

Universität
Münster

Status of TRD mainframe

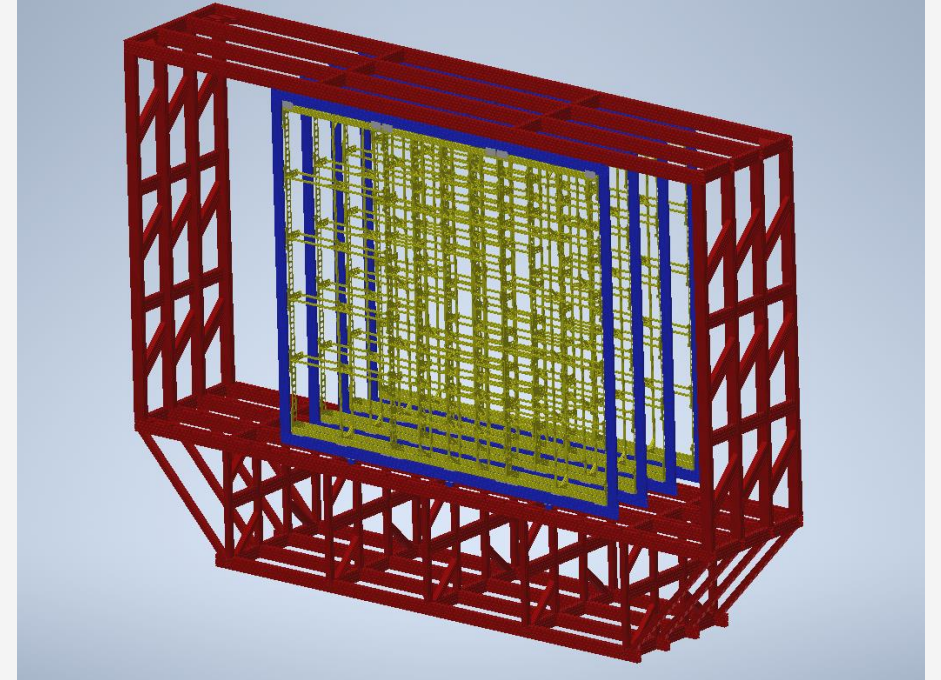
CBM-TRD Retreat, 8th November 2023, Dorfweil
Lukas Wahmes

living.knowledge



TRD mainframe

- Outer frame (red)
- Secondary frame (blue)
- Detector support (yellow).

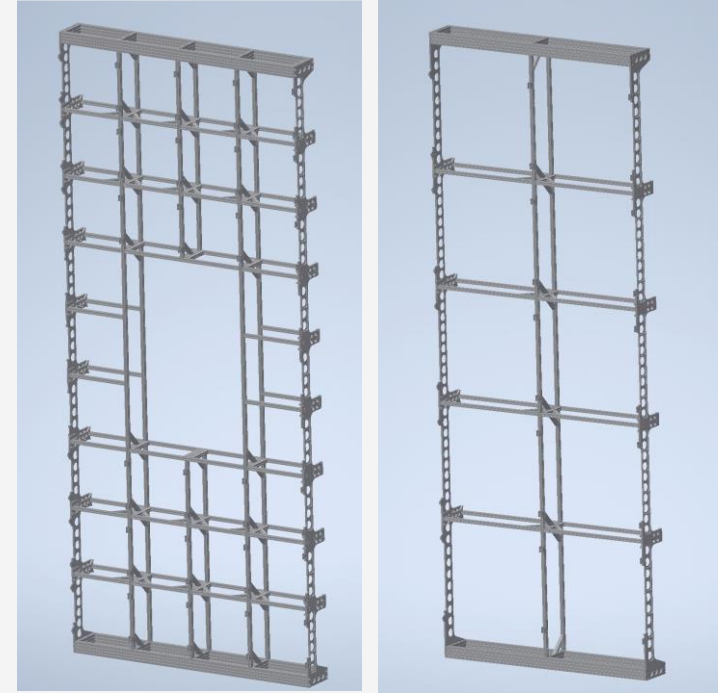


TRD mainframe.

TRD mainframe

TRD detector support structure

- 6.25 m width in x
- 5.35 m height in y
- 0.3 m length in z
- 320 kg (150 + 2x 85 kg) per Layer.

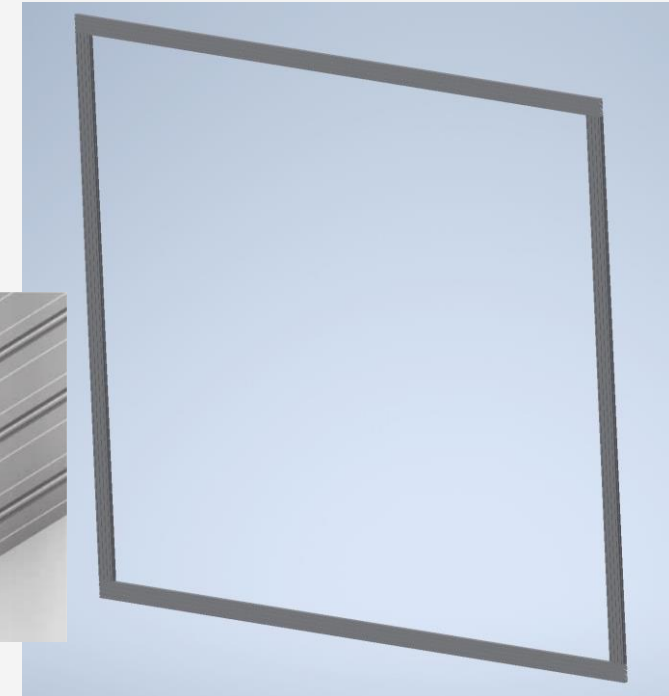
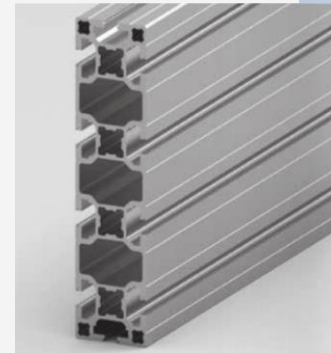


Support structure for type3 and type5/7 detectors.

TRD mainframe

TRD detector support structure

- 6.25 m width in x
- 5.35 m height in y
- 0.3 m length in z
- 320 kg (150 + 2x 85 kg) per Layer.

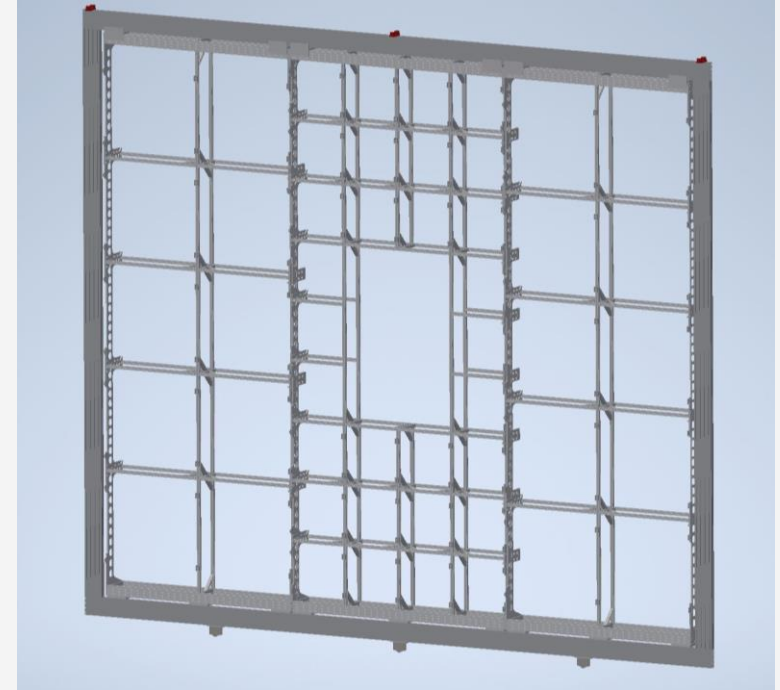


Secondary frame.

TRD mainframe

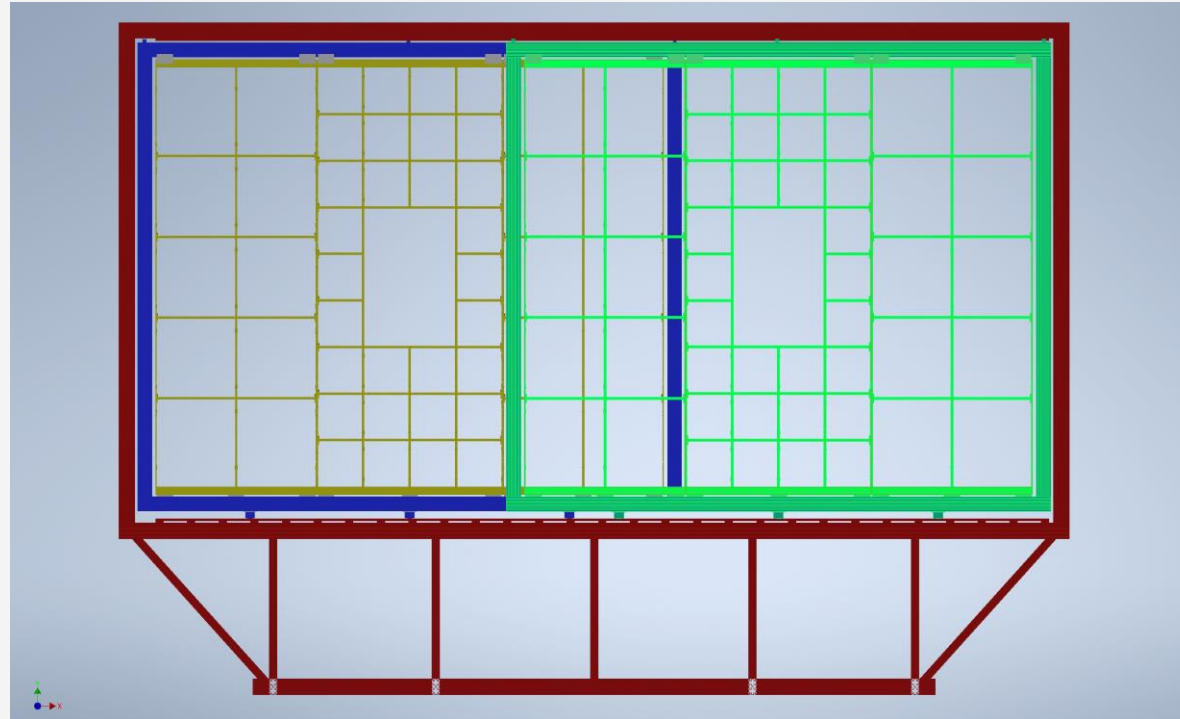
TRD inner frame (detector support + Secondary frame)

- 6.7 m width in x
- 5.9 m height in y
- 0.3 m length in z
- 565 kg per Layer.



Support structure for one detector layer.

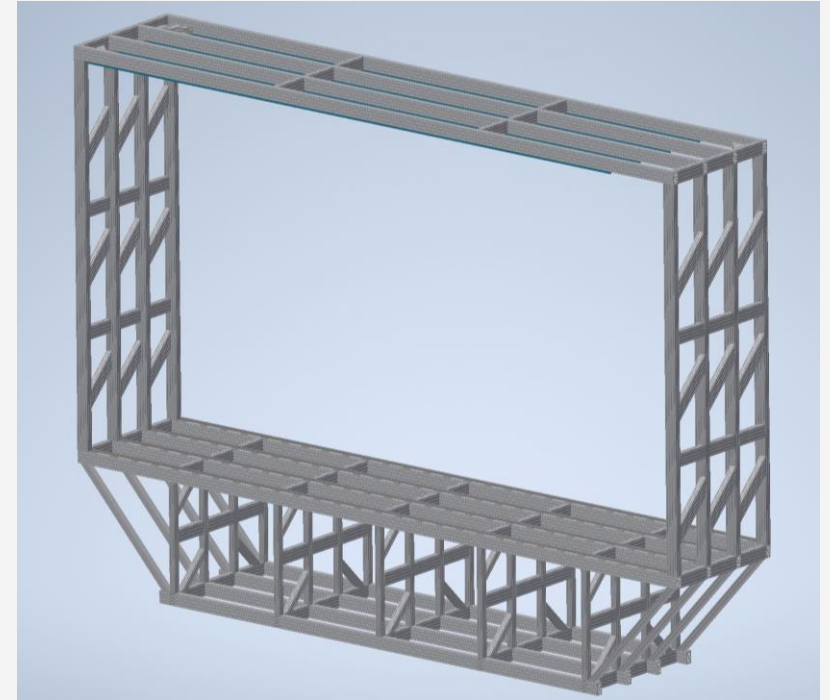
TRD mainframe – innerzone maintenance



TRD mainframe

TRD outer frame

- 12 m width in x
- 8.3 m height in y
- 2.2 m length in z
- 5300 kg.



Outer frame carries all 4 TRD Layers.

TRD mainframe

Offer status for sub-assemblies:

Outerframe	87393,60 €	Date of offer: 08.02.2023	Delivery time: 12 – 18 Weeks
Innerframe	36176,00 €	Date of offer: 12.12.2022	Delivery time: 12 – 18 Weeks
Innerframe	22084,00 €	calculated from parts price, no offer	
(reduced Version)			

TRD mainframe

FEM Simulation and calculation

- FEM tool: Inventor Professional 2022, simplified profiles
- Test setup used for comparison of real displacement and simulation

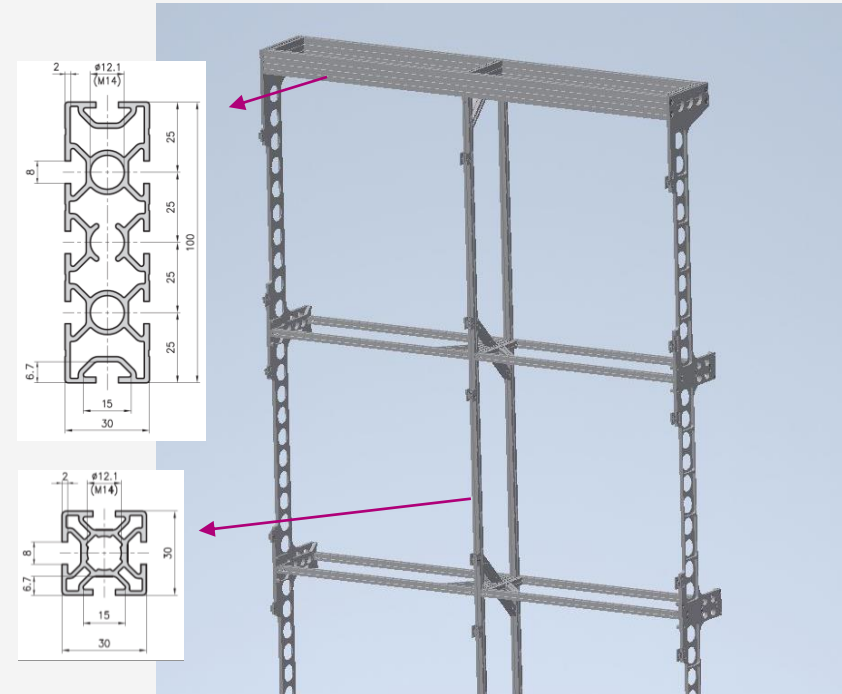
Thank you, for your attention!

Back up

TRD mainframe

TRD detector support structure - profiles

- KANYA 30x100
- KANYA 30x30
- Custom made aluminum sheets.

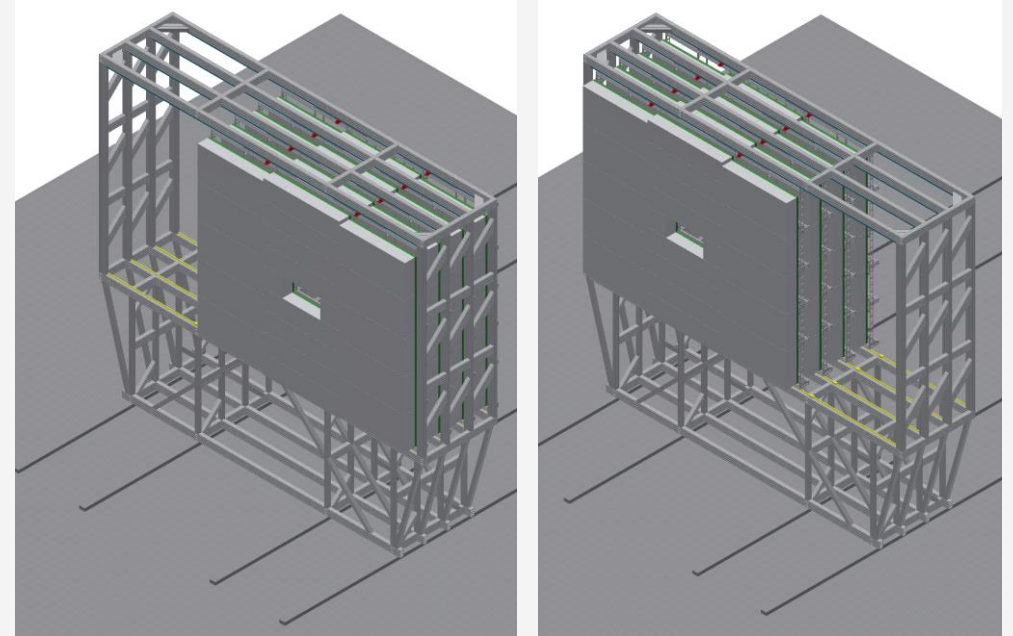


KANYA profiles.

Support structure

TRD - movement

- Movement in z, compact
- Movement in x, 4 independent layers.

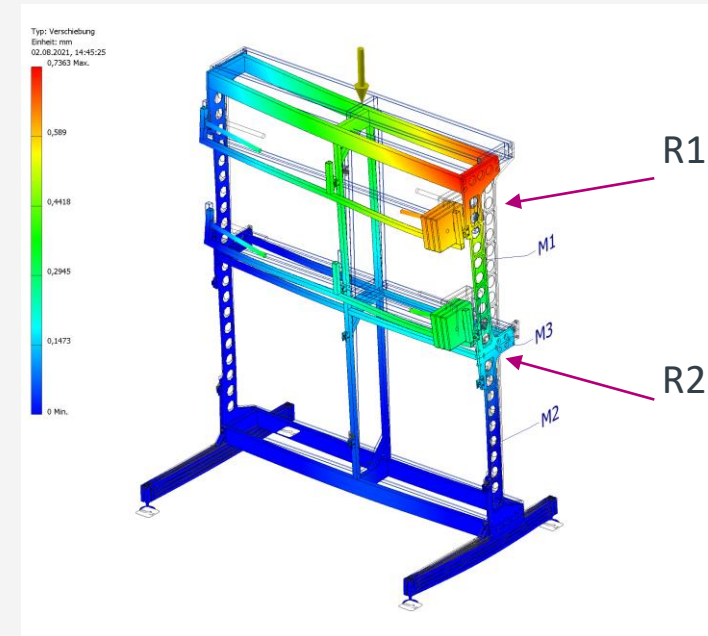


TRD movement in x, 4 layers independently.

TRD mainframe – support test setup

Direct comparison of real displacement and
simulation

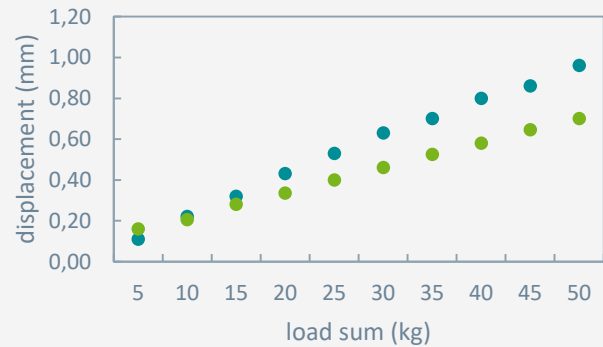
- use of a test segment of detector support
- 5 kg per load mounted on different position
- 3 reference points



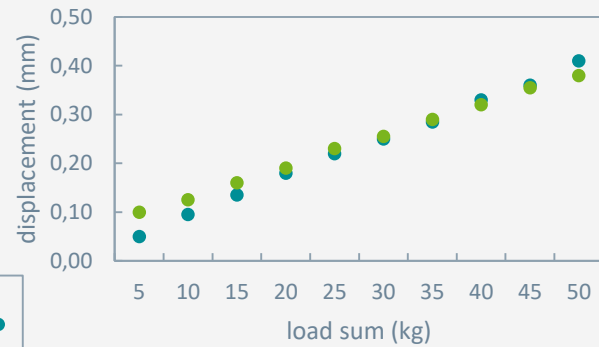
Test setup of support structure for type 5,7 modules.

TRD mainframe – support test setup

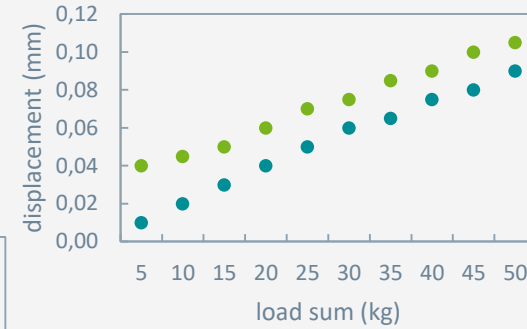
Loads R1 and R2



● ref. point 1 ● ref. point 1 (simulation)



● ref. point 2 ● ref. point 2 (simulation)



● ref. point 3 ● ref. point 3 (simulation)