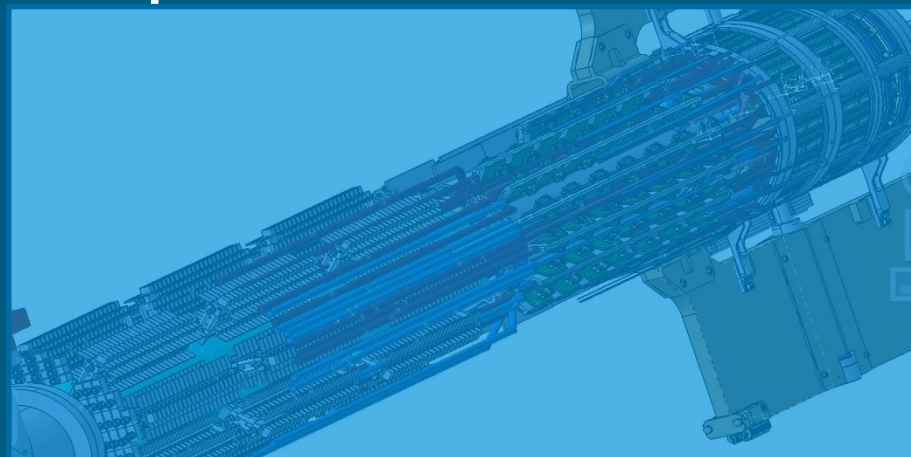


# Micro Vertex Detector of $\bar{\text{P}}\text{ANDA}$ Mechanics updates

MVD Mechanics  
GSI 10.06.2014

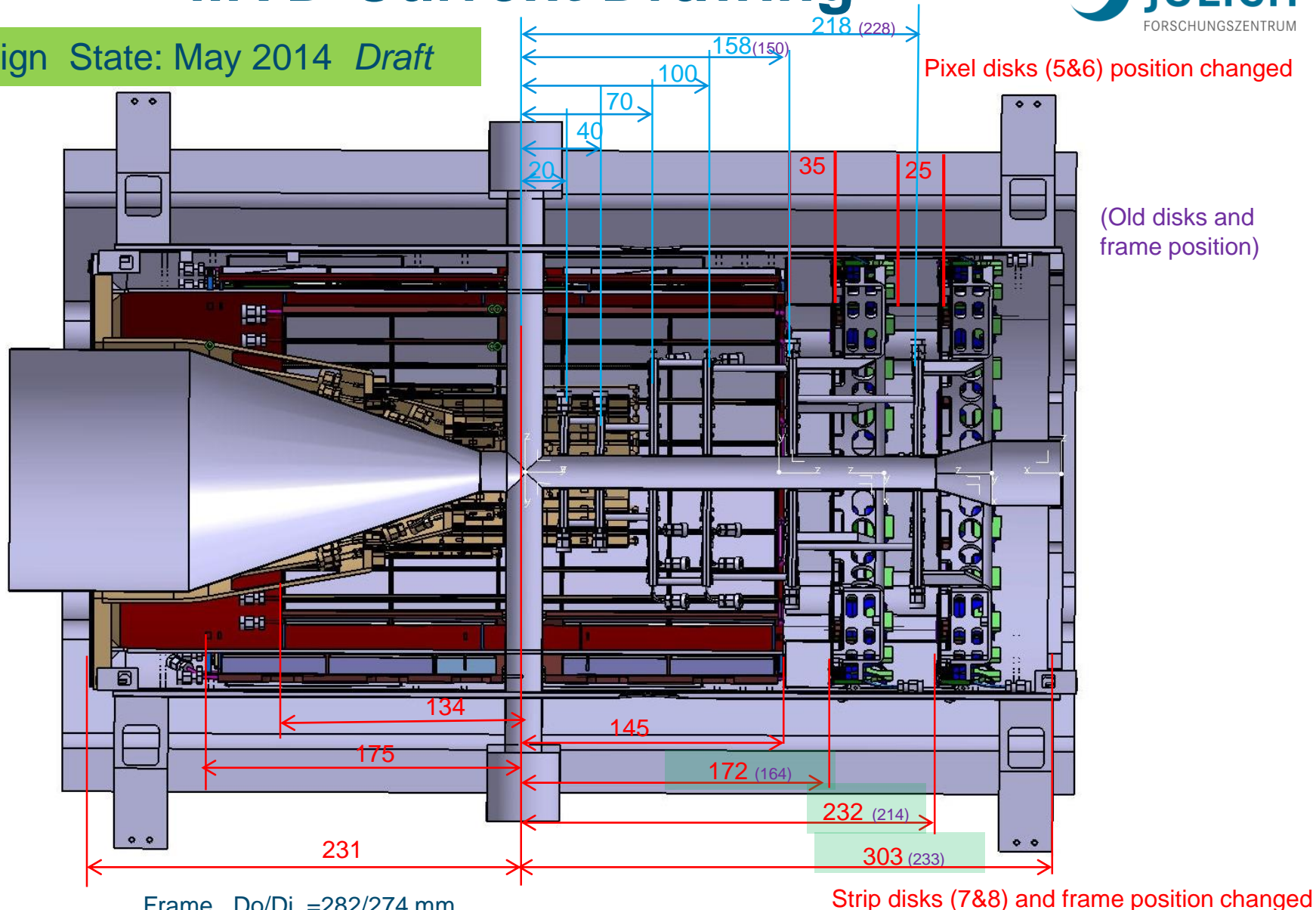


ZEA 1: V. Fracassi, D. Grunwald, E. Rosenthal, R. Schmitz

- **MVD Mechanics updates**
  - Frame geometry
  - Adaptation of strip and pixel discs.
  - Manifold position
- **Manufacturing**
- **Thermal conductivity experiments**

# MVD Current Drawing

Design State: May 2014 *Draft*

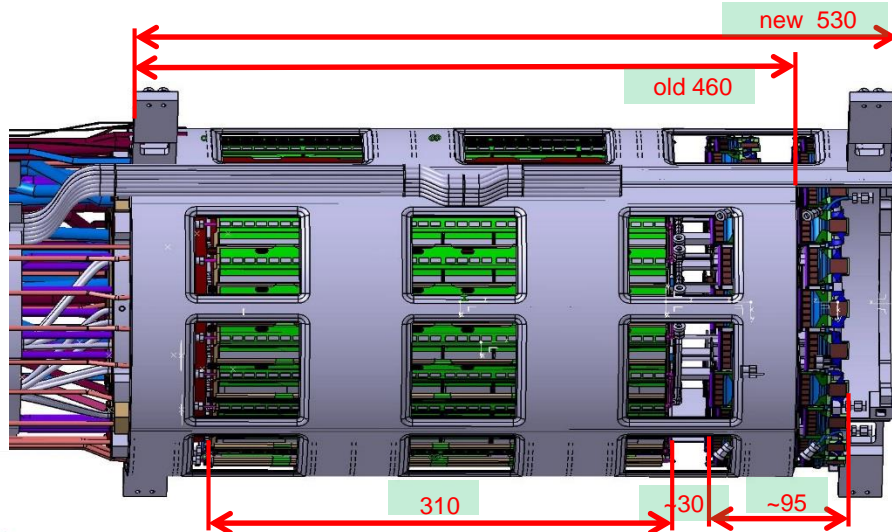


Frame Do/Di = 282/274 mm  
 Disc Do/Di = 265/144 mm  
 Barrel Do/Di = 259/259 mm

# MVD new frame design

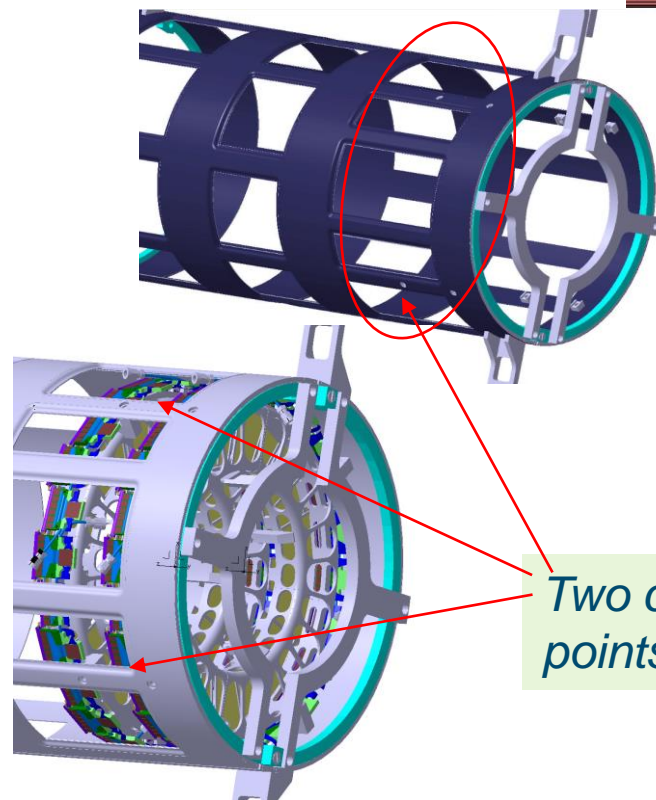
## Longer structure

The frame has to be extended from 460 mm to 530 mm beam downward.

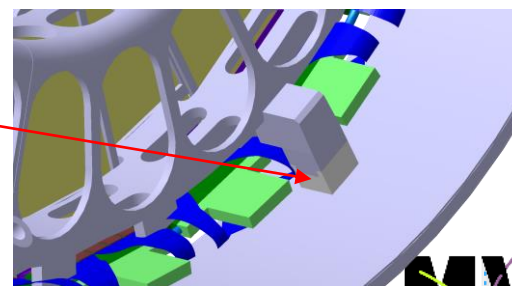


## Enlarged windows

The frame windows was adapted according the requirements for cable and pipe devices.  
*In addition, (if its necessary) the discs cutouts on the top and on the bottom from the frame have to be done in particular for pipe throughout on the vertical axis.*

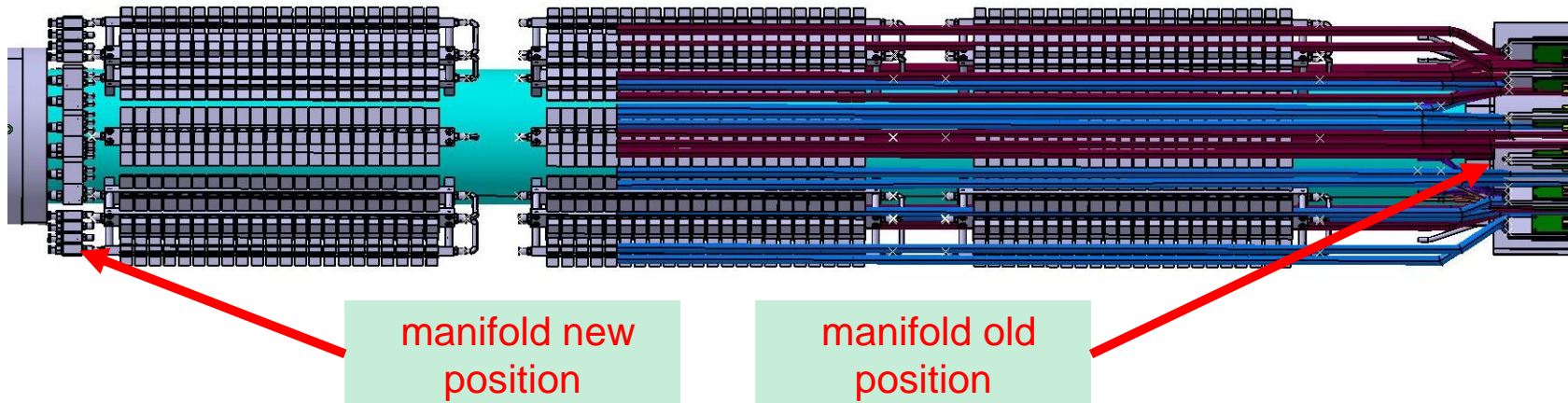


Two connection  
points /half disk



# Manifold position

Design State: May 2014 *Draft*



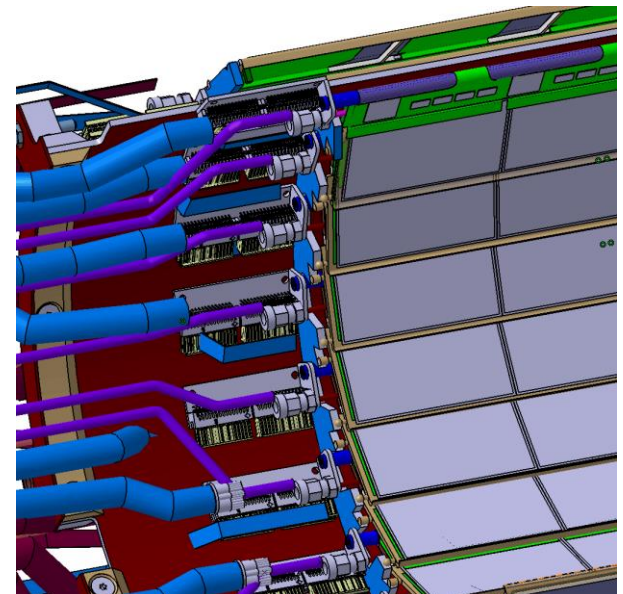
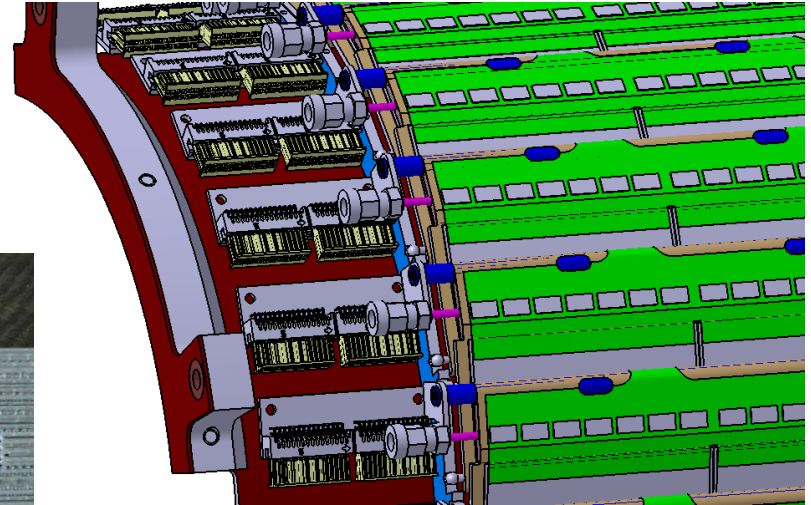
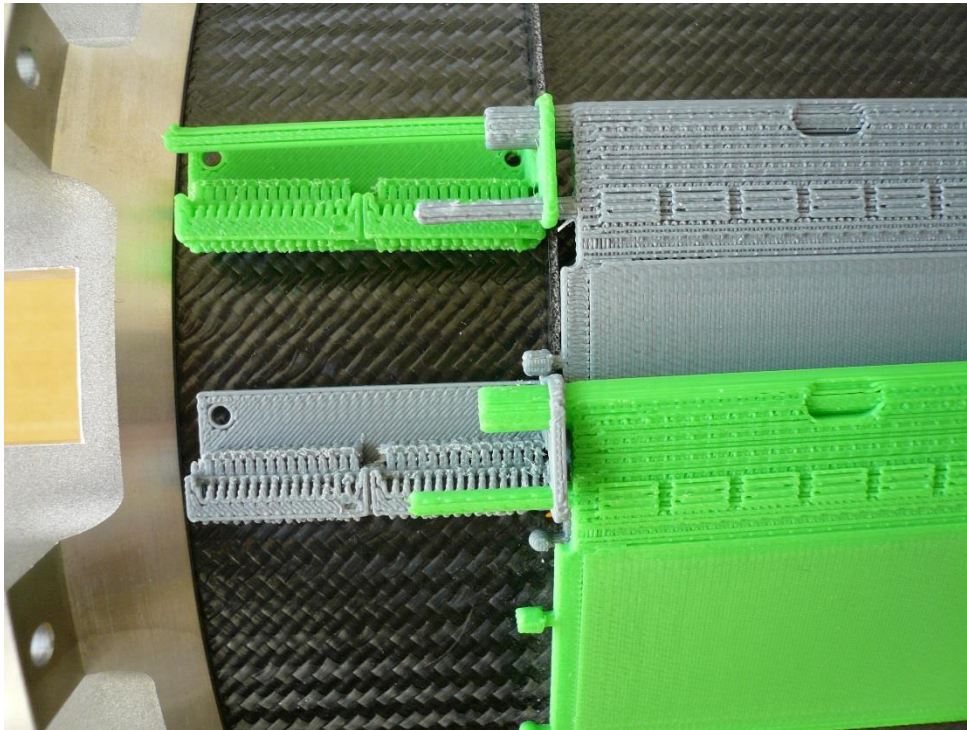
The number of cables is still a great space problem. A final solution could not be found. However, it will be required that the manifold must be moved from its current position between DC-DC converter and the GBT to the outer position before the DC-DC converter outside the magnet.

An option to create more space for passage of the cables and pipes is to omit the horizontal connector bridge of the GBT and to enable the corresponding connections of the signal cable by prolonging the GBT.



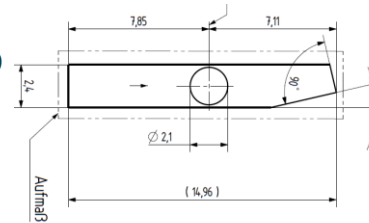
# Cable connector

*First proposal for a 60-pin cable connector developed from ZEA 2*

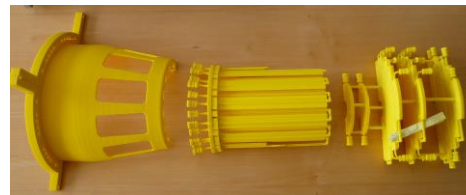


# Investigation of manufacturing process

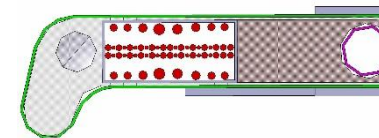
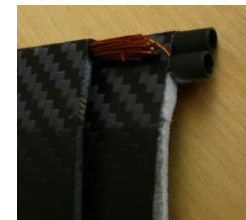
- Test for the processing of carbon foam (Poco HTC) (~2,5\*310 mm)
  - Milling, grinding and eroding wire



- Components for the ½ 3D model

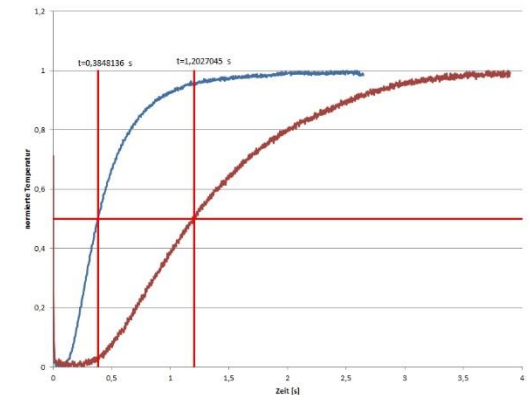
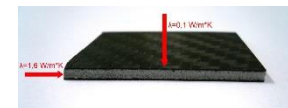
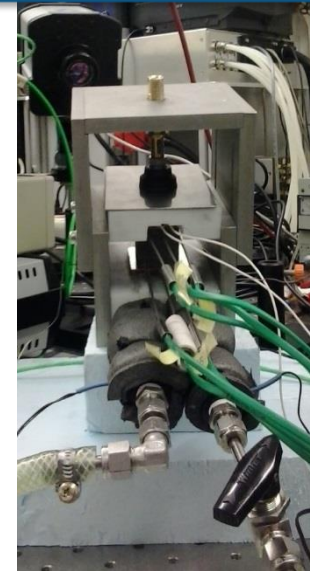
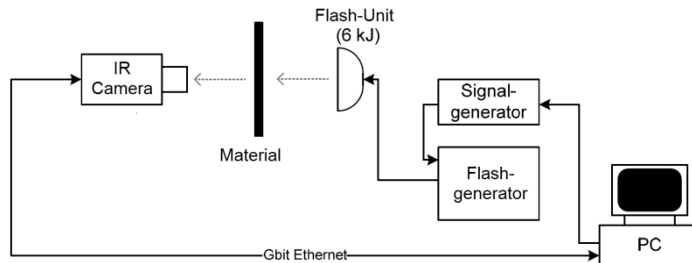


- New Stave Prototype
  - One tube, two tube (short version ~200 mm di=4mm)
  - canal version (~2,5\*7mm) (is ongoing by IKV Aachen)
- Test structure for ¼ Strip Disc (is ongoing by IKV Aachen)



# Thermal conductivity investigations

Fast quality check of the thermal conductivity of materials with unidirectional heat conduction



<u>Material</u>	<u>Direction</u>	<u>Thermal conductivity</u>
CFK-Prepack	out of plane	0,3 W/m*K
CFK-Prepacks with RohaCell51 in between	in plane	1,6 W/m*K
	out of plane	0,1 W/m*K
HTC-PocoFoam	in plane	70 W/m*K
	out of plane	210 W/m*K



# Outlook

- Design optimization, (Support and positioning system)
- ½ 3 D Model
- Manufacture implementation
- Thermal investigation
- Thermal Hydraulics tests
- FEM Validation
- Cable Routing

Thank you for  
your attention