PXD Mechanics Overview

Karlheinz Ackermann, Martin Ritter

7th Belle II VXD Workshop
18th International Workshop on DEPFET Detectors and Applications
January 21, 2015

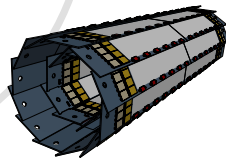Max-Planck-Institut für Physik
(Werner-Heisenberg-Institut)

DEPFET

Active Pixel Detector

Overview

Overall PXD Design well advanced and stable, lots of detailed work still to be done

- ▶ finalize PXD
- ▶ assembly procedures
- ▶ service space
- ▶ BEAST
- ▶ …

➡ heavy workload on Tscharlie

- ▶ highest priority: plan module assembly (see Lacis talk)
- ▶ highestest priority: prepare cooling blocks for thermal mockup

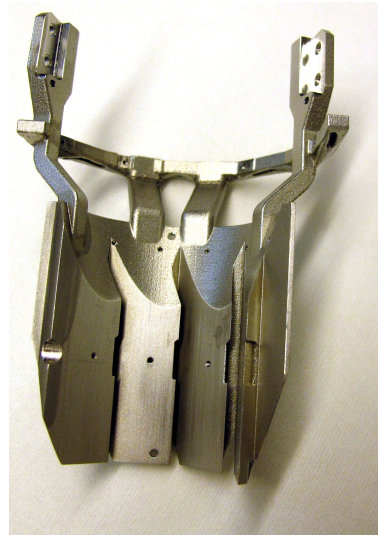## Support and Cooling Blocks (SCBs)

Cooling blocks received November of last year

Measurement of surface position and quality took longer as expected

- ▶ new personnel
- ▶ new software
- ▶ holidays
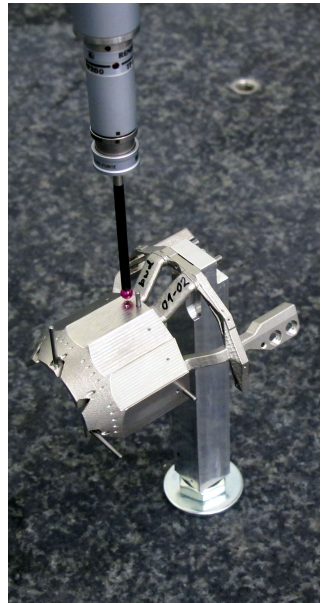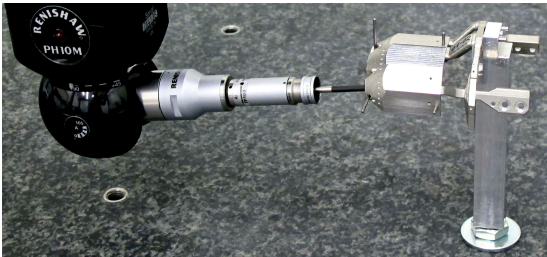- ▶ complexity of the cooling blocks

To be done:

- ▶ currently soldering cooling channel connections
- ▶ pressure and tightness testing
- ▶ gluing of carbon tubes

Precision Measurement of Cooling Blocks
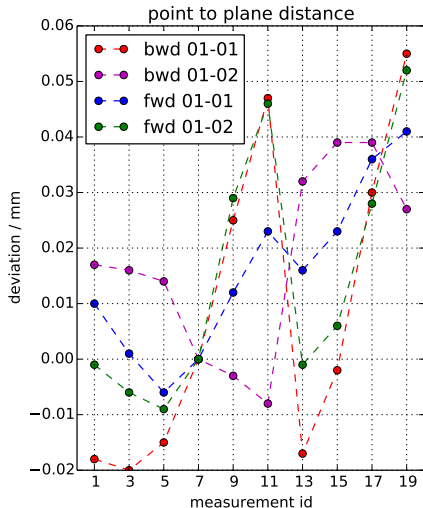
Measurement of surface position non-trivial:

- ▶ very complex part
- ▶ define two planes as zero
- ▶ measure relative distances to other surfaces

Precision Measurement of Cooling Blocks

Measurement results:

- roughness R_a around 0.25 μm
- flatness better than 7 μm
- displacement mostly below 20 μm but some are above (up to 55 μm)
- will probably not improve for the final set

Particle Contamination of Cooling Channels

Cooling channels were cleaned after manufacturing

- blow N_2 into cooling channels
- measure particle contamination at outlet
- probe volume $0.1\,\text{ft}^3/\text{min}$

| particle size	contamination	N_2 line
0.5 μm	9000–15000	8000
0.7 μm	4000–8000	3000
1.0 μm	2000–4000	1000
2.0 μm	300–1500	200
5.0 μm	20–80	30

Module Assembly

Lot of work has been invested designing module assembly procedures and tools

- ▶ first detailed study, not finalized
- ▶ details of current status presented by Laci in module assembly session
- ▶ feedback is important to continue this work
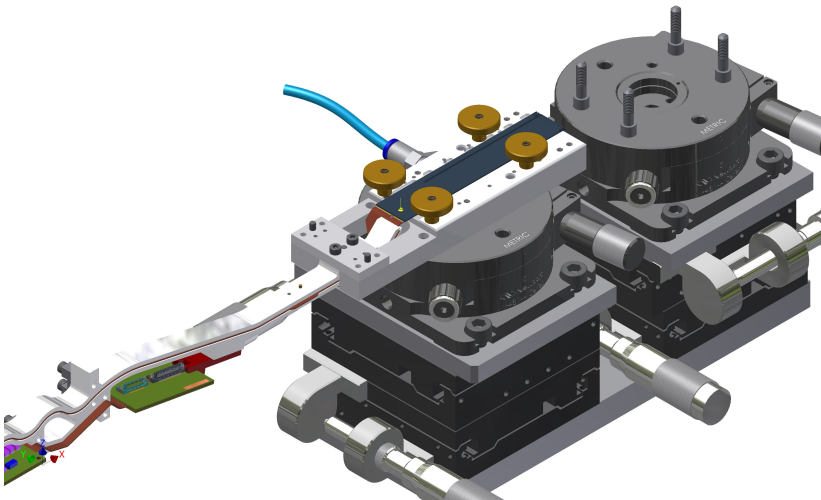
Kapton Bending Jig

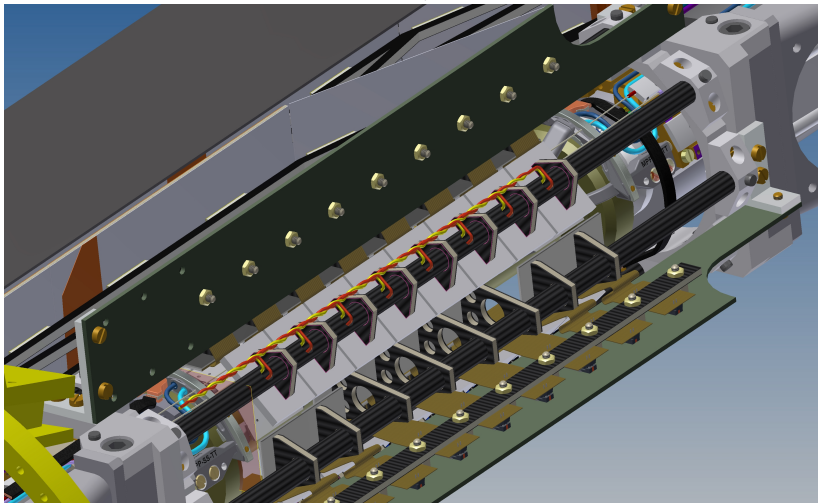Design for kapton cable bending jigs has been done
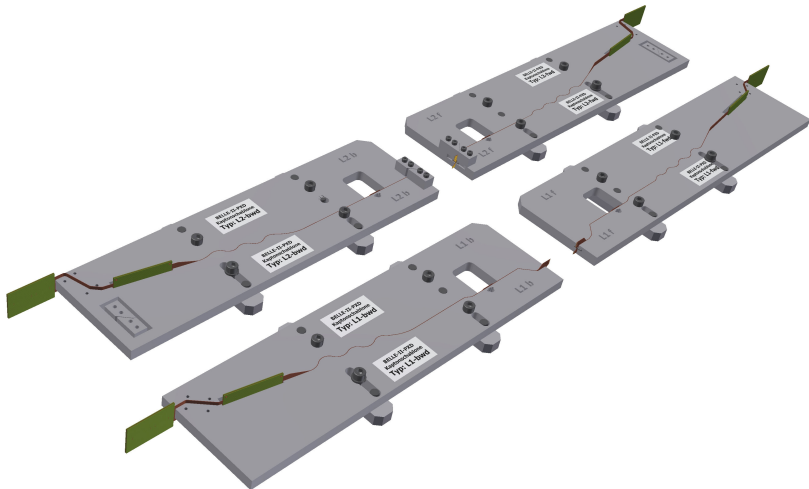
➡ currently waiting for offers from companies

BEAST Phase 2 (VXDP2)

Currently BEAST phase2 design is very fluent: too many options and changes to work on meaningful design

- ▶ there are some ideas but not enough specifications to work on details
- ▶ due to high workload, BEAST currently suspended

Conclusions

Lots of work still to be done

- ▶ working on cooling blocks for thermal mockup
- ▶ started detailed studies on module assembly
- ▶ BEAST ideas still in heavy flux

VXD Installation method

- ▶ Benjamin will leave us end of march
- ▶ selection of interviews for new full time technician next week

Thank you
for your attention