

ALLEGRO: Noble-liquid calorimeter

External rings assembly and general tooling

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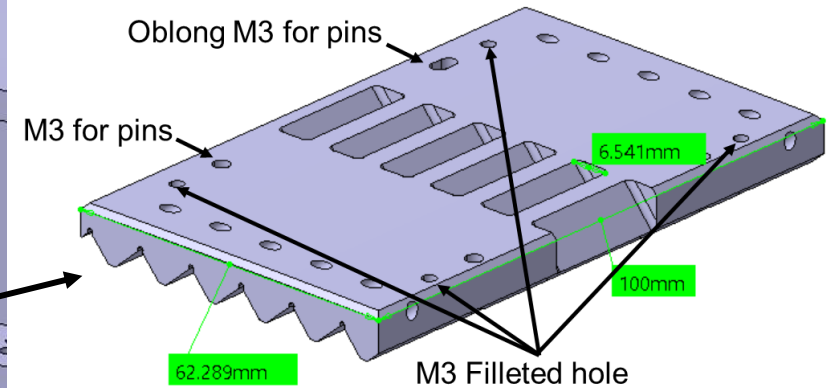
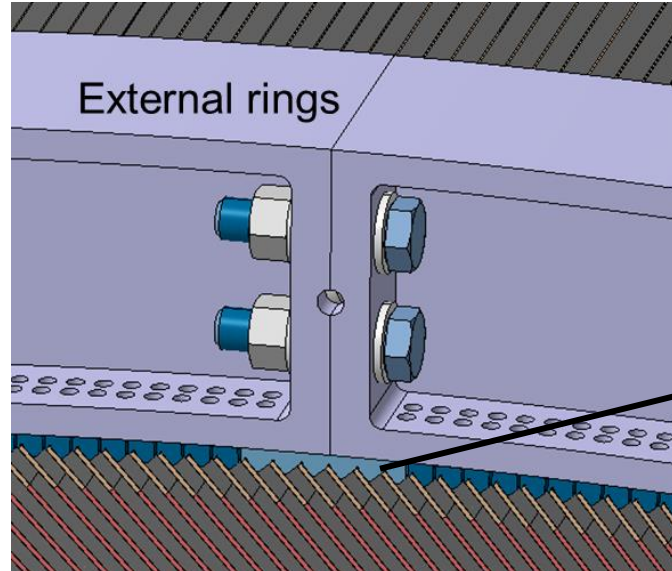
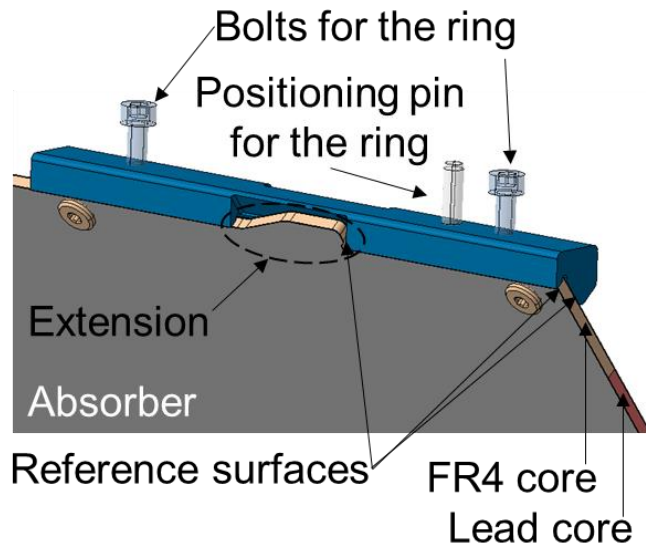
Prototype for the assembly of absorbers

The idea of using stainless steel bars of the length of the external rings width was developed with the objective of building a prototype to test the production and the assembly of the parts.

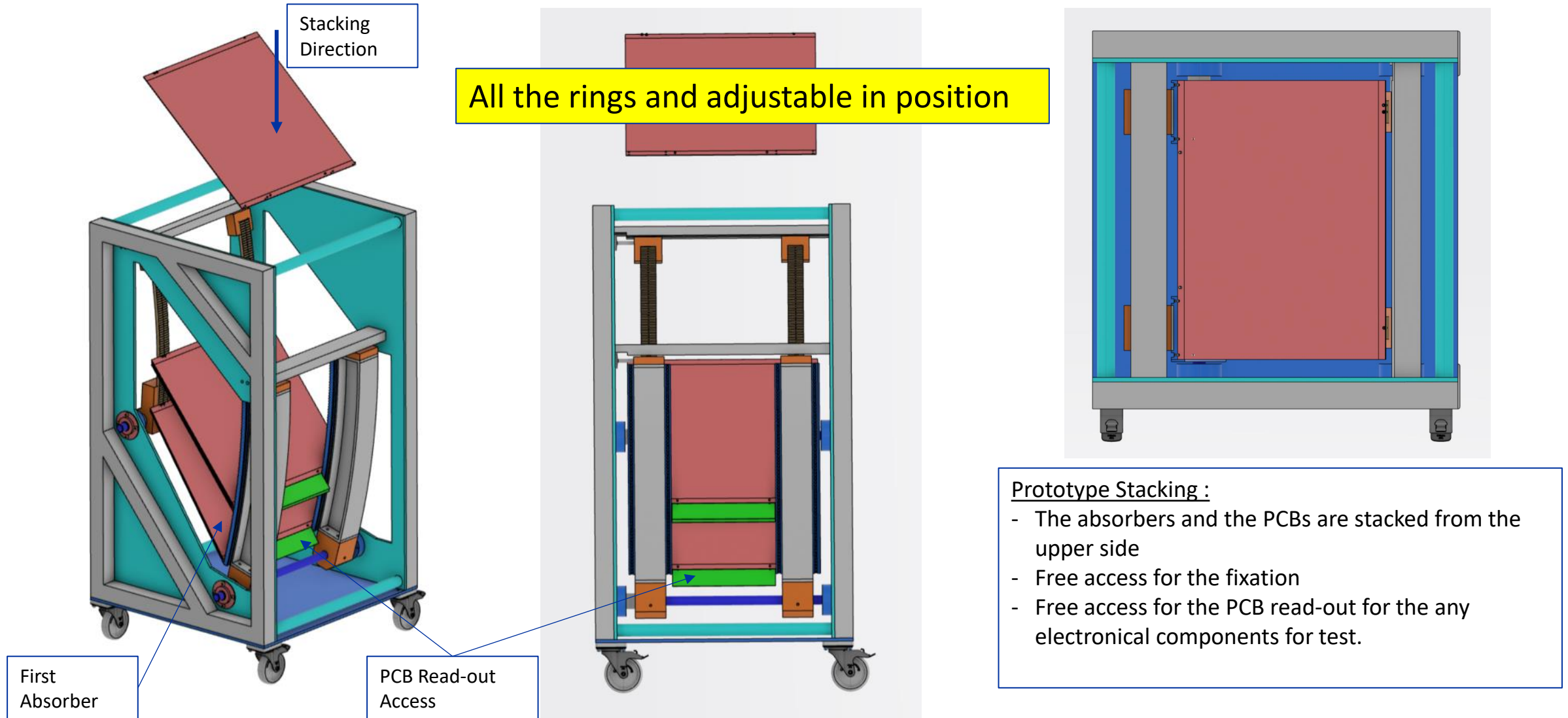
The bars are positioned in the absorber by some reference surfaces and bolted using 2 M3 bolts.

Once we have two bars bolted to the absorber, they are positioned in the ring, thanks to the pins, and bolted to them by M3 bolts. The stainless steel bars do not touch each other. So, the tolerances are not crucial on the external faces of the part. All the holes goes to the end of the part to avoid air trapped after bolting.

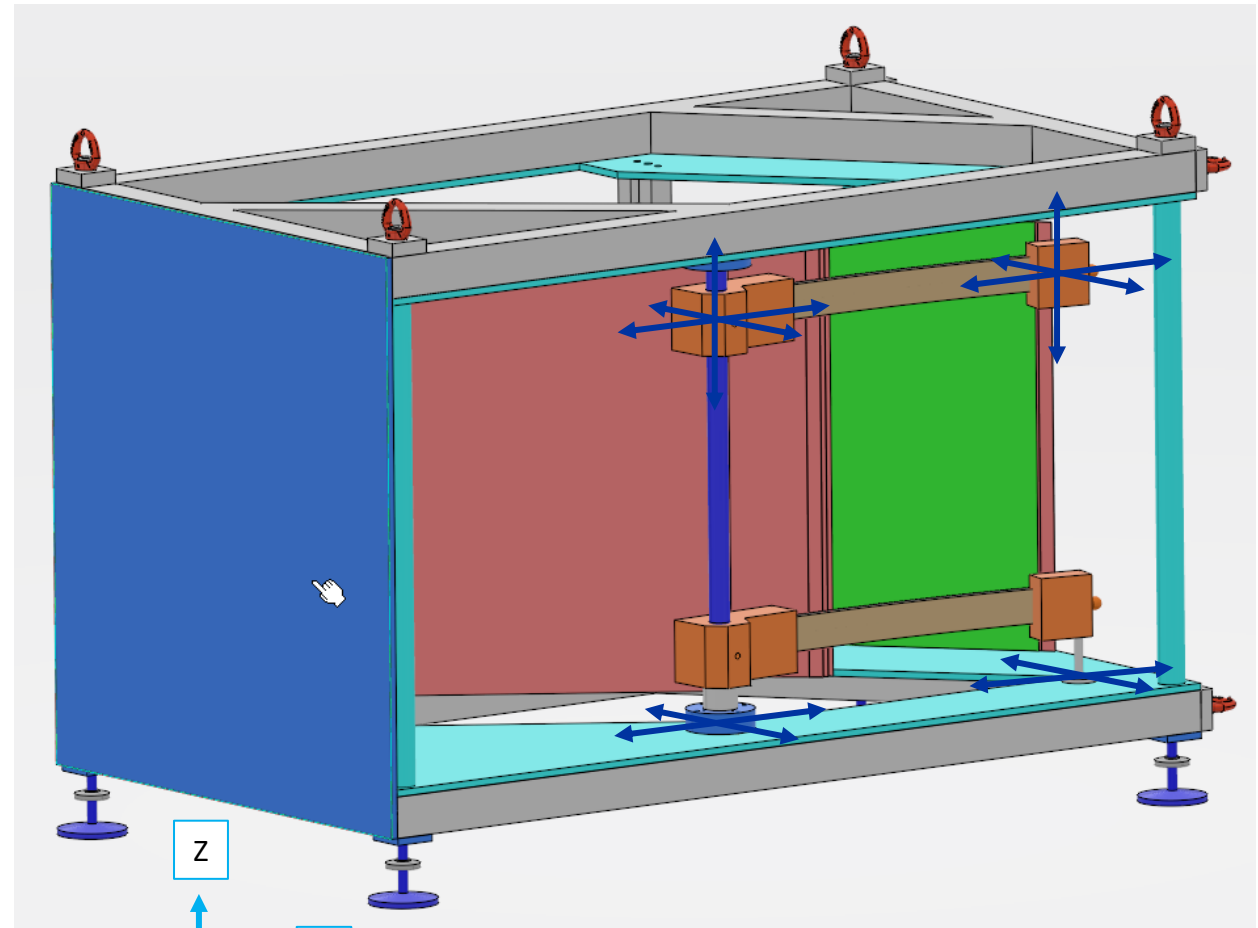
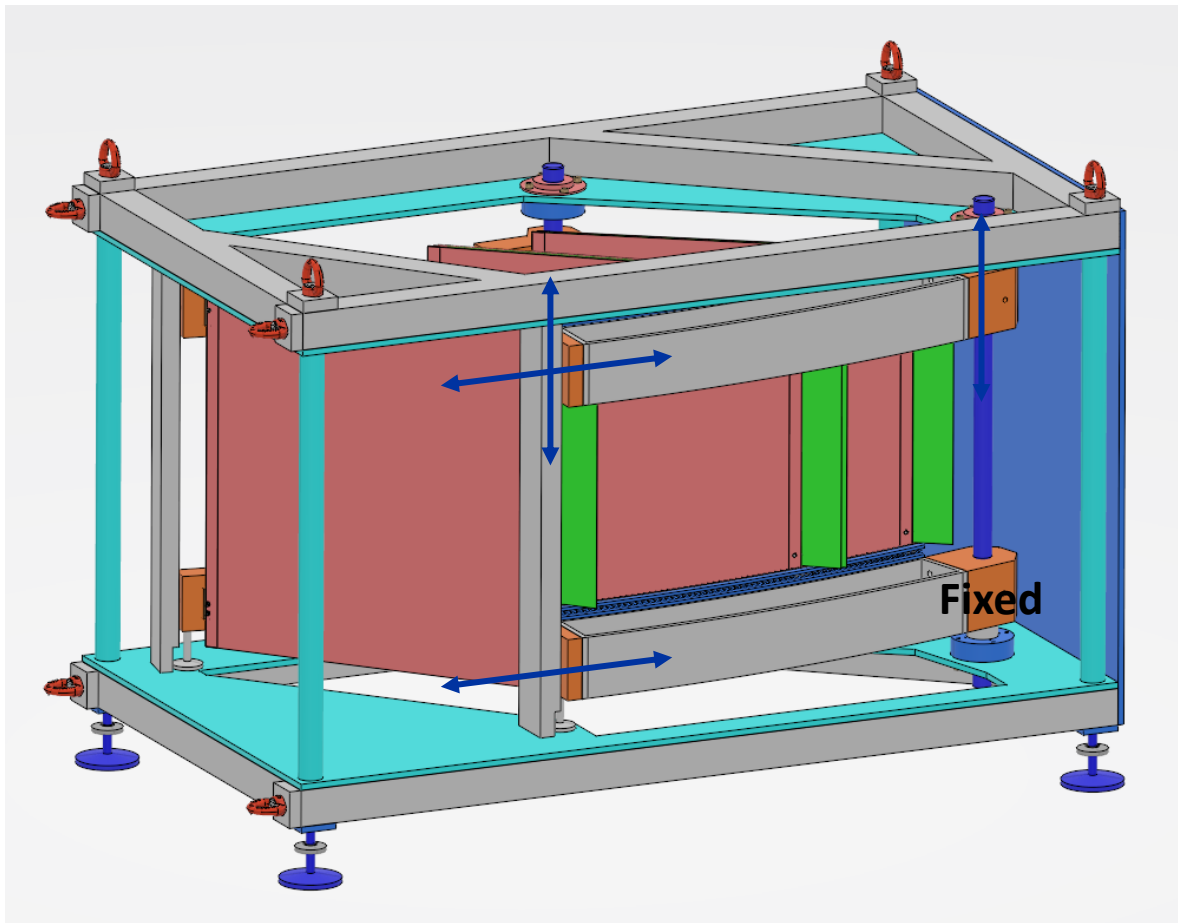
As in the joint between rings the bars cannot be bolted, another part is design that will take 6 absorbers and it will be bolted to two rings.



Assembly tooling A: Prototype stacking

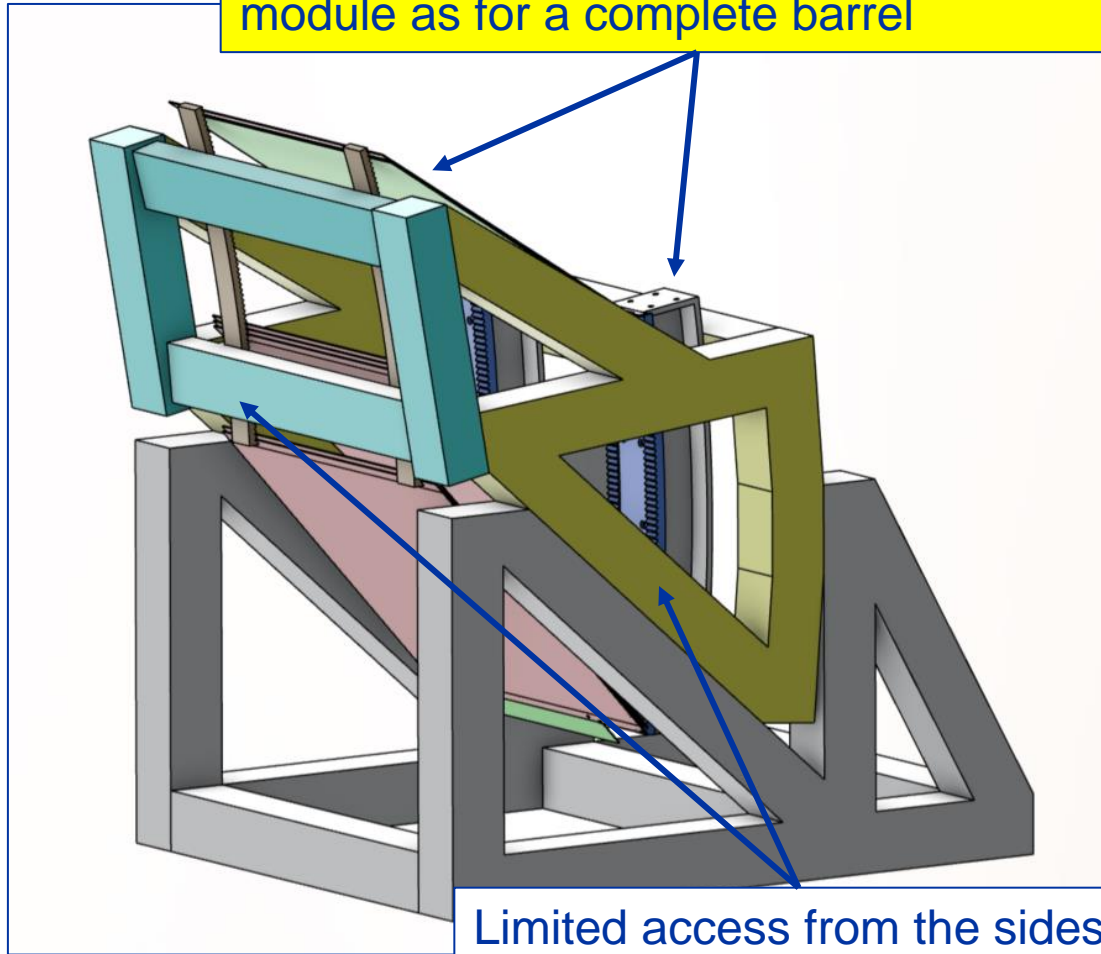


Assembly tooling A: Cold test, degrees of freedom



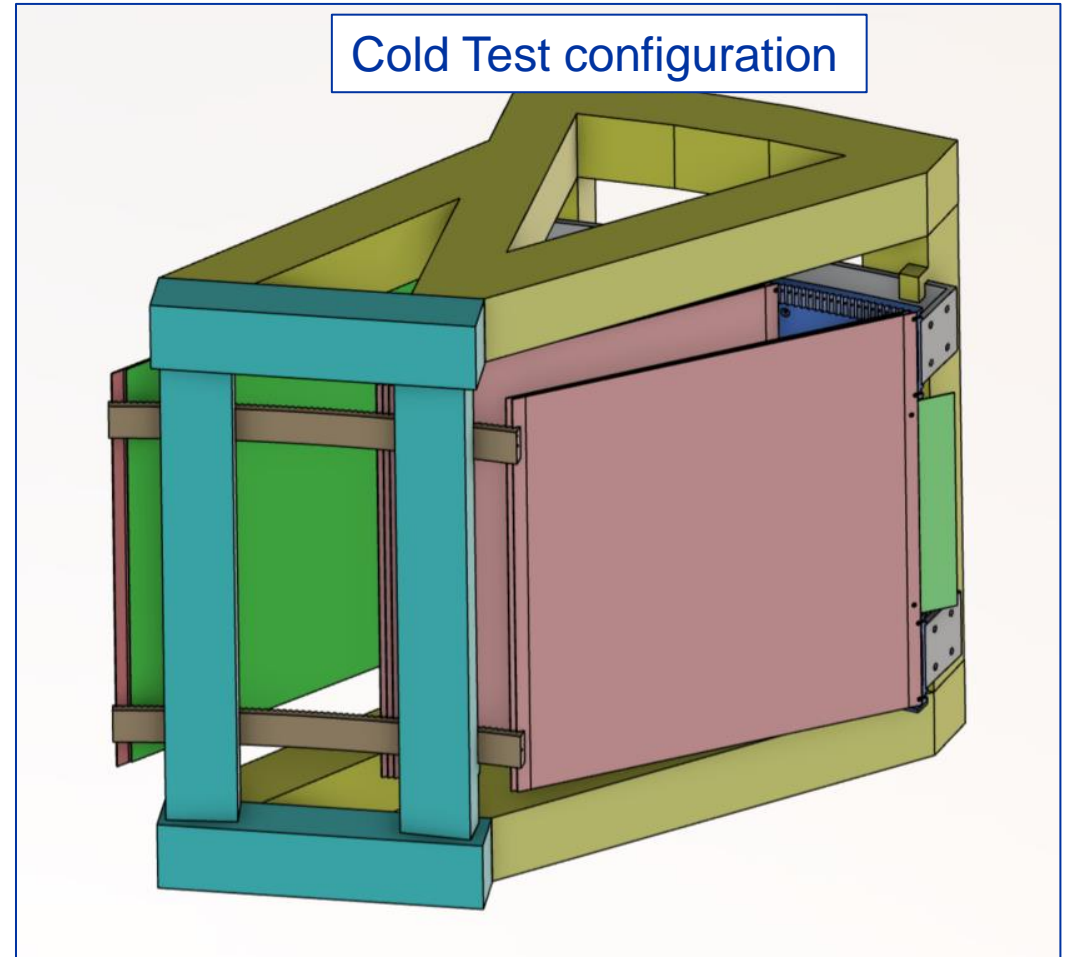
Assembly tooling B: as for a complete barrel

Free extremities for a fixation with another module as for a complete barrel



Limited access from the sides

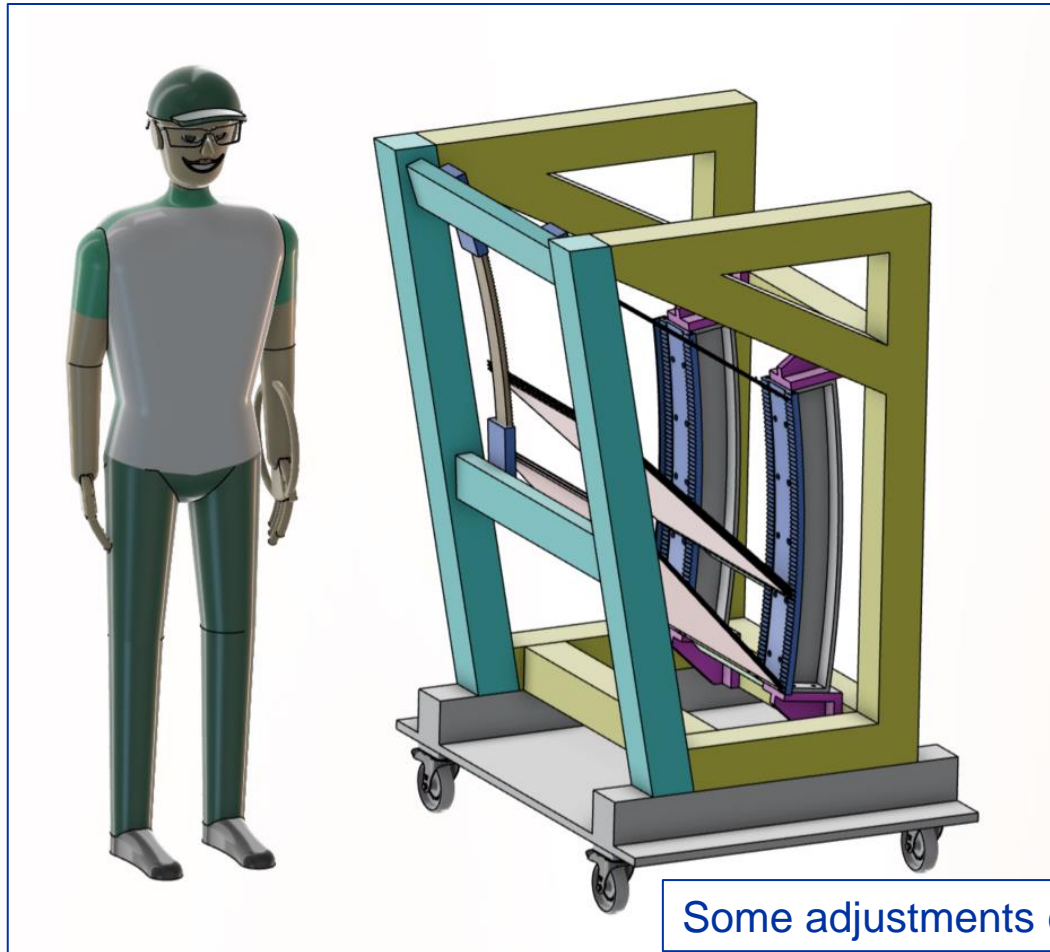
The ring are positioned with machined interfaces on the assembly frame (simpler than version A)



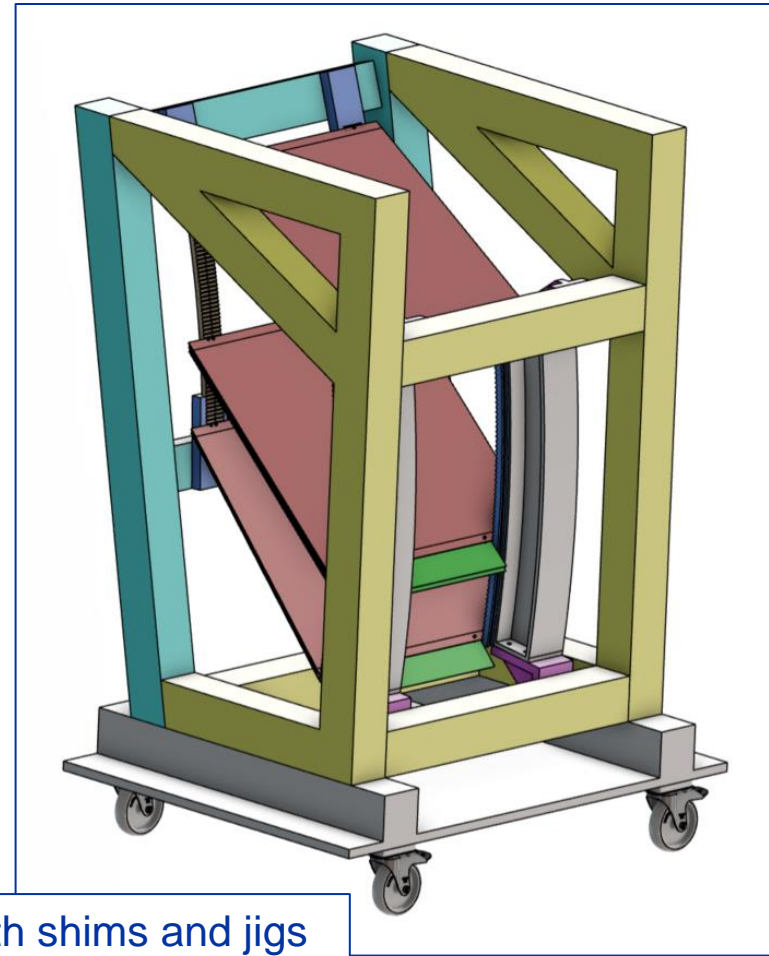
Cold Test configuration

Assembly tooling C

Free access from the sides

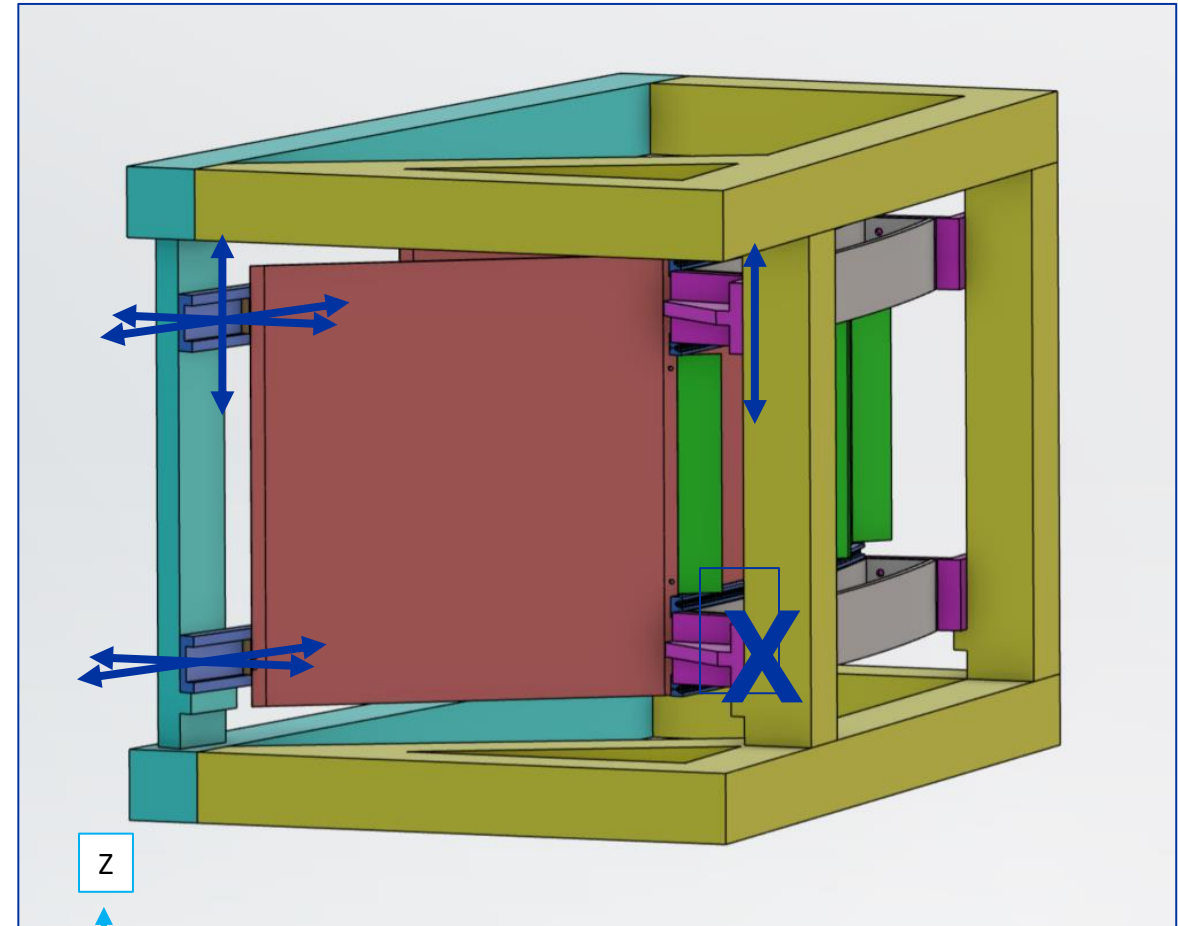
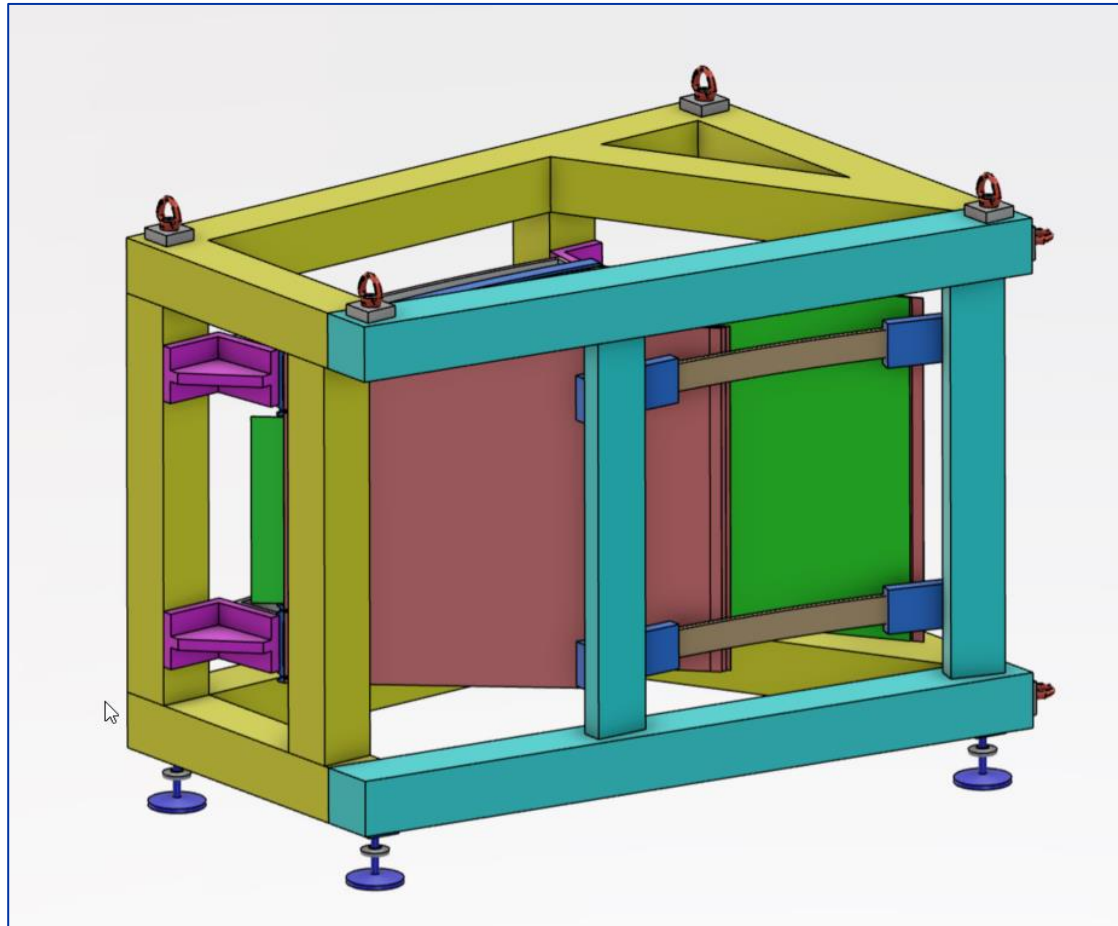


The ring are positioned with machined interfaces on the assembly frame (simpler than version A)

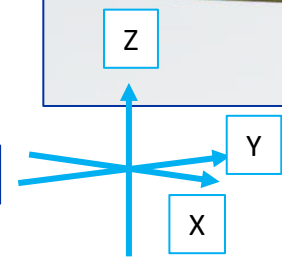


Some adjustments can be done with shims and jigs

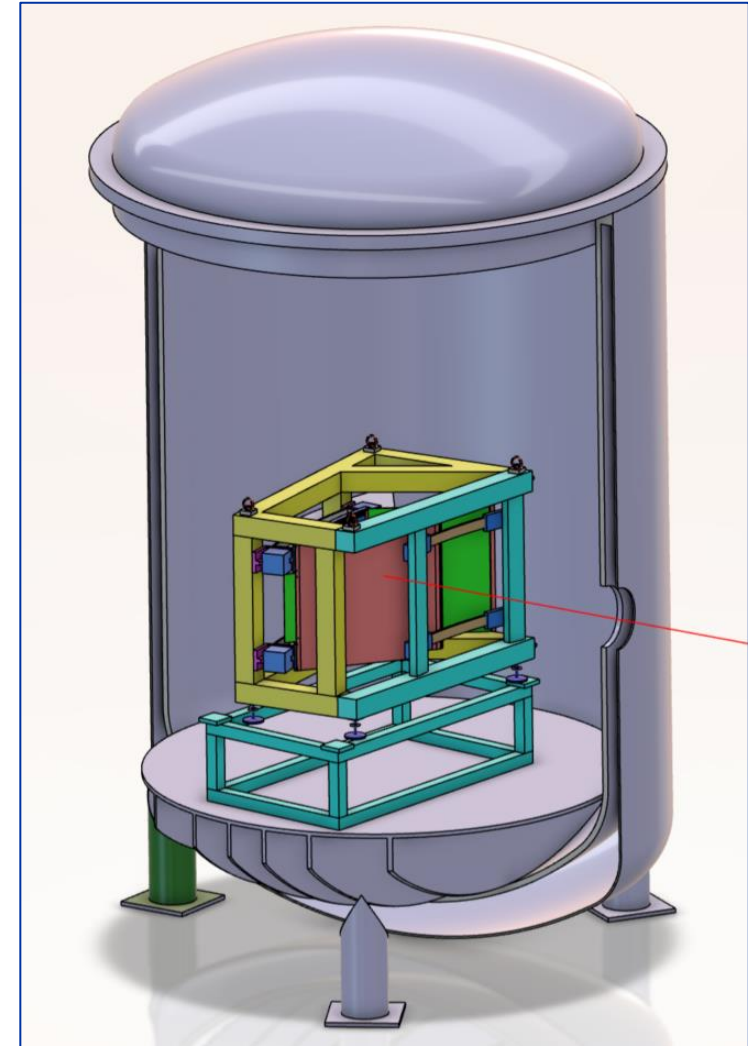
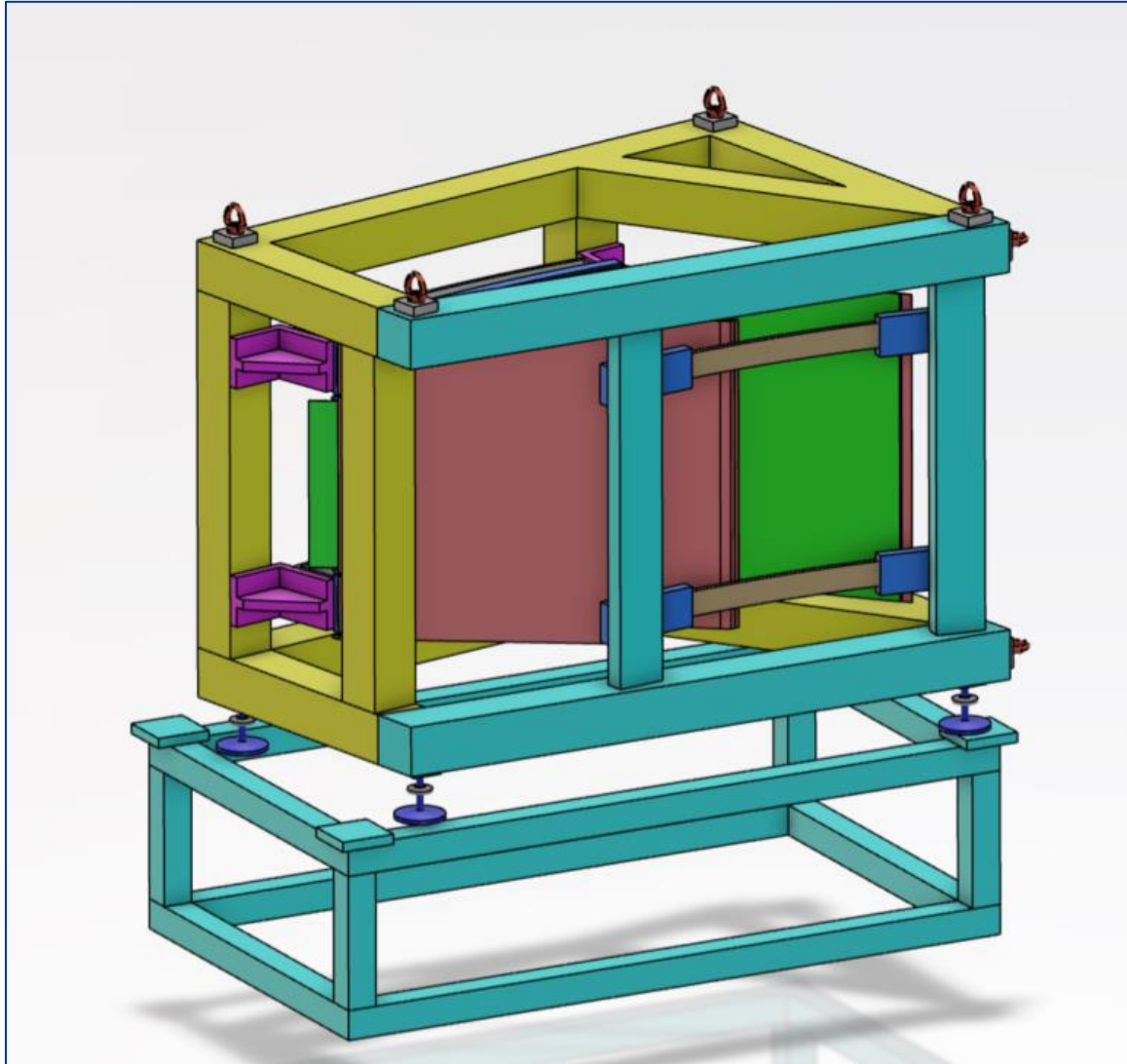
Assembly tooling C: Cold test configuration



Degree of freedom \longleftrightarrow

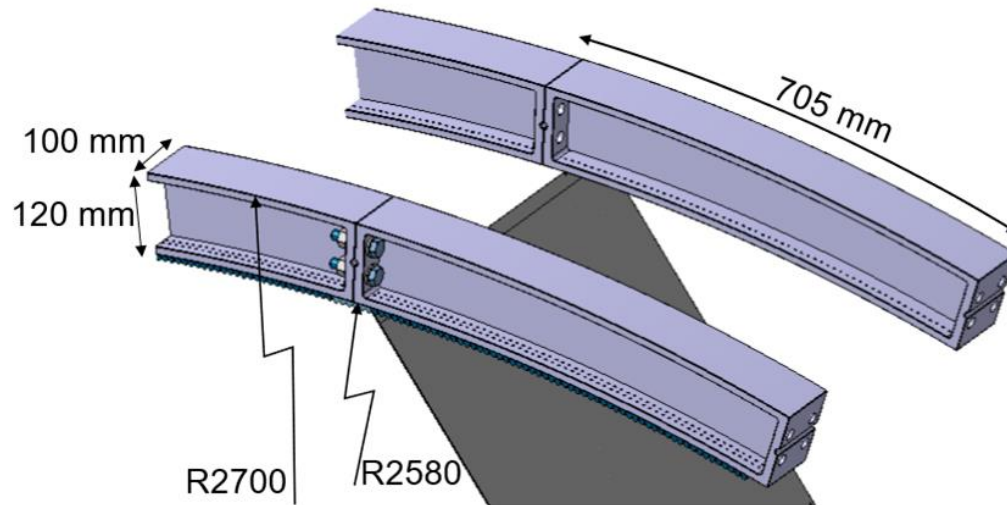


Assembly tooling C: In the cryostat

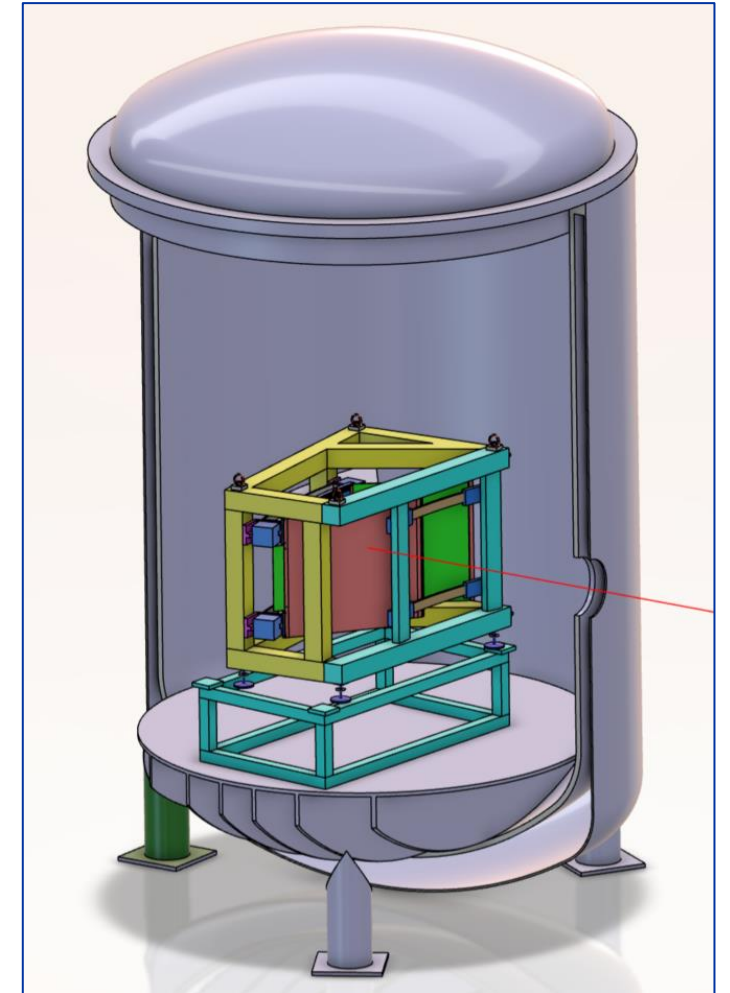


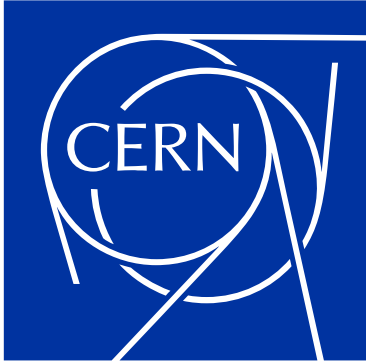
Conclusions

- After some discussions, the design to make some rings and the parts to join the absorbers are finished. Needed actions:
 - Update the warm geometry, so the dimensions are achieved at 87 K.
 - Drawings.
- 2 weeks to get the price. Between 8 and 10 to finish the parts. The main workshop help us, but the production will be done outside CERN.
- For the tooling, the assembly C is preferred because of its simplicity and the better accessibility to the prototype, what make easier the assembly.



Assembly tooling C in the cryostat





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