

# Testing strategy and timeline of E-det 80k

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# ● Sensors - timeline

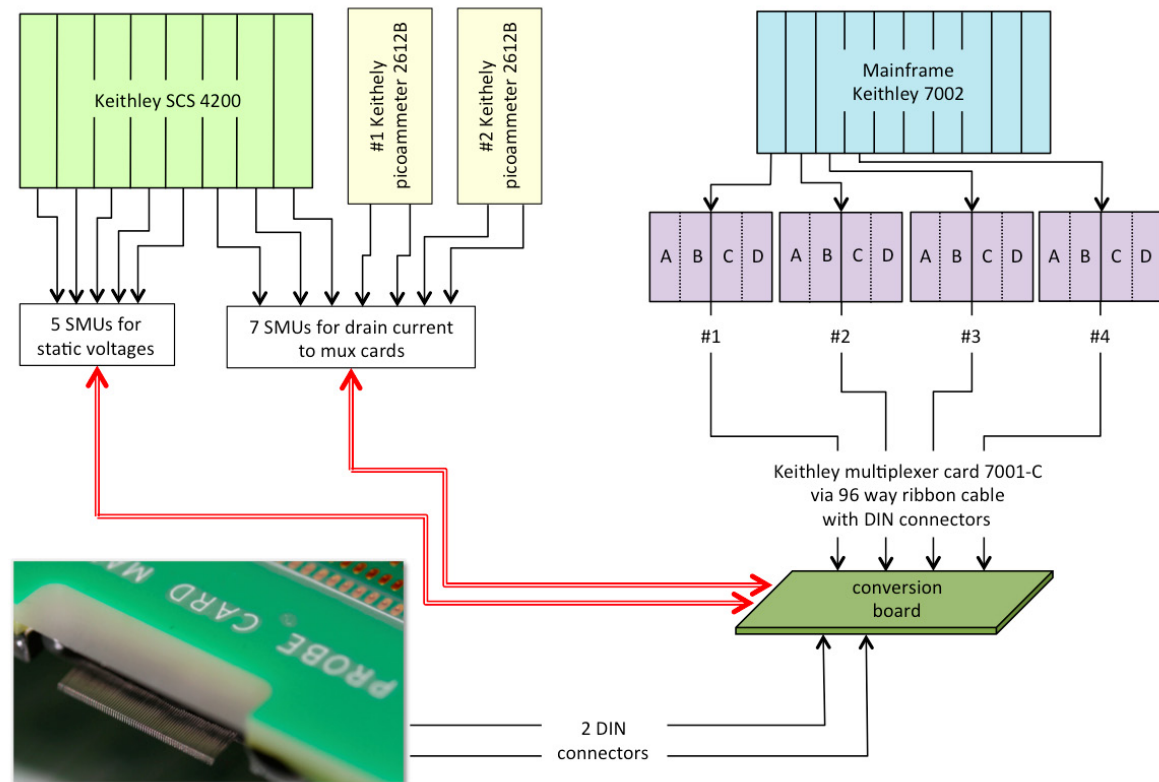
- Metallization started 1.05. → sensors available August 2016
- **Wafer level testing**
  1. Testing after Al1
  2. Testing after Al2
  3. Testing after Cu
- **Dynamic testing – assembled sensor structures**
  1. Single DEPFETs, small DEPFET arrays
  2. Small test matrices
  3. Large quadrants

## ● A1 level testing – wafer level after Al1

- Basic static measurements of DEPFETs and Diodes, CAPs – quality of the production
- @ manual probe station in the clean room
- Planned end of May/June 2016
- No preparations necessary
- status: ready for execution as soon as wafers are at the stage

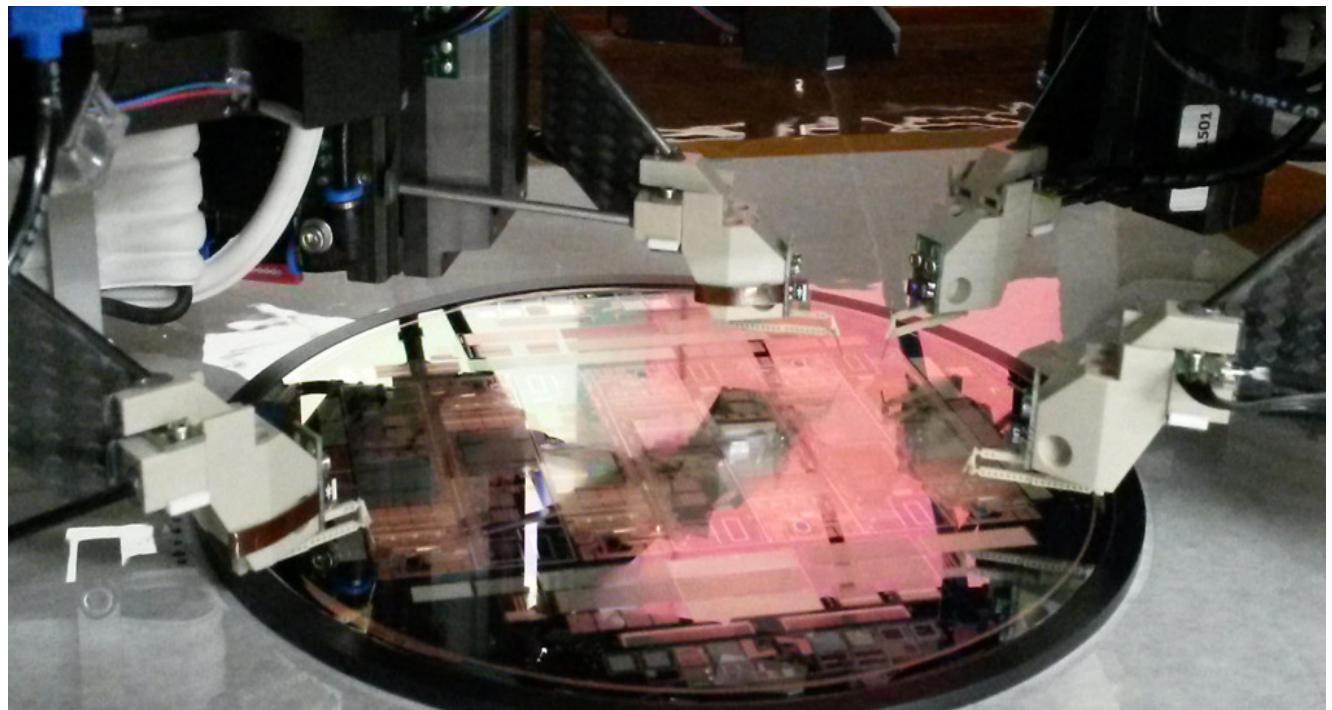
## A2 level testing – wafer level after A12

- Check of the integrity of the metal system in the sensor area: shorts and opens
- At semiautomatic probe station in the prober lab – reuse the PXD switching system
- Planned end June 2016
- Probe card necessary – small changes to be implemented compared to the BELLE one



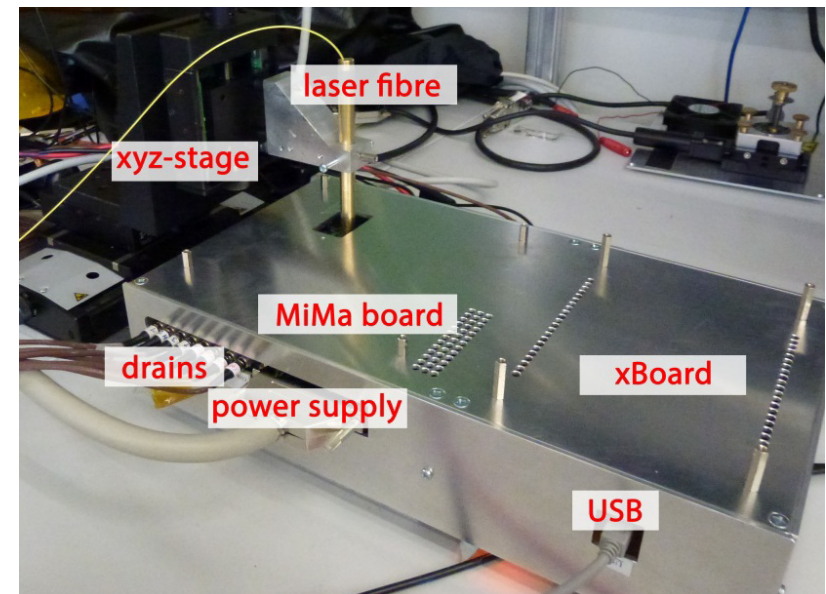
## ● A3 level testing – wafer level after Cu

- Check of the integrity of the metal system in the non-sensor area: shorts and opens
- At flying prober in the prober lab
- Planned end July/August 2016
- Hardware available



# ● B1 level testing – single DEPFETs, small DEPFET arrays

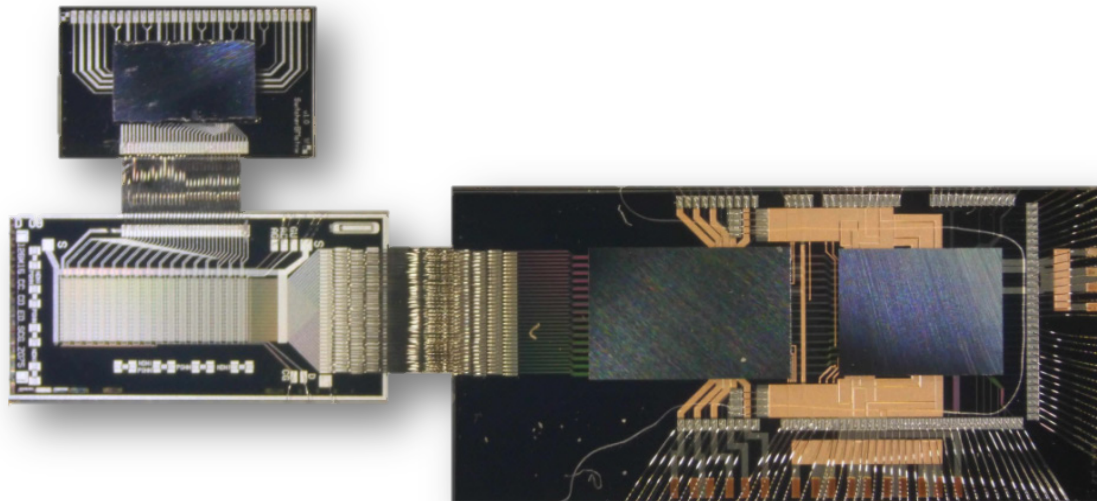
- **First dynamic measurements on DEPFETs – non linearity measurement**
- Single pixel setup is in preparation (Martin/Johannes) – to be ready July 2016
- MIMA setup to be revived and operational @ HLL with help of Charles University Prague
- First structures assembled in August 2016
- After those measurements we can/should continue with remaining wafers
- Estimate: end Oct 2016 to start processing of remaining wafers





## ● B2 level testing – small DEPFET matrices

- First structures assembled in August 2016
- Start with SW+DCDE+DHP testing on Hybrid 5
  - DMC will be compatible with existing Hybrid 5 layout so that once it is available it can be tested using this system – special wire-bond adapter needs to be produced (Oct-Nov 2016)
- Dedicate one PXD test setup with DHEv2 (2 x Infiniband connectors) and two Hybrid 5 PCBs to EDET
- Re-use PXD test software (EPICS and CS-Studio, Python scripts) for test setup
  - changes for DCDE + DMC readout needed
- Estimated testing Oct/Nov – new PhD student @ HLL



## ● B3 level testing – large DEPFET matrices

- First structures assembled in Oct/Nov 2016
- Start with all SW+DCDE+DHP testing on thick sensors – system development and debug
  - DMC will be compatible with existing DHP layout so that once it is available it can be tested using this system
- Required changes to PXD setup
  - Hybrid - L shaped patch panel
  - Power supply
  - Cooling system



## ● Module 0 assembly and testing

- first system test– May/Jun 2017
  - Thick matrix
  - DCDE, SW, DMC
  - Hybrid, Power supply, cooling
  - DAQ rack with sequencer card - raw data streaming to hard disk, DHE and ONSSEN not needed for experiment

→ First quadrant: end 2017

## Summary

- Pilot run finished by August 2016
- Dynamic measurement on small structures to confirm non linear response by Oct/Nov 2016
- Main production resume by Nov 2016
- First large matrix assembly by Nov 2016 – system test with DHP
- DMC available Feb 2017
- Module 0 assembly by May/June 2017
- Quadrant assembly by end 2017

Thank you!