

Test bench of aluflex cables

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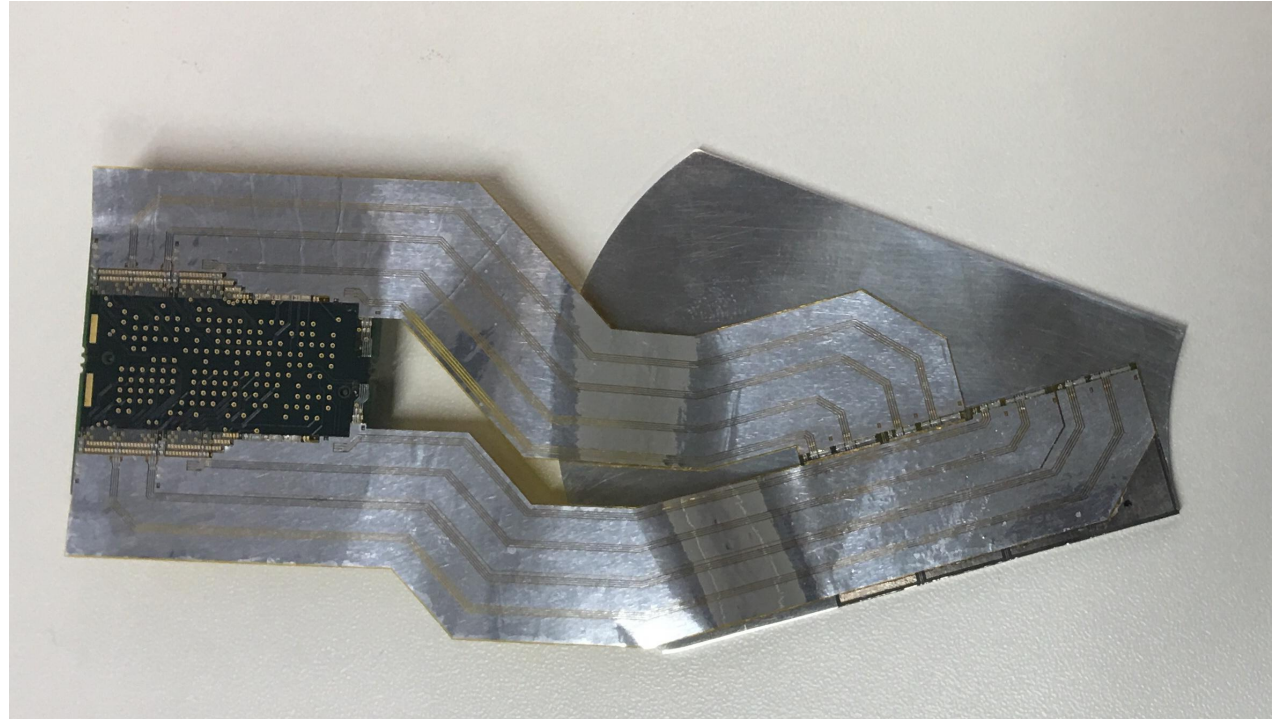


Me

- Bachelor student at JGU (→ Institut für Kernphysik)
- Group: SPECIF (Prof. Dr. A. Denig, Supervisor: Dr. C. Motzko)
- Email: jpeter02@students.uni-mainz.de
- Office at HIM: 03-131

The aluflex cable

- at the moment only one cable at HIM (5 expected)
- Manufacturer: LTU

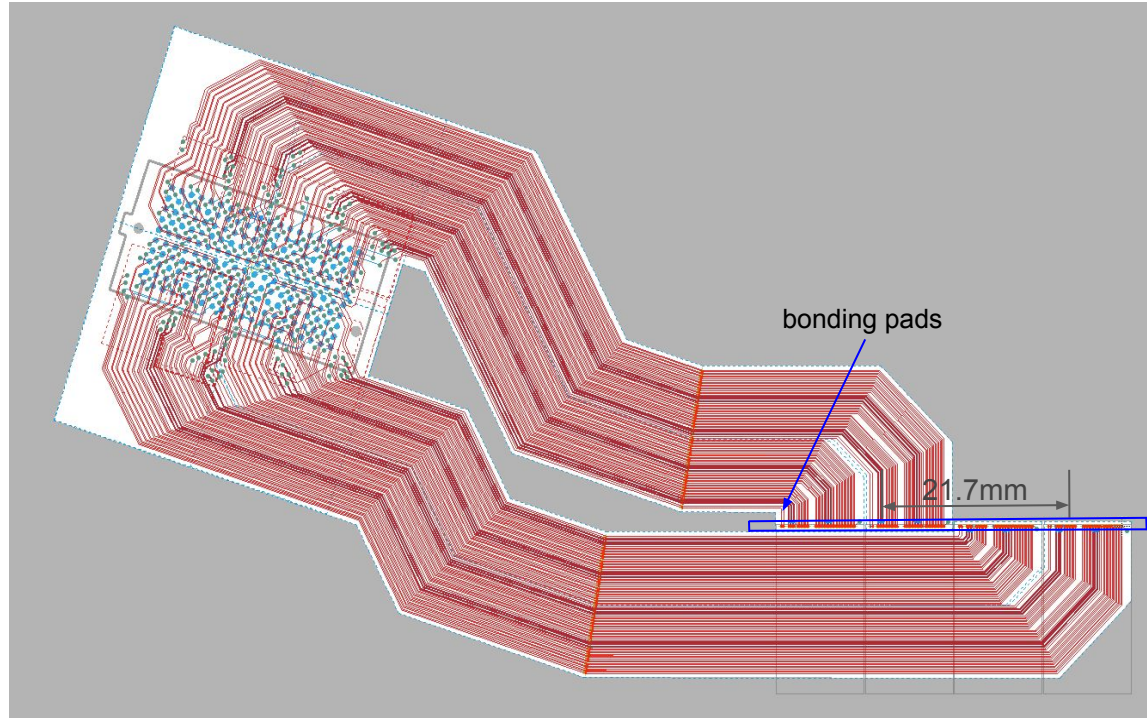


The aluflex cable

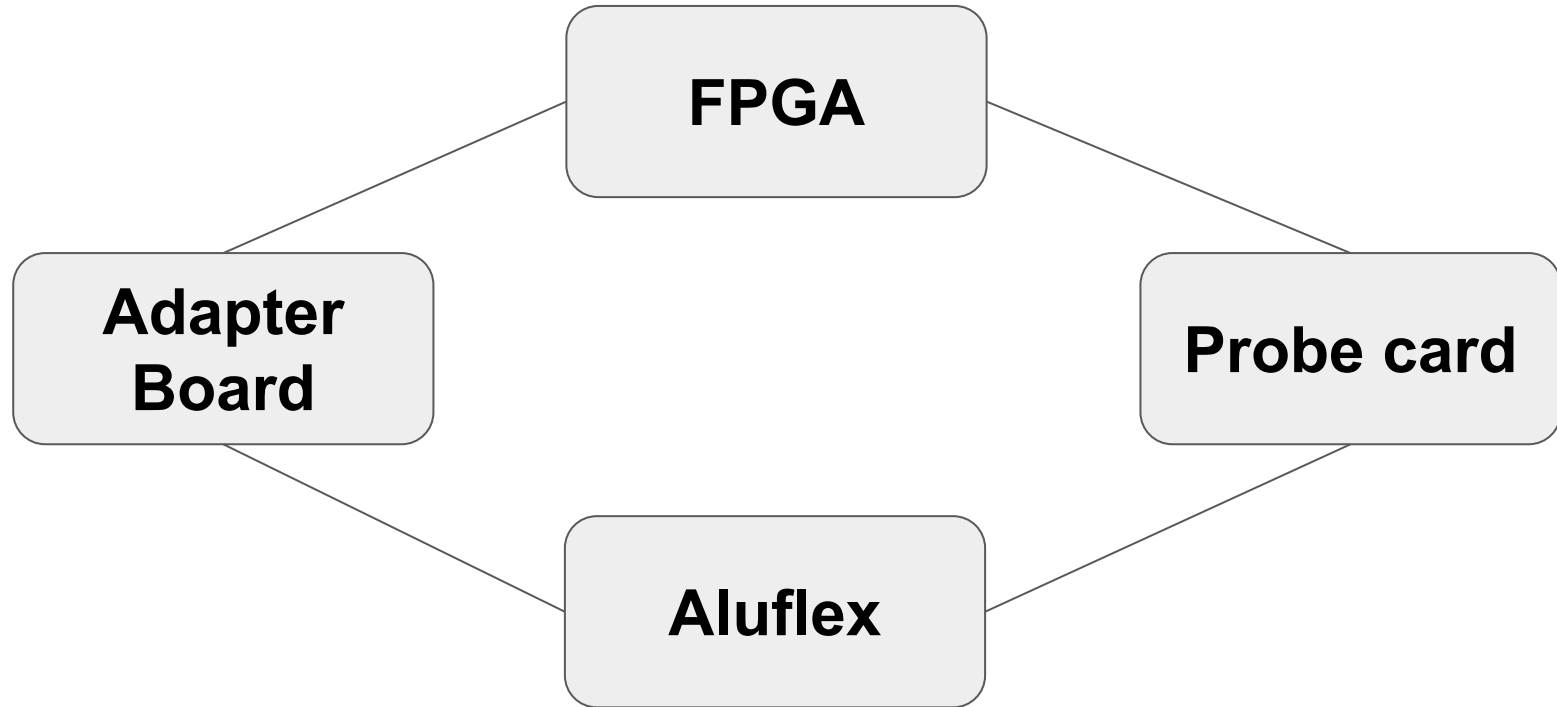
- 4 MuPix8 sensors
- 50 pins per sensor
- pad size = $80\mu\text{m}$
- min. pad distance = $70\mu\text{m}$

→ precise test bench!

- 7 LVDS pairs per sensor for high data transfer
- HV, LV for power supply
- Single line traces for control

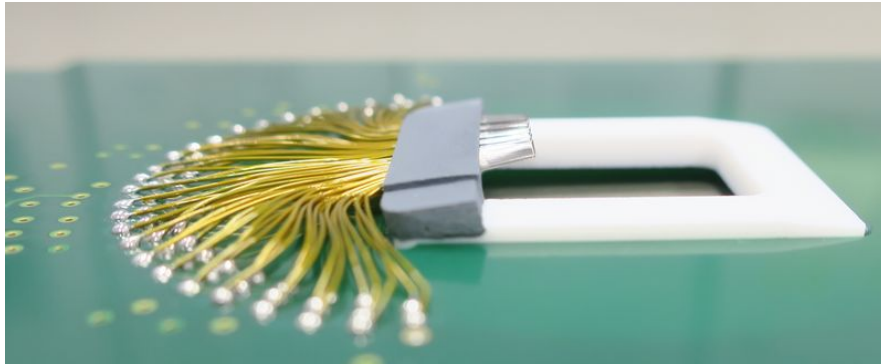


Test bench schematic

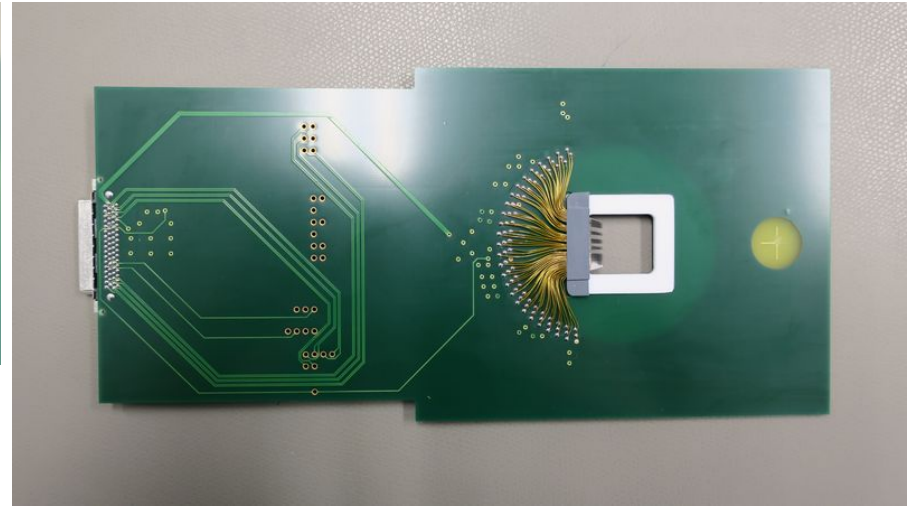


The probe card

Exemplary pictures of a probe card



- interface between an electronic test system and device to be tested
- price about 4.5k€
- **Problem:** How to precisely connect the probe card with the aluflex cable?

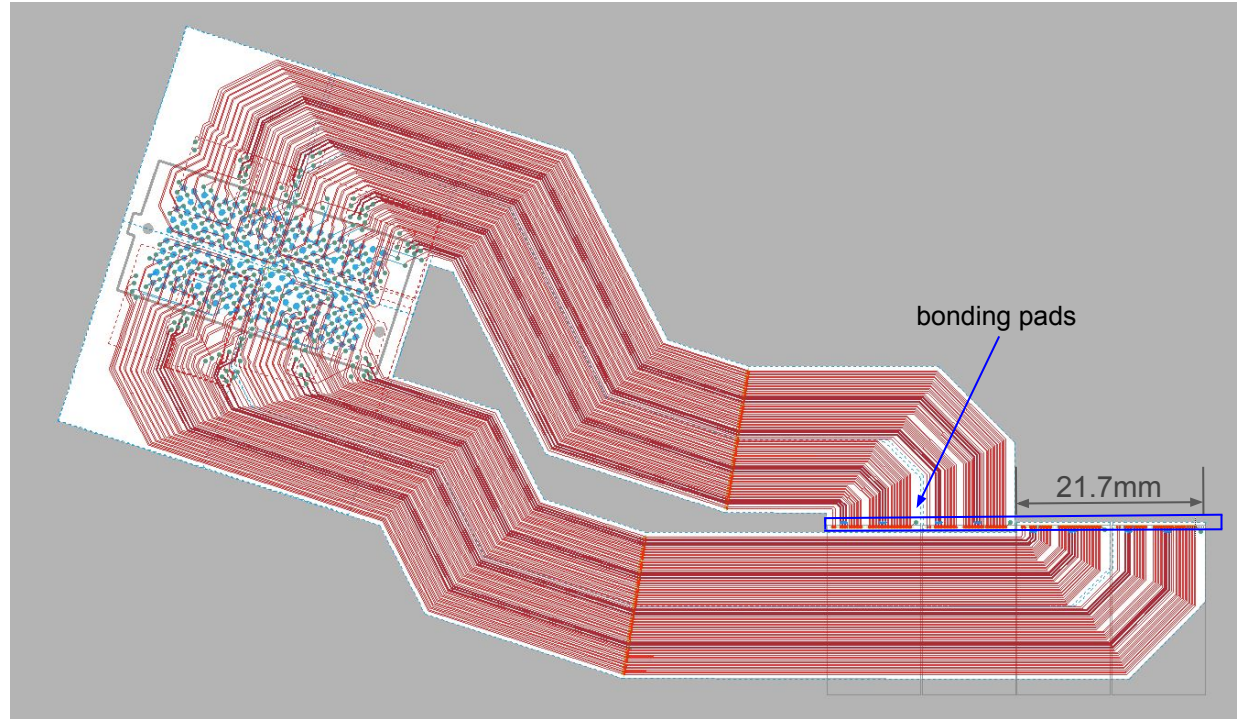


Source: T.I.P.S. Messtechnik GmbH, www.tips.co.at

The aluflex cable

- cable halves are independently movable

➔ contact only one half of the cable at the same time for better precision



Positioning elements

precise connection can be achieved with micrometer stages

- X-Y Positioning Stage
- 360° Rotary Stage
- Vertical Translational Stage



Source: www.edmundoptics.com

positioning elements will be screwed on solid, stable metal plane

To ensure successful connection to the cable a USB microscope will be used

Problem: How to fix the cable onto the positioning stage?



Source: <http://www.veho-us.com>

Vacuum clamping table

Custom-made vacuum clamping table
made by 3D-printer at HIM

- carefully fixes the cable
- easy on-/off-fixation

final layout does not exist yet

Exemplary Vacuum table



Source: www.datron.de

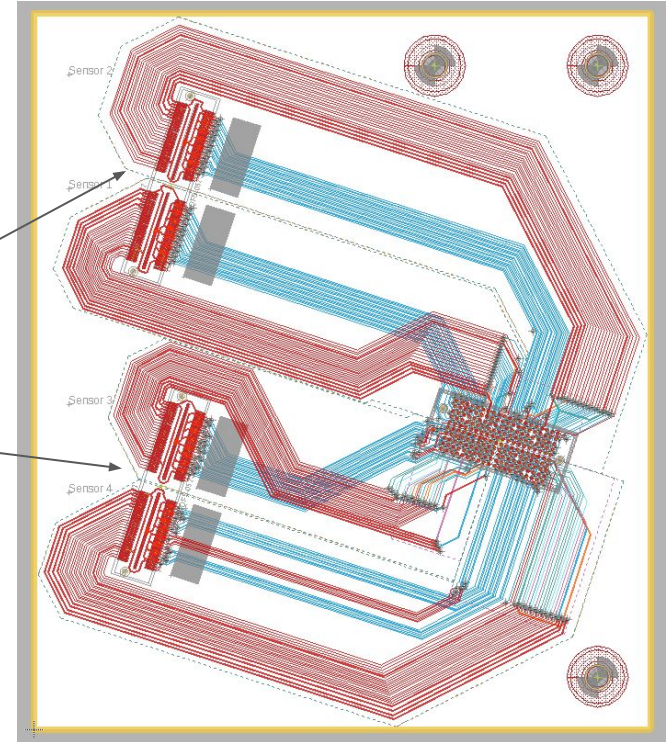
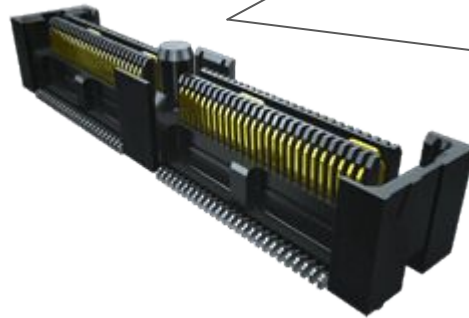
Adapter PCB

Board

- impedance matched traces
- aluflex angle adjusted
- about to be screwed onto the clamping table

Connector

- Interface: Samtec QFS connector
- 28+ Gbps solution

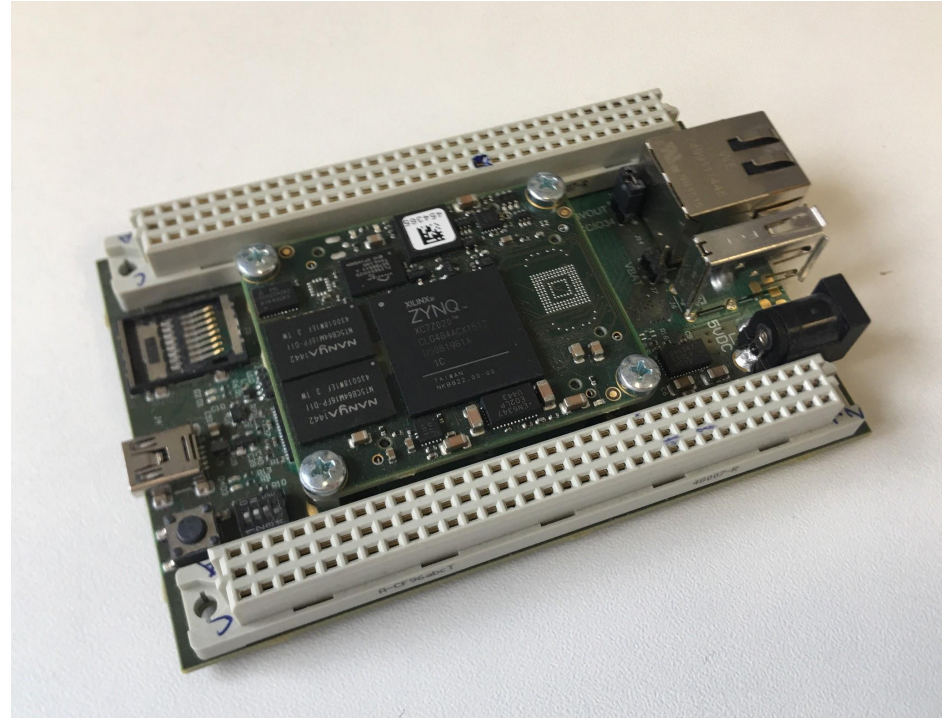


FPGA

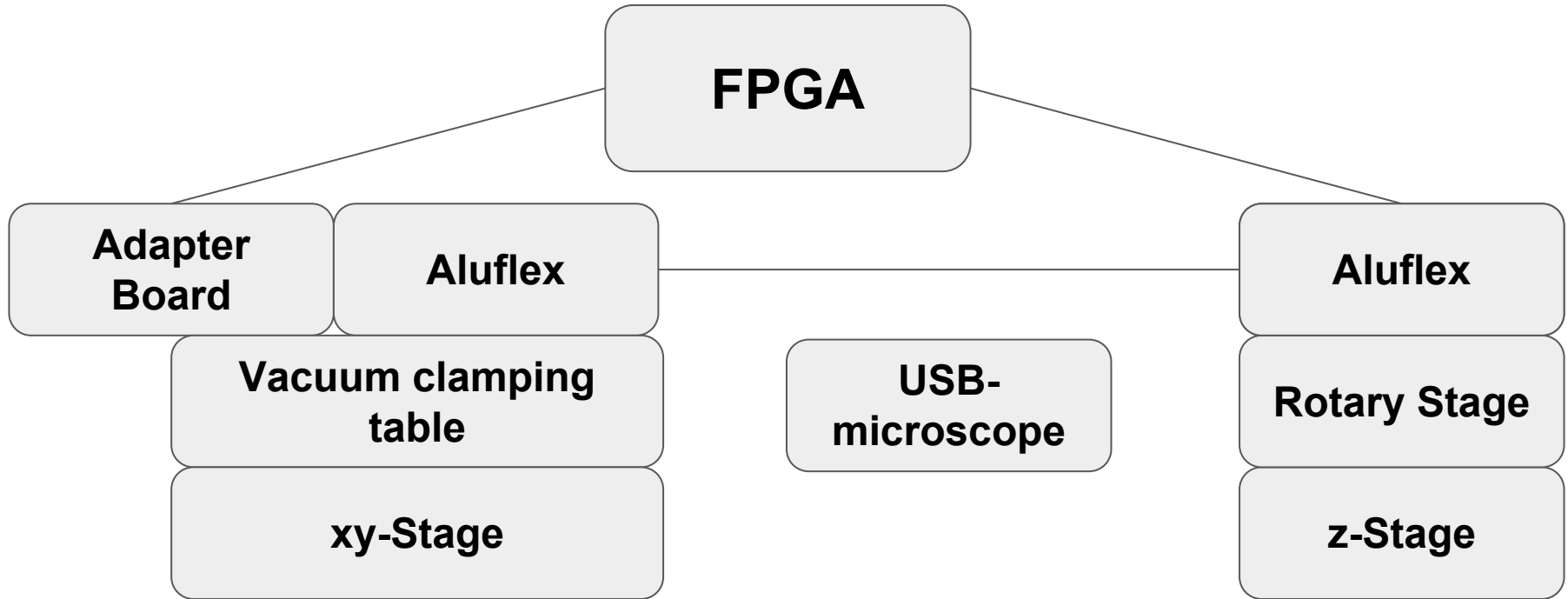
XILINX ZYNQ XC7Z020

We want to test the cable with:

- Bandwidth: 800 MHz
- Transmission rate: 950 Mbit/s
(later new FPGA with 1.25 Gbit/s)
- has not been programmed yet



Detailed test bench schematic



Conclusion

- positioning elements have been ordered (mechanical setup can start soon)
- probe card and adapter board are ready to be ordered
- vacuum clamping table will be built by H. Leithoff, HIM
- FPGA programming will be realized by Dr. C. Motzko, HIM
- first test expected at the end of this year