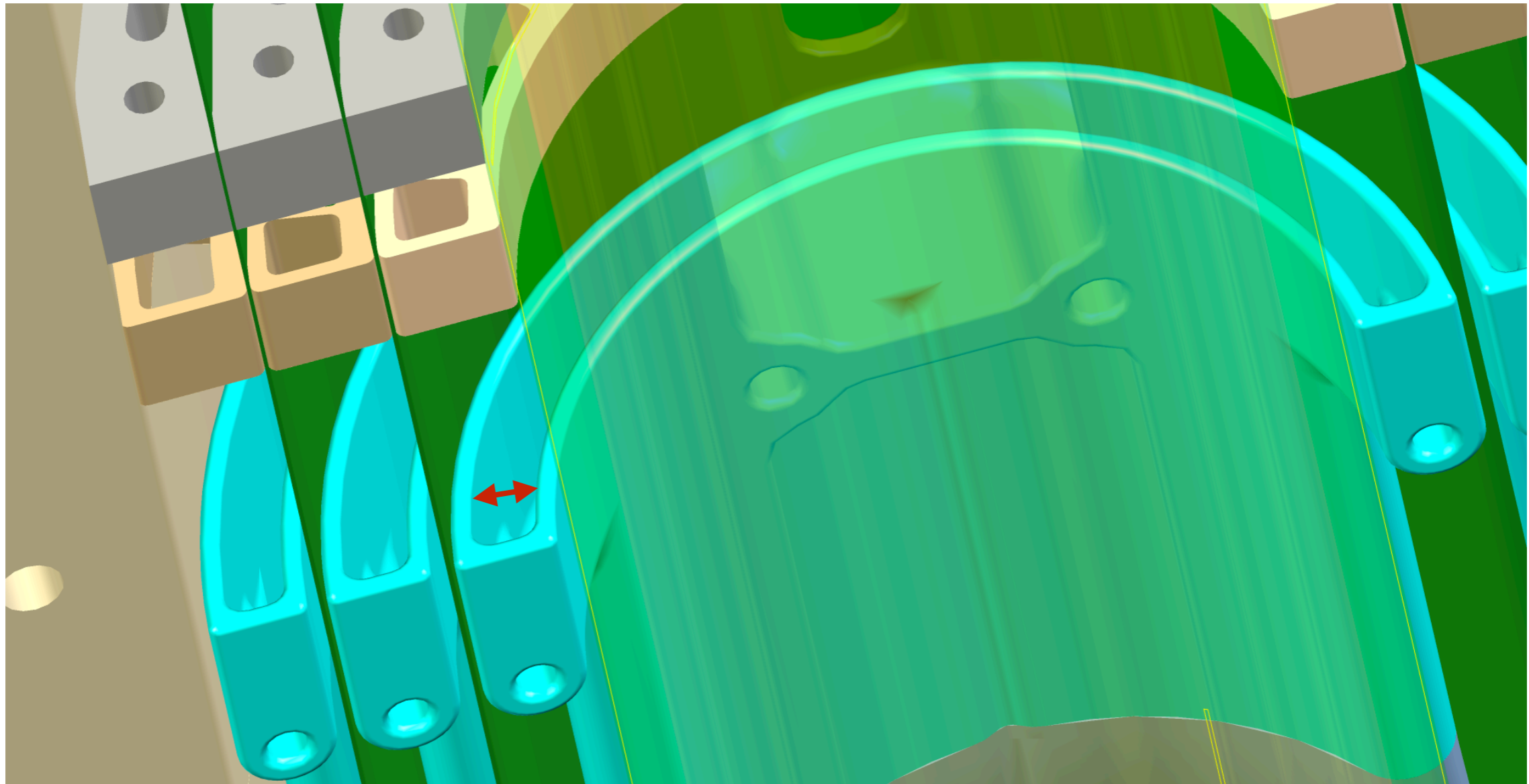
## 2) AIR DUCTS



Thickness of the air ducts to be fixed.

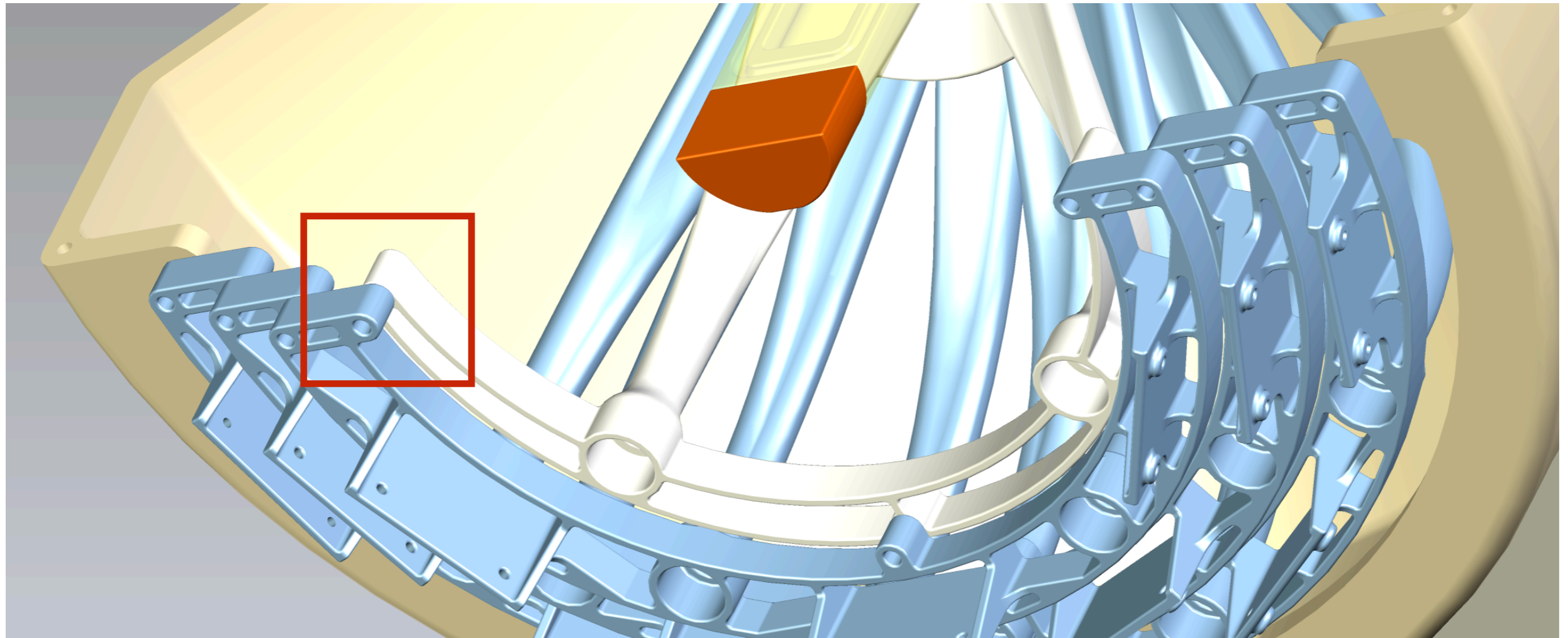


## 2) AIR DUCTS



If no update from Gael, proposed solution is to keep fixed internal dimension and make thicker wall from external side, filling the missing volume.

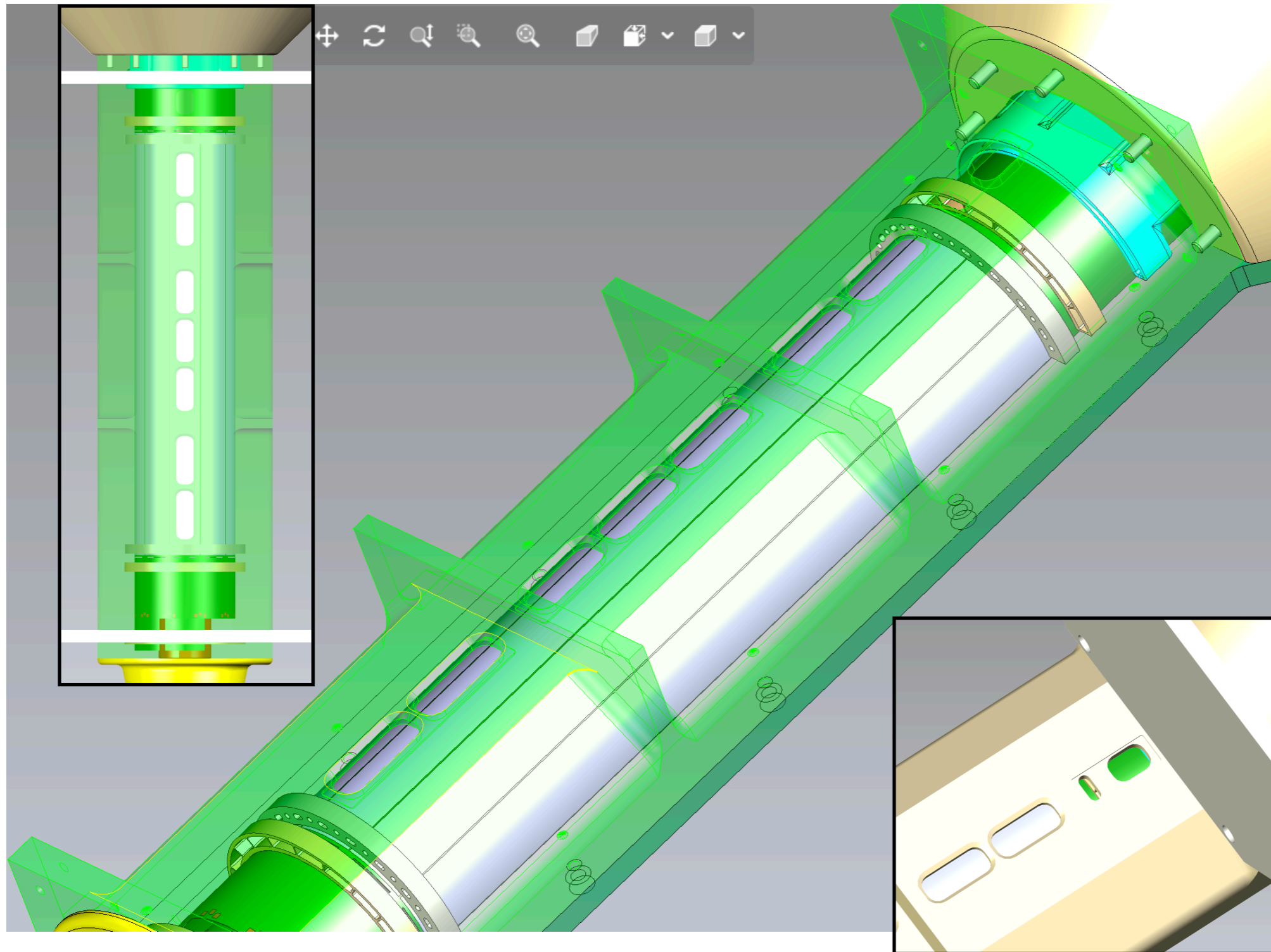
### 3) AIR DUCTS CONNECTION TO THE SHELLS



Can you give us details about the connection between the end of air ducts and the patch panel?

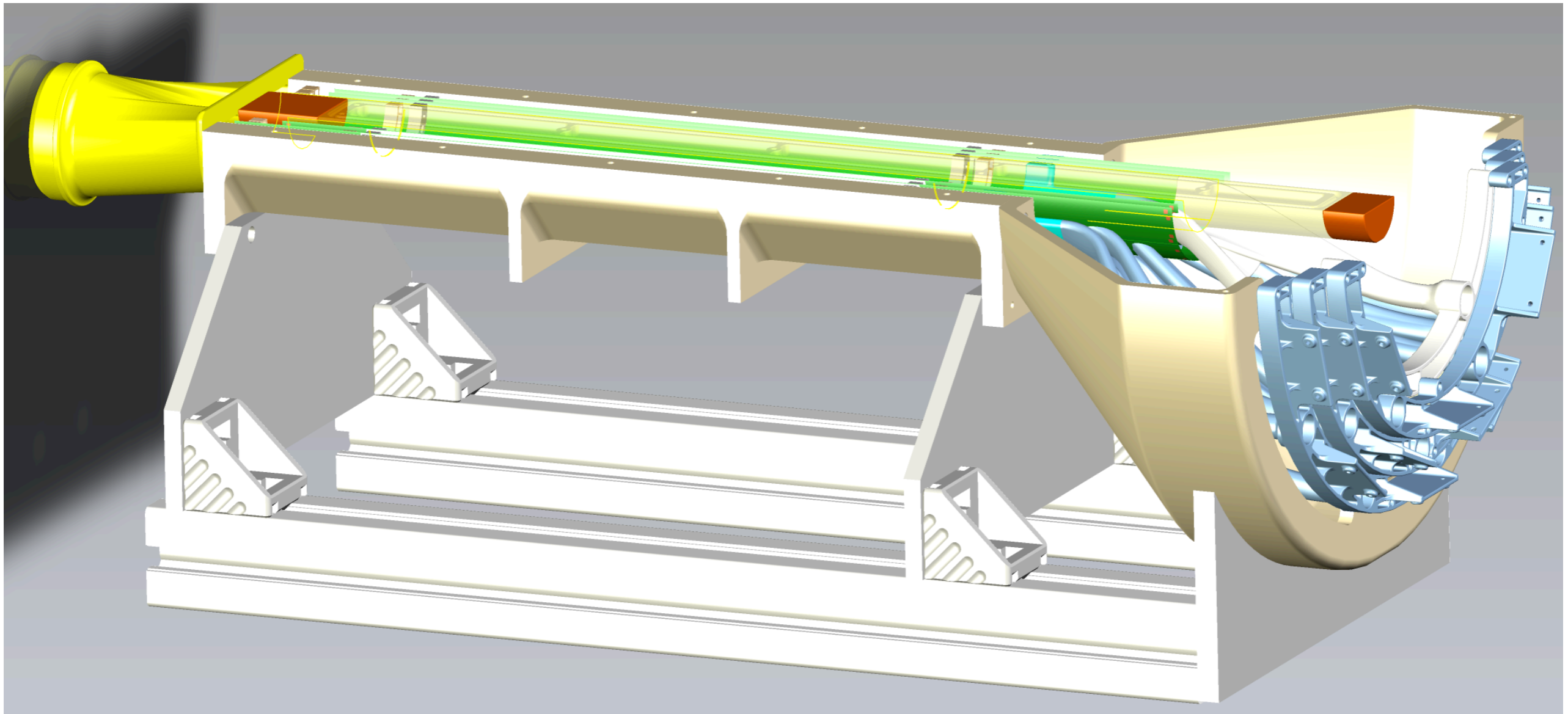
Do we actually need to have the patch panel?

## 4) WINDOWS POSITION IN THE CYSS



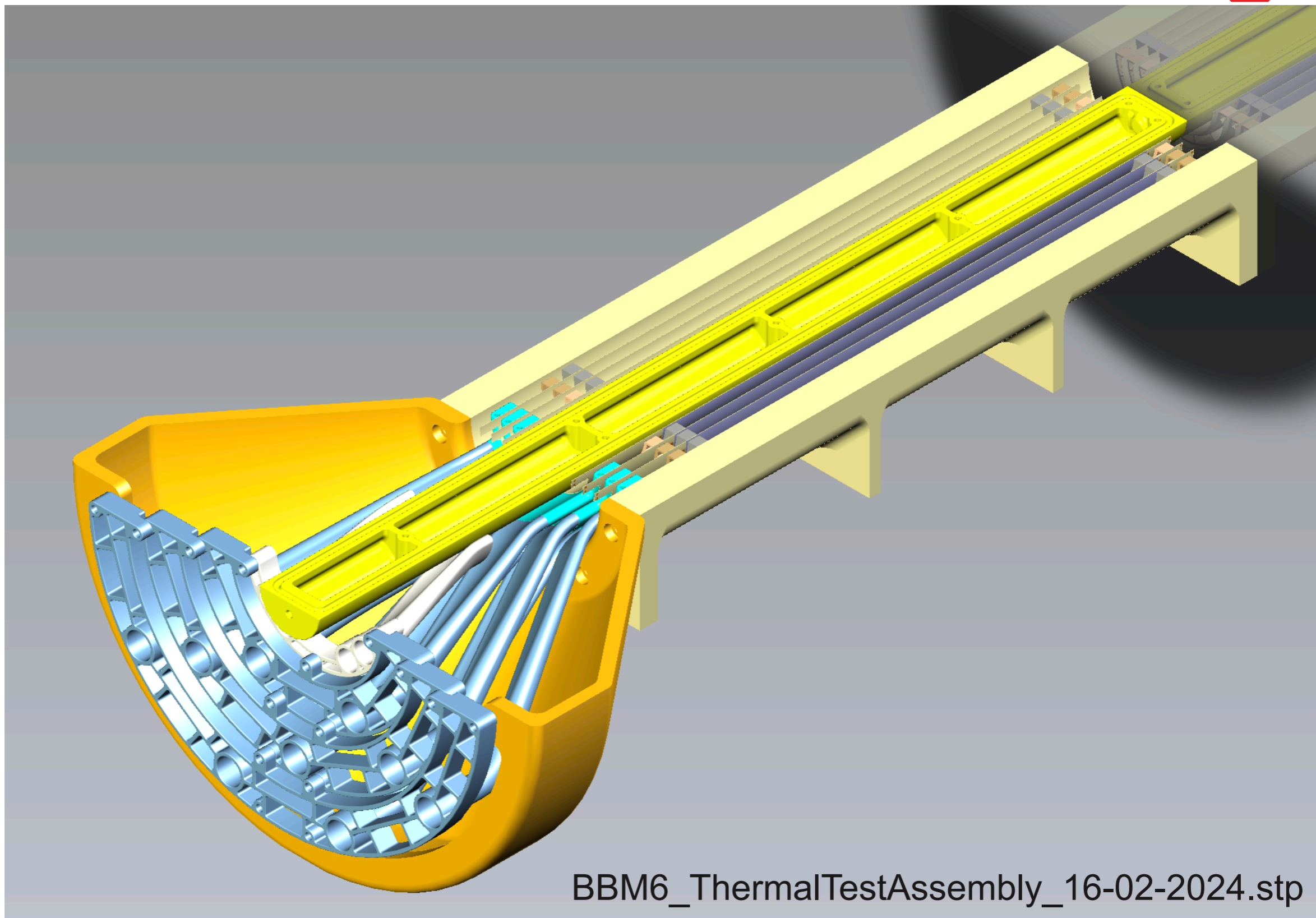
All the windows positioned in the agreed places

## 5) SUPPORT STRUCTURE



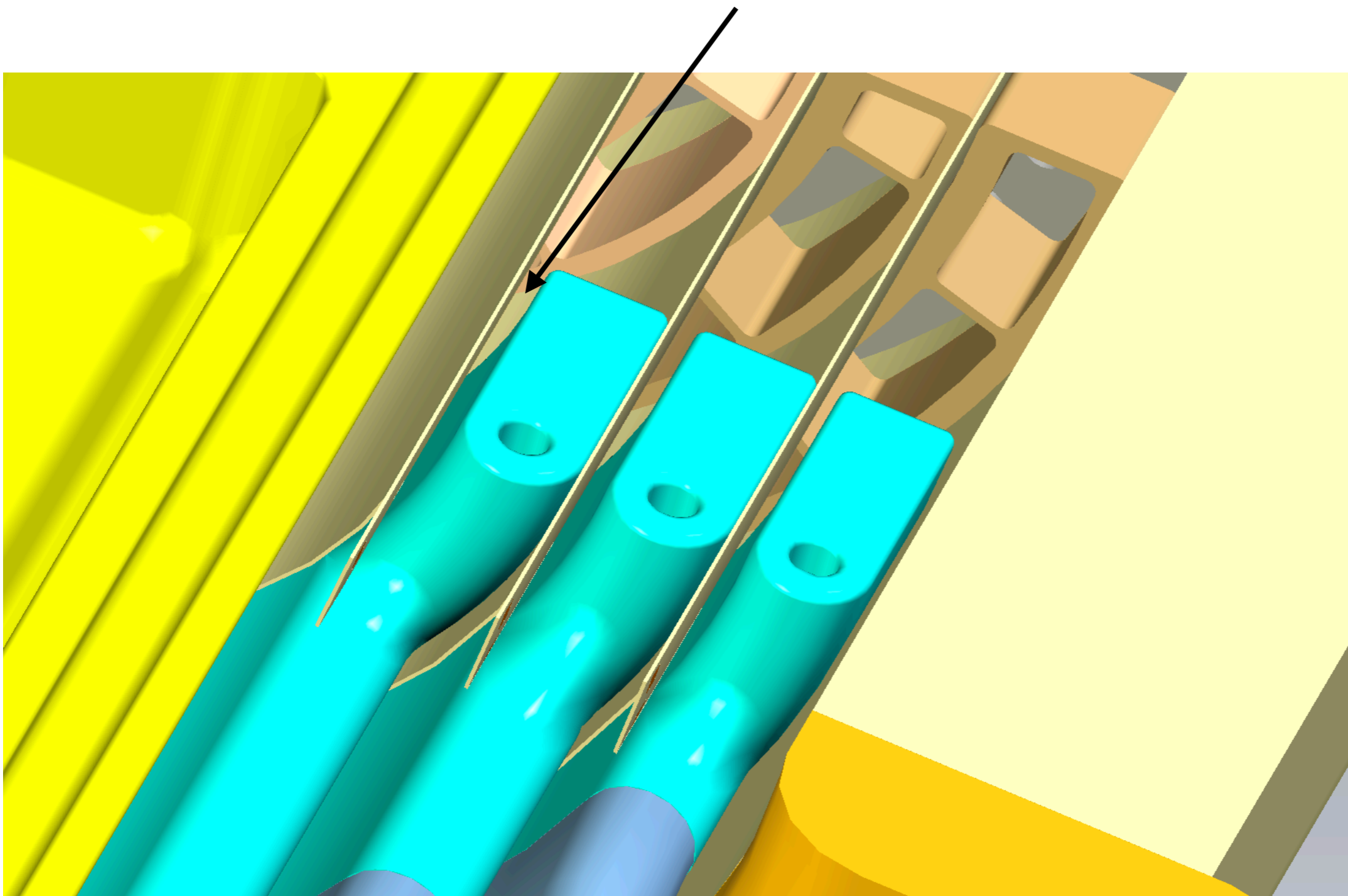
Is this solution compatible with wind tunnel?

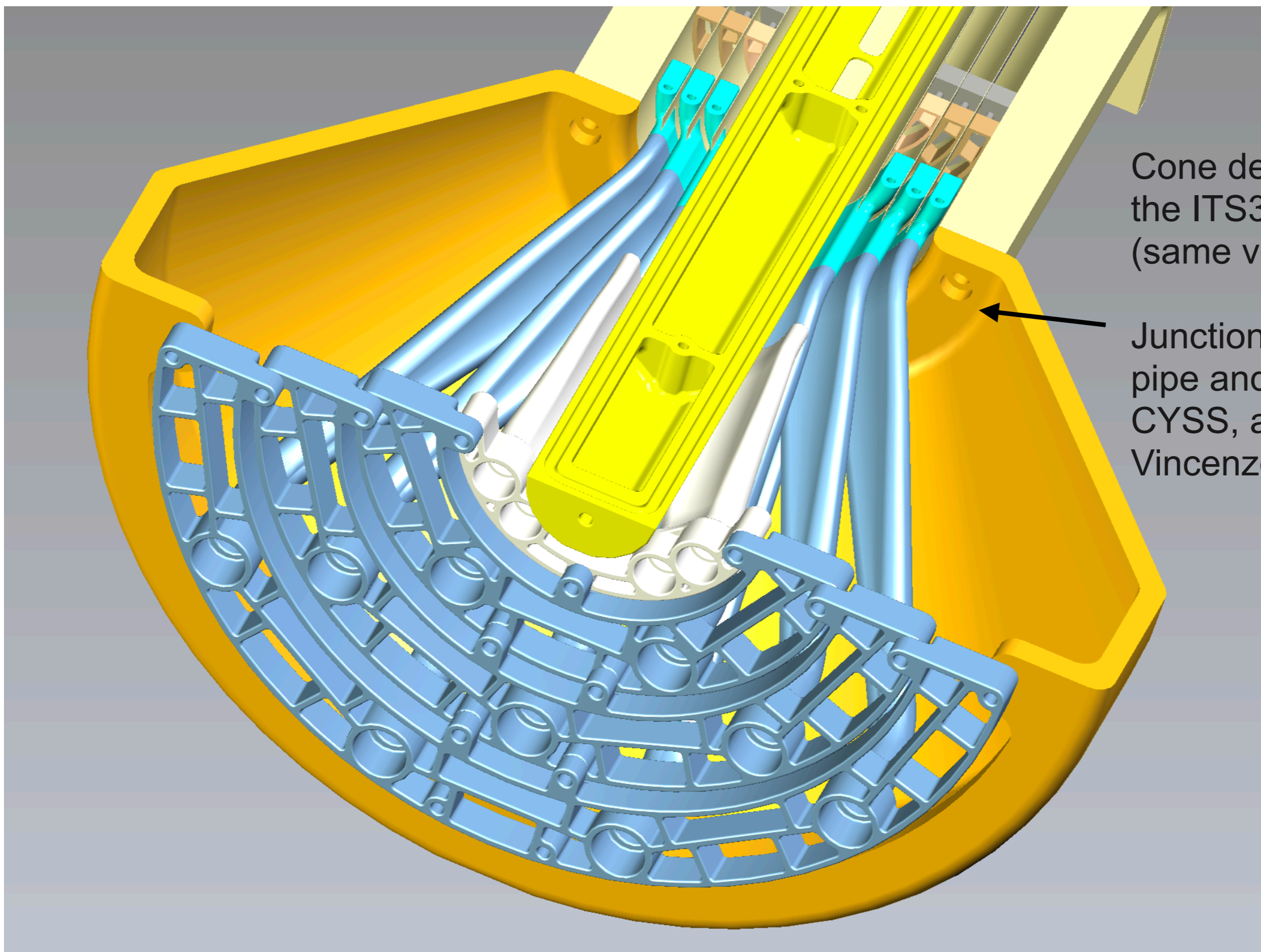




BBM6\_ThermalTestAssembly\_16-02-2024.stp

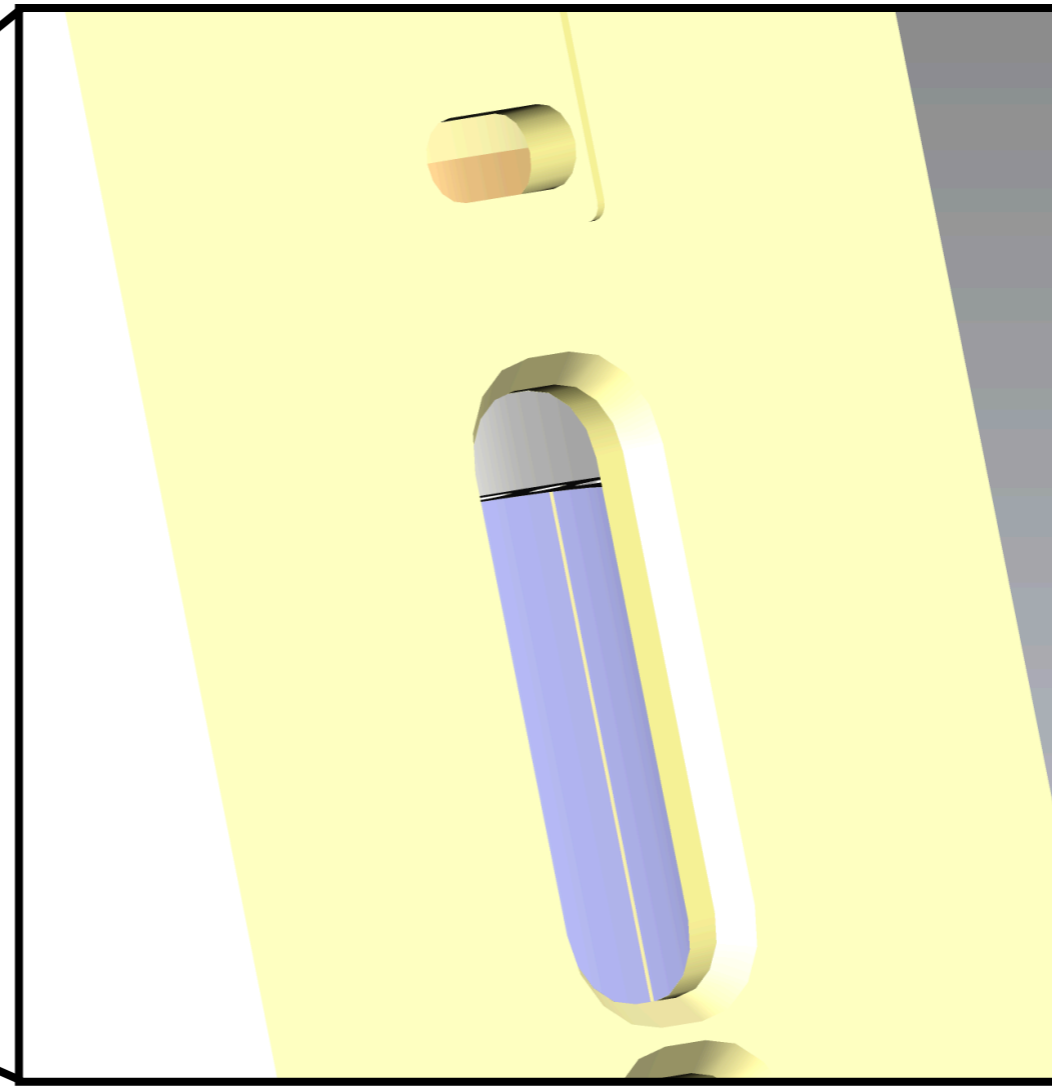
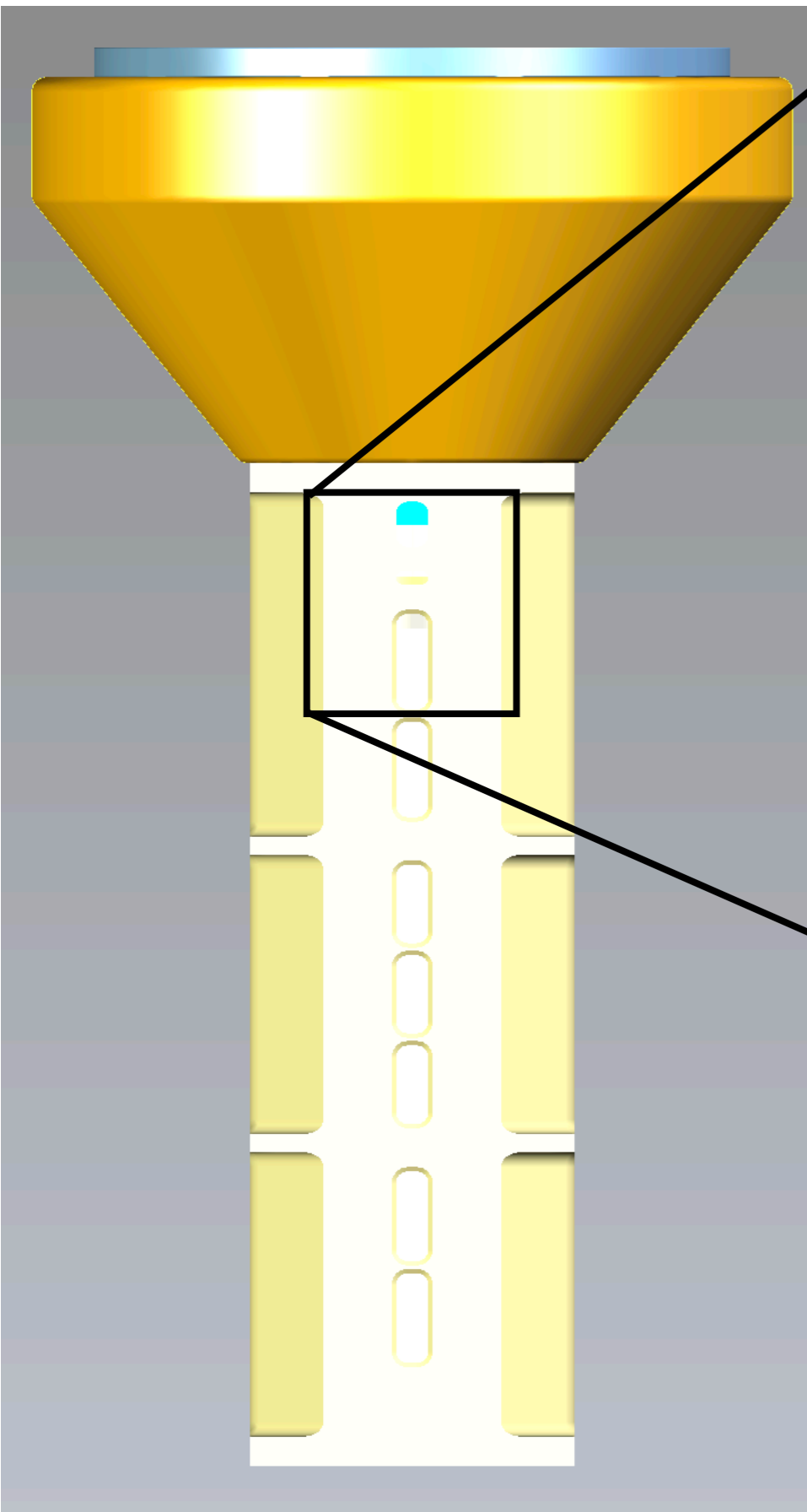
Changing layers radii and layers separation distance the cooling pipe thicknesses need to be adjusted



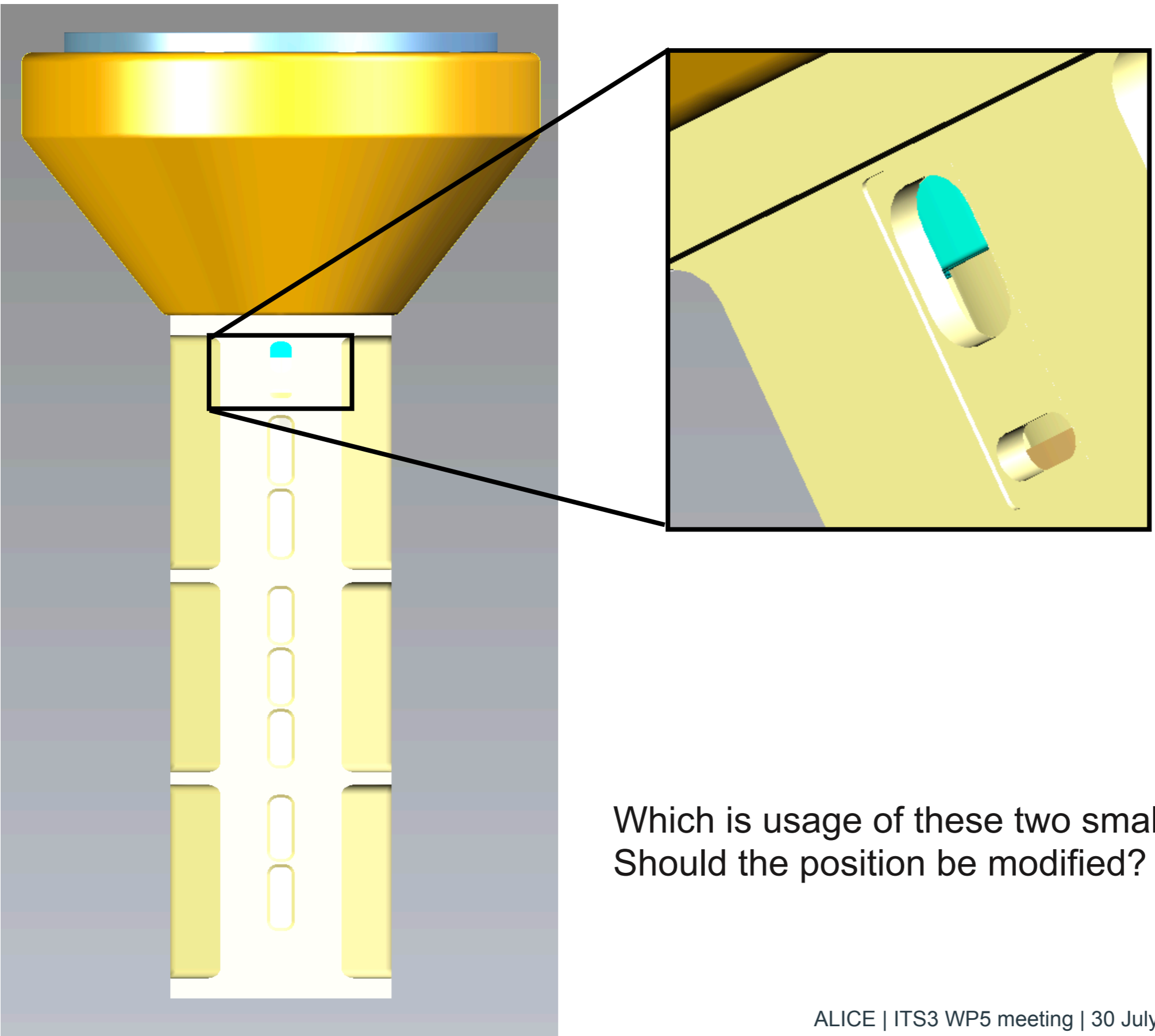


Cone design based on the ITS3 cone model (same volume).

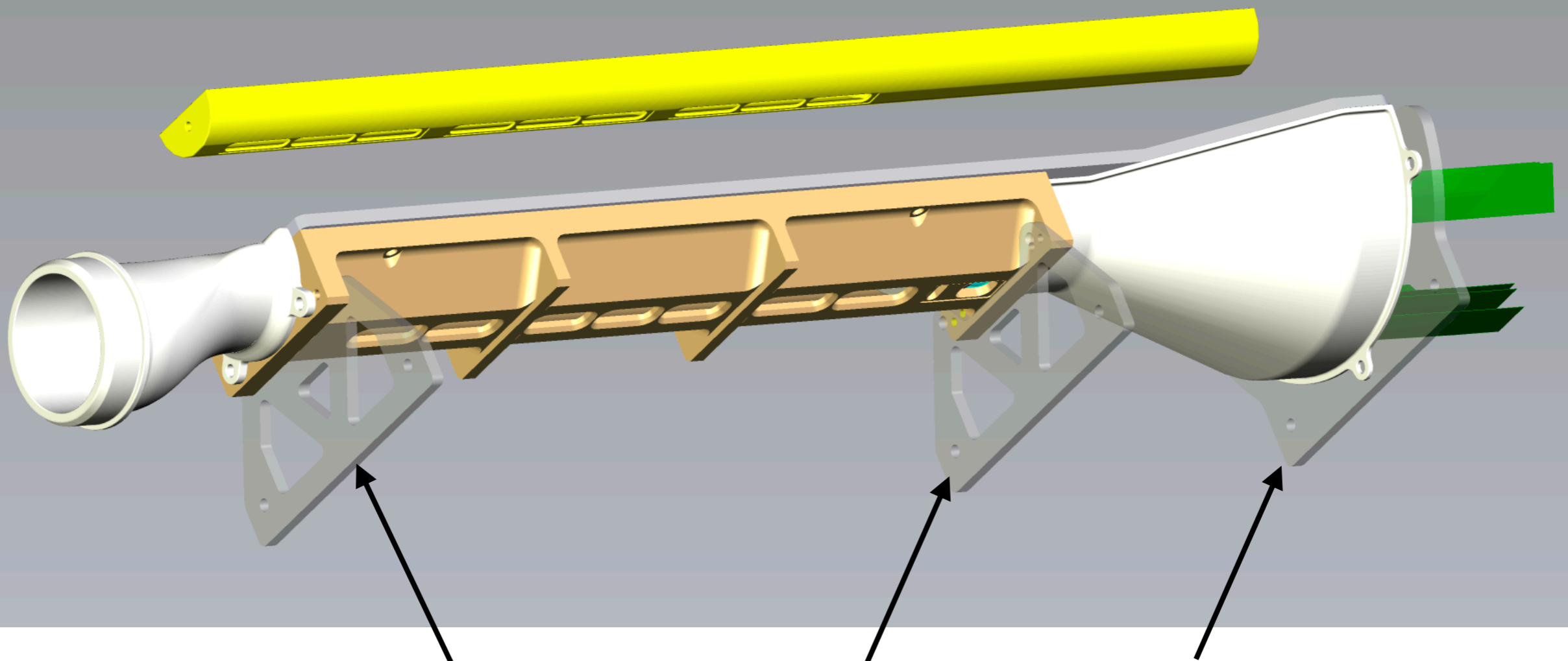
Junctions to the cooling pipe and specific CYSS, added by Vincenzo.



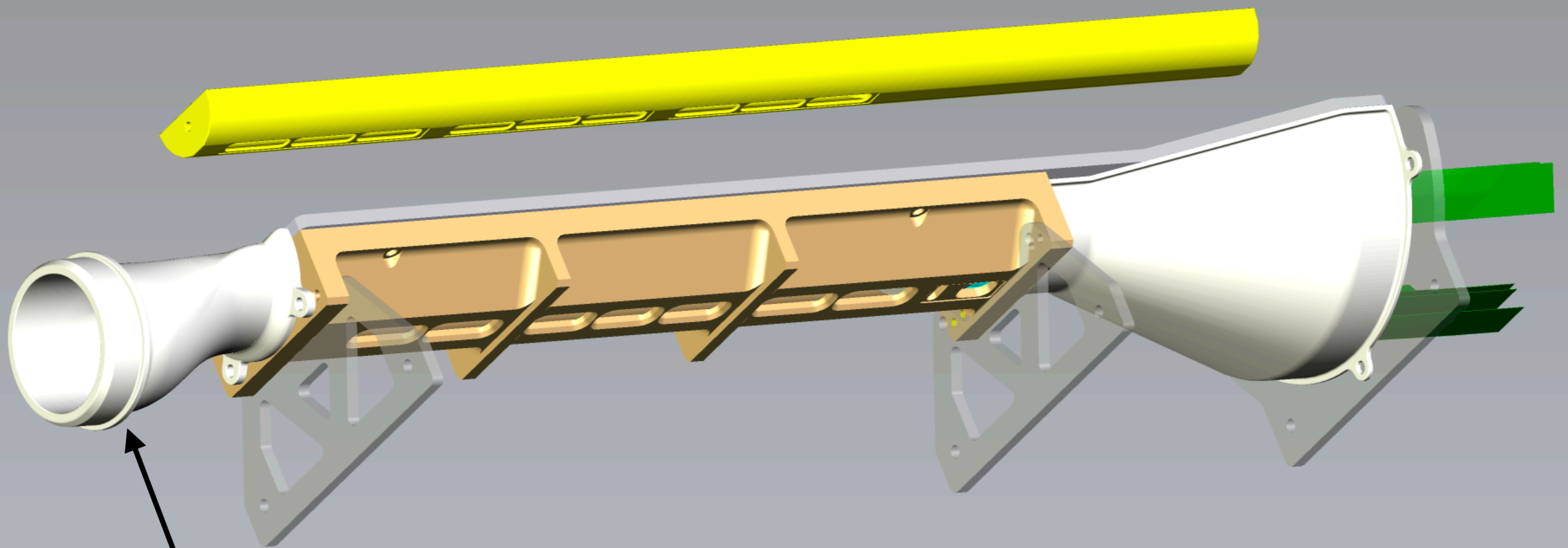
- Dimensions and positions of the big openings have been respected.
- Position of the first one interfere with the below half-ring.
- True also for the small window above interfering with service half-ring.



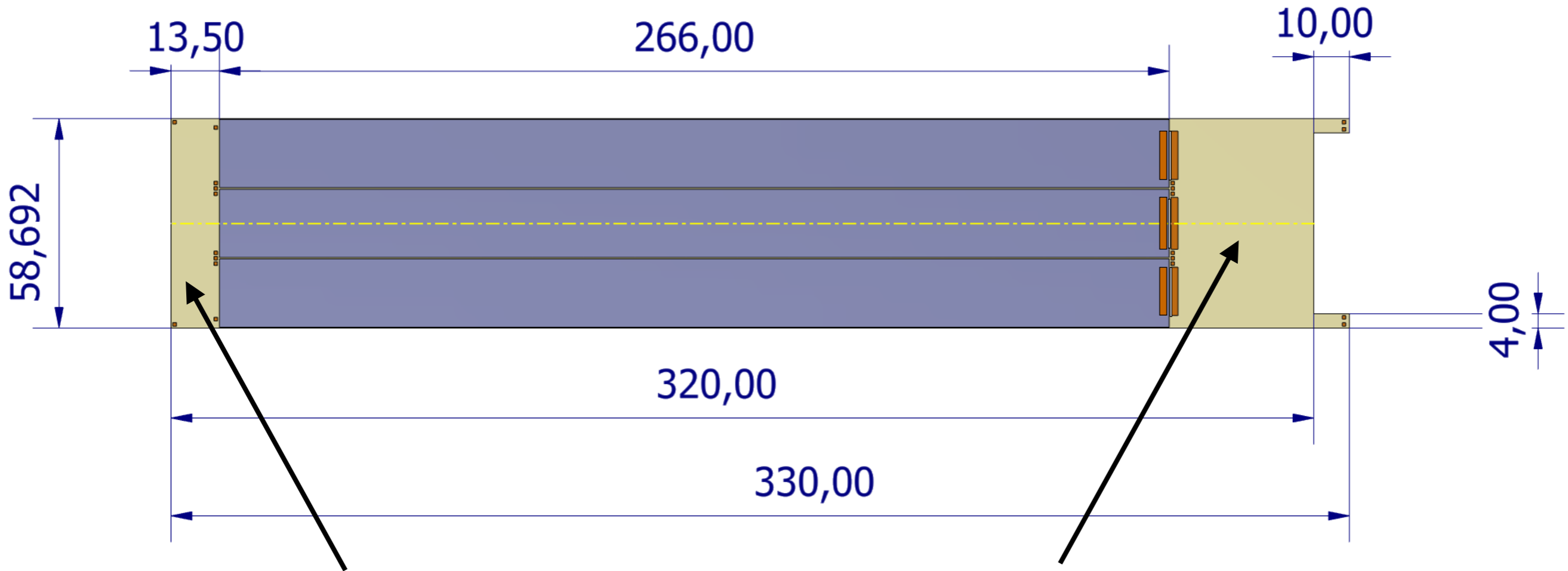
Which is usage of these two smaller windows?  
Should the position be modified?



Are these supports used?  
The holes in the bottom part of the supports have a special meaning and should be kept?



This needs to be redesigned.  
Should we do it or you prefer to implement special constrains?  
I assume that the diameter of the output should be kept.



Maybe question to Rui/Serge.

Total thickness in the sensor region 160 um, from Massimo's slides.

What would be the thickness in the region without sensor?

Should we look for a thickness close to the FPC one?

