



QUAD status

New testbox

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NIKHEF

Nikhef/Bonn LepCol meeting
September 3, 2018

Brief examination new InGrids

- Received August 7
 - 30 chips class A
 - 16 chips class K, R, F for testing, dummies etc
- Some grids look bit messy
- Occasional delamination of part the broad dyke at the wirebond side



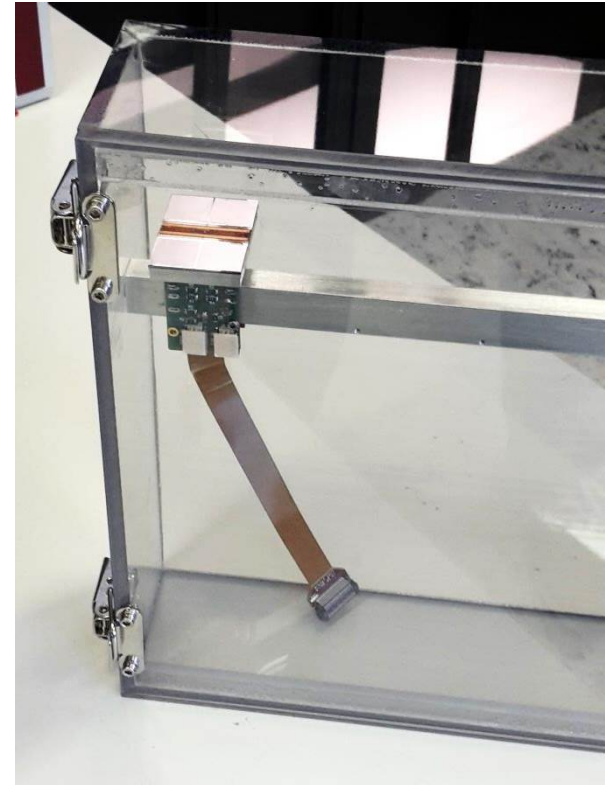
Under the microscope

- Grids look under the microscope even better than on photographs
 - Irregularities seen on the photographs originate from minor delaminations from the pillars
 - Height deviations 5 – 7 μm
 - => only limited effect on gas gain
- **Conclusion: as far as can be seen from the first superficial inspection all class A and B chips can be used**



Status QUAD production

- Delay because of movement to another cleanroom (H070)
 - Vacuum, compressed air, internet to the assembly PC
- QUAD 10 (damaged flex) will be used to make demo using class K,R, .. Chips
- QUAD 11
 - Mostly done
 - Leak tight (< 1 ml/min)
 - Low O₂ diffusion (< 30 nl/min)
 - Ref: at the present laser chamber we have $27 \mu\text{l/min}$
- QUAD 12
 - Being assembled
- QUAD 13
 - Assembly started



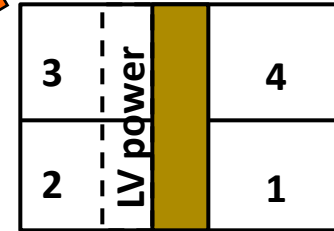
Assembly sheet QUAD 11

Task	Date done	Comment
Read PCB ID	30-8-2018	18024300000006
Remove notch of LV connector	20-8-2018	
Attach ID labels	29-8-2018	
Close guard holes and make M1.2 thread	23-8-2018	
Measure COCA dimensions	28-8-2018	39.584; 28.388
Machine wirebond PCB to size	22-8-2018	
Assemble QUAD mechanics	20-8-2018	
Remove glue traces, mount HV wires	22-8-2018	
Make QUAD gastight	23-8-2018	
Check gas-tightness (and O2 leak)	27-8-2018	< 1ml/min; < 5 ppM@6 ml/min
Mount thermal tape	30-8-2018	
Align chips	30-8-2018	1: W23-G9 2: W23 J9 3: W23G10 4: W23 K6
Position verification	31-8-2018	
Wire bonding		
Electrical test		
Glue HV wires (Traduct)		
Glue HV wires (araldite)		
HV test in air		

■ (nominal COCA dimensions: 39.600; 28.380)

Alignment errors QUAD 11

*OUAD origin
for chips 2 and 3*



Orientation in QUAD

- Chip 3 (X, Y)
 - 0.021 0.011 First pad
 - 0.012 0.017 Last pad

- Chip 2
 - 0.003 0.018
 - 0.007 0.022

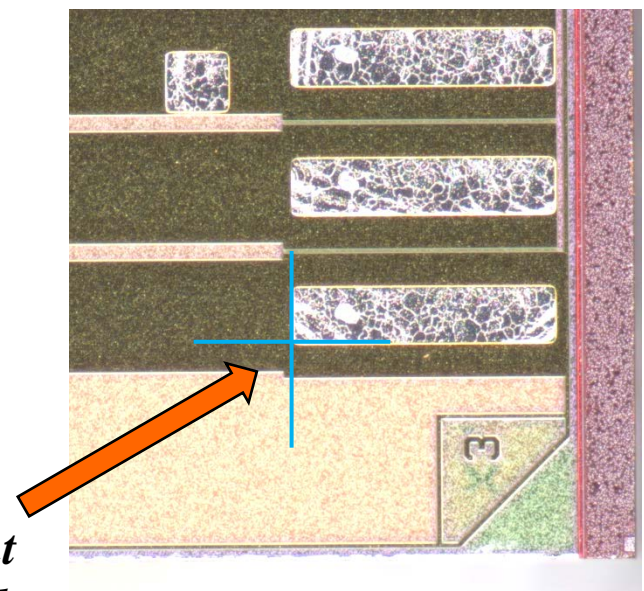
- Chip 1
 - 0.020 -0.003
 - 0.007 0.002

- Chip 4
 - 0.008 0.005
 - 0.003 0.008

*OUAD replaced
in alignment jig*

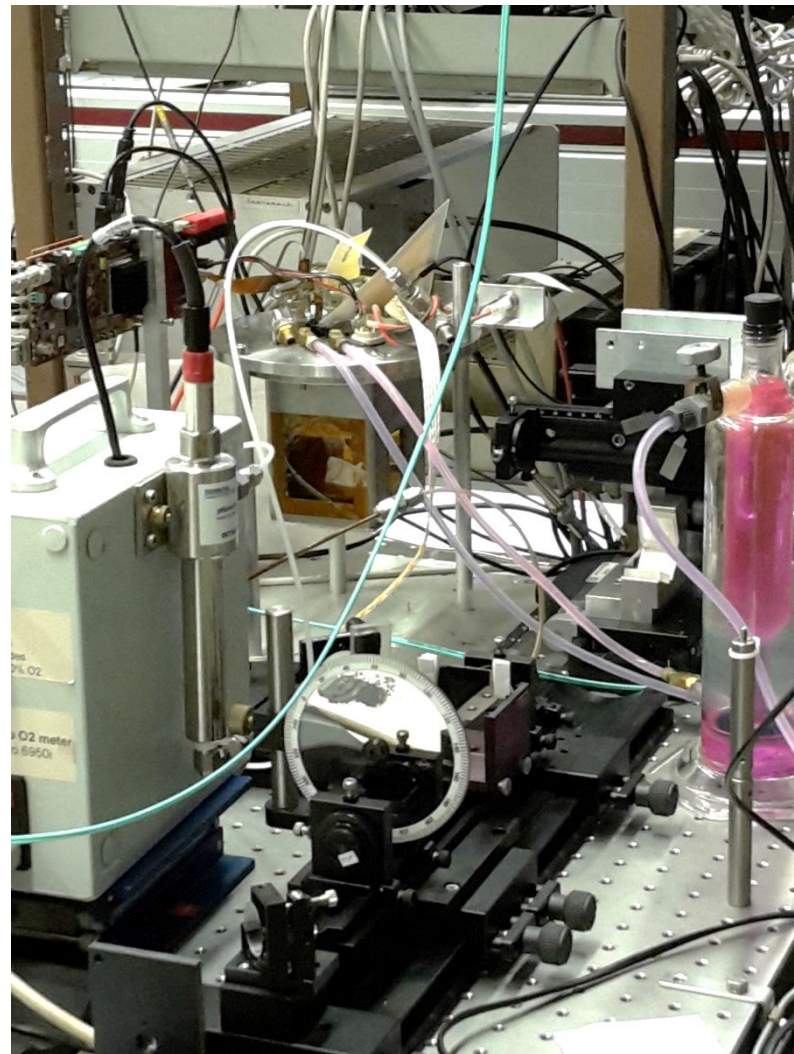
*Immediately
after alignment*

*Reference point
1st bonding pad*

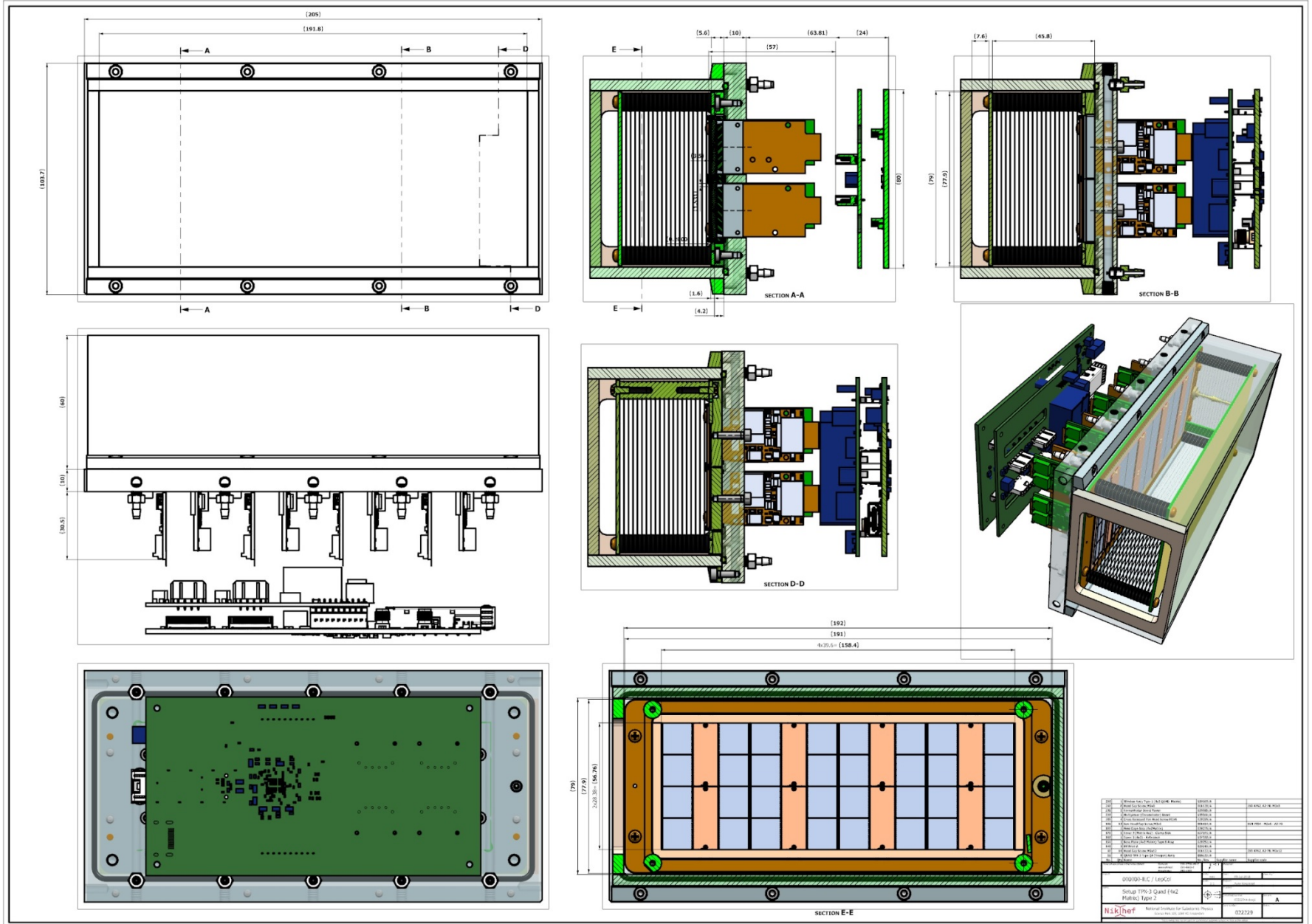


Laser setup single QUAD

- Still operational
- Occasional data taking
 - Kees L
 - Naomi?
- Problem: O₂ and moisture diffusion
 - O₂ diffusion ~ 1600 ppM @ 16.7 ml/min
 - Scales inverse proportional with flow
 - => 27 μ l/min
 - Cause not understood (flex feed through?)
- May be cleaned with O₂ filter
 - 150 ml capacity
 - => 93 h running @ ~ €180
- Moisture diffusion
 - 65% => 27% RH (~ 6000 ppM)
 - Affects drift velocity



Design 2 x 4 testbox ready

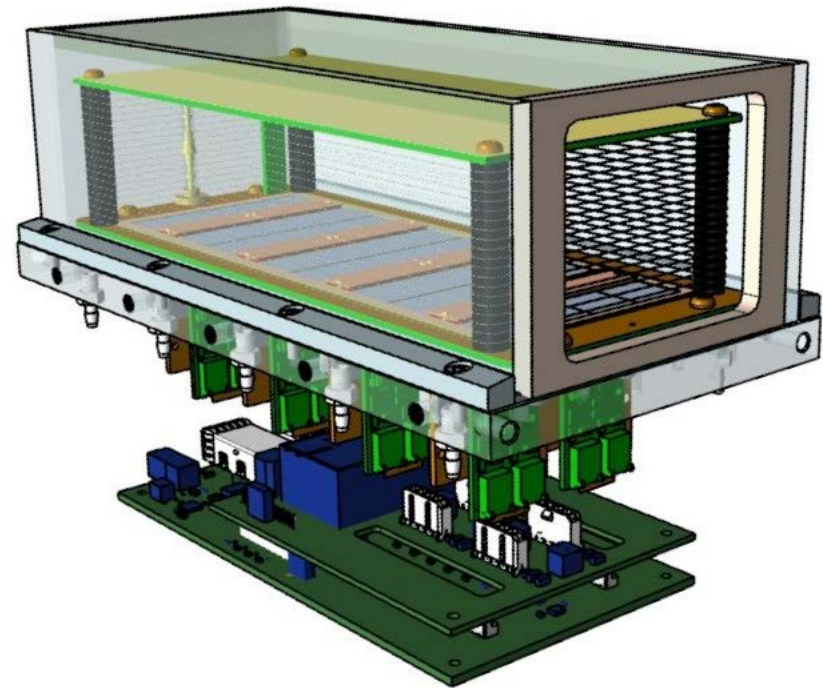


Rev	Description	Date	By	Appr
01	Initial Release for Review	2010-09-15	...	...
02	Design Changes	2010-09-15	...	...
03	Final Design	2010-09-15	...	...
04	Production Release	2010-09-15	...	...

010001-01-C / 1 (RSC)	...	...
Setup: TPC-3 Quad 1Hz	...	...
Part: IC Type 2	...	...
		032223

Testbox in production

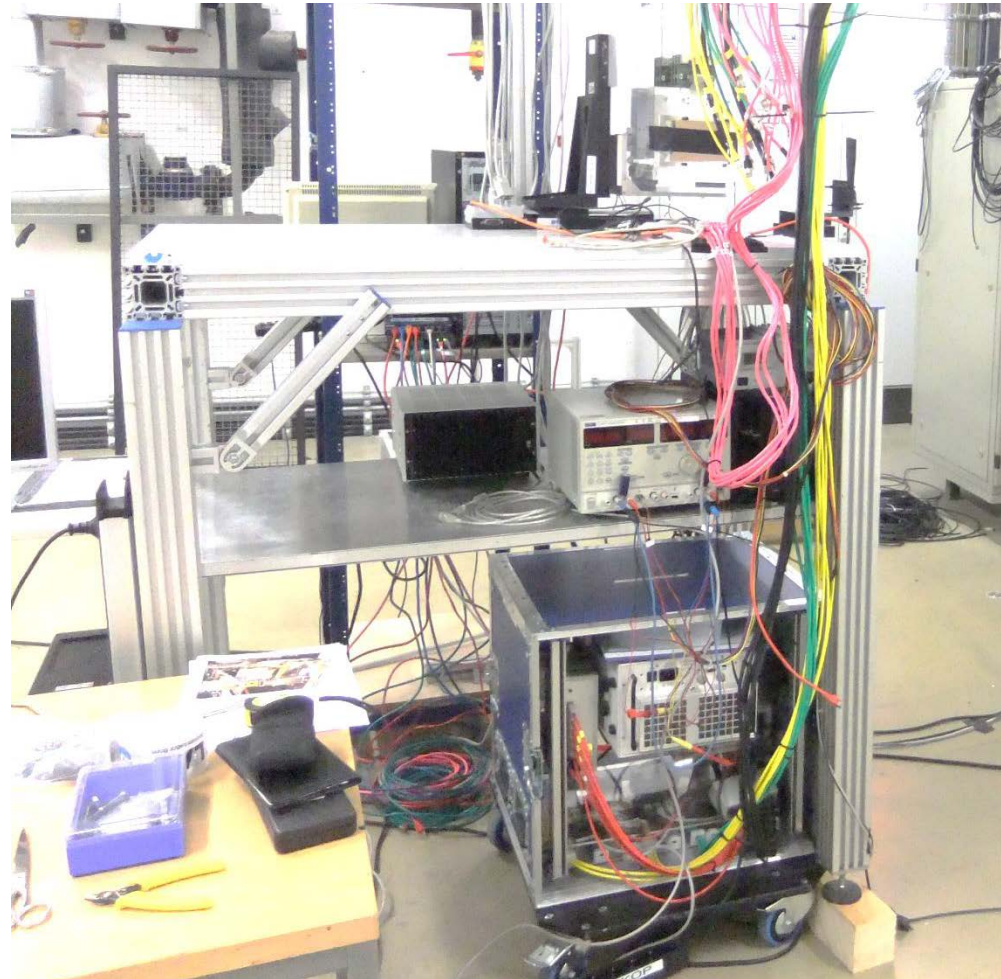
- Mechanics ready ~ mid September
- Glass plates ordered
 - Expected mid October
- Power board for concentrator ordered??



Bonn testbeam

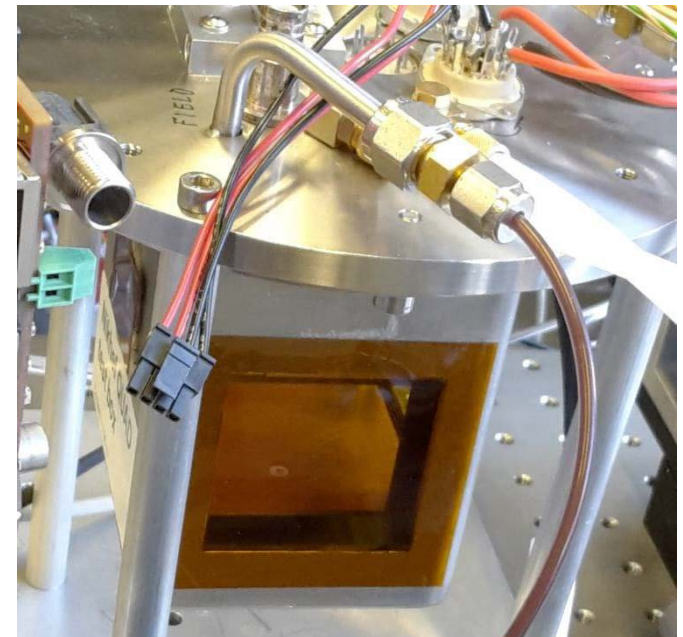
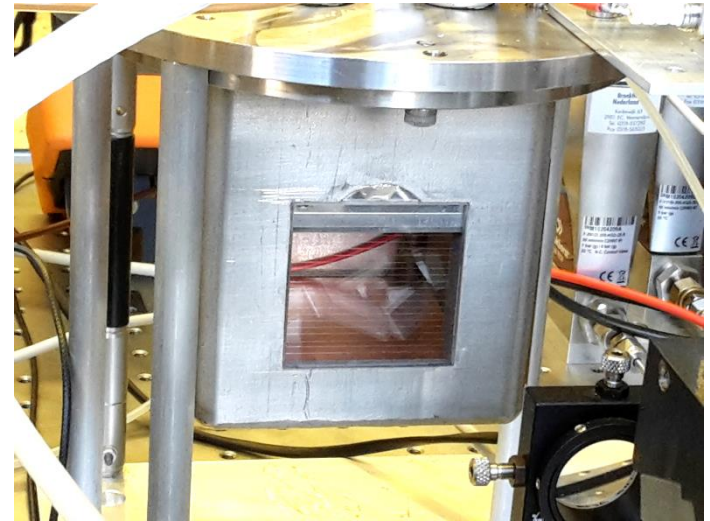
Preliminary time schedule

- Preparation
 - September 17 start making model setup at Nikhef
 - September 26 start packing
- October 2 (Tuesday) travel to Bonn, unloading
- October 3 installation
 - Access??
- October 4 – 6 (Thursday – Saturday) data taking
- October 7 (Sunday) loading car, travel home



Testbeam issues

- Do we need a refreshment of the safety course?
 - Last one was in June 2017
 - Peter needs a full safety course
- How about planned access periods?
- Are there other experiments installed on the same experimental table?
- Are we the main user?
- Can we integrate our detector with the Mimosa telescope?
- Fred will travel one day in advance to Bonn to inspect the area
 - Preference September 17 - 23



Testbeam issues (ctnd)

- Adjusting the detector in the beam
 - 17.8 cm above table plane
- Which degrees of freedom do we want?
 - X, Z
 - Remote, no accuracy
 - Horizontal rotation
 - (Too) small rotary table
 - Remote, bit wobbly
 - Vertical rotation
 - Goniometer

■ Participants

- Fred
- Gerhard?
- Harry?
- Jan
- Kees
- Kevin?
- Peter
- People from Bonn?

