

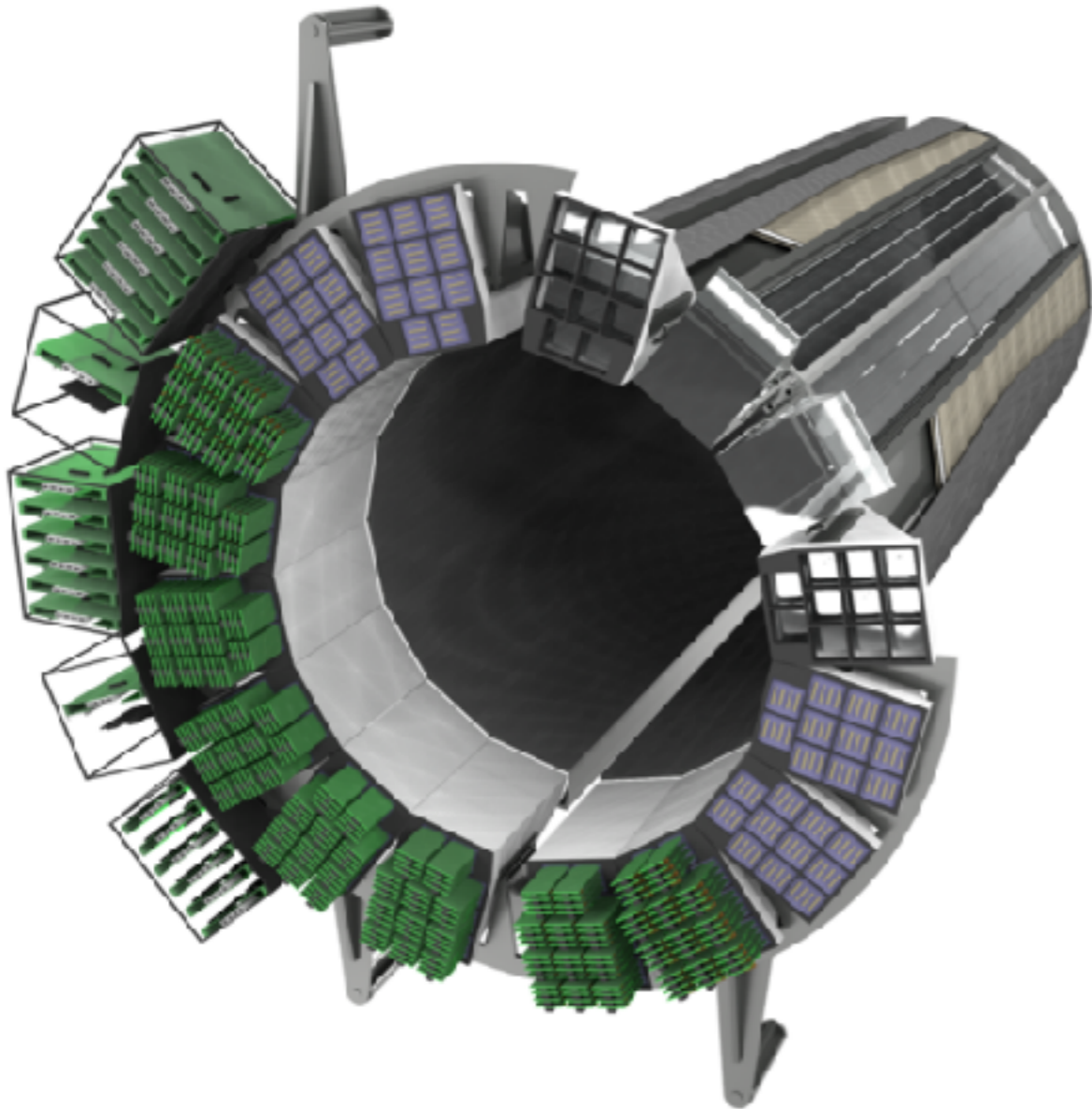
Barrel TOF Mechanics

Ken Suzuki, Stefan-Meyer-Institut, ÖAW
on behalf of the Barrel Time-of-Flight group

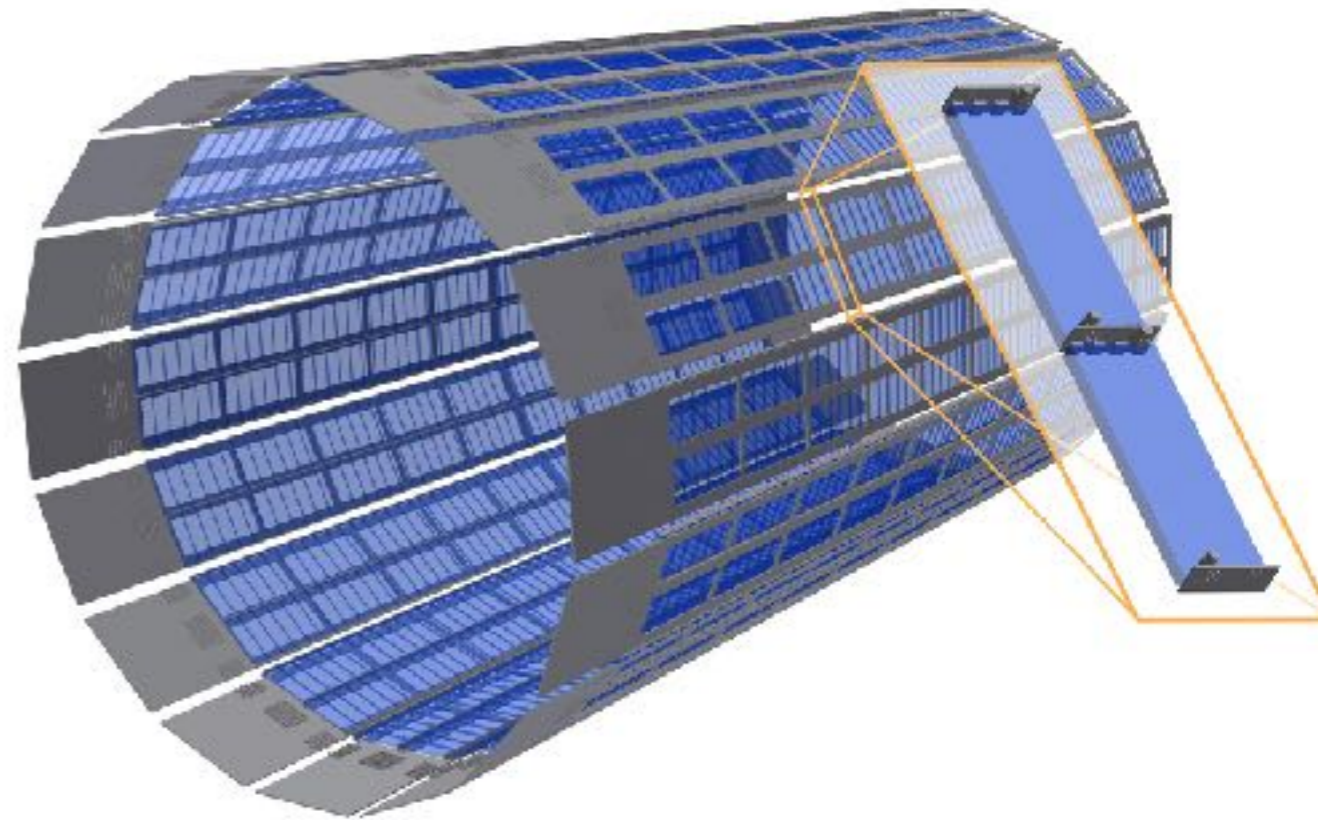
14.12.2017, GSI

Barrel TOF and Barrel DIRC

B-DIRC+B-TOF



B-TOF



Barrel TOF shares its mechanical frame with Barrel DIRC

First, from a bigger picture to details.

Barrel DIRC/TOF integration in PANDA

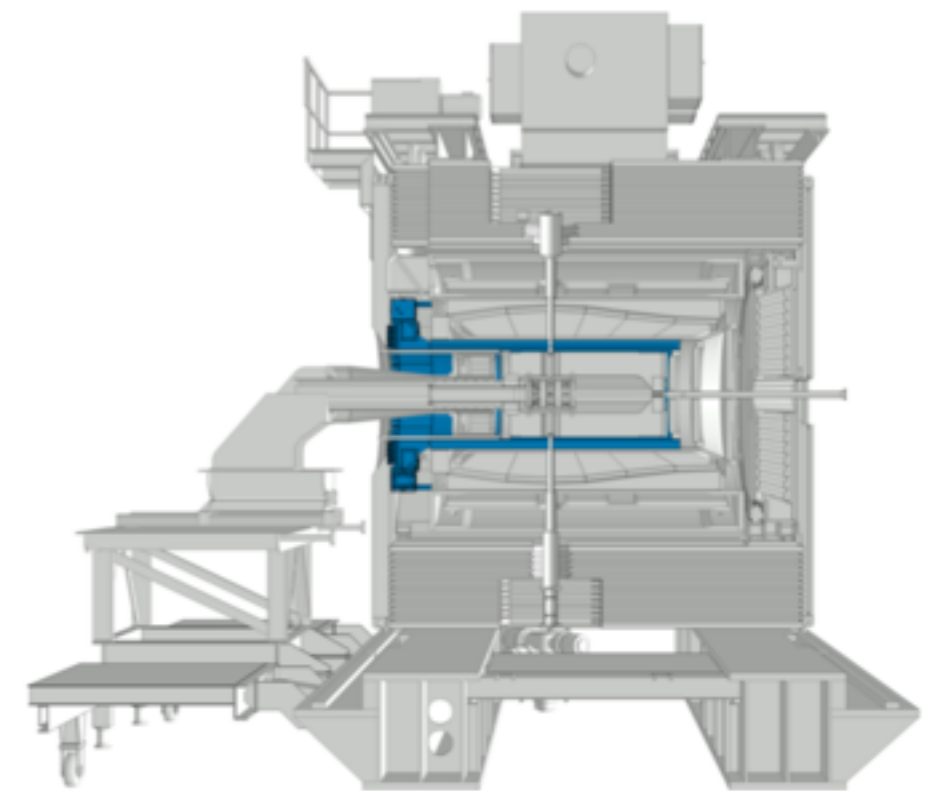
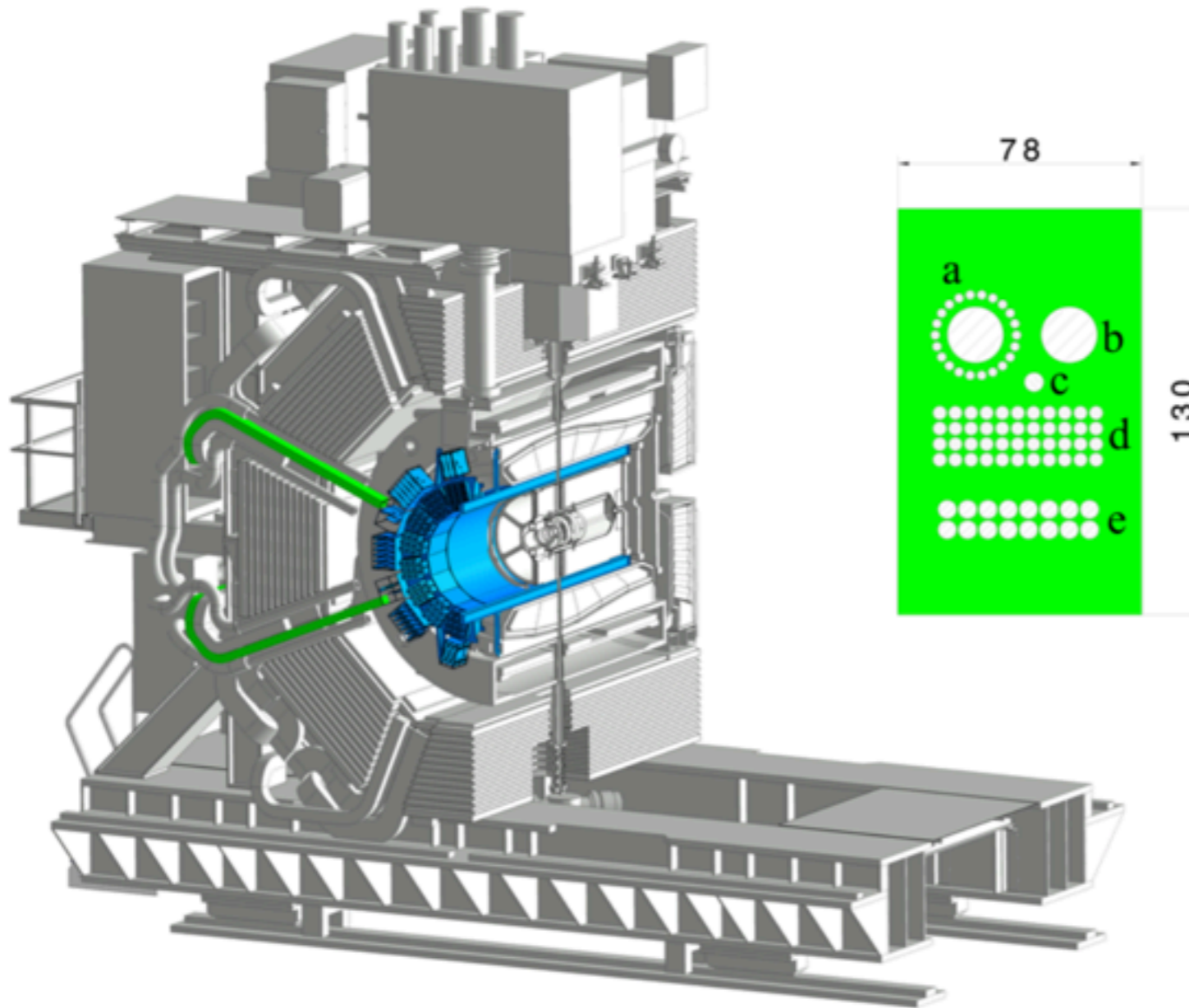


Figure 7.14: Cross section of the \bar{P} ANDA Target Spectrometer with the Barrel DIRC marked in blue. The auxiliary platform used for detector installation is seen on the left.

Figure 7.17: View of installed \bar{P} ANDA Barrel DIRC - half-section view. Cable ducts (marked in green) used in each quarter of the detector. Cross section of one single cable duct - dimensions in mm: (a) LV, arranged around FEE cooling line, (b) FEE cooling, (c) ethernet, (d) HV, (e) nitrogen supply.

DIRC Radiator+TOF part and DIRC readout unit

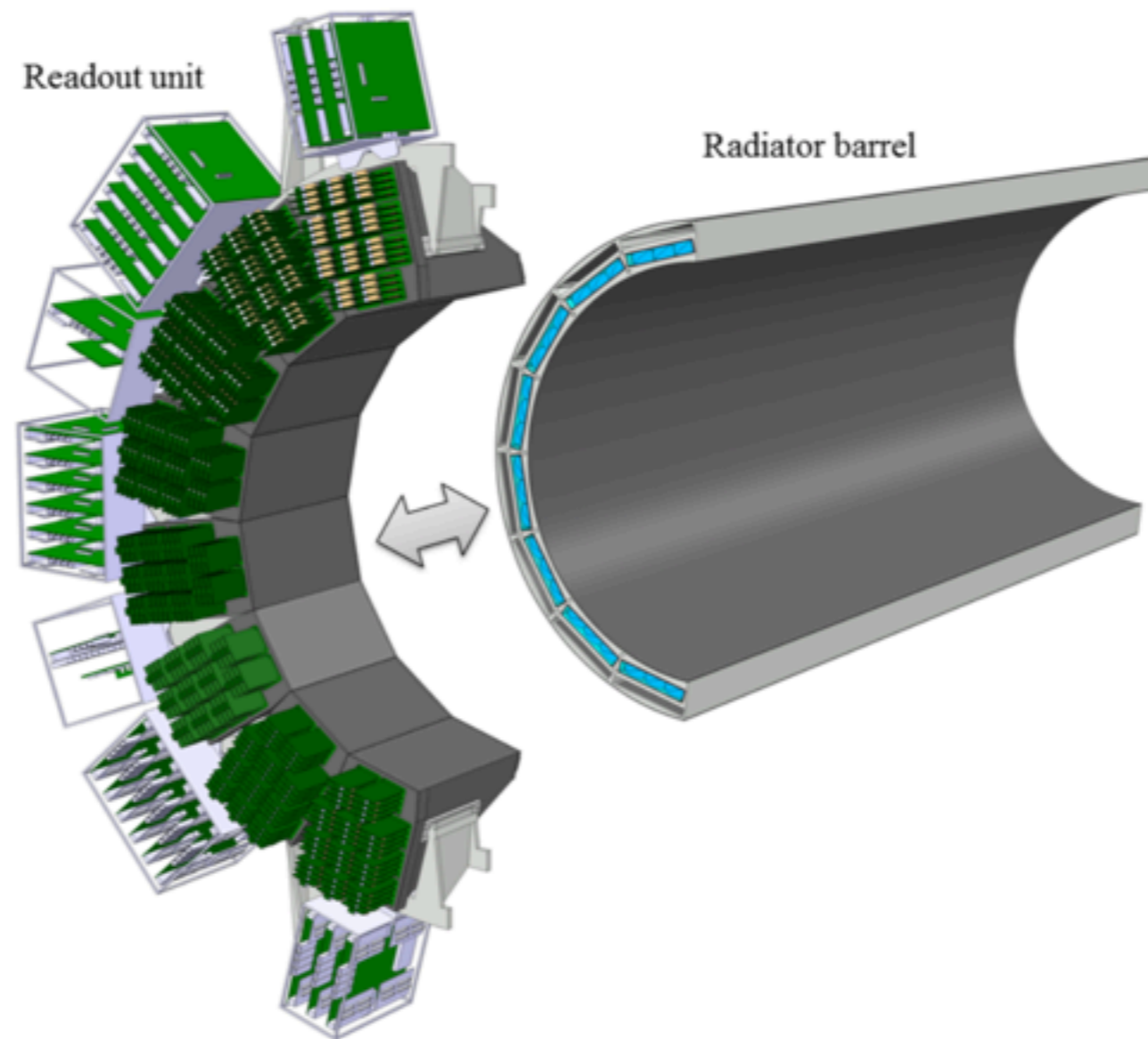


Figure 7.1: Mechanical design of the two main parts of the \bar{P} ANDA Barrel DIRC - half-section view: Readout unit and radiator barrel.

Barrel DIRC+TOF Installation Procedure

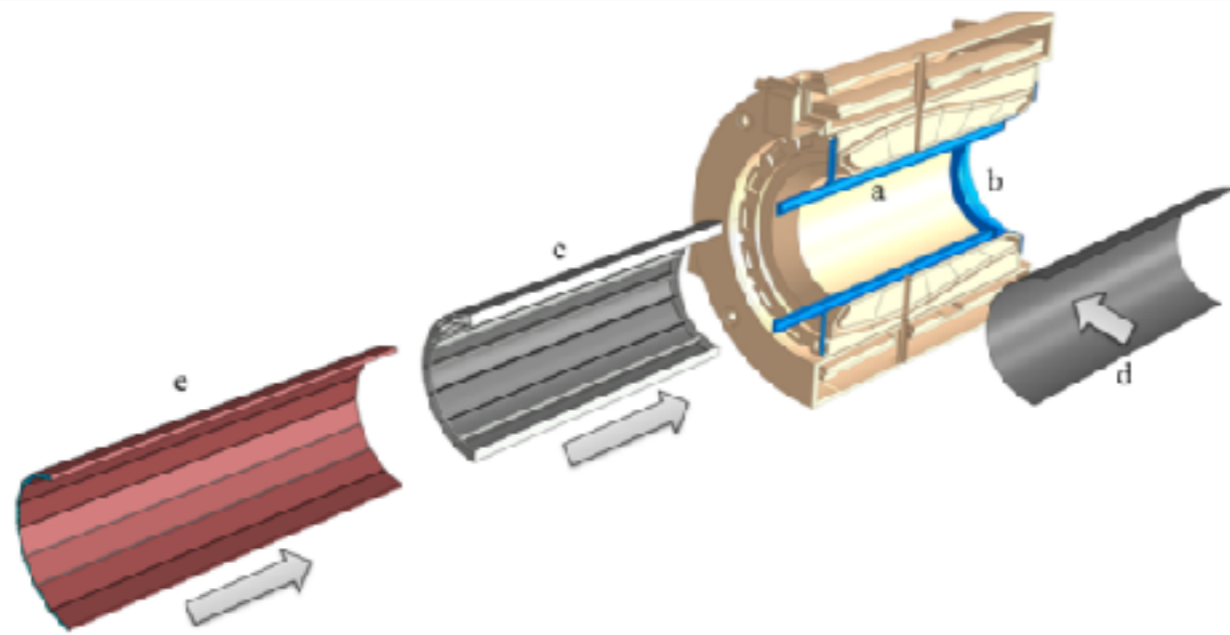


Figure 7.15: Installation procedure of the barrel - half section view: (a) central tracker (CT) beams, (b) downstream CT beam support cone, (c) half-frame of the barrel, outer sheet mounted, (d) inner sheet of the half-frame, (e) eight bar boxes.

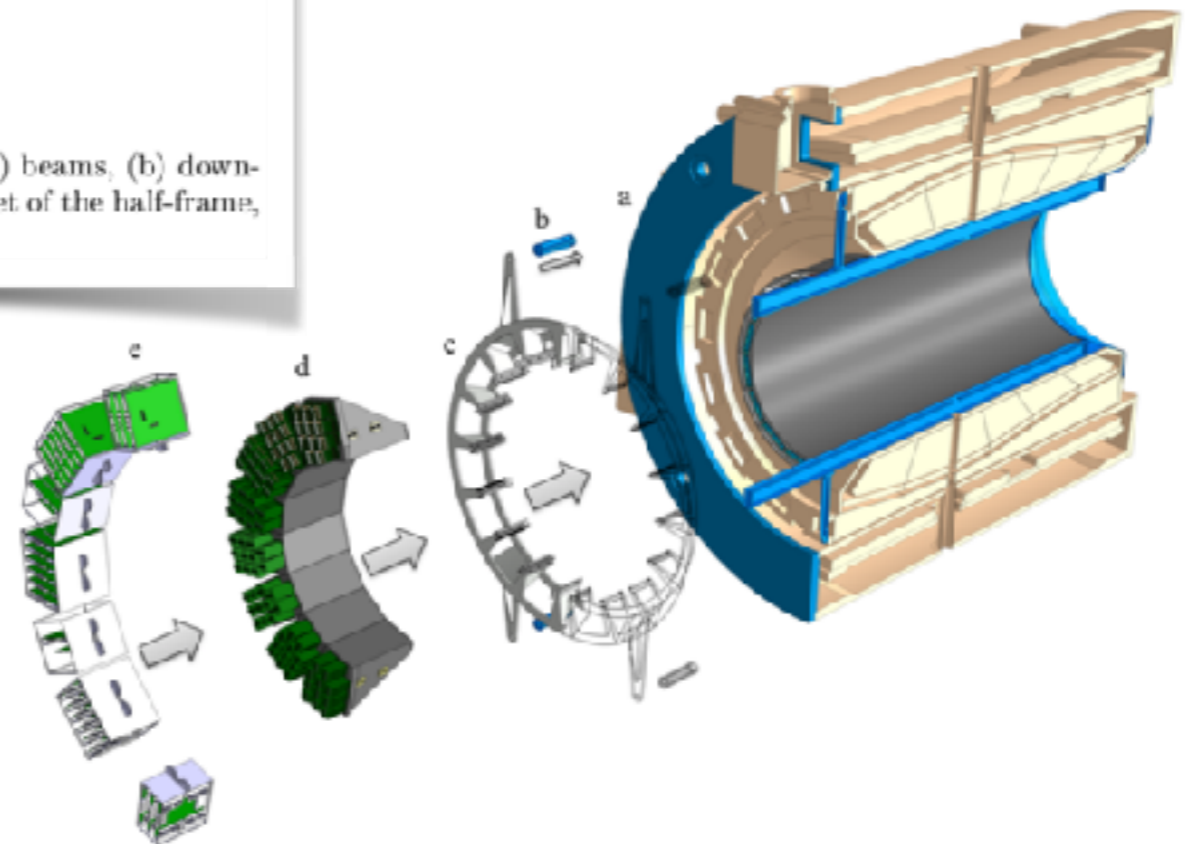
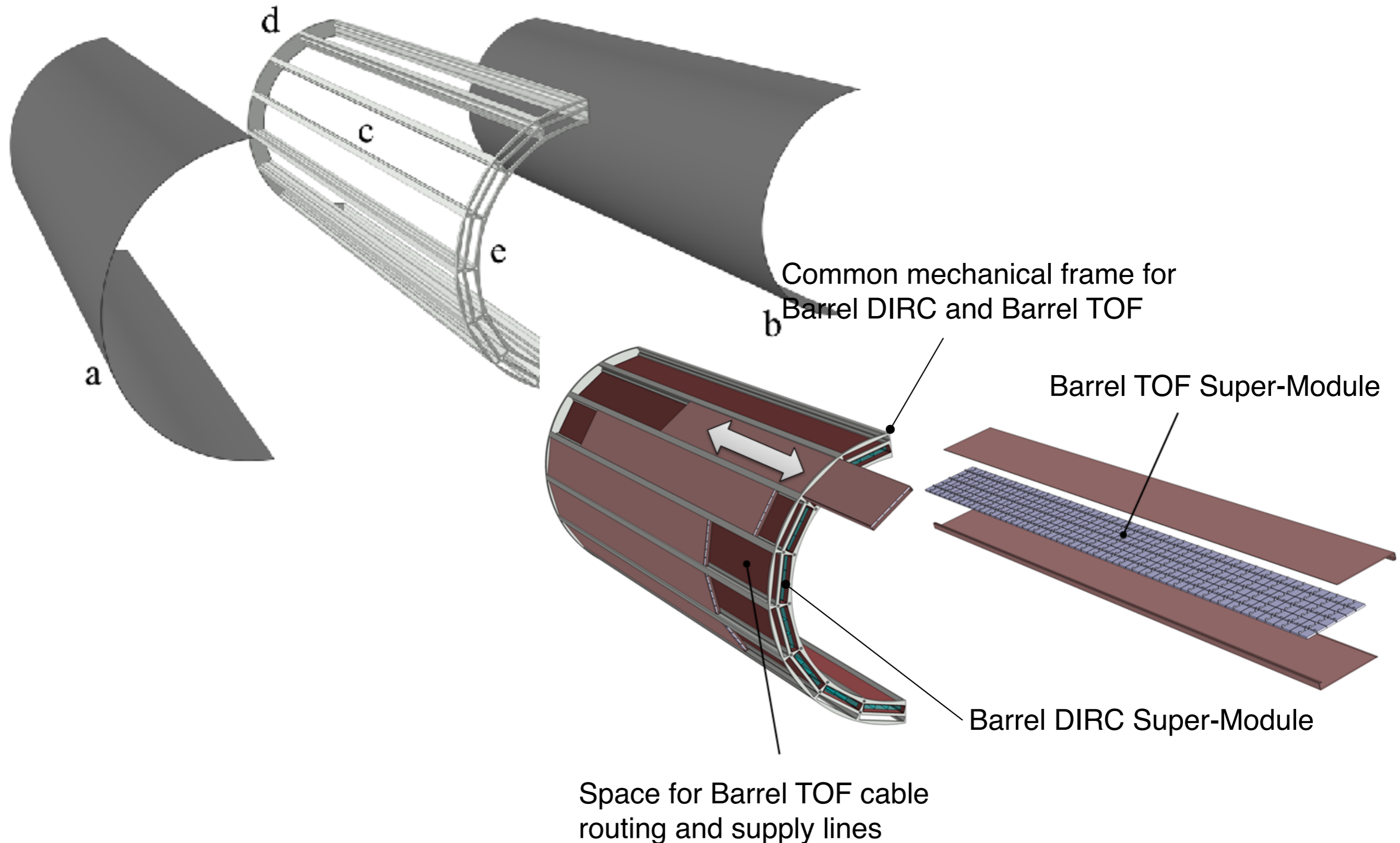


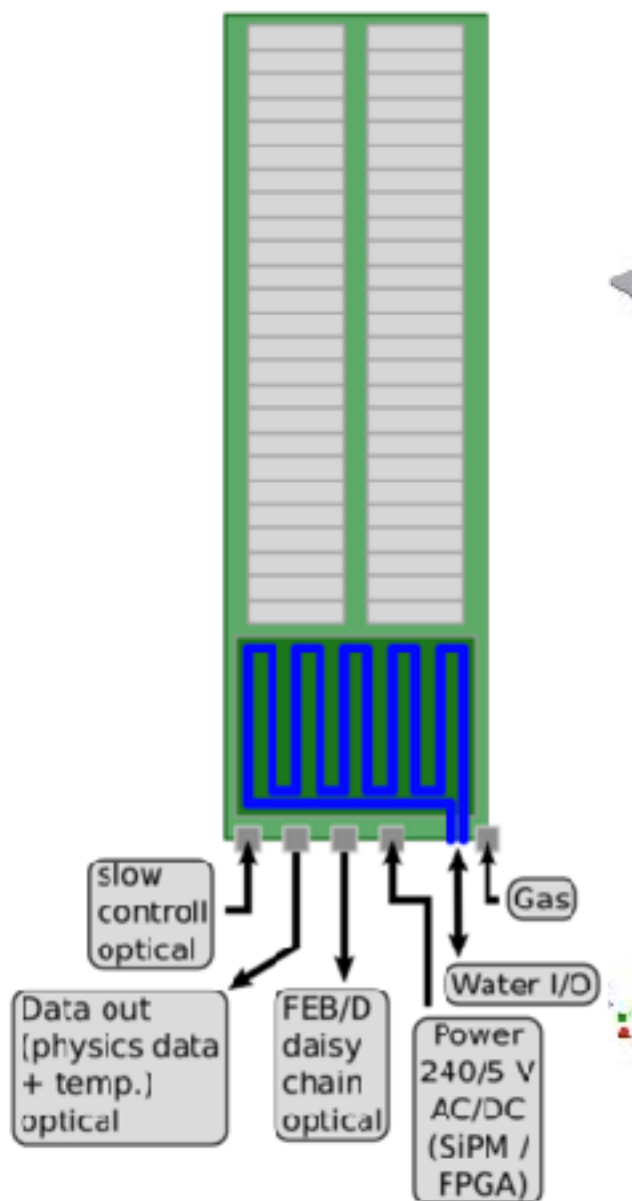
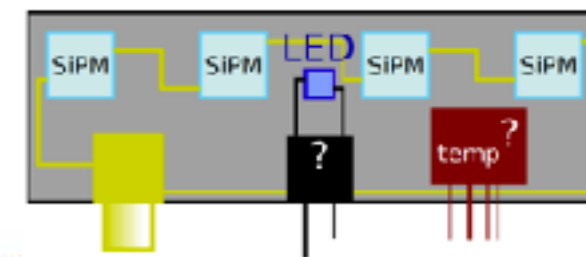
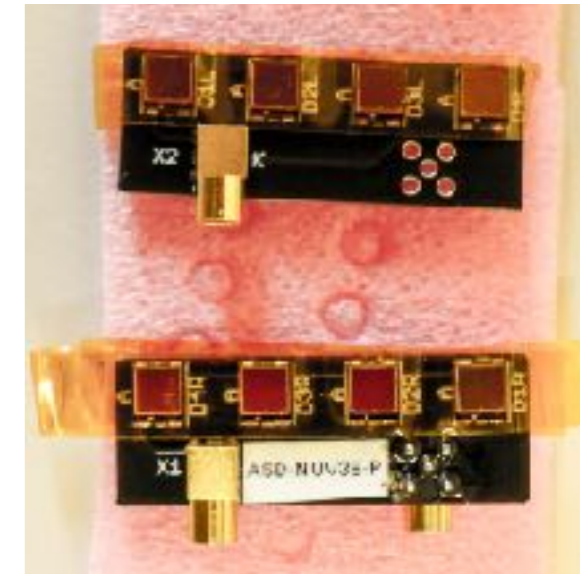
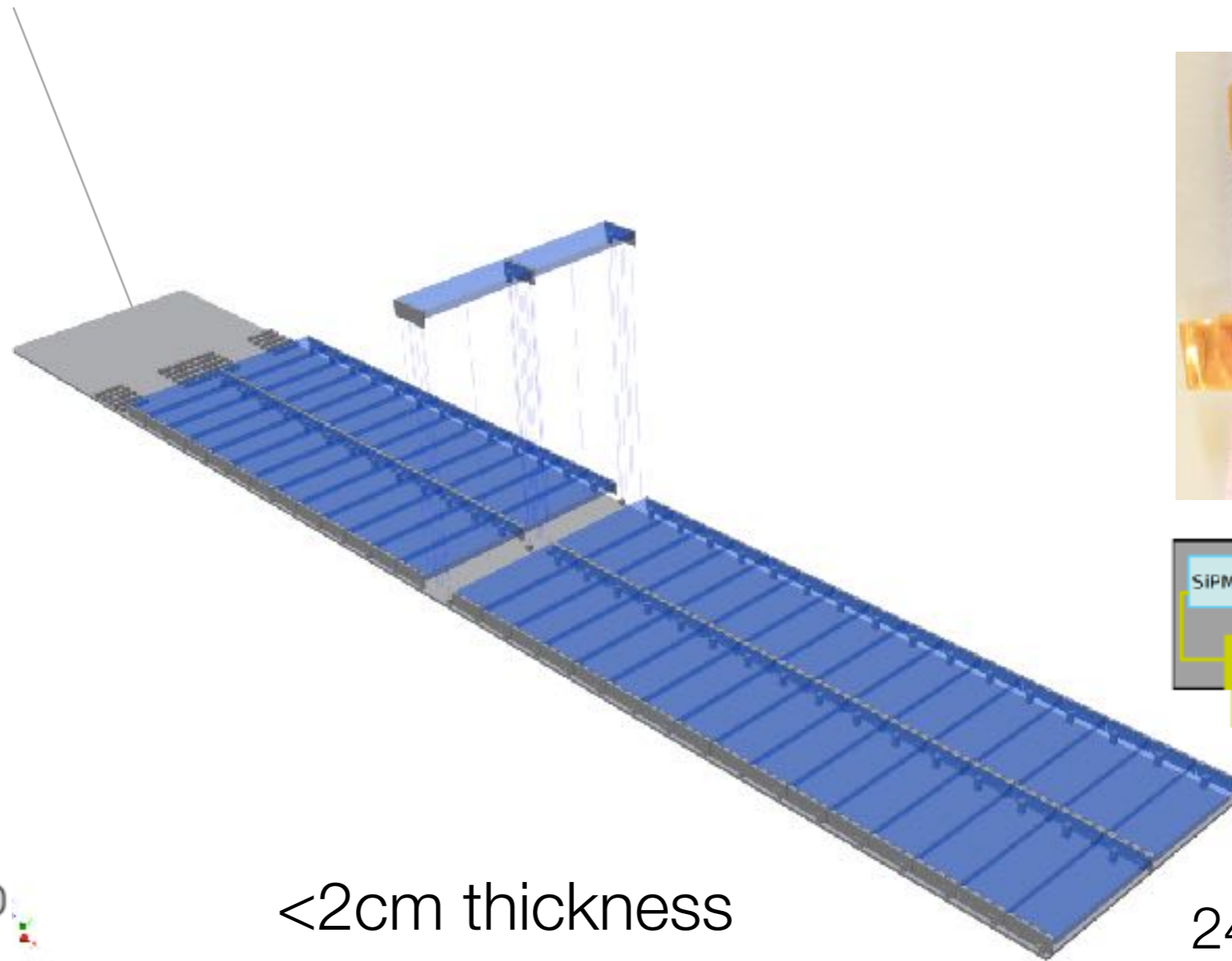
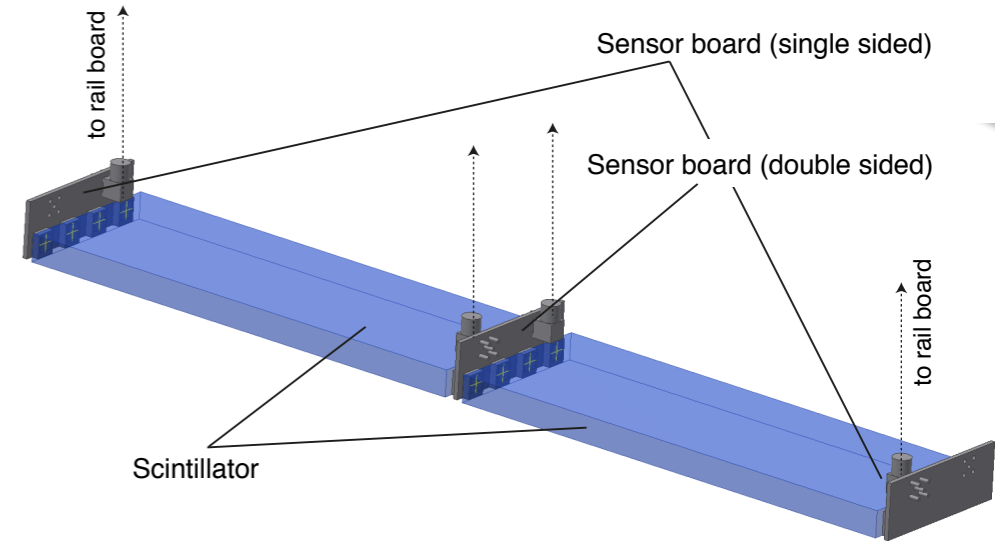
Figure 7.16: Installation procedure of the readout unit - half section view: (a) cryostat upstream flange, (b) rigid spacers, (c) readout unit support ring, (d) eight prism boxes, (e) readout electronics.

Common Mechanical Frame for the B-DIRC/TOF



Supermodule Design

space for FEE ~180x700



<2cm thickness
~5 kg

240 ch. /SM

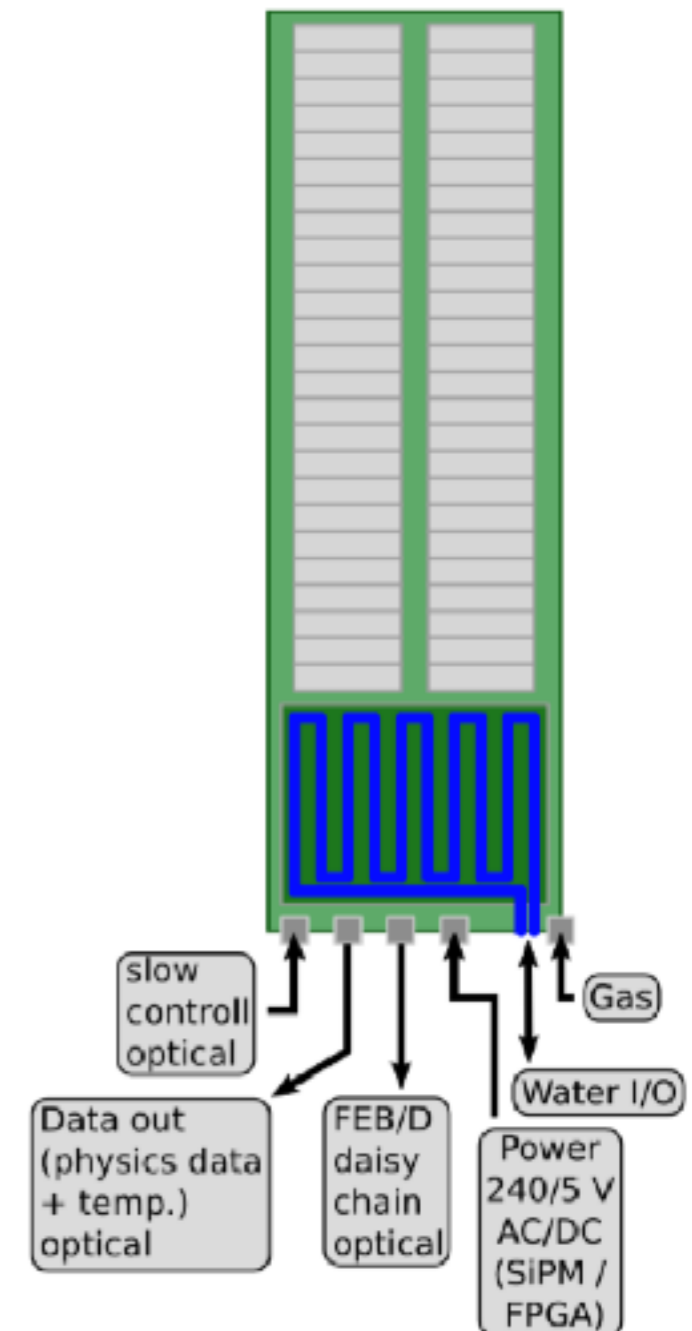
16 Super modules

Now inversely, from details to a bigger picture

Remarks, Open issues

Barrel TOF IOs

- The supermodule includes readout electronics.
 - No external “readout unit”
 - Only cables in/out
- Cable routing
 - assuming parallel to the B-DIRC
 - around the DIRC readout unit?

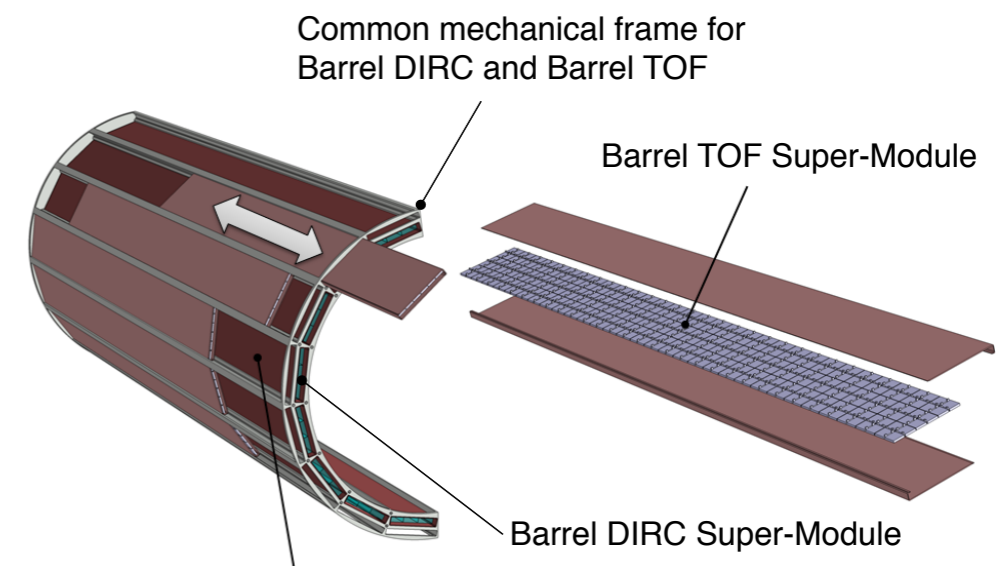
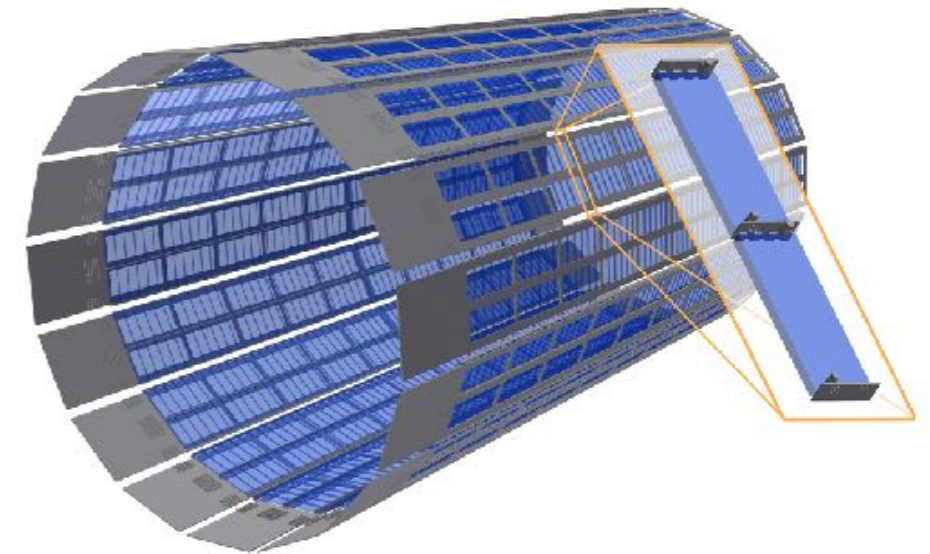


Monolithic Railboard?

- of 2500x180
 - Mezzanine board for ASIC?
 - or a separate FEE part
 - 1800x180 + 700x180
 - a draining board structure (punching holes)
 - Will be mechanically strengthened



TOFPET FEB/A v2 board



Funding

- failed to get the funding for mass production 2018-2020
- 2021-2023??
- slips out from the day-1 setup?

PD position in Vienna

- Accelerating the FEE R&D.
- Collaboration with the PANDA End-Cap DIRC group for the TOFPET chip test.
- Manpower
 - 1 PhD (S. Zimmermann), 1 Engineer (~0.3 FTE?), 1 Master (W. Nantes)
 - **1 PD position will be opened hopefully soon.**
 - **2 years, Vienna.**
 - **Expected to work on the FEE development.**

Backup

BARREL TIME-OF-FLIGHT DETECTOR GROUP

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- II. Physikalisches Institut, Justus Liebig Universität Gießen, Gießen, Germany
- Friedrich Alexander Universität Erlangen Nürnberg, Erlangen-Nürnberg, Germany
- Gauhati University, Assam, India