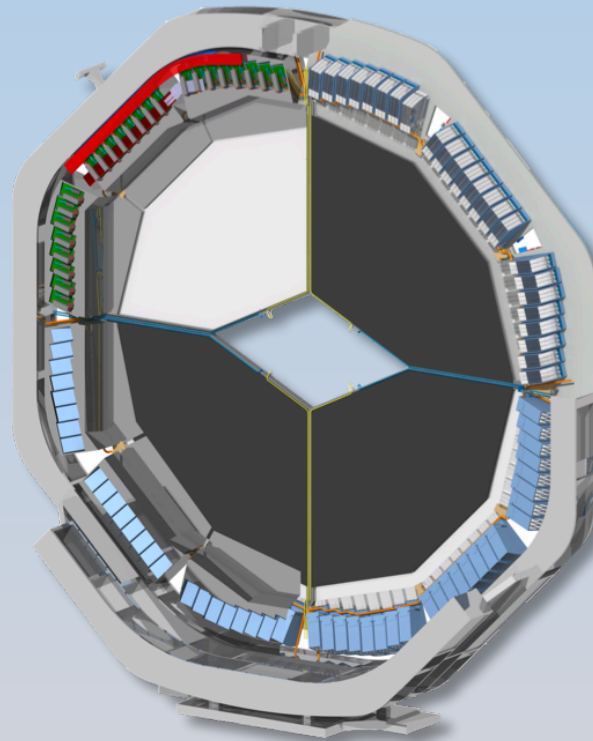


Endcap Disc DIRC-Mechanics Status

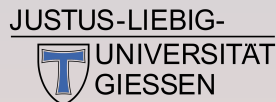


PANDA CM 20/3 – MEC Session - 2020/10/27

Ilknur Köseoğlu Sarı, Simon Bodenschatz, Lisa Brück, Michael Düren, Avetik Hayrapetyan, Jan Hofmann,
Sophie Kegel, Jhonatan Pereira de Lira, Mustafa Schmidt, Marc Strickert



Bundesministerium
für Bildung
und Forschung



HGS-HiRe for FAIR
Helmholtz Graduate School for Hadron and Ion Research

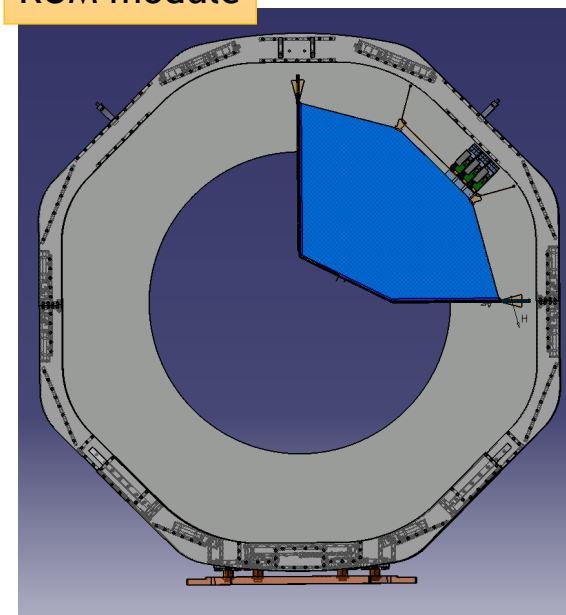
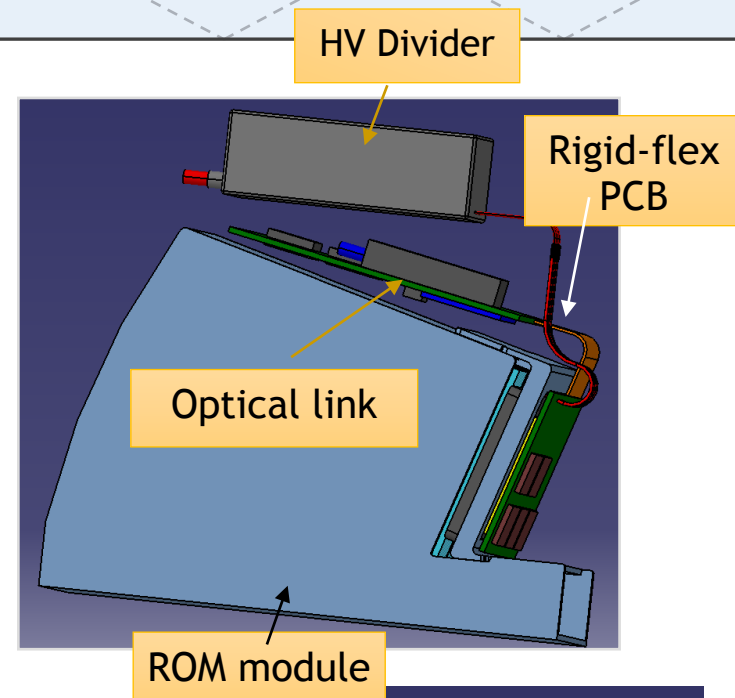
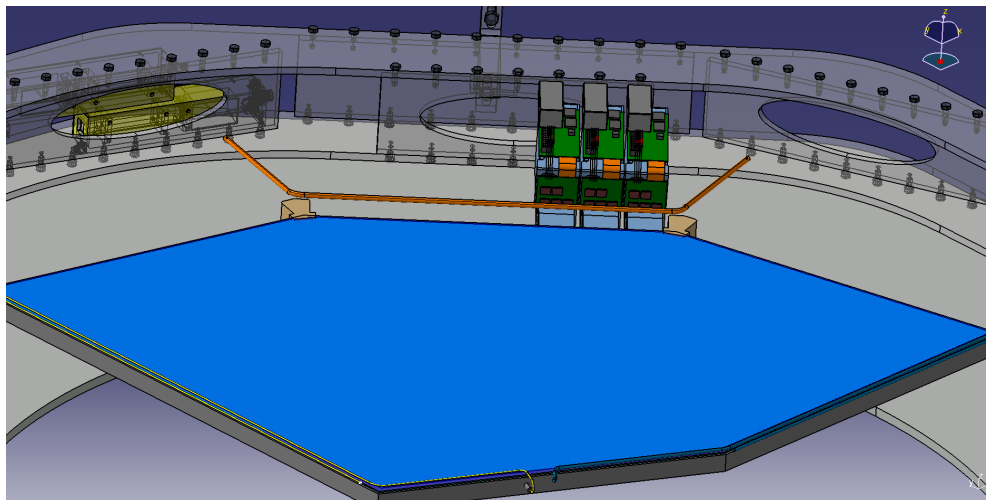
GSI
GSI Helmholtzzentrum für Schwerionenforschung GmbH

HIC for FAIR
Helmholtz International Center



Design for Prototype & Phase 1

- ➔ We need financial support for a better setup during Phase-1.
- Our desire is to have 2/3 of the full quadrant for Phase-1
 - 16 ROMs, 16 MCP-PMTs
 - 48 FEL, another company LensTec Jena GmbH will produce
 - Complicated geometry,
 - mirror at the the back surface
 - High- quality of polishing is necessary
 - 16 FEE-board
- We can install our prototype for phase 1 if we have a financial support otherwise we have only 3 ROMs.

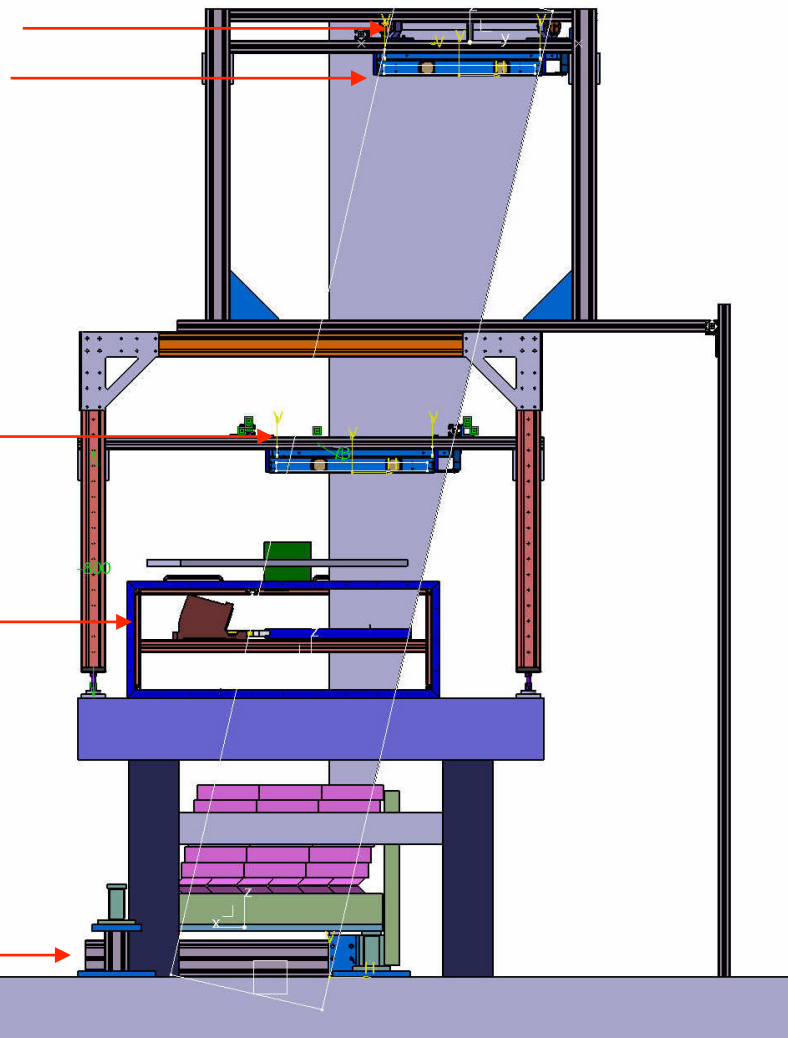


Updates in EDD mechanics

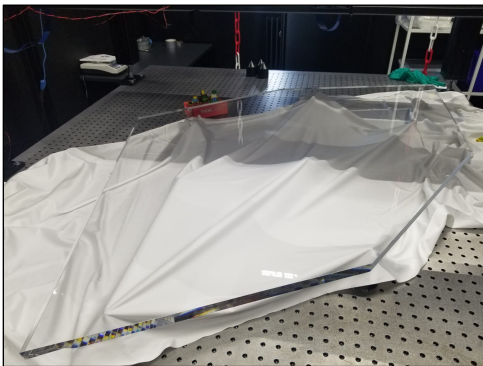
- ➔ Currently, we have one full size radiator positioned horizontally in our Giessen Cosmic Station.



(Scintillator plate)
Trigger plates
Cosmic Boxes
(SiPM bars)



Radiator plate in full size

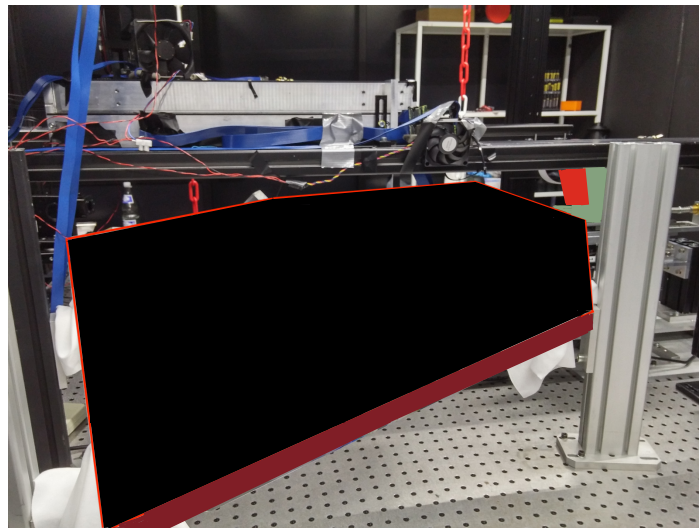
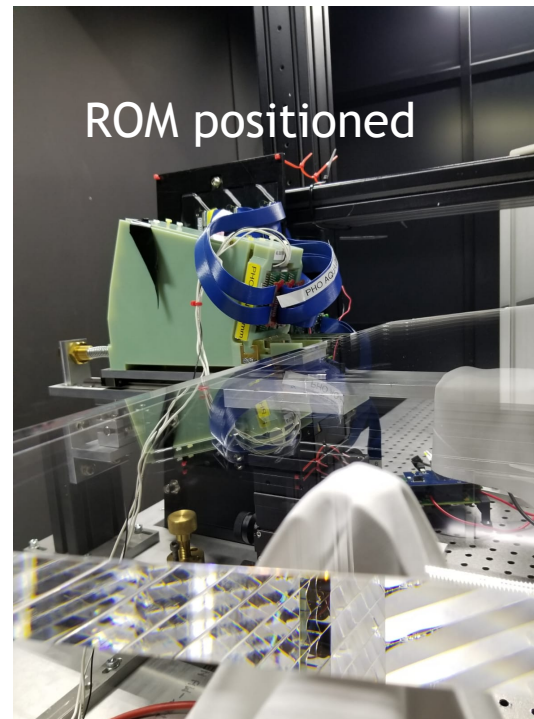
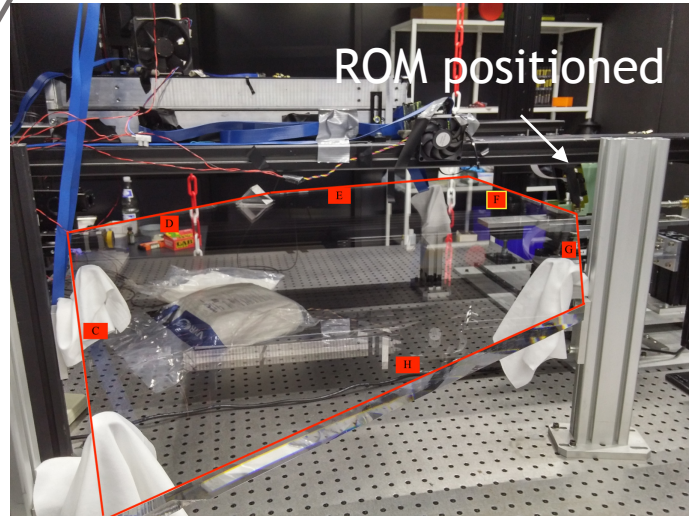


➔ Prototype / Radiator

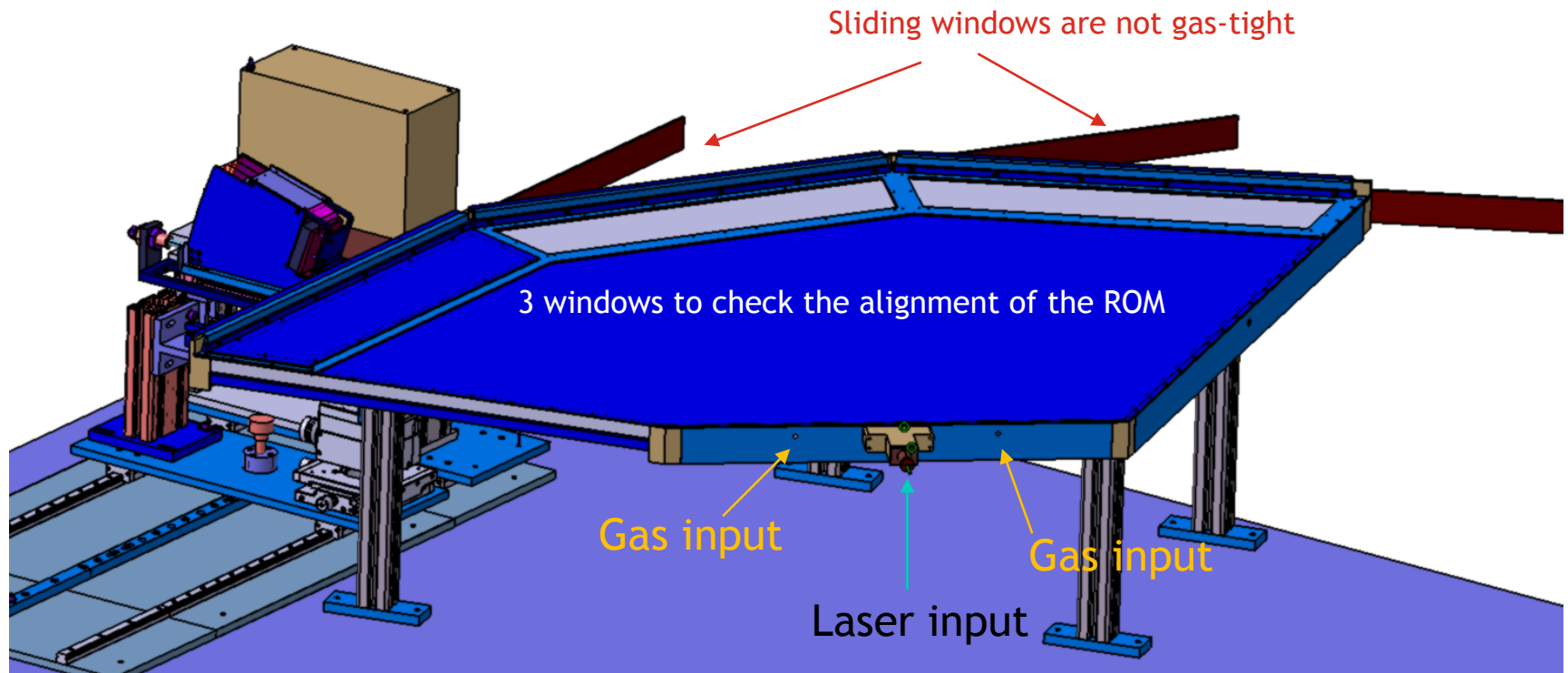
Trigger plates

Updates in EDD mechanics

- Since we will use it in GCS, the current design is prepared for position horizontally.
- Radiator and ROM case are light-tight, radiator case is also gas-tight.

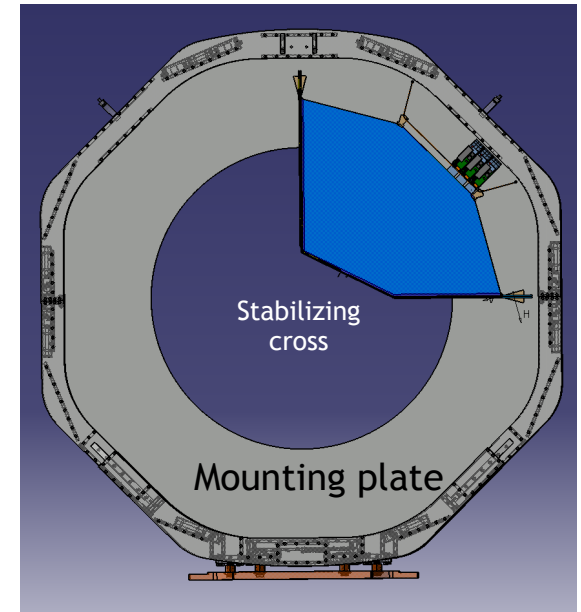
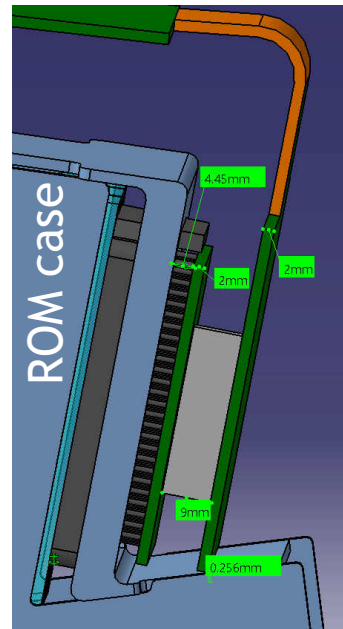
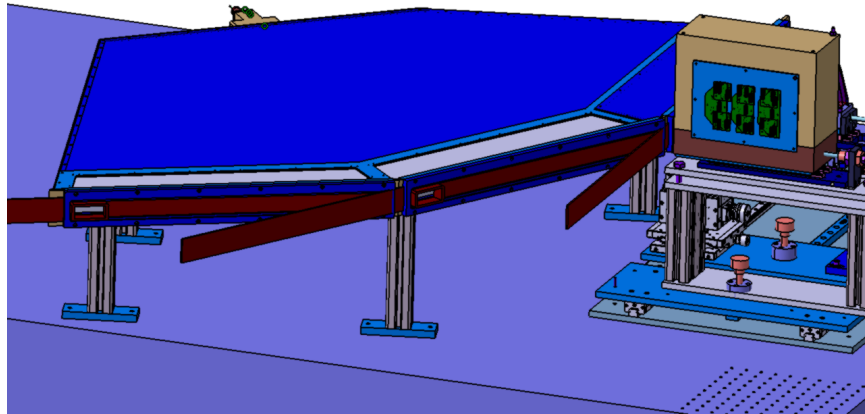


Updates in EDD mechanics



- We are one step closer to the final design. The thickness of the top-part is exactly same for the final design. The distances between the radiator and the case is 1 mm. Currently, we ordered and expect to have the case in a few weeks.
- In order to not to damage the radiator (fused silica), the dot-shaped soft material or soft-strings we will put in between the case and the radiator.
- Since we don't have spatial limits for GCS, we have the big ROM-cases which will be changed for the final design.

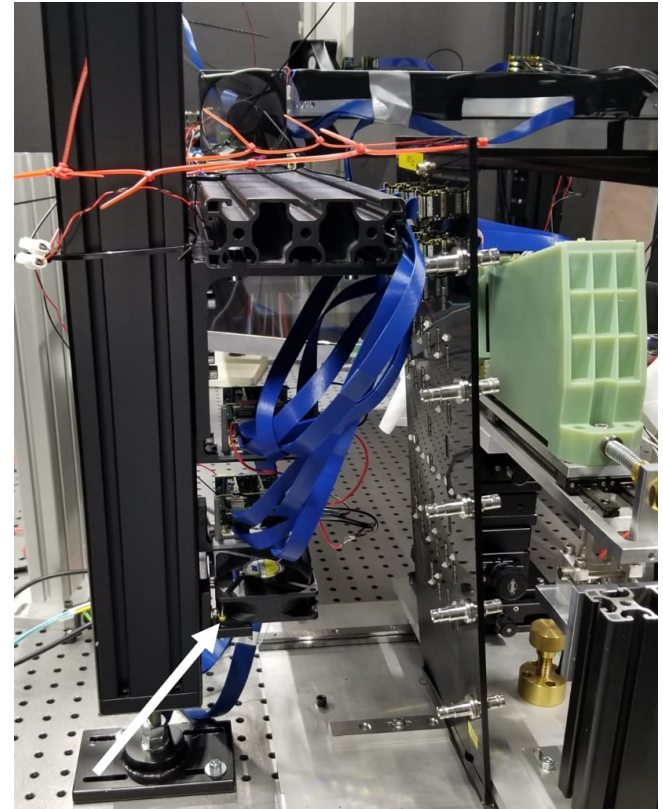
Differences between the current and the final design



- For the final design, we don't need sliding openings. It was designed to make it light-tight where the bars are touching the radiator side.
- It will be vertically aligned.
 - Mounting plate and stabilizing cross should be designed and produced.
- ROM case should be designed as covering the sides of the sensor.
- The cooling system studies will be explained by Lisa M. Brueck with the following slides.
- The gas tests will be done. Since we can not use Nitrogen in our clean room, we are looking for the options (maybe cleaned, dust free air). -> Any suggestions?
-

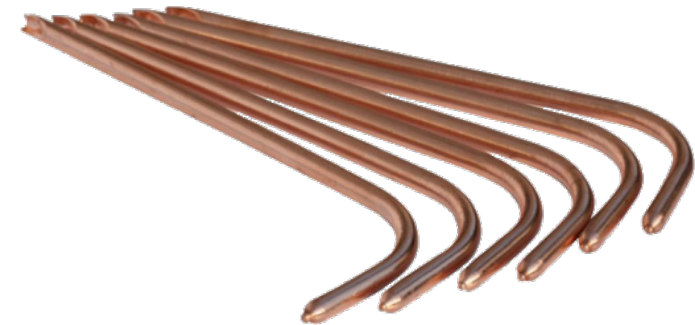
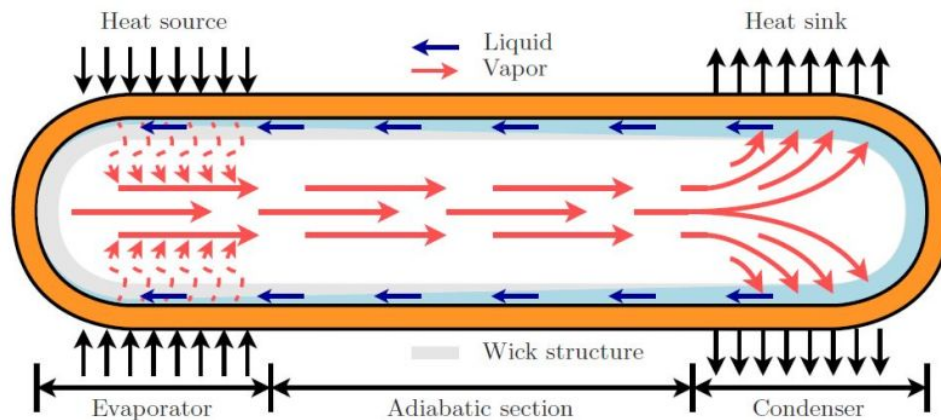
Cooling system overview

- Currently PCBs are air cooled
- New custom PCB design as of the end of November which leads to a new cooling approach - water cooling
- Aim: create a single ROM experimental test stand and comparison to a simulation
- If results match: upgrade to three ROM setup
- Final goal: reliable simulations for 16 ROMs and even for the full EDD

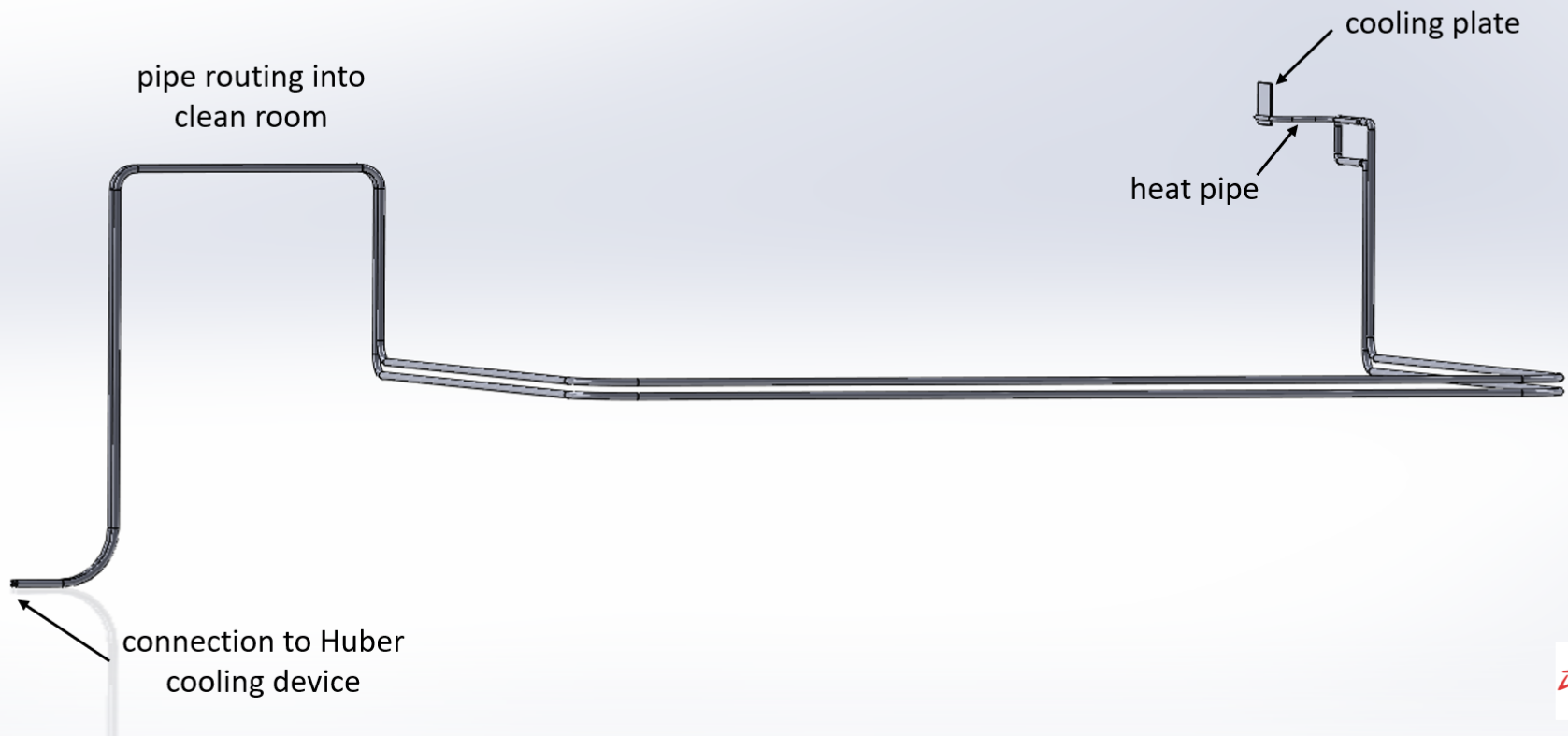


Experiment and simulation

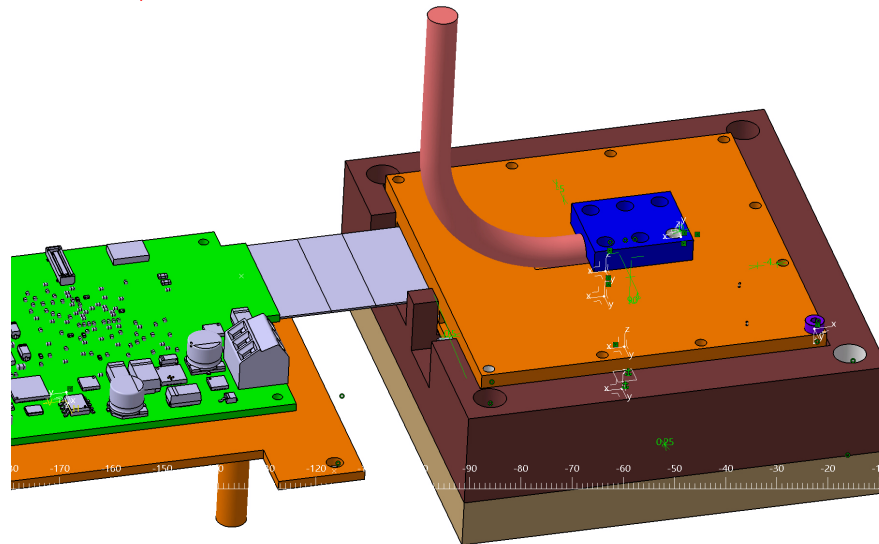
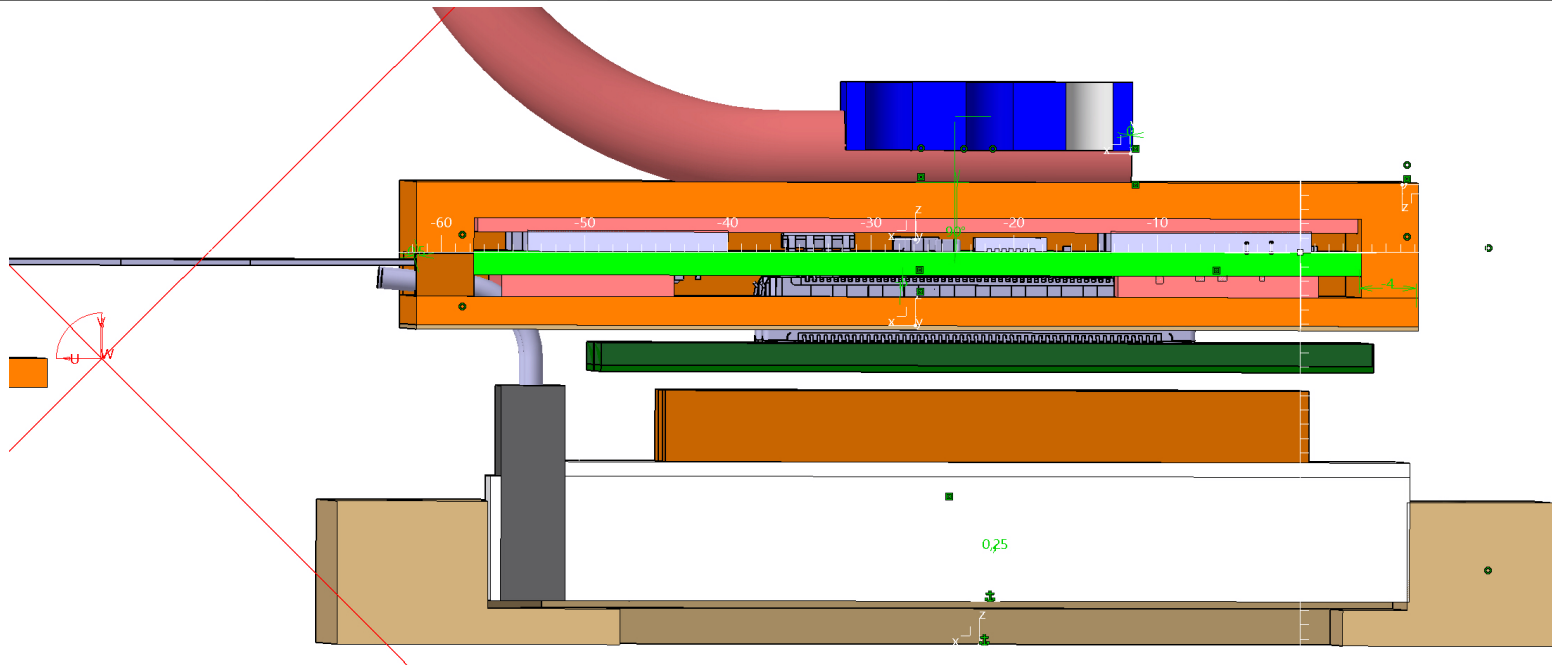
- First approach: cool single ROM (~35 W) to 18 °C
- Available cooling device: Huber CC415 (-20 to 200 °C)
- One main water cycle for general heat transfer
- Connection of ROMs to main water cycle with heat pipes with a low thermal resistance (~15 K/W)



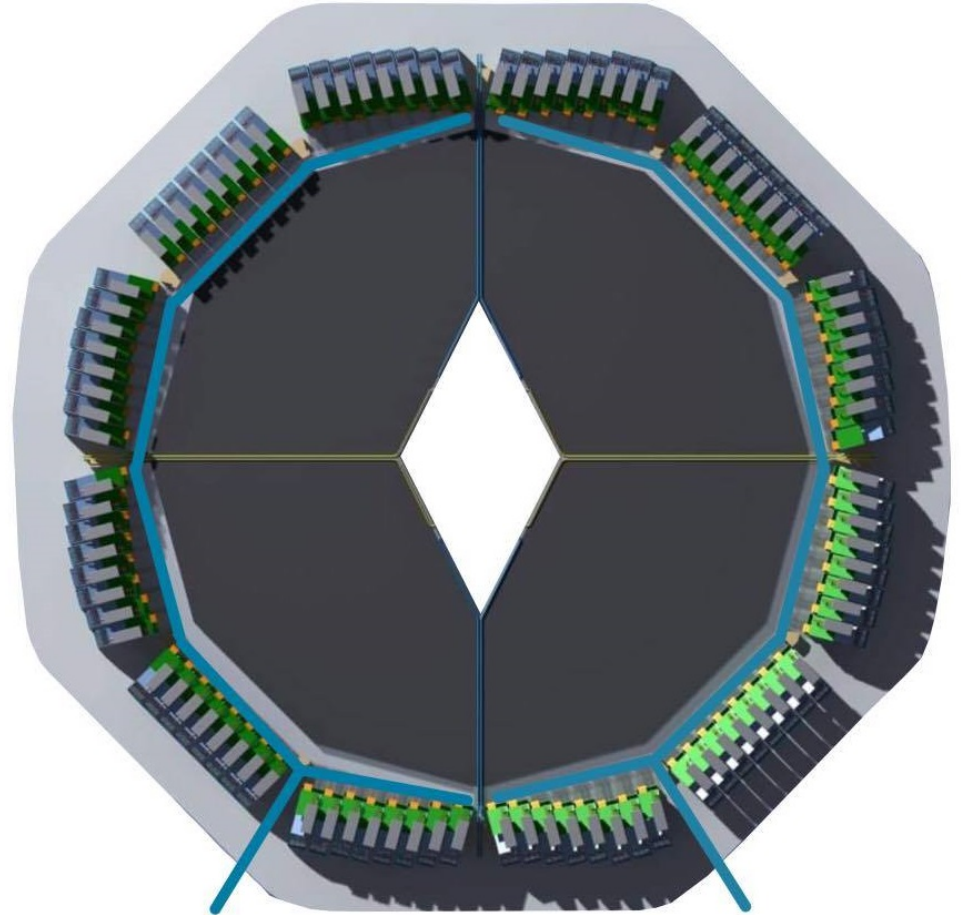
Experimental setup



Cooling assembly



- Two symmetric water cooling cycles for each half of the detector
- Application of results from test stand and simulations





Thanks for your attention!