

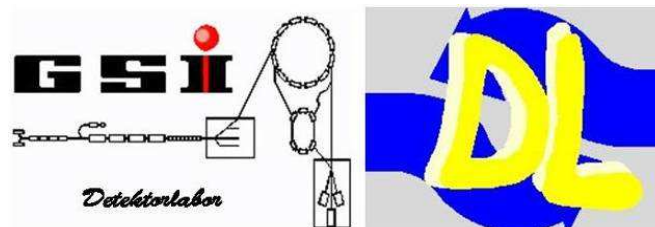
Forward GEM-Tracker

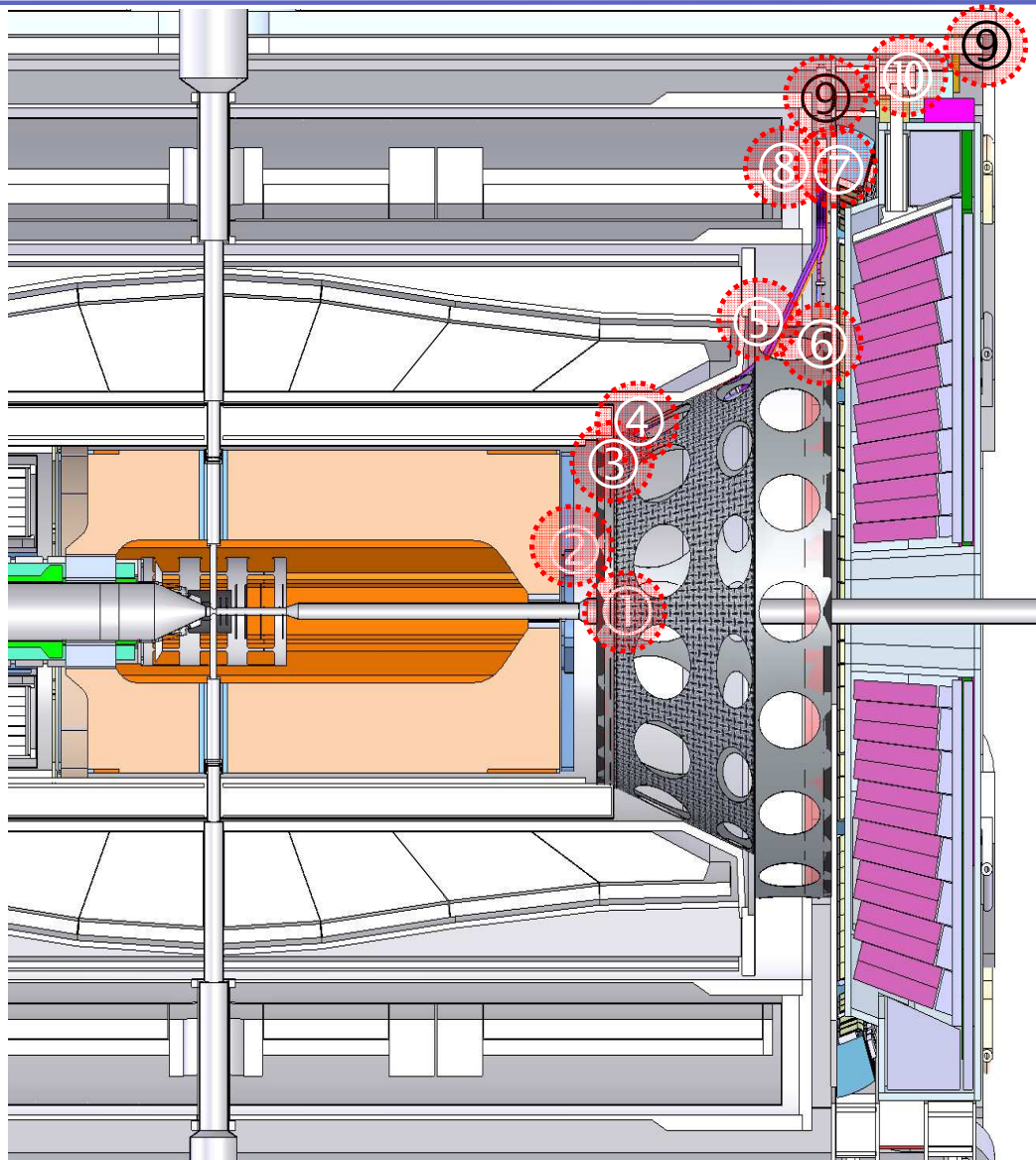


MEC Status Q2/2019

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- Little kinks at interfaces require attention & actions:

- ① Beam pipe
 - ② STT
 - ③ Barrel-EMC
 - ④ Beam for CT-System
 - ⑤ Barrel-EMC & -mounting
 - ⑥ Disc-DIRC(EDD)
 - ⑦ Disc-DIRC(EDD)
 - ⑧ Solenoid
 - ⑨ Magnet & μ -System
 - ⑩ EDD & f-EMC
- solved
 - under discussion
 - stalled, information missing

Target spectrometer@PANDA 'V1802'

GEM-Tracker System



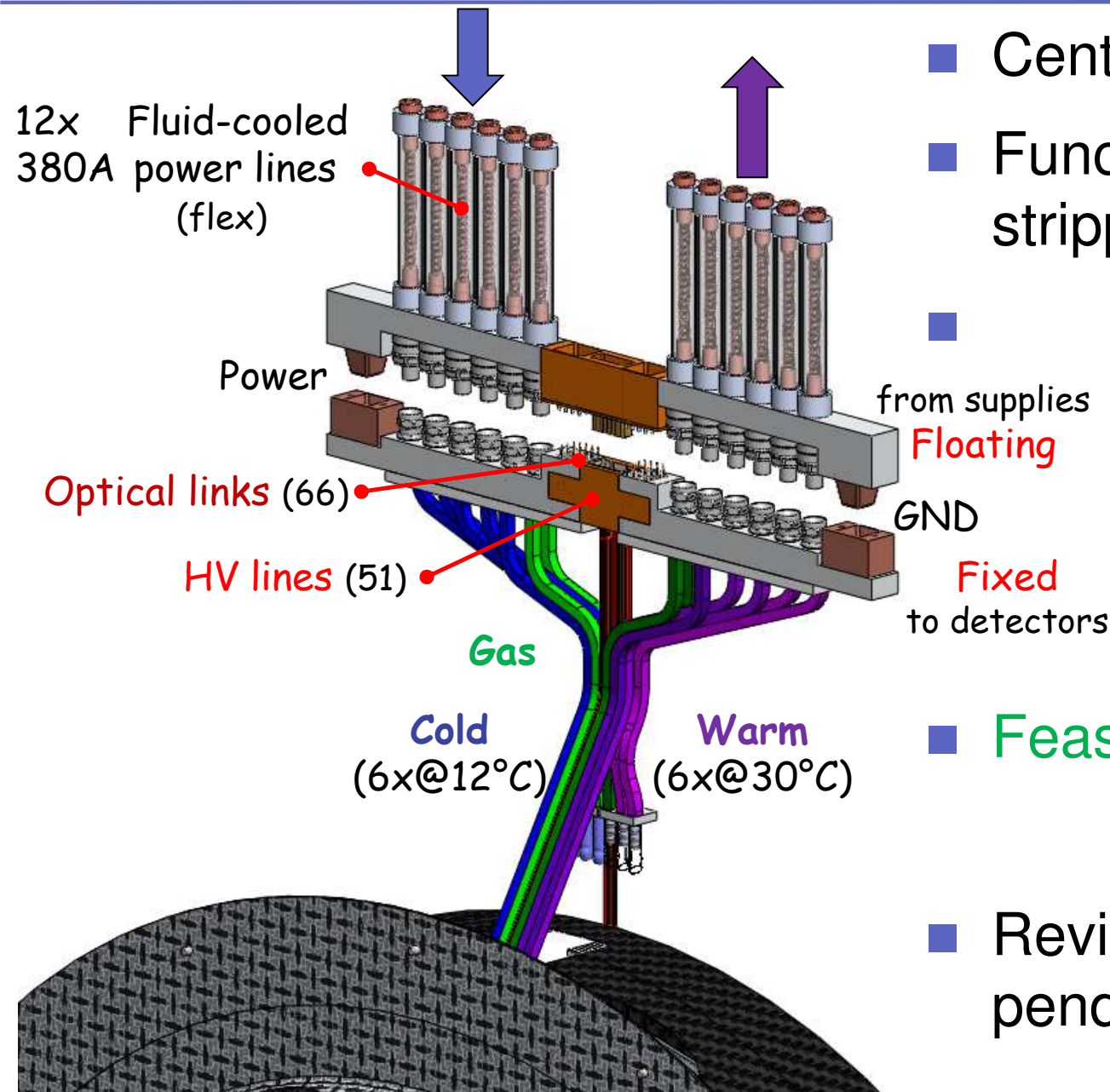
3 GEM-Discs system in an outer-shell skeleton 'Riddle'

100% lab pre-mounted with internal precision $O(100\mu\text{m})$

supplied through a common conduit with an internal patch panel

Supplies conduit

Internal panel



- Centrally locked interface
- Functionalities (protection, shield, etc.) stripped & grouped

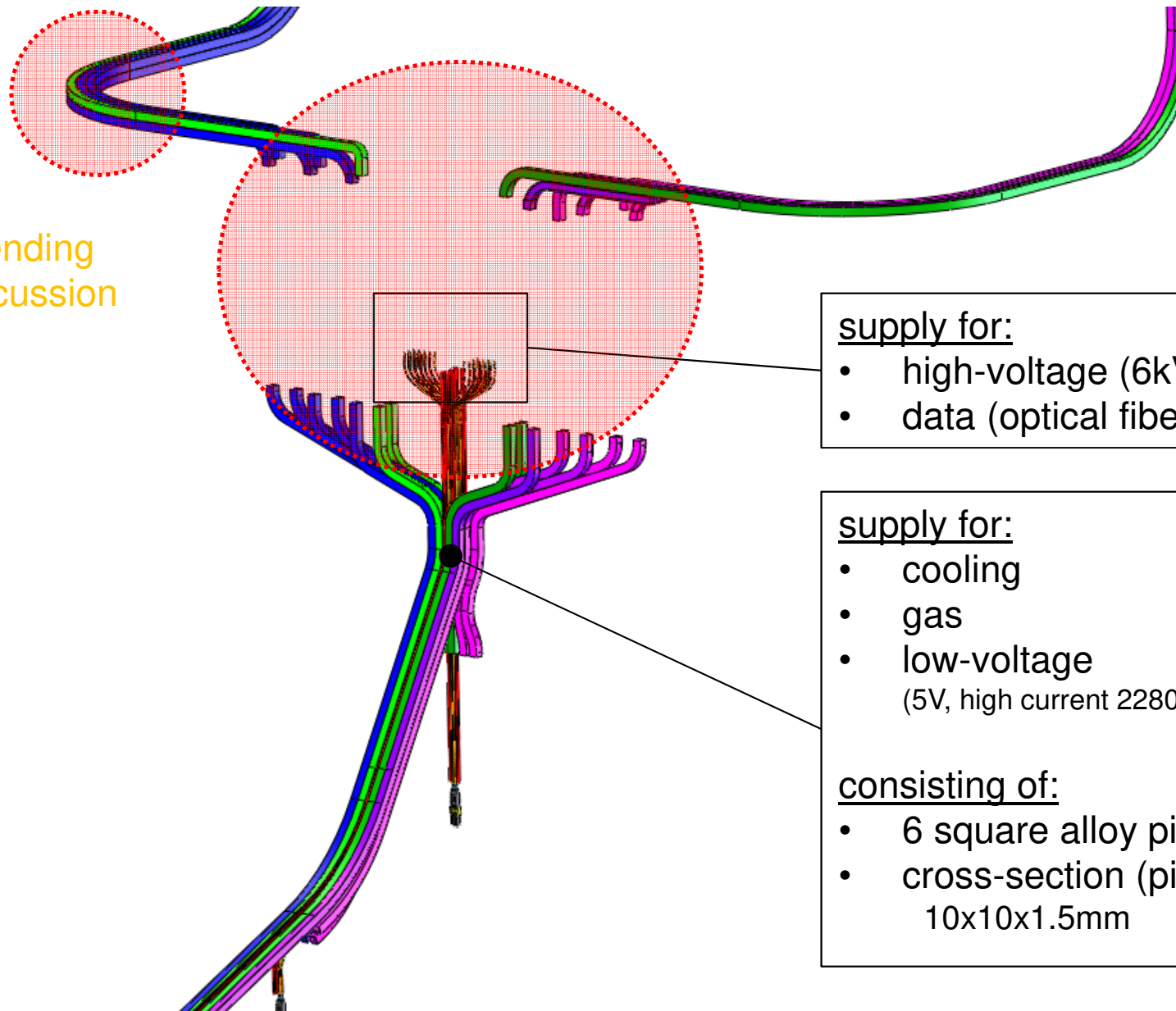
- Rectangular Al-tubes
Standard & customized
plugs

from supplies
Floating
GND
Fixed ...panels with housing removed
to detectors

- Feasibility tests (2013) successful

- Revision with new electronics pending

routing/bending
under discussion



supply for:

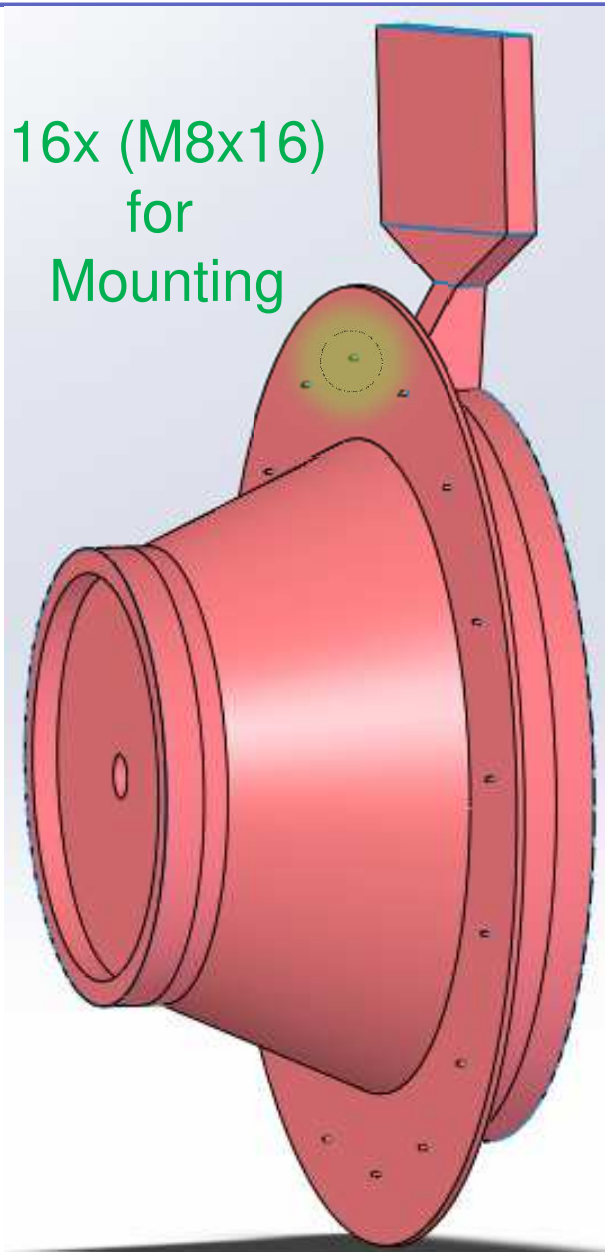
- high-voltage (6kV)
- data (optical fiber)

supply for:

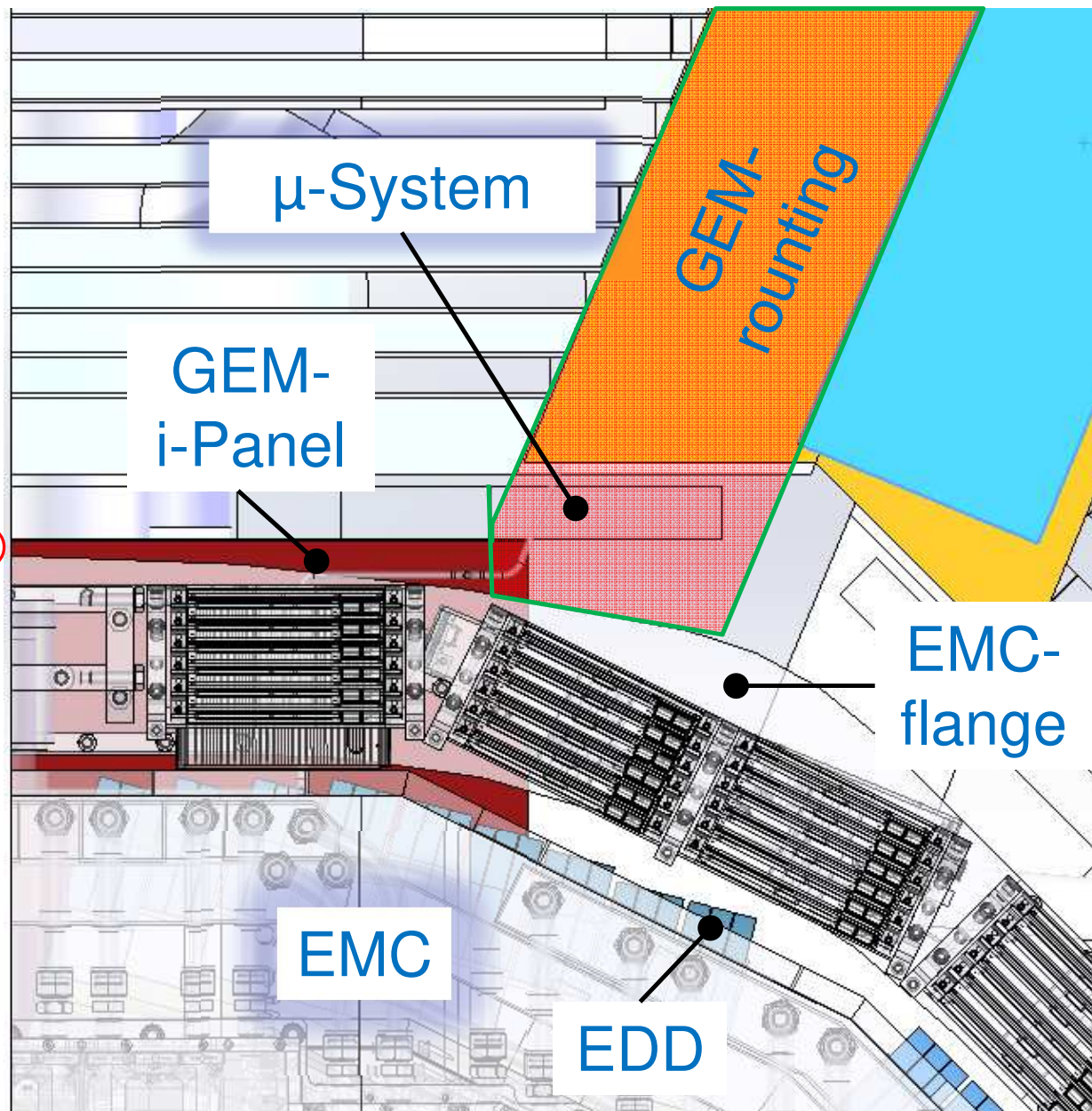
- cooling
- gas
- low-voltage (5V, high current 2280A)

consisting of:

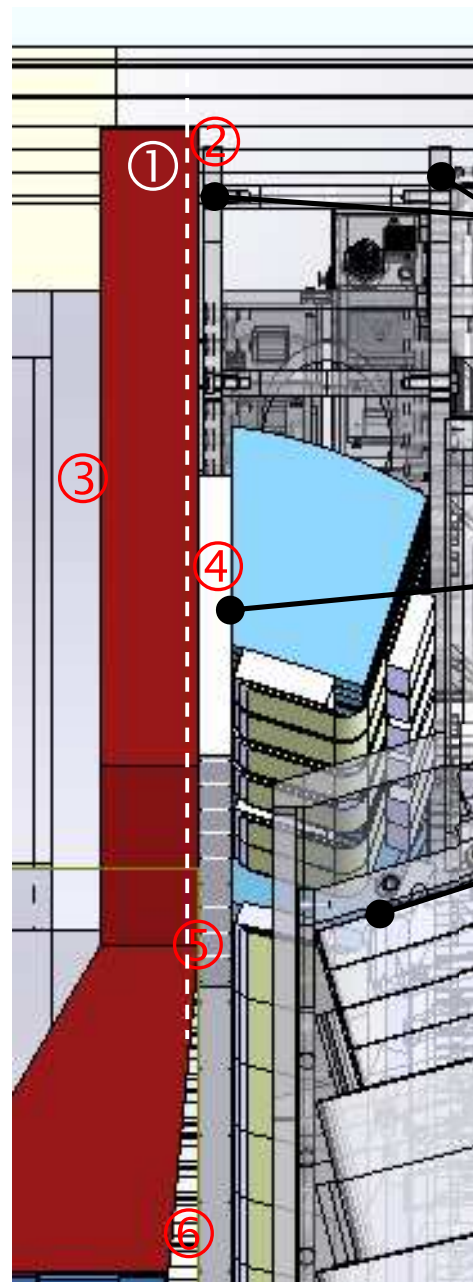
- 6 square alloy pipes
- cross-section (pipe): 10x10x1.5mm



- Safety envelope:
 - virtual skin of 2 mm thickness
 - obeying the agreed construction volume
 - added to all bodies of the GEM-Tracker system in the direction of volumes occupied by neighboring systems
 - except at dedicated interfacing or contact-surfaces
 - includes elements for the envisaged mounting 'sticking out' (16 screws M8x16)
- Should be applied for quick cross-checks on potential clashes (ongoing work)
- Refinement for static cable-routes ongoing through Disc-DIRC, f-EMC touching magnet, μ -system



- Cut-out in Magnet
- GEM-Tracker:
- Internal-Panel volume
- Spread route (wrong)
- Routing area agreed & actually available 1/2 due to L/R symmetry
- **Be aware:**
 - **EDD** preliminary/under revision (mounting plate, cabling)
 - **EMC** (semi-transparent) detailed but still without cabling
 - ① only some mm vertically not enough for routing



EMC
flanges

EDD
main
bodies

EMC

- ① 60 mm ,available', 46 min. req.
- ② 9 mm eff. left vertically by EMC
- Clashes due to EDD...
 - representing the **main bodies only** no T-screening, no cabling...
- ④ **Mounting flange** (t=15mm) **missing** in previous models
- GEM-Tracker...
 - ⑤ squeeze out >10 mm (dashed line)
 - ⑥ to come closer to the ,left' 19mm
- **EDD will supply envelope asap** (incl. t=2mm ,security skin)
- ⑦ Still **no details**: **Solenoid, μ -System**

Trying to develop solutions we found:

- Available CAD **data** (EDMS, STP) is **sketchy** (were we took a look)
- Apparently **no stringent structure** / hierarchy present
no naming conventions realized
- **Reduced STEP data** (no cabling, mounting etc.) is strongly **misleading**
- Information on three levels required at different stages:
 1. **Envelope**
,summary' volume incl. security-rim on every detail on the outer surface
 2. **Cross-volumes**
no screws etc. but all functional items incl. cabling as volumes
 3. **Detailed items**
the full monty

Trying to develop solutions we found:

- Overall **tough communication** with slow/minimal response- & update-times insufficient for an effective progress
- Pipelining requirements slow down
- ‘Chinese whispers’ often alter or even suppress information
- **Direct bi- & multi-lateral communication** between groups involved are mandatory
- **List of involved persons** should be collected, published and updated frequently
- **Push information** (updates, requests etc.) avoid necessity to pull for them (or provide detailed information ab initio)
- Streamline/focus workflow: ‘CAD Topical weeks’ (cw32/33 2019)



GEM-Tracker Current crew members & tasks

André Ehret

Andrea Neeb

Olga Bertini (HIM)

Andrii Gromliuk

Andreas Heinz

Can Kaya

Volker Kleipa

Jochen Kunkel

Dima Melnichuk (NCBJ)

Milad Nuri

Nami Saito (HIM)

Sandra Schwab

Bernd Voss

Joachim Weinert

GEM2D assembly, CAD

Relief person, gofer

Phys.-Simulations (setup-wise, PANDARoot)

Det.-Simulations, Design (PadPlane), Electronics

Electronics, test-software

Supplies Conduit, set-up & functional tests

Electronics

General support, drawings, assembly, gofer

Det.-Simulations (GEM/PadPlane, Garfield)

Supplies Conduit, set-up & functional tests

GEM-QA, data analysis

Mechanics fabrication

Design, Tests, Concepts, Flea circus tamer

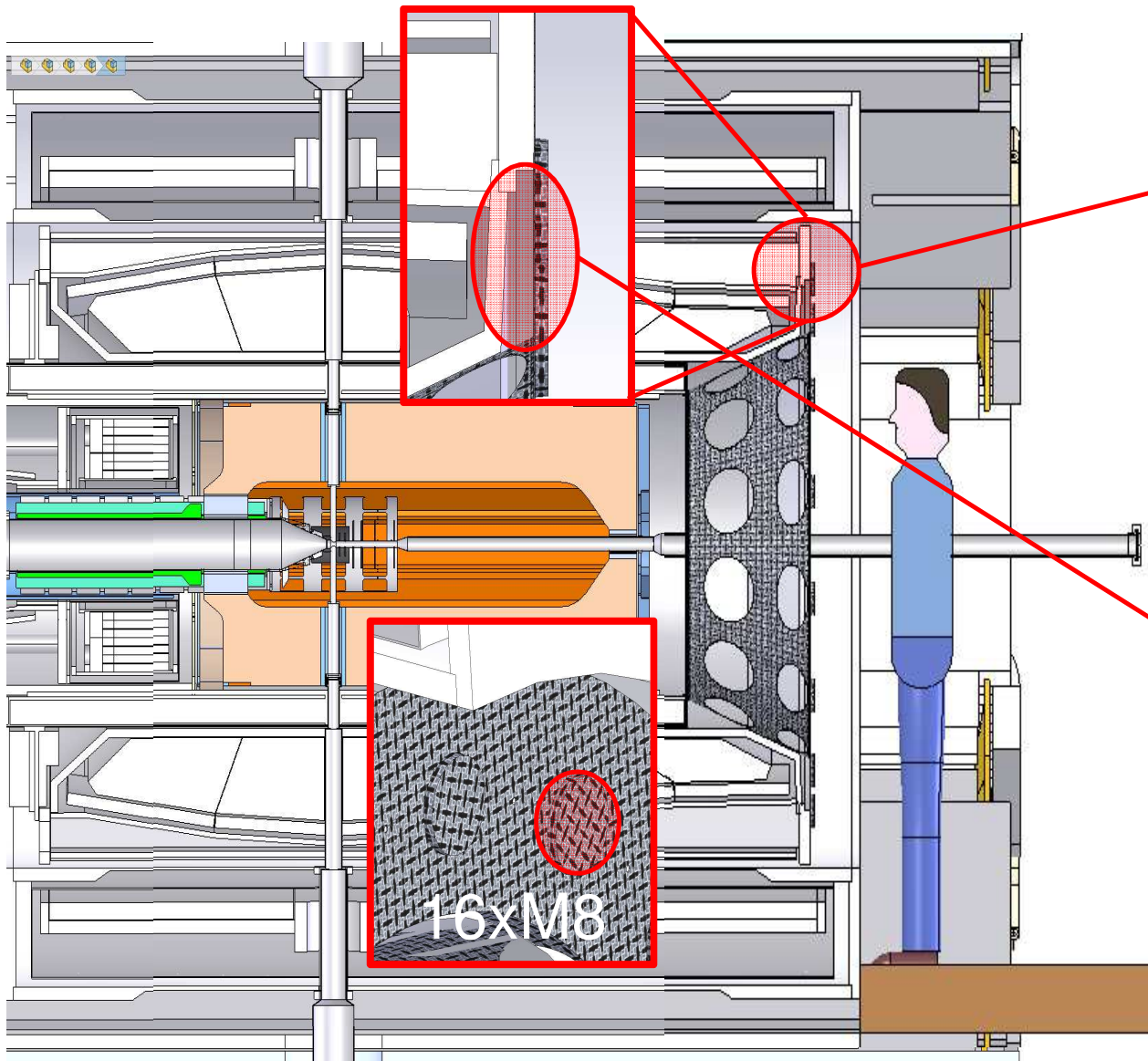
Mechanics fabrication

Takehiko Saito (HIM)

Bogdan Zwieglinski (NCBJ)

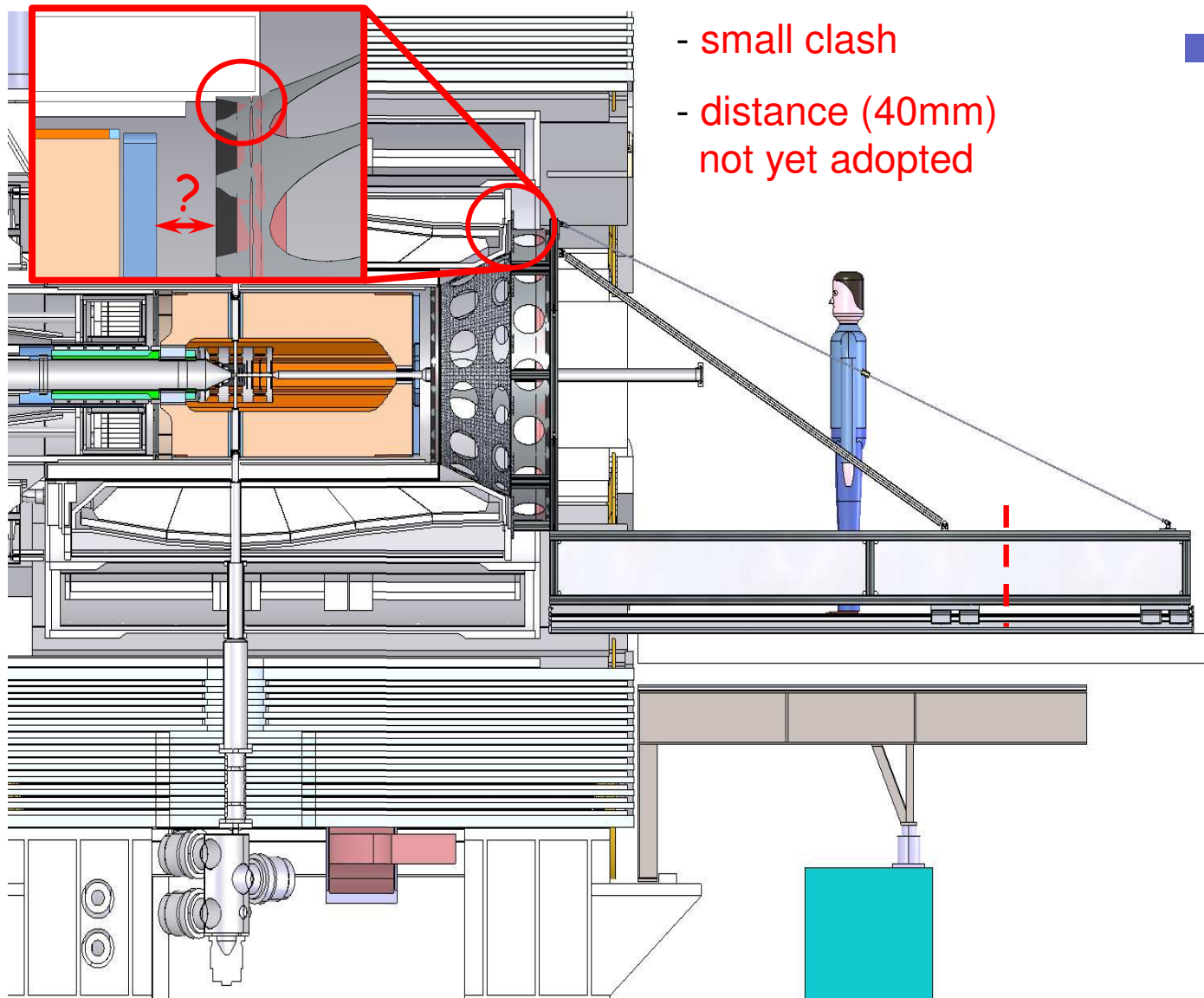
... and many more students plus the GSI common infrastructure

Backup slides



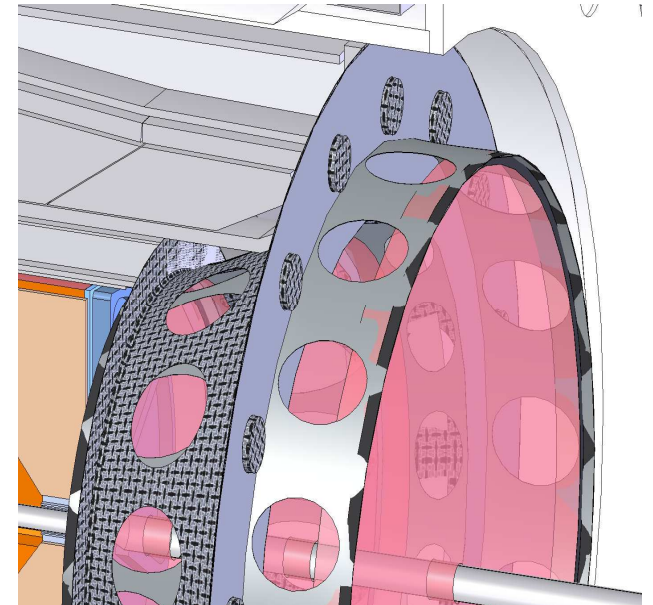
- 'Plug' inserted
- Brim now $\varnothing 1880\text{mm}$ to fit to the 40mm flange to be mounted on
- as agreed after discussions in 03-12/2012
- sub-optimal shape of installation surface
- Distances to TP
 - front-face 1270 mm
 - back-face 1719 mm

Target spectrometer@PANDA 'V1802'



- small clash
- distance (40mm) not yet adopted

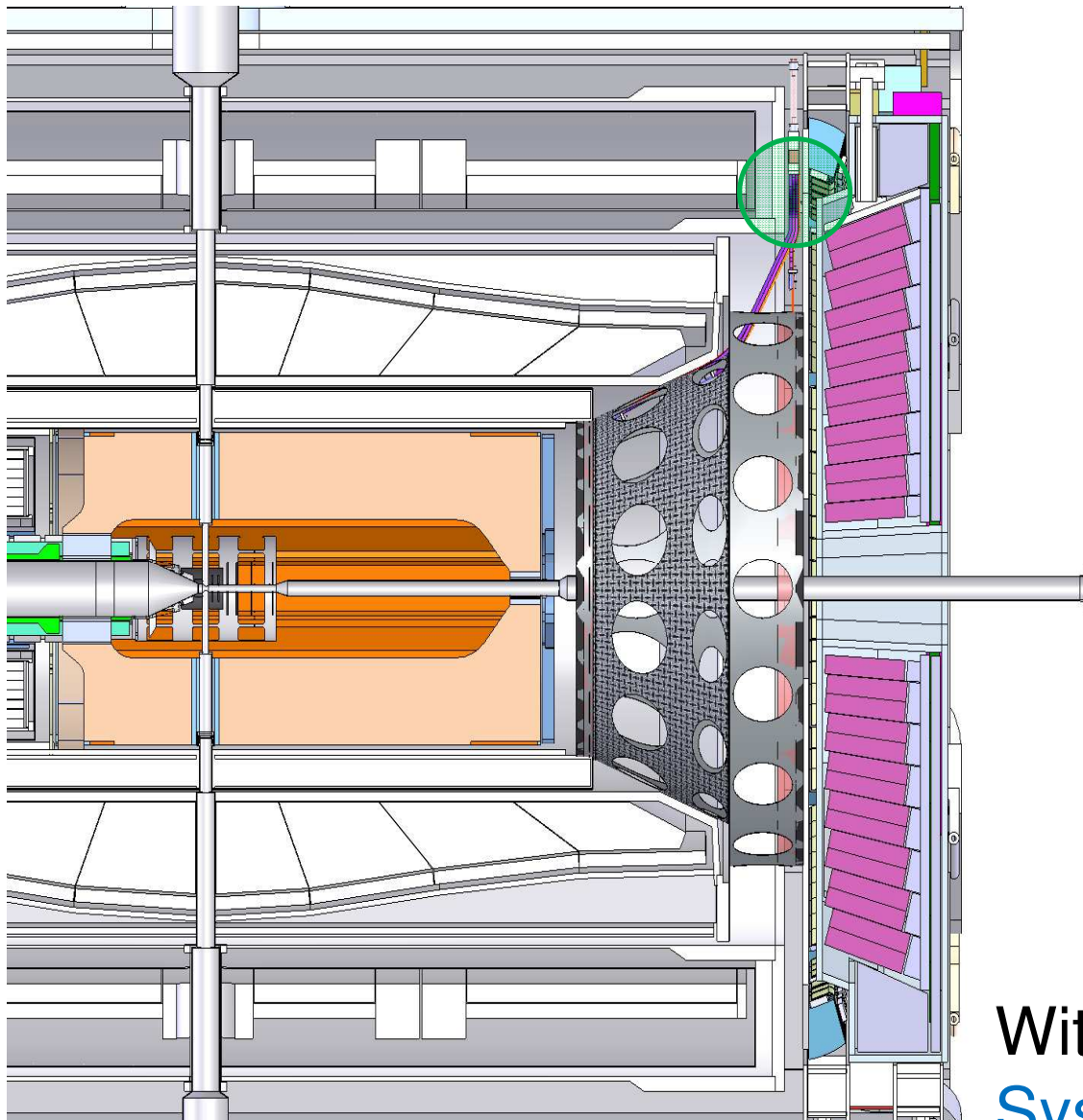
- 'Riddle' inserted screw-fixed 16x M8 to the flange



Distances to TP

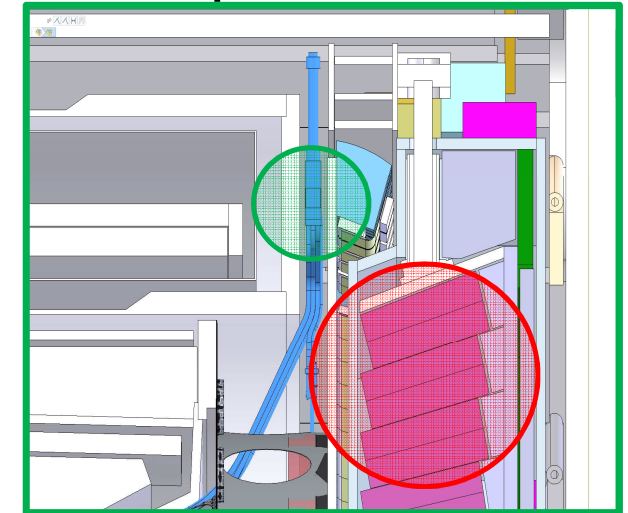
- brim 2988 mm
- back-face 1719 mm

Target spectrometer@PANDA 'V1802'



Target spectrometer@PANDA 'V1802'

- Mission accomplished all Systems in place
- Patch-panel fits nicely



- Effect on **outer crystals** (to me still a mystery)

With Plug of 2009 and GEM-Tracker System of 2012 **everything fits more ore less nicely** in version TS V1802