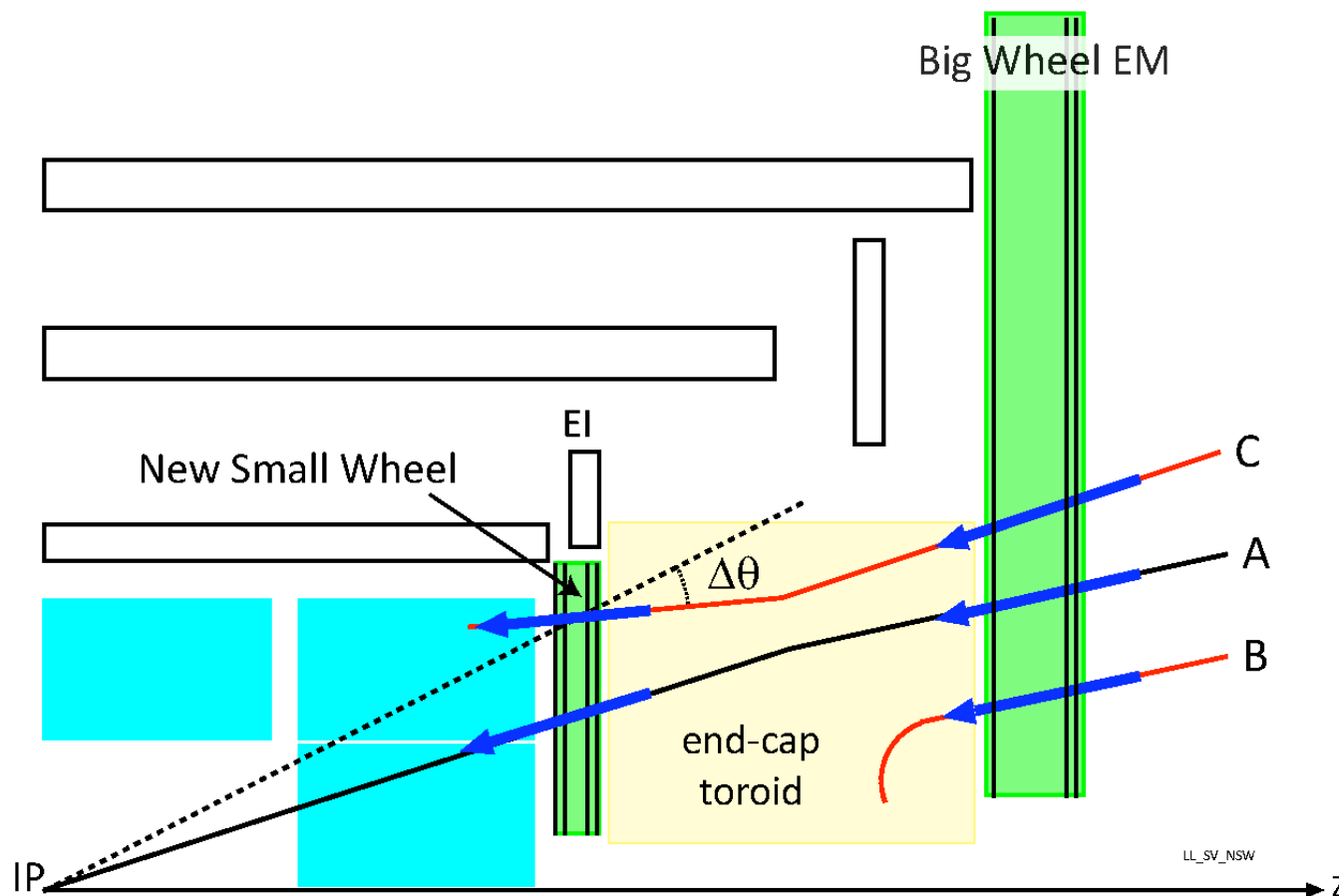


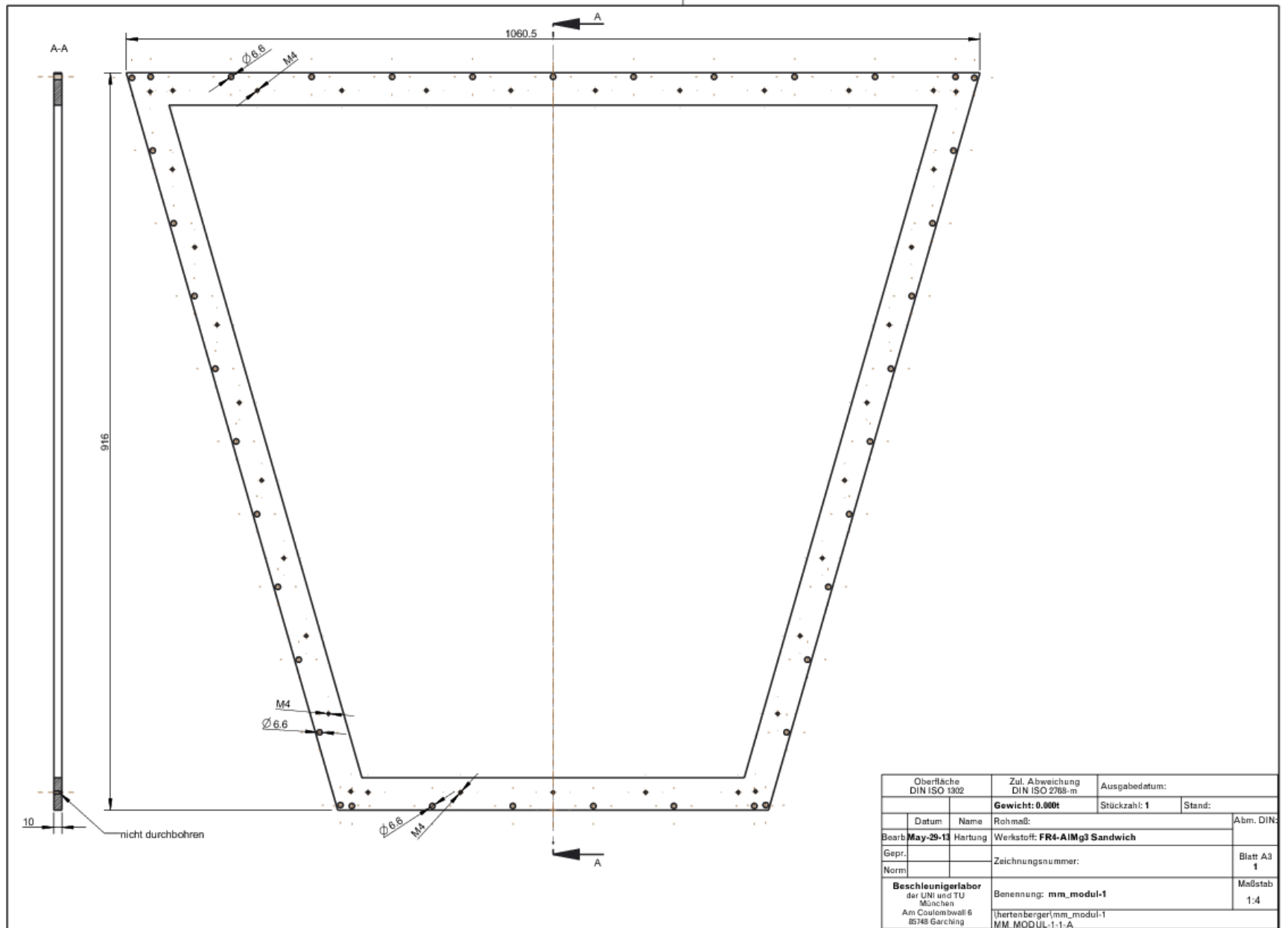
# Status of the NSW MM Mechanical Prototype M1



**Ralf Hertenberger, LS Schaile, LMU München**

General Micromegas Meeting, Cern 6. Nov. 2013

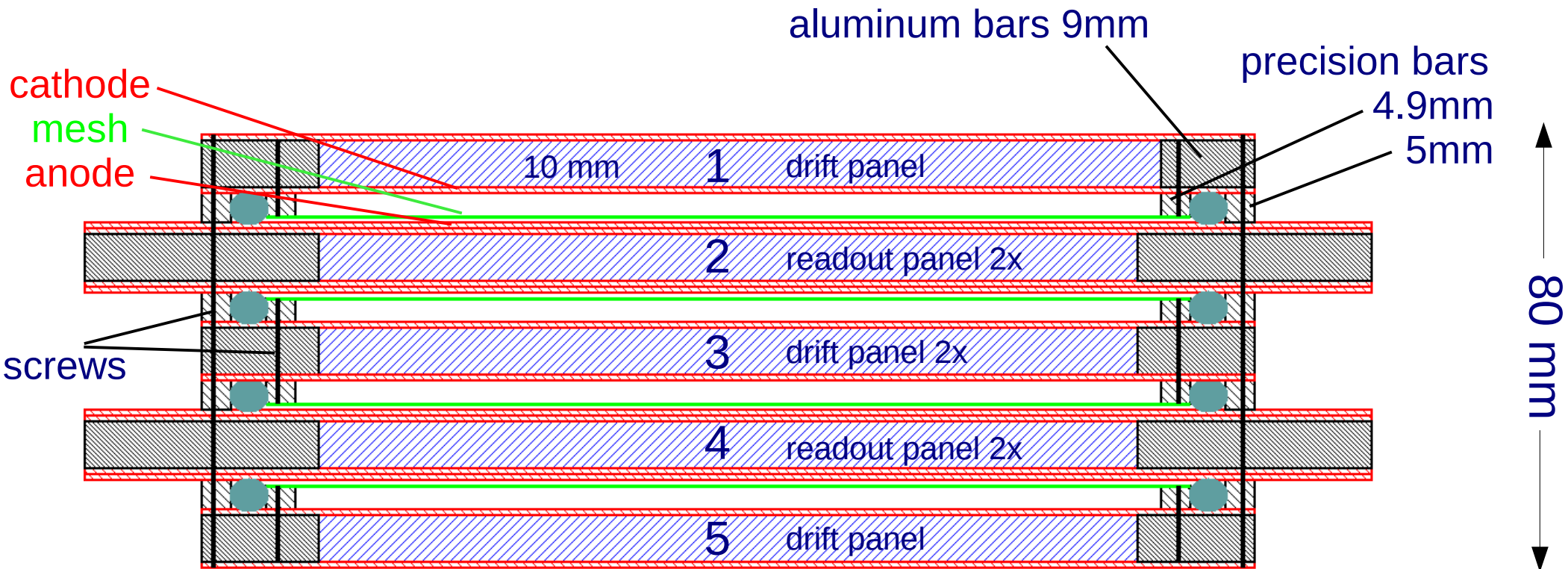
# Dimension of the M1 Mechanical Prototype



Photograph of a Drift Panel Sandwich  
1st glueing step  
for mechanical prototype 1060 x 916 mm<sup>2</sup>



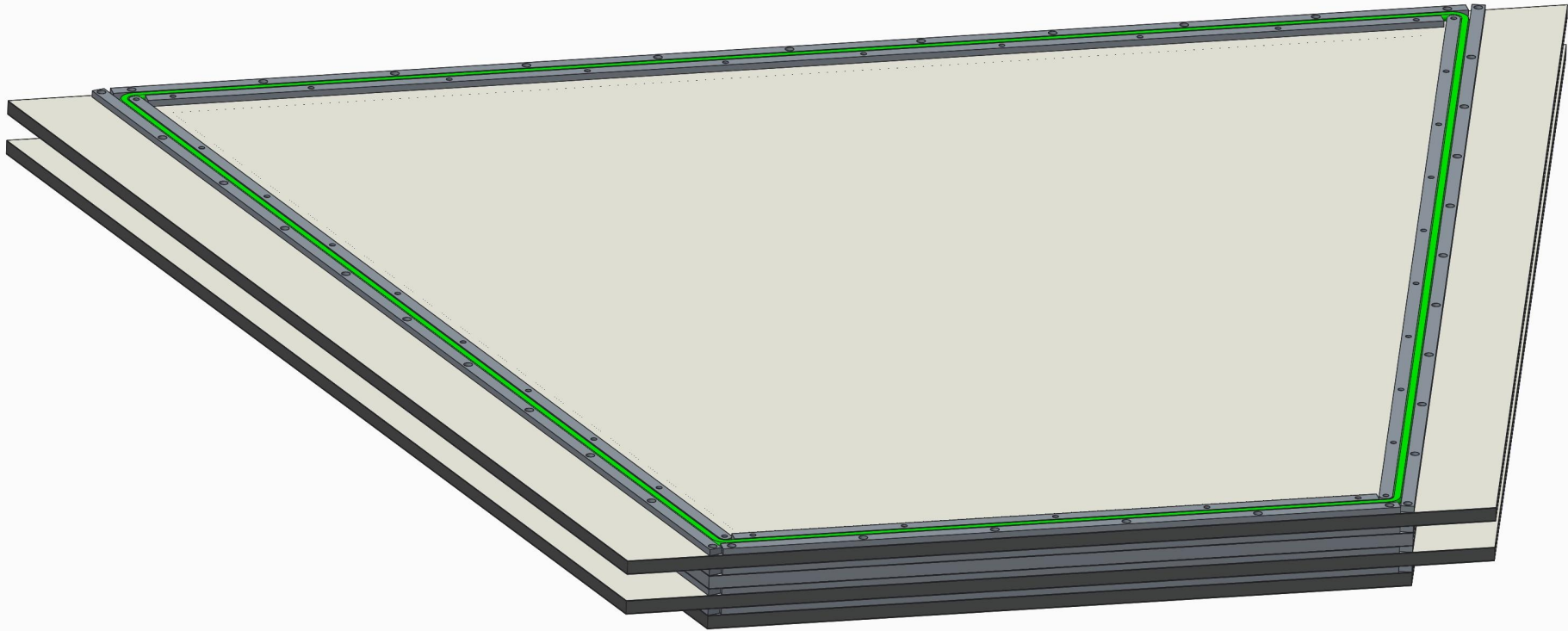
# MM Quadruplet Made of 5 Precision Sandwich Panels



planarity better **50  $\mu\text{m}$**       parallelicity better **0.1 mm**  
planarity transfer from granite table  
stiffness due to honeycomb-sandwich construction  
precision bars (Alu) define drift-space (5.0 mm)  
micro-mesh (4.9 mm)

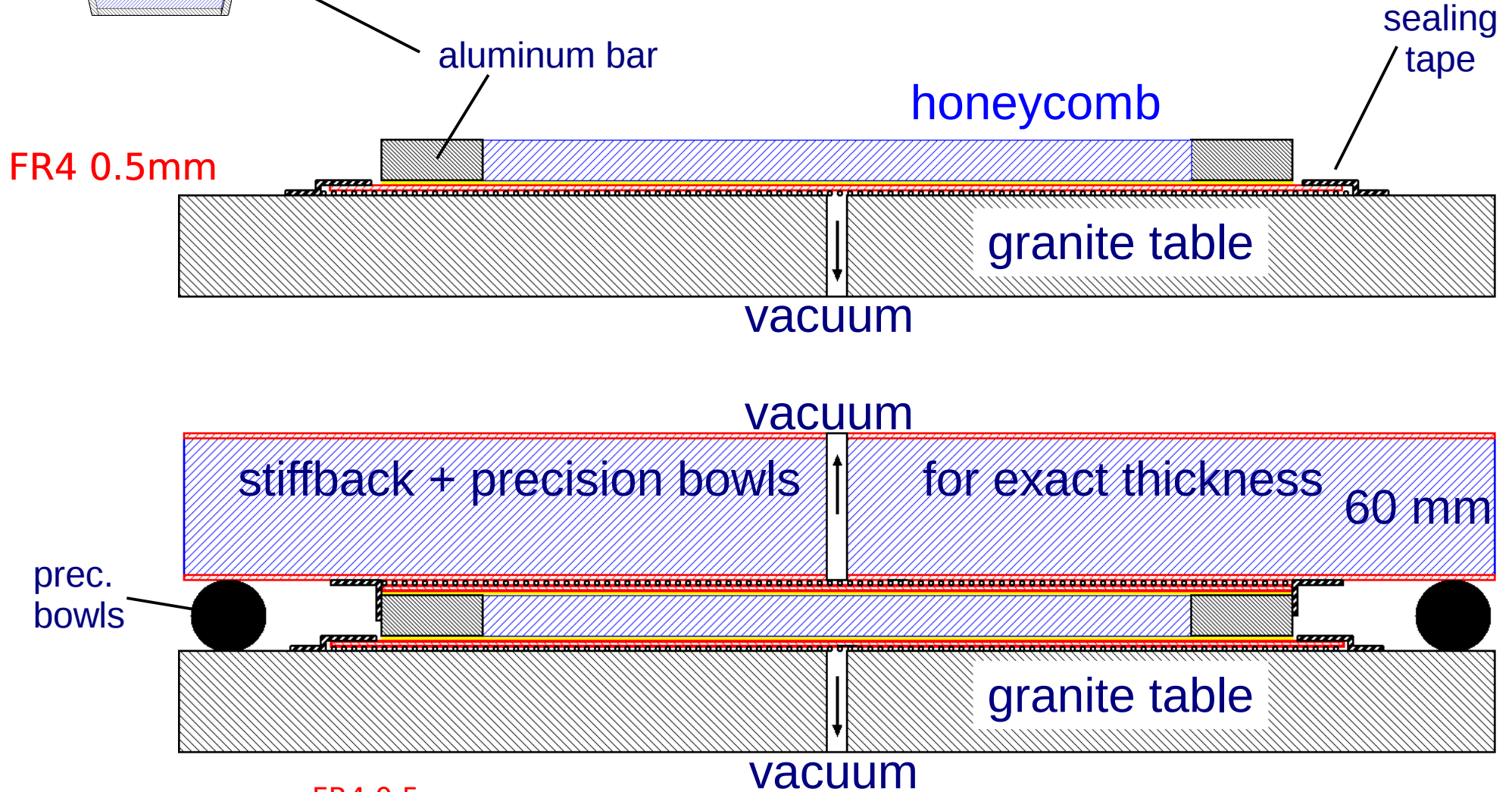
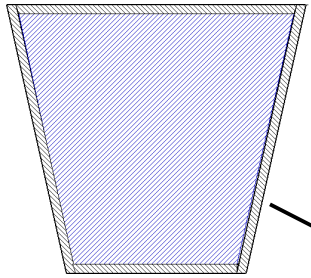





## 3D Drawing Without Upper Drift Panel



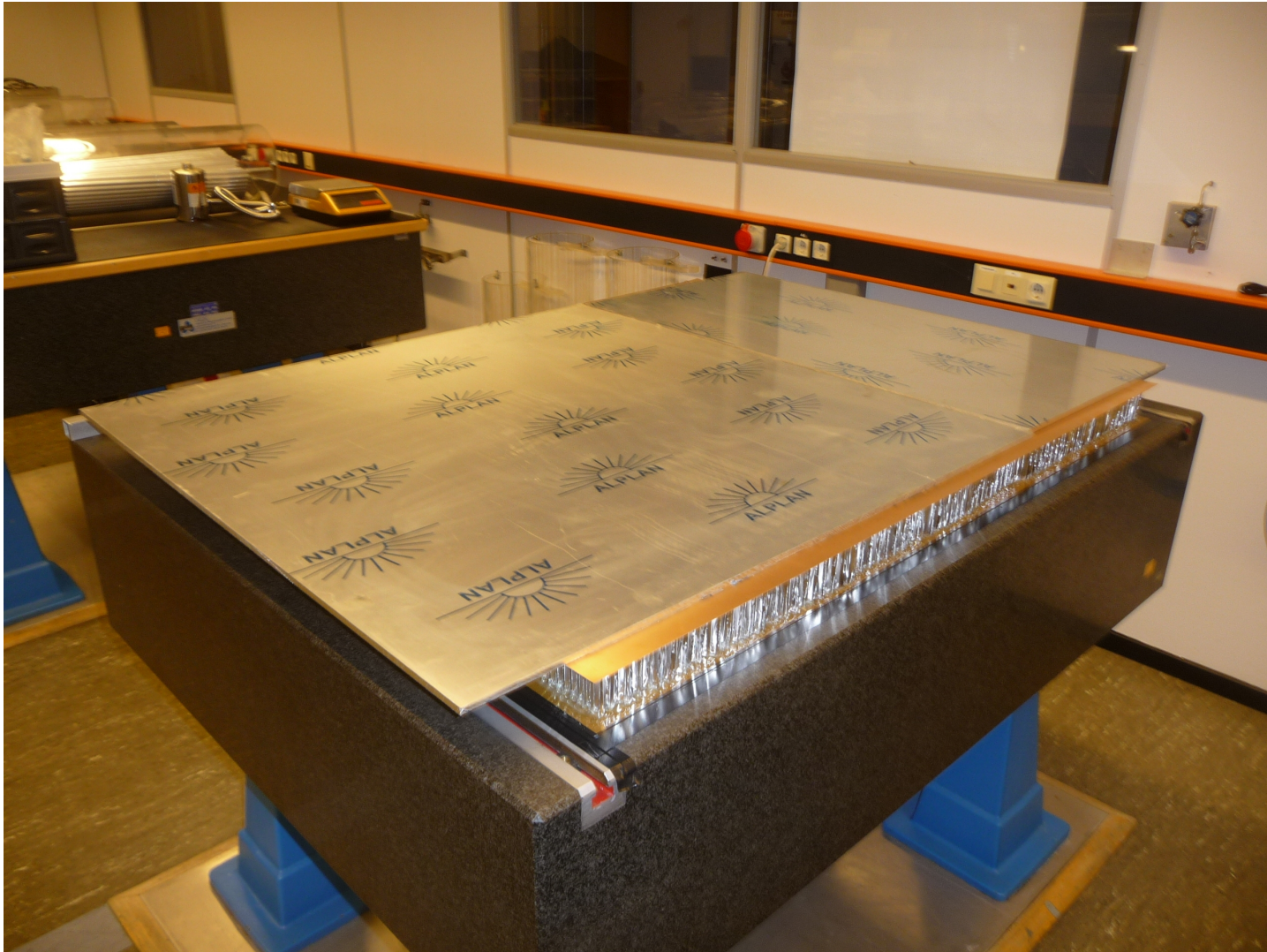
# A Precision Sandwich in 2 Glueing-Steps

( a quadruplet is built from 5 precision sandwiches )



- sealing tape  FR4 0.5mm
-  araldite
- mesh 

Stiffback is produced similarly



60 mm honeycomb  
by itself very stiff => no contact to FR4 at many positions 7



=> Honeycomb is not glued on 30 % of surface





## Much Better: Use of Vacuum Bag during 1. Glueing of 2. Stiffback



upper side of sandwich is flat after vac.bag treatment  
this results in a flat well glued surface at 2. glueing step



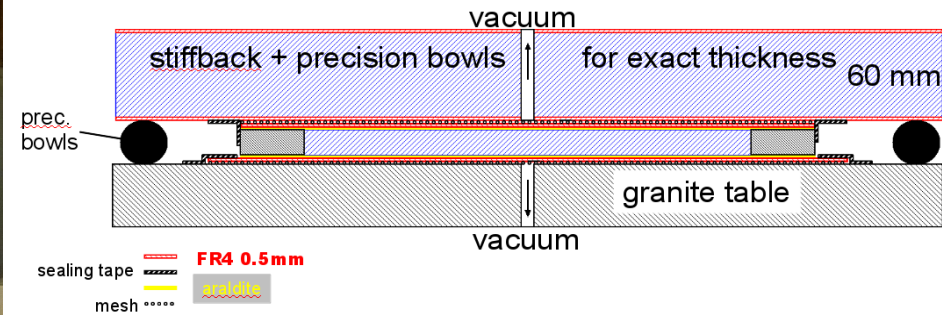
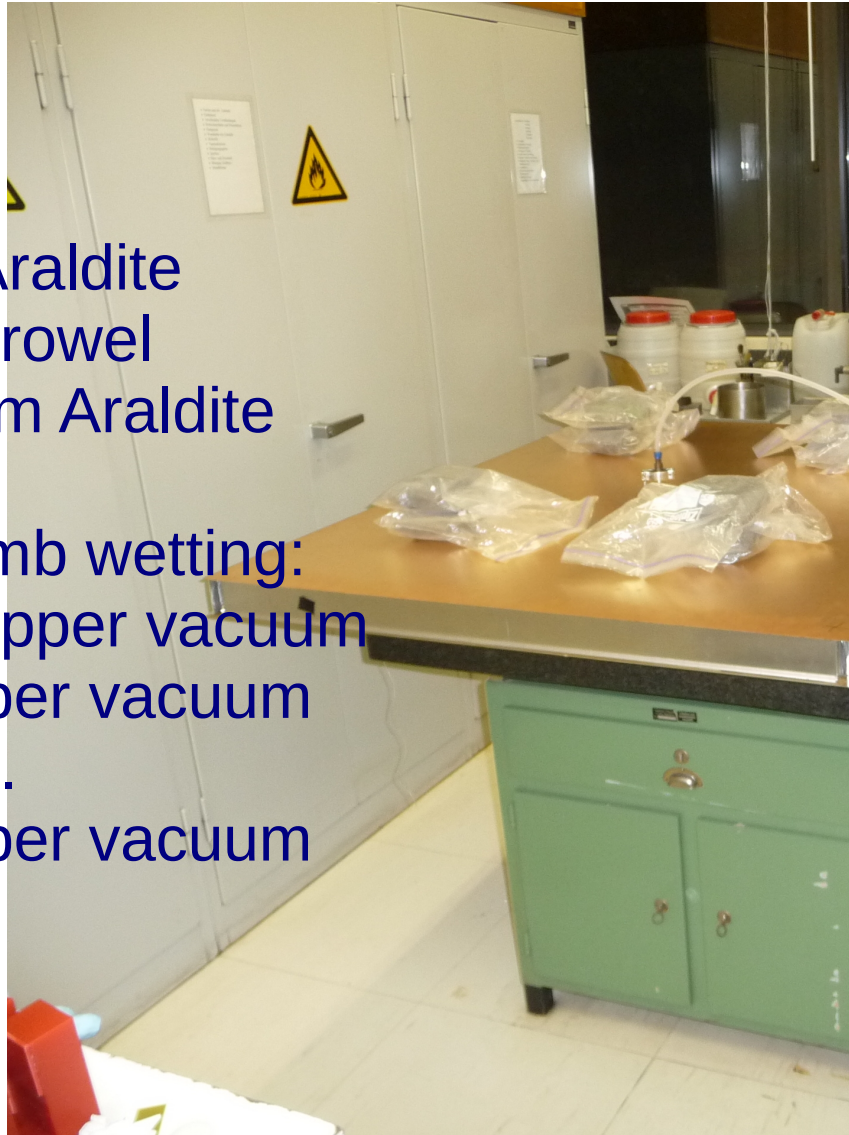








2 stiffbacks 0.5+ 6 +0.5mm produced 1268 x 1070 mm<sup>2</sup>  
one good stiffback large enough for 1060 x 916 mm<sup>2</sup>  
one medium good stiffback



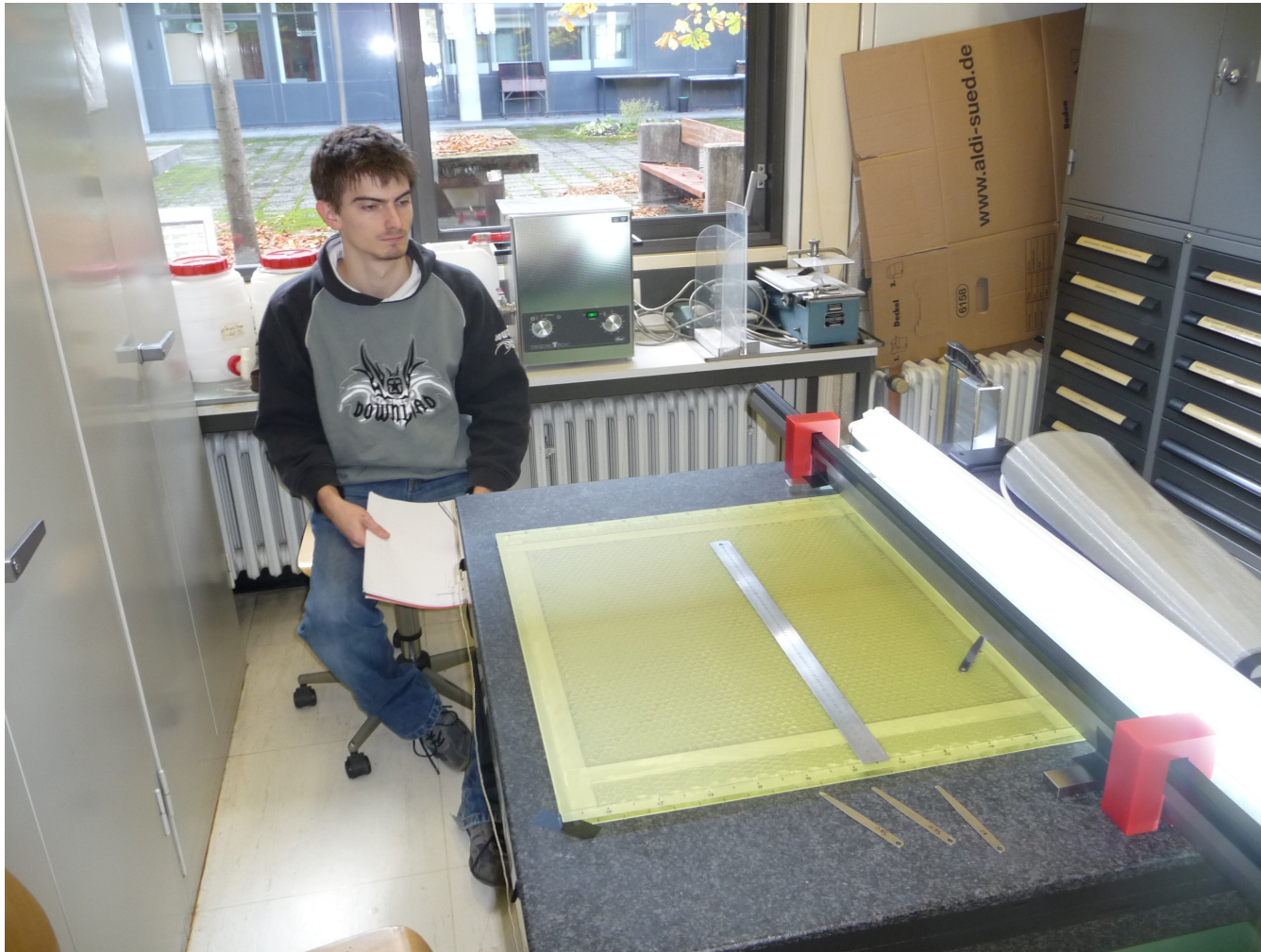
0.3 mm Araldite  
notched trowel  
=> 0.5 mm Araldite

honeycomb wetting:  
release upper vacuum  
apply upper vacuum  
release ...  
apply upper vacuum

glueing of the 2. step of the 62 x 54 cm<sup>2</sup> testsandwich

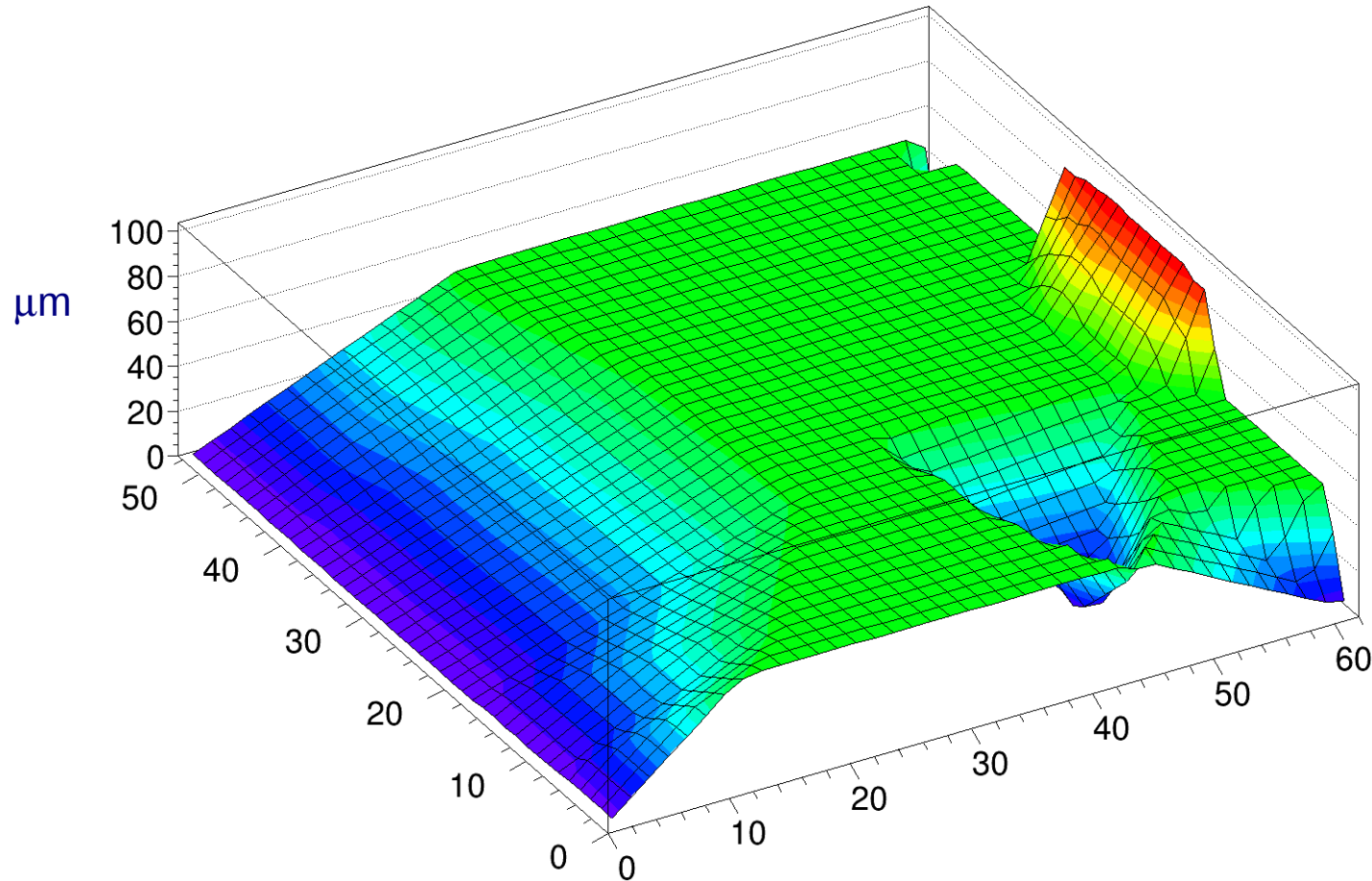


## The Planarity of the 62 x 54 cm<sup>2</sup> Testsandwich



precision ruler, 1.5m long, 11  $\mu\text{m}$   
feeler gauges  
neon tube !

# The planarity of the 62 x 54 cm<sup>2</sup> Testsandwich estimated by feeler gauge and precision ruler preliminary



only a first test, measurement modulo 50 μm  
a second sandwich was produced as well  
a more realistic measurement will follow in Freiburg  
stiffening plate for MUC floating strip detector

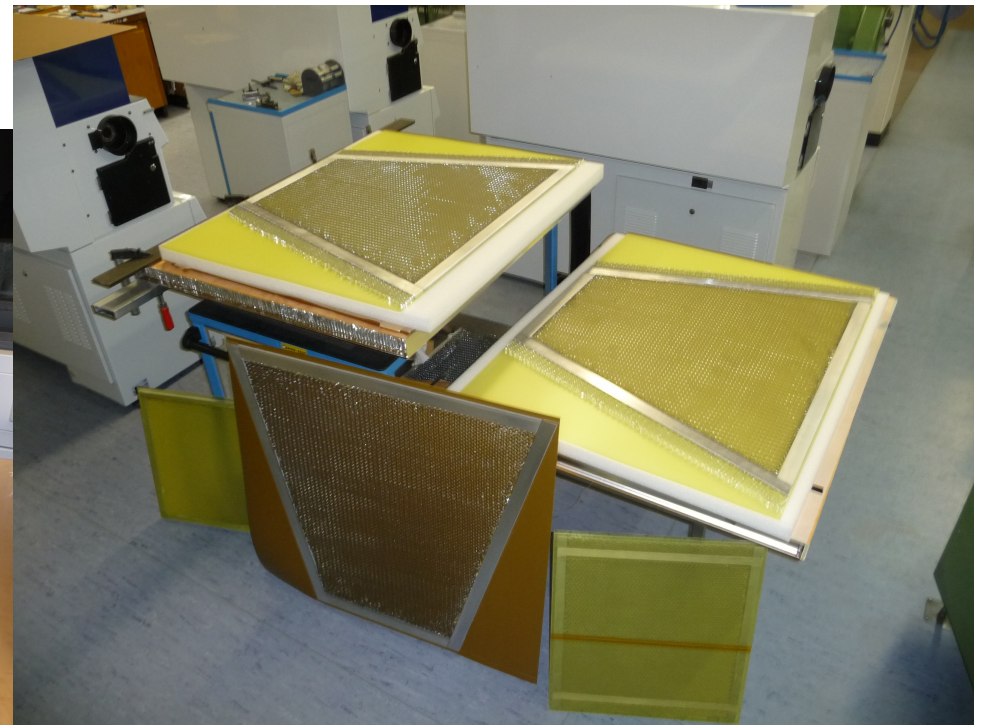
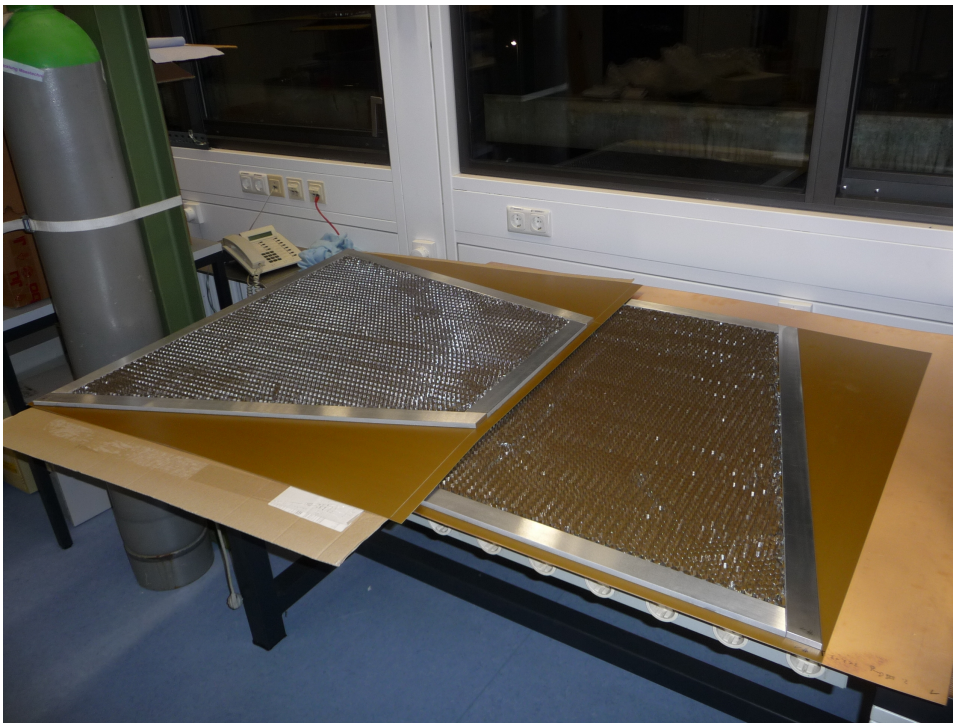


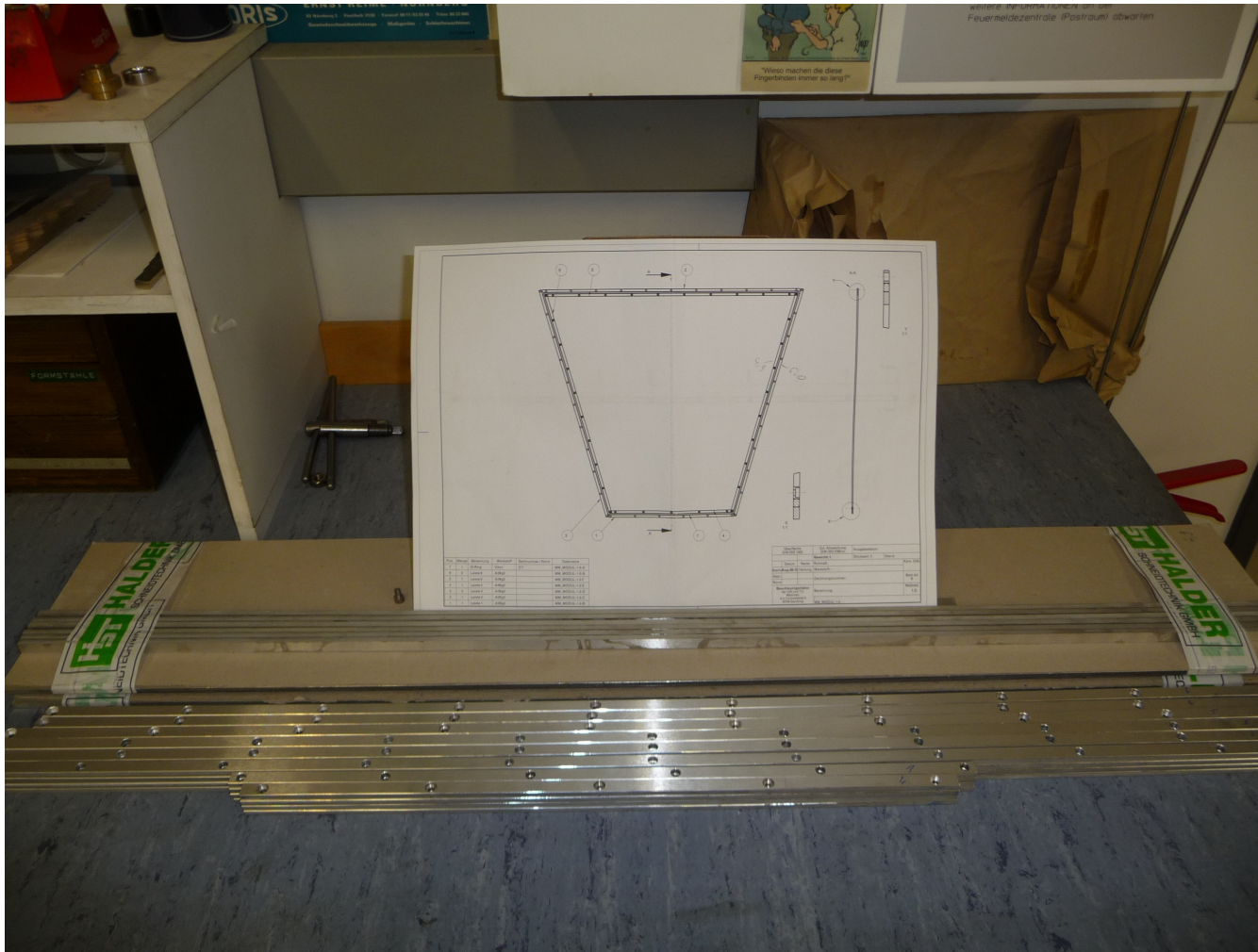
Status:

2 full sandwiches 62 x 54 cm<sup>2</sup>

3 half sandwiches 1060 / 535 x 916 cathodes for M1

2 half sandwiches 1175 / 660 x 916 “anodes” for M1  
glued on 5 successive days





all aluminum bars are machined to complete the mech. prototype  
2 stiffbacks are produced and tested  
the 5 sandwiches will be completed asap



# First Results of L1 MM ( 1m<sup>2</sup>) in MUC CRF

additional scintillators on top of micromegas

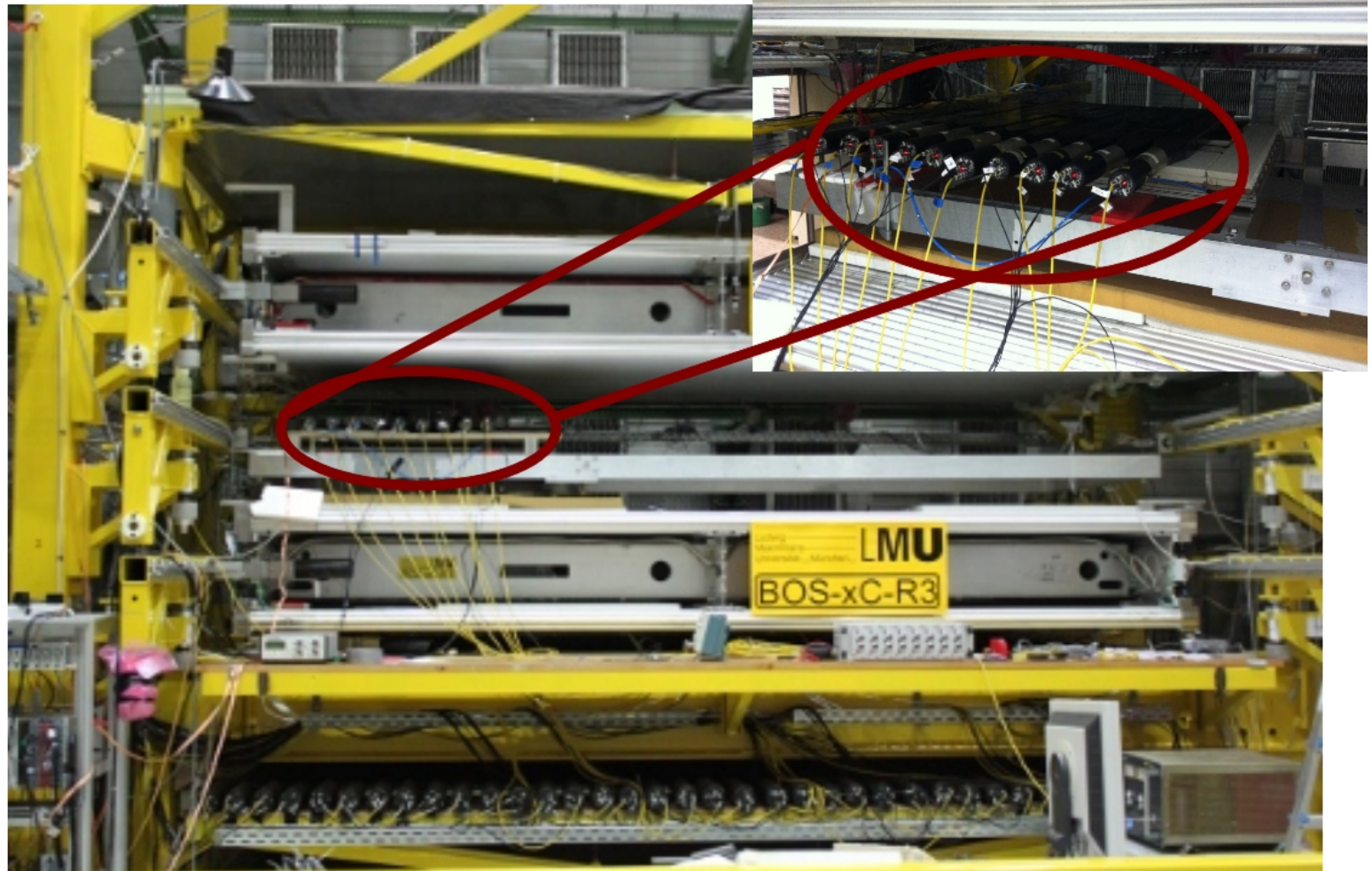
hodoscope trigger

BOS upper ref.

micromegas

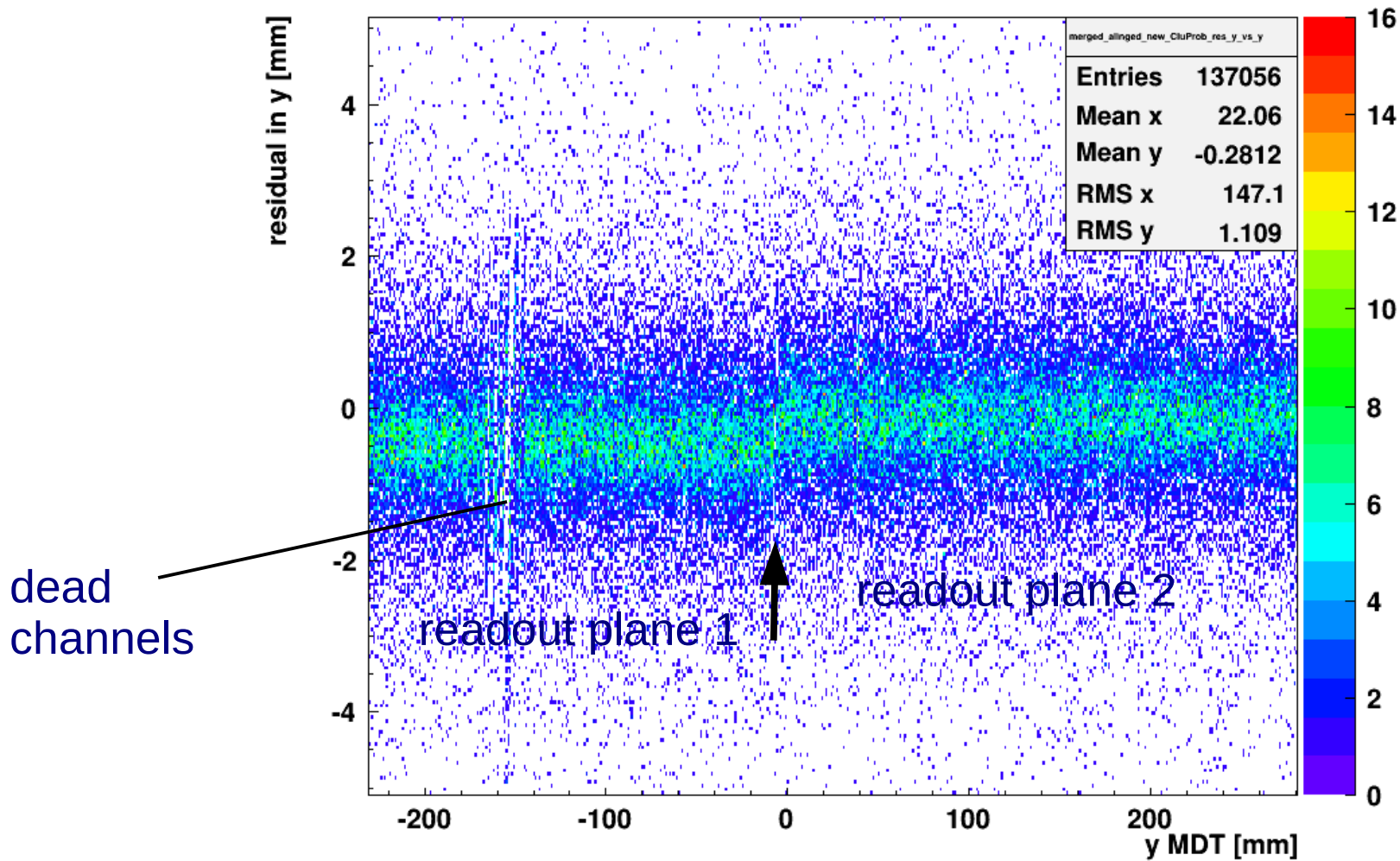
BOS lower ref.

hodoscope trigger



# Correlation Between MDT and MM Data ( SRU works )

res\_y\_vs\_y

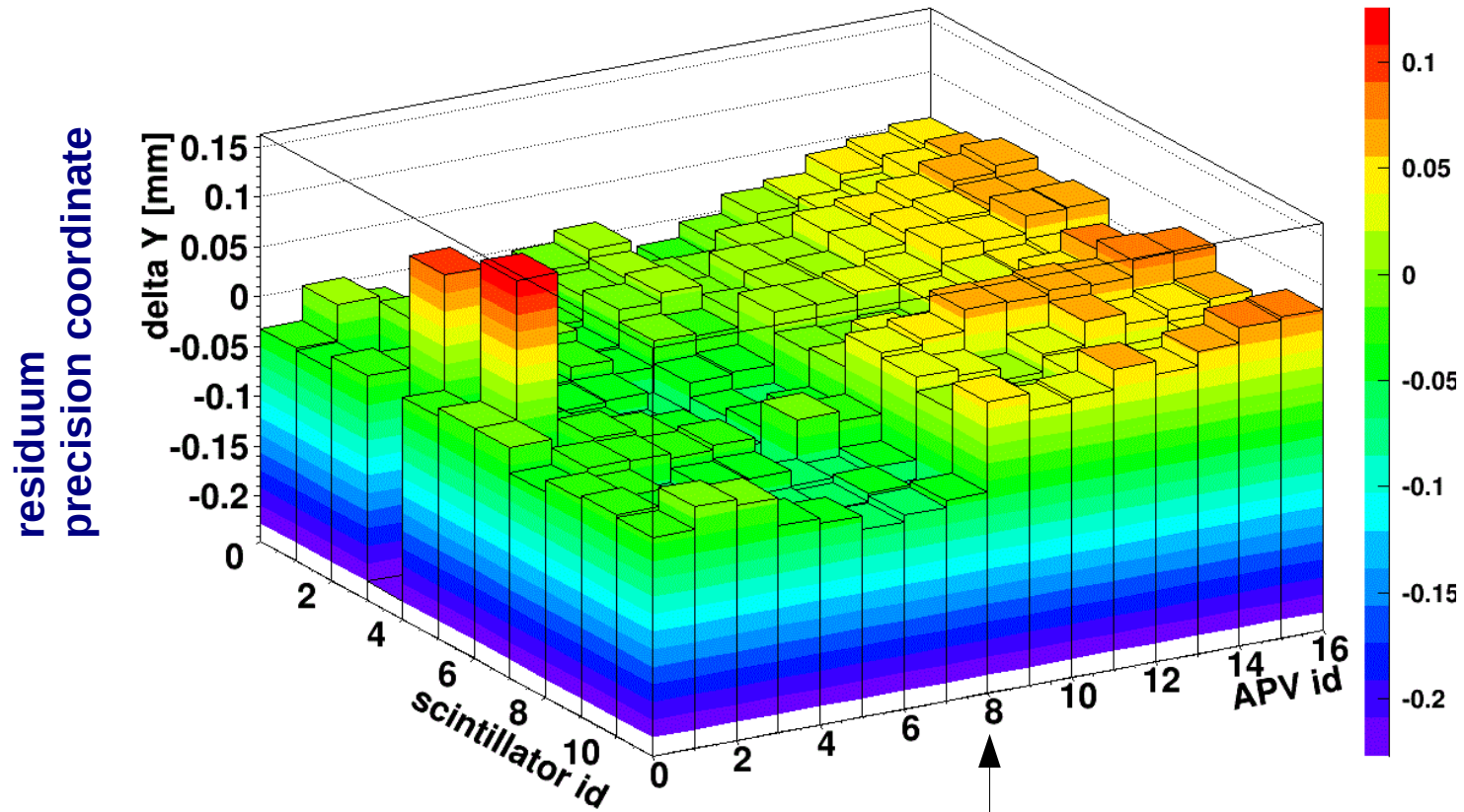


2.5 days  
of data

Drawn at: 2013-08-30 17:43:29

step of 0.3 mm between the two readout boards

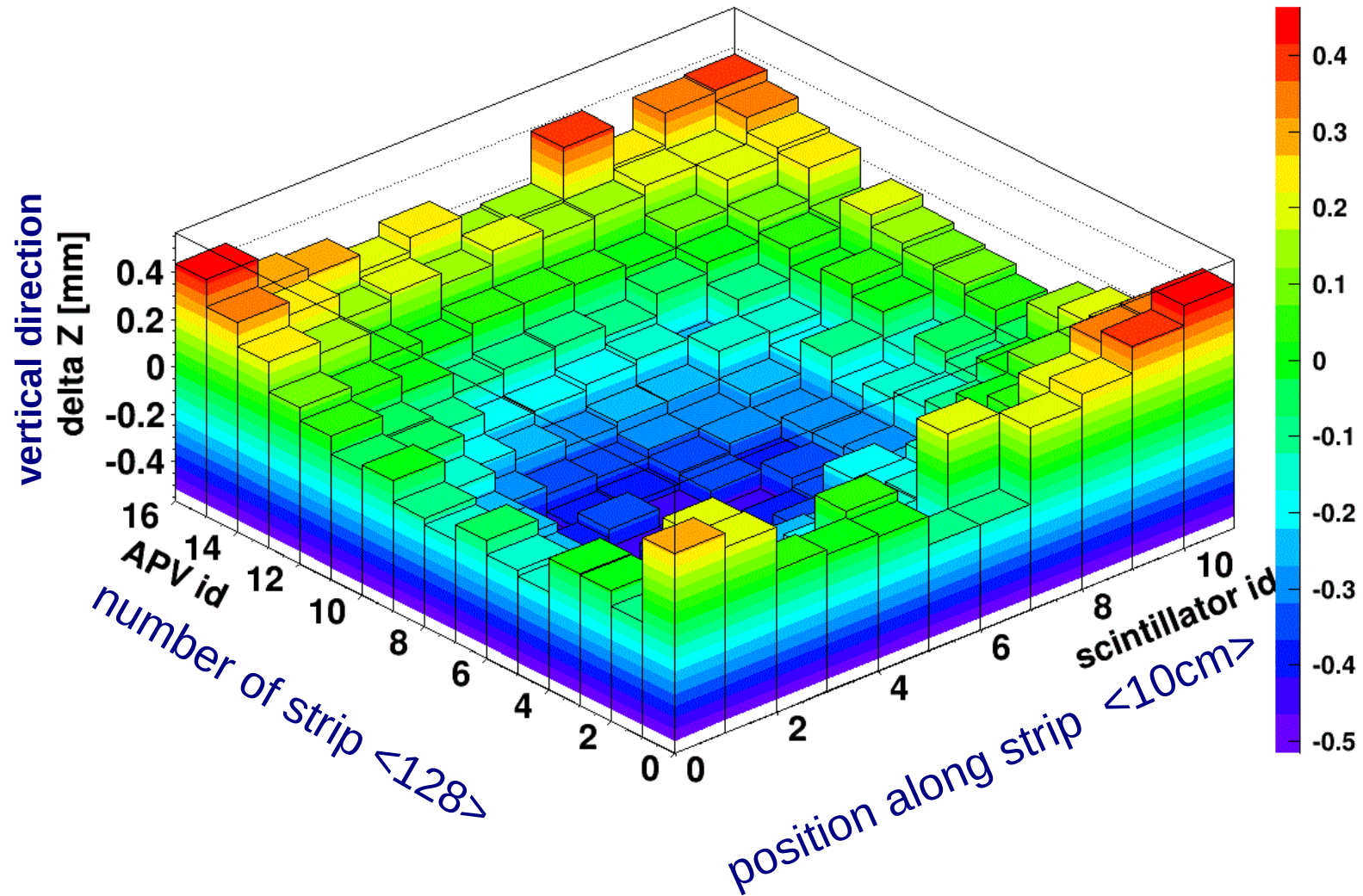
# preliminary analysis of the “anode plane”



inclination of both ro-planes  
against each other



## Sag of MM L1



analysis is ongoing

goal: determine deformations of single (or groups of) strips