

MVD UPDATES

- **Cooling**
- **MVD's frame behaviour**

COOLING

New heating resistors delivered (end-July)

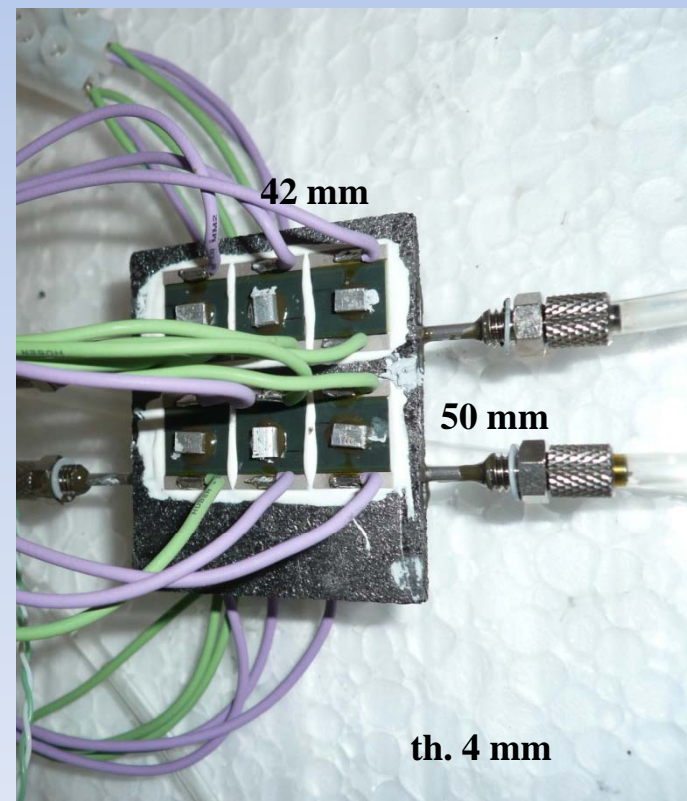
New dummy-disk done

- 12 resistors on 4 rows, 2 rows x side
- “disk body” by POCO-HTC foam
- 2 tubes embedded ($\varnothing_e 2\text{mm}$, $\varnothing_i 1.84\text{mm}$)

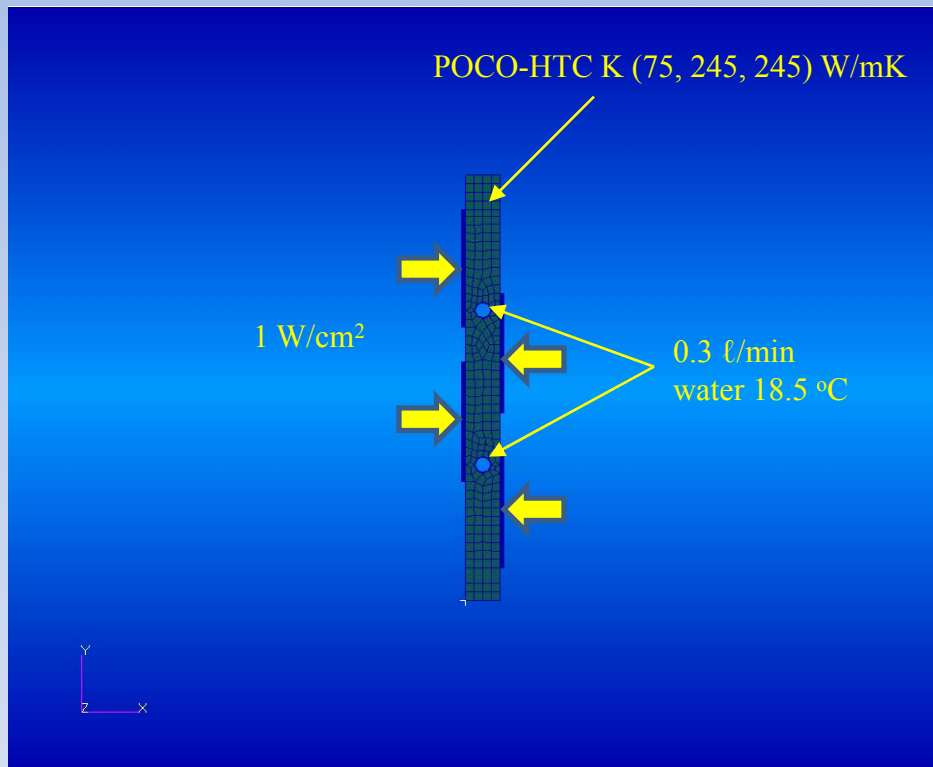
New simulation

New tests...

The aim of this job is to find the values of the various parameters comparing the results between FEM and test and validate the FE model.

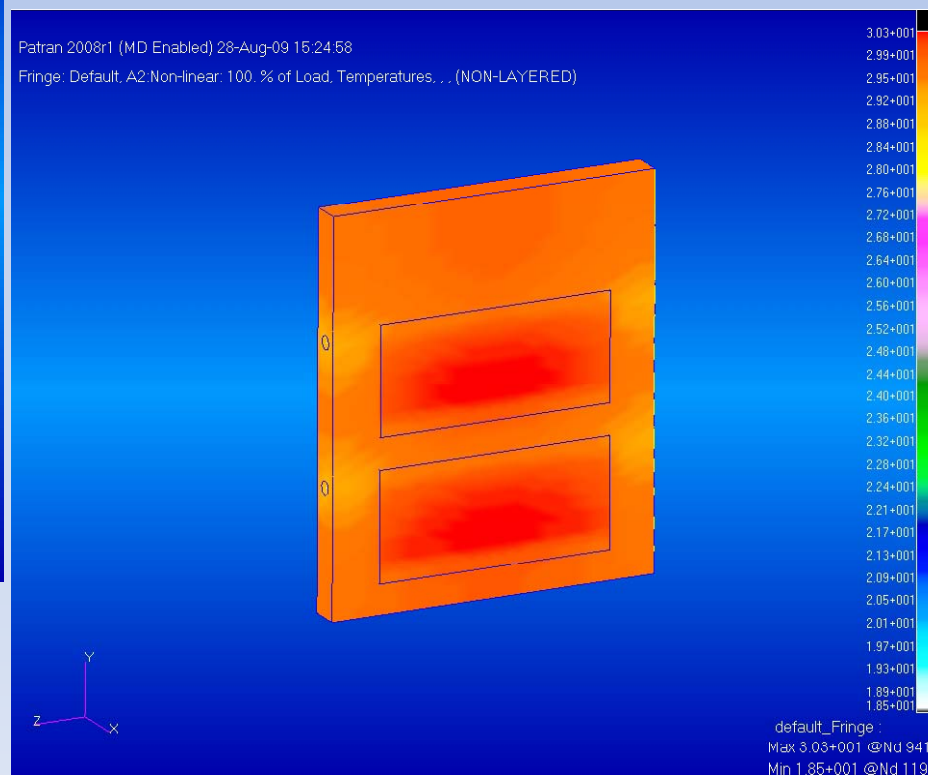


COOLING FEM

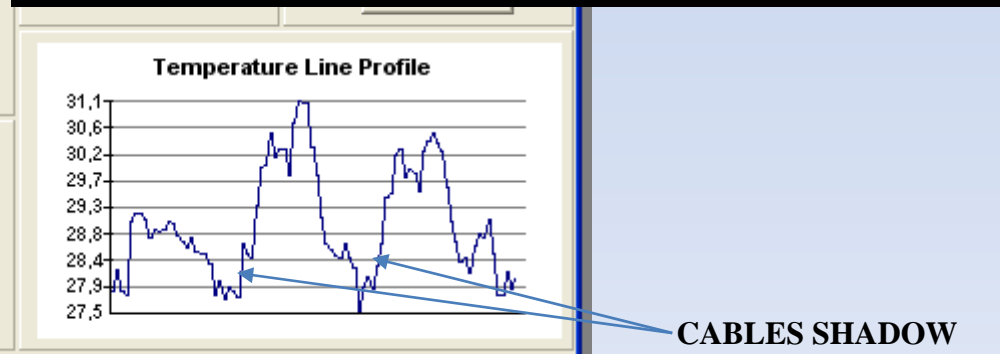
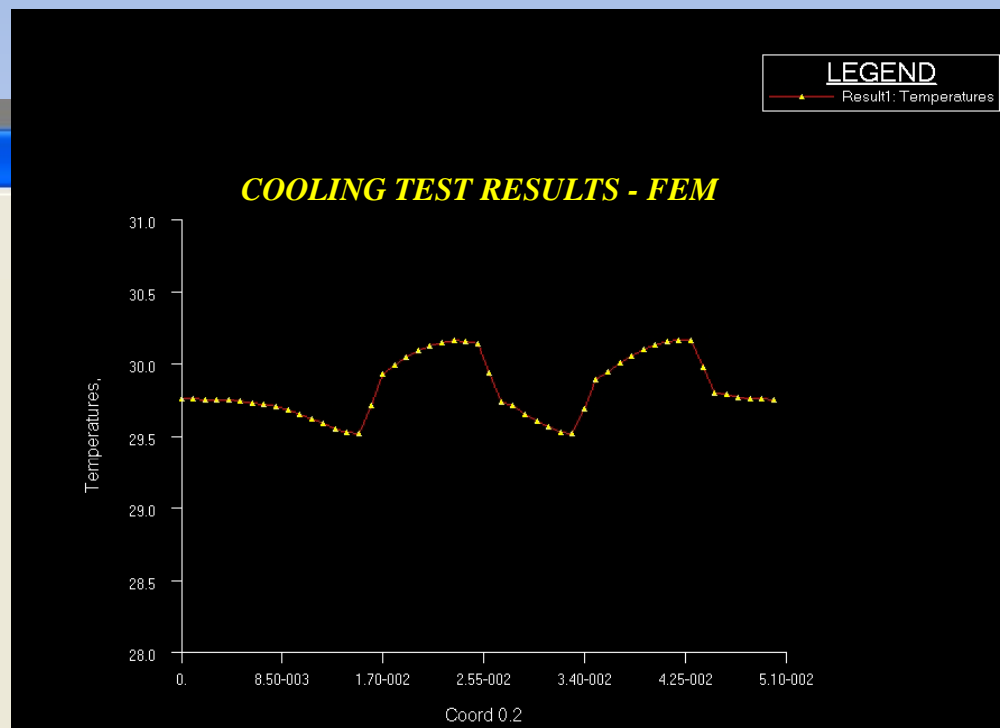
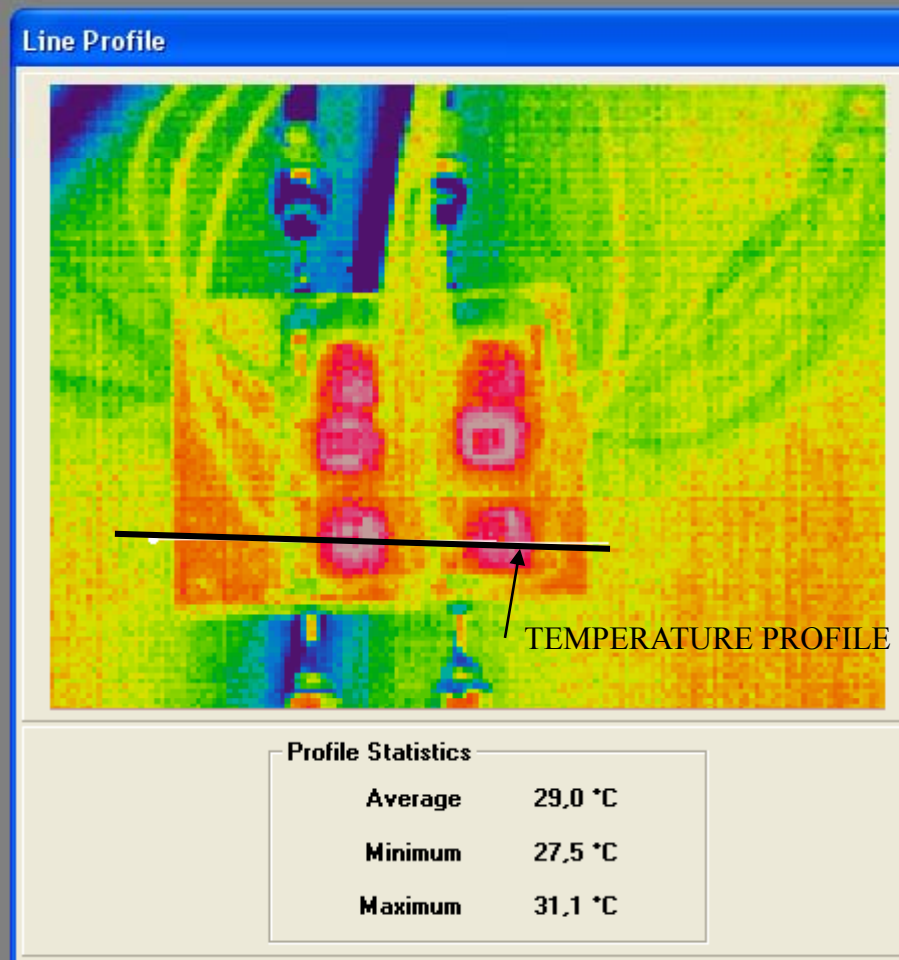


INPUT DATA

FEM RESULTS



COOLING TEST RESULTS - IR IMAGES

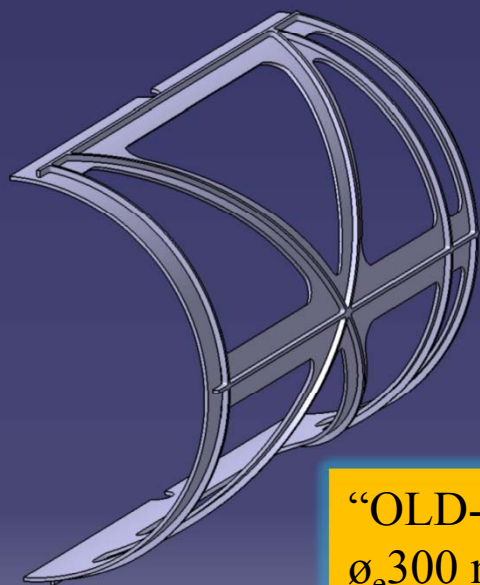


COOLING

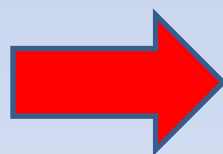
- ✓ The FE model is in good correlation with the experimental data with $<3\%$ error. We can use it as a powerful tool for further investigations of the impact of any changes in the design.
- ✓ We can use this data as input for the simulation of the full disks and barrel elements. (*Minimization of the number of the tubes vs. max. temperature reached, temperature distribution,...*)
- ✓ We can use the simulation as material selector – *i.e.* thermal properties.

MVD's frame

- Limited space for services → New frame concept.
 - Mechanical properties conserved.

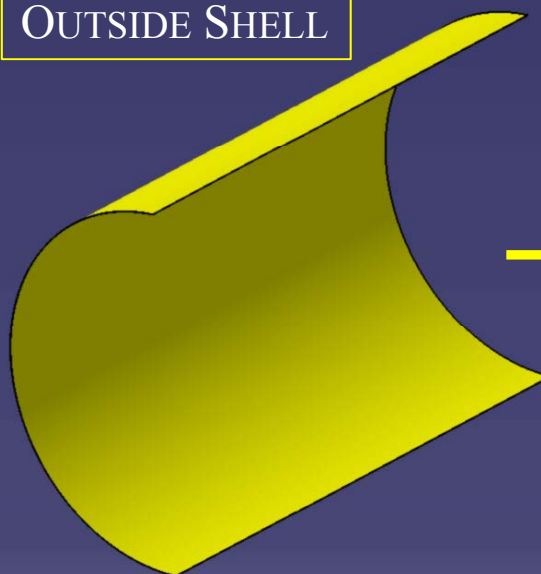


“OLD-STYLE” frame
 \varnothing_e 300 mm
 \varnothing_i 285 mm



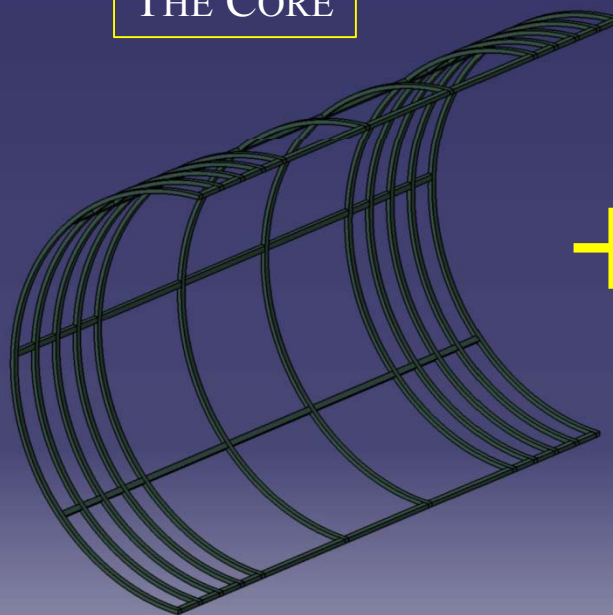
- ALL RIBS ARE EMBEDDED INTO THE BODY
- SIMULATION
 - ✓ NUMBER & DISTRIBUTION OF THE RIBS
 - ✓ DEFORMATION
 - ✓ STRESS DISTRIBUTION

OUTSIDE SHELL



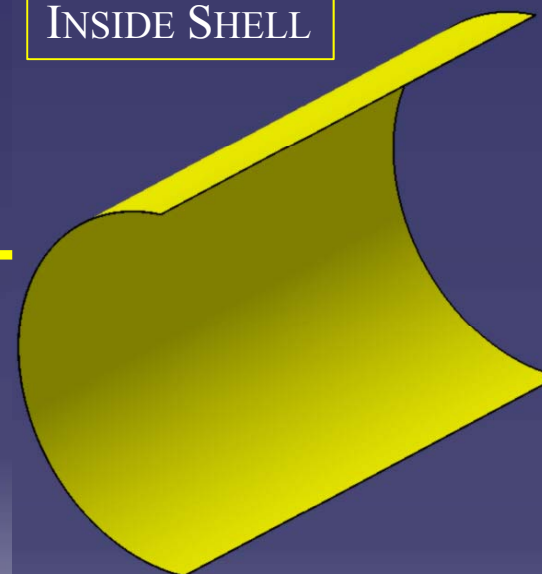
1 SHELL \varnothing_E 292 mm
Th 0.250 mm

THE CORE



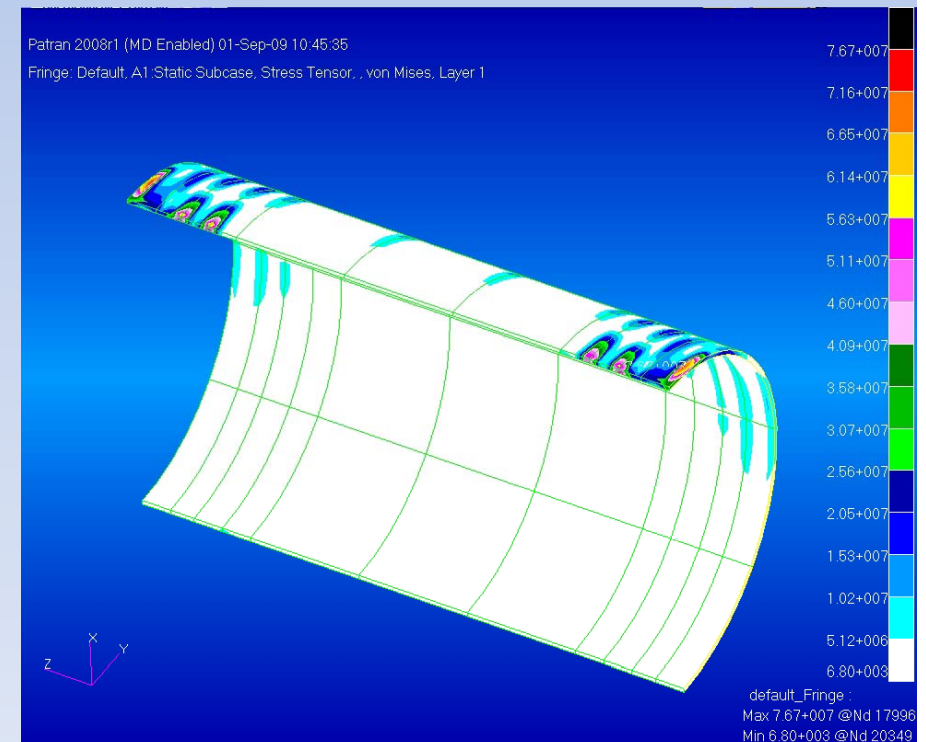
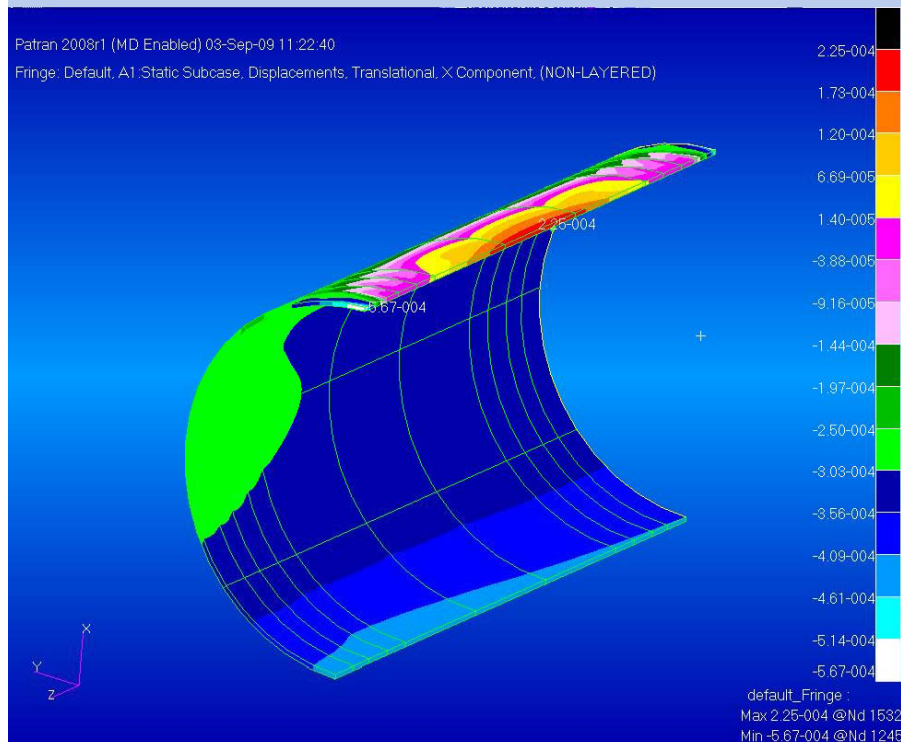
12 SEMI-CIRCULAR TRANSVERSE RIBS
4 LINEAR LONGITUDINAL RIBS

INSIDE SHELL



1 SHELL \varnothing_I 285 mm
Th 0.250 mm

Constrains → three regions: two on the upper edge, one lower edge.
 Loads → on each end: 100 N vertical force + 10 N·m bending moment

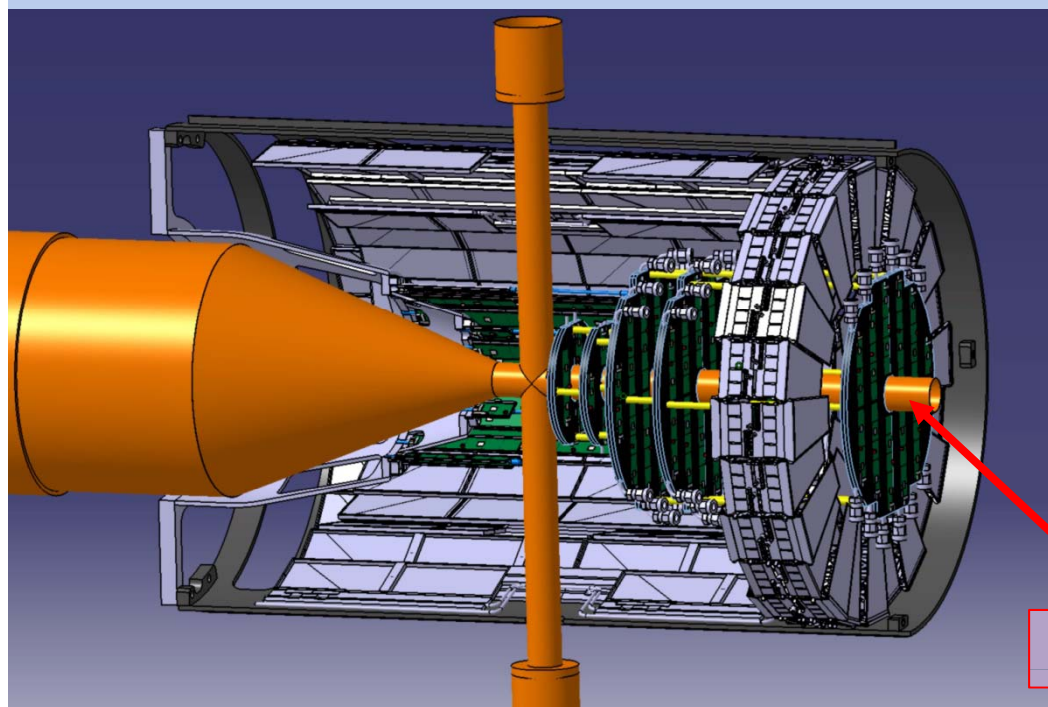


CONCLUSIONS

- New style frame needs more work, but the solution with ribs embedded seem to be promising.
- The solution allow us to gain 4 mm on radius for services.
- Links to the central frame are not affected.
- Feasibility must be investigated.

MVD CHANGES

- DISCK 6 → Request: extend the beam pipe enlargement from 200 mm to 250 mm (ref. I.P.) ($\varnothing 20.4 \rightarrow \varnothing 41$) **REJECTED**



Implications:

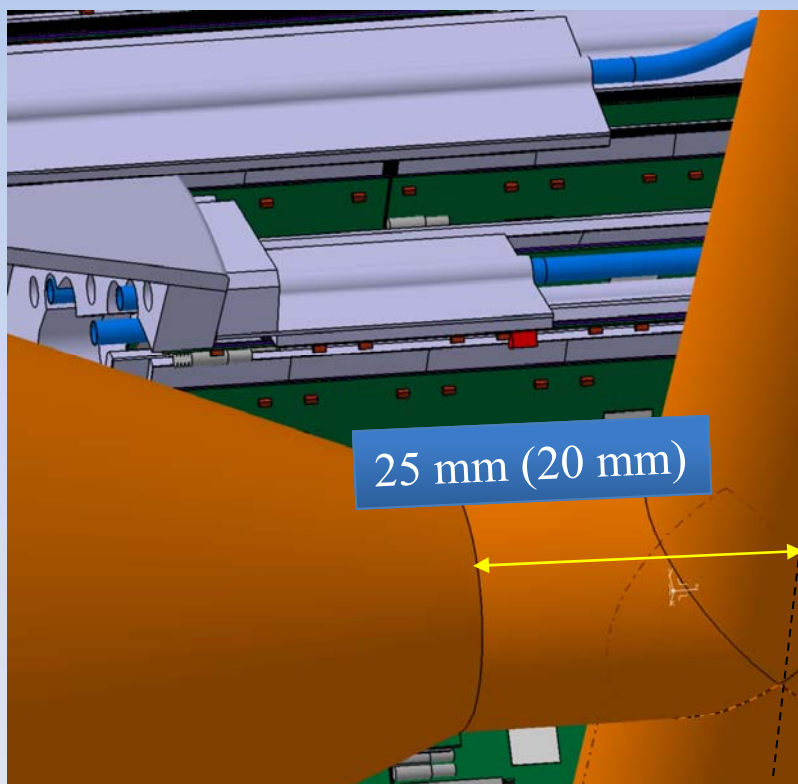
central hole → $\varnothing 42$ mm

sensors must be re-arranged

$\varnothing 42$ mm

MVD CHANGES

- LAYER 1 → Request: extend the beginning of the cone from 20 mm to 25 mm
REJECTED



Implications:

layer 1 reduced → some barrel elements have ONE single chip assembly.

Correlation with layer 3 & 4 conserved.

