
Belle II
DEPFET
Active Pixel Detector
SuperKEKB Commissioning Detector
BEAST II
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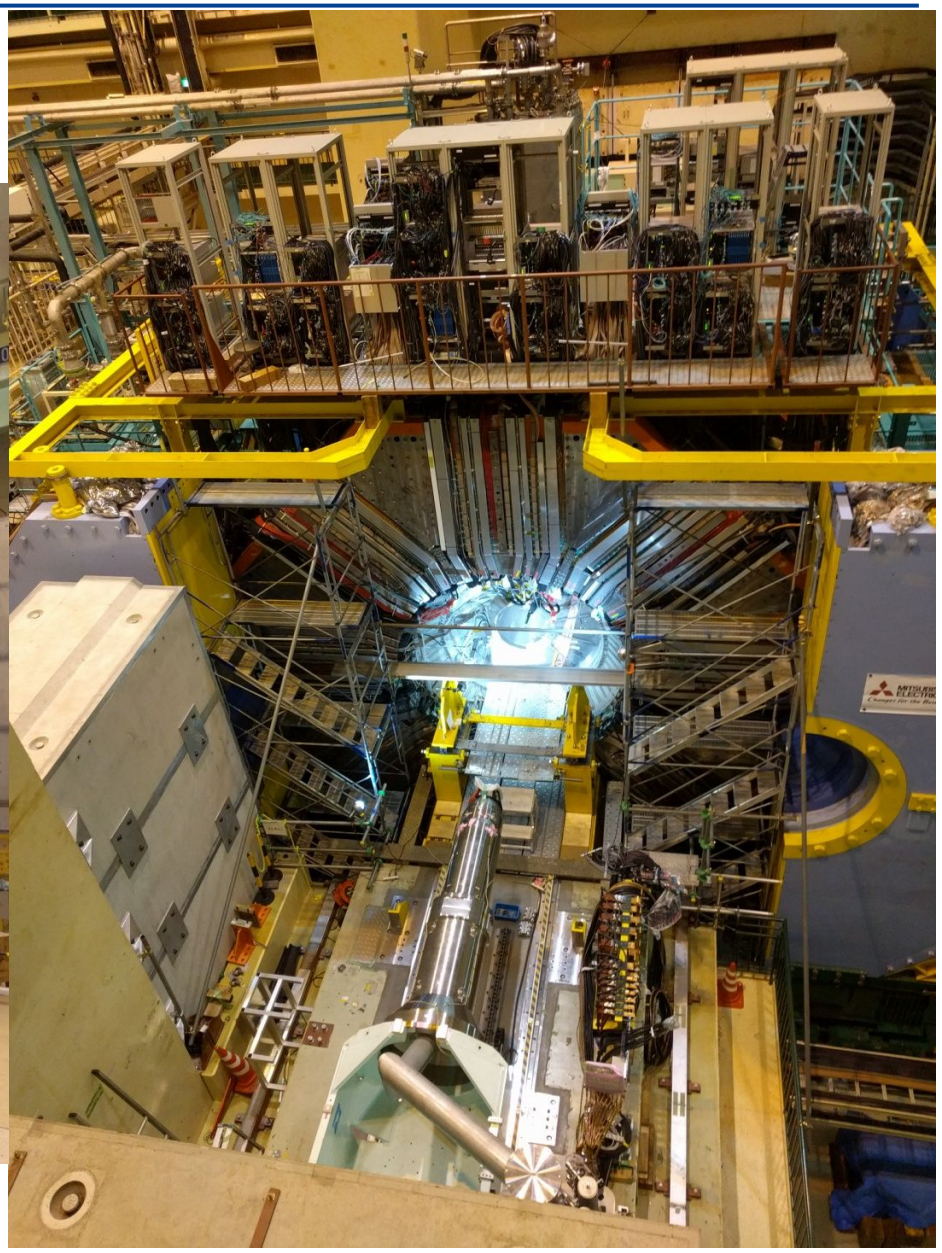
Belle II Collaboration
Phase 2 PXD

Where does PXD live?



Where does PXD live?

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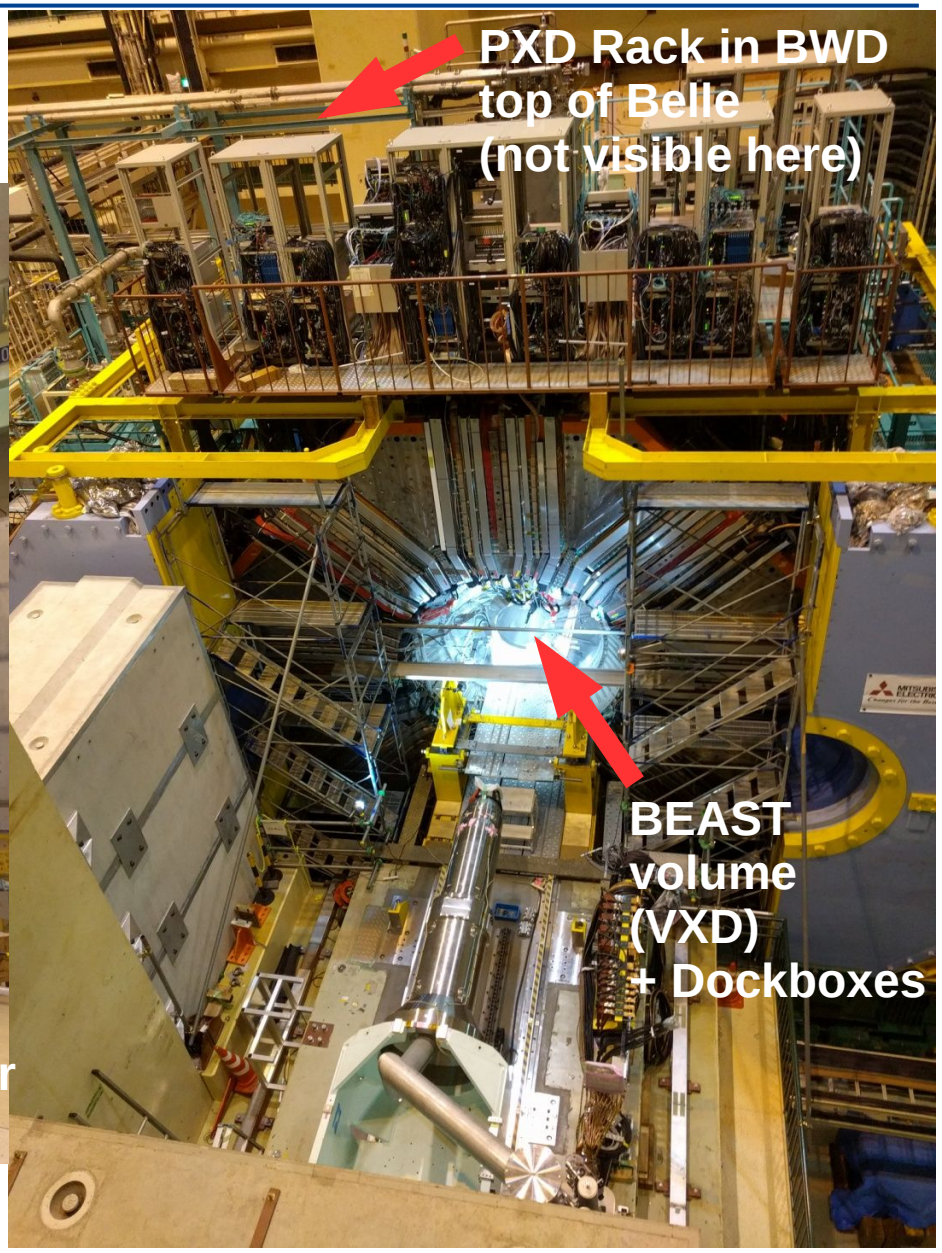
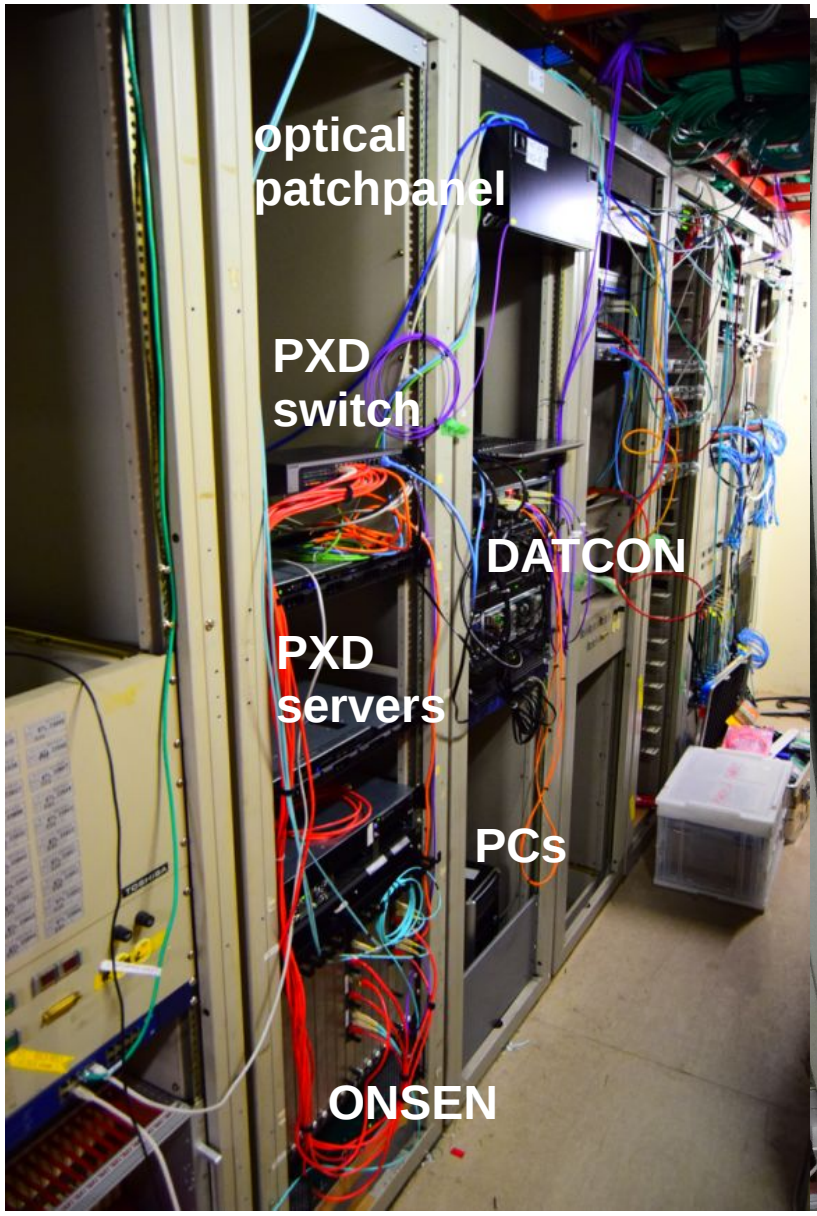
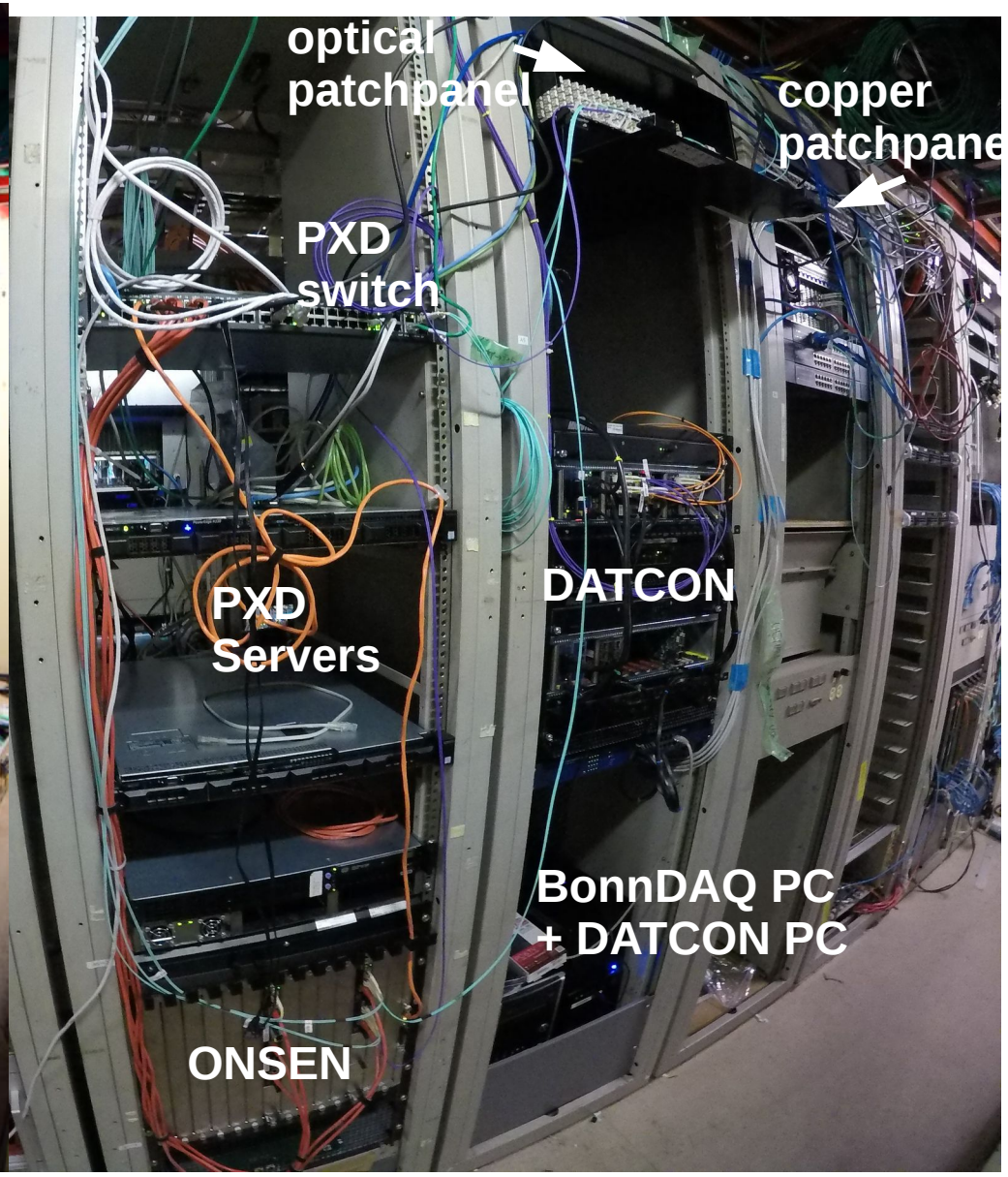
IBBelle (B1 level BWD side)

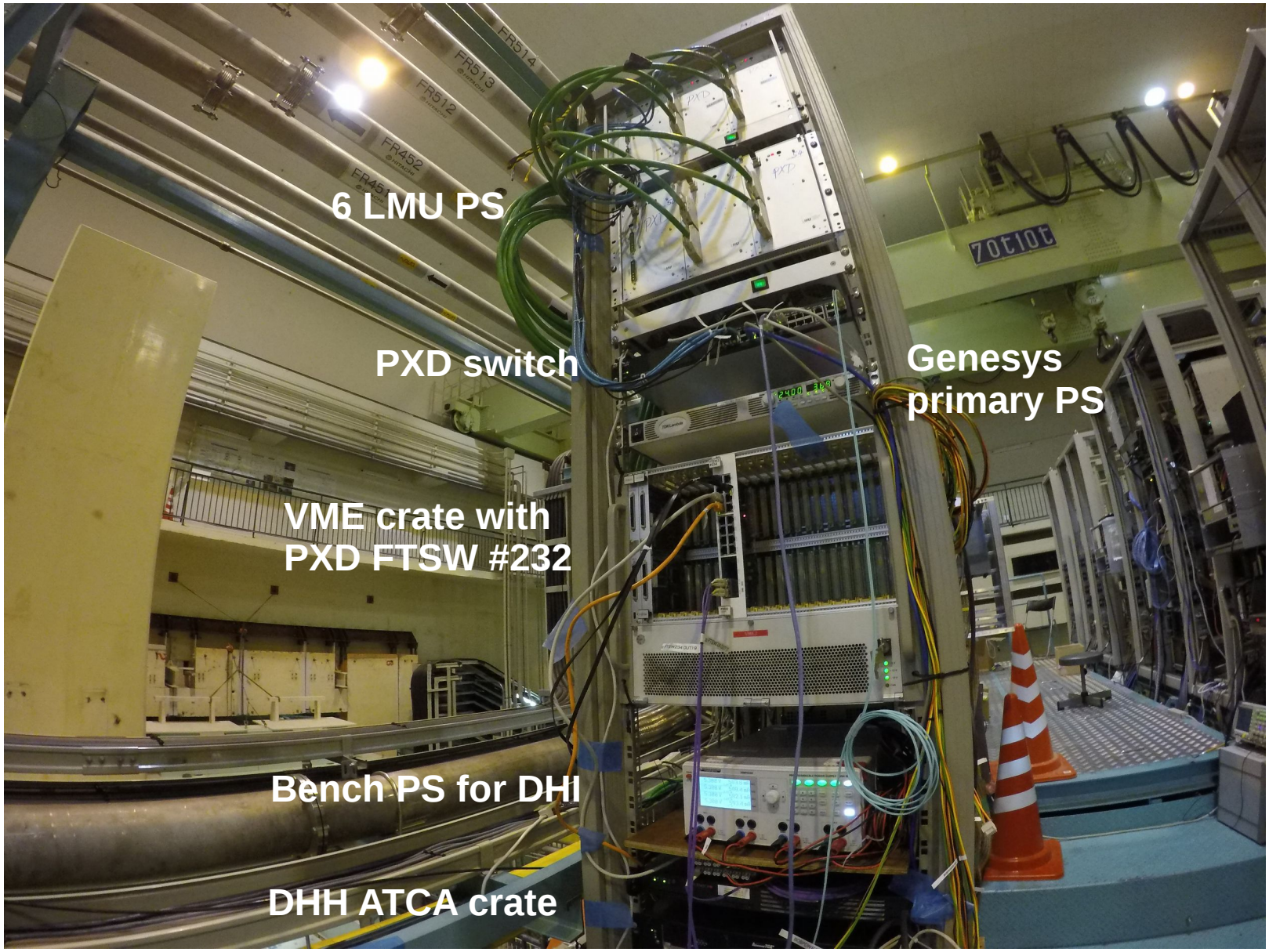


PXD Hardware in the E-Hut

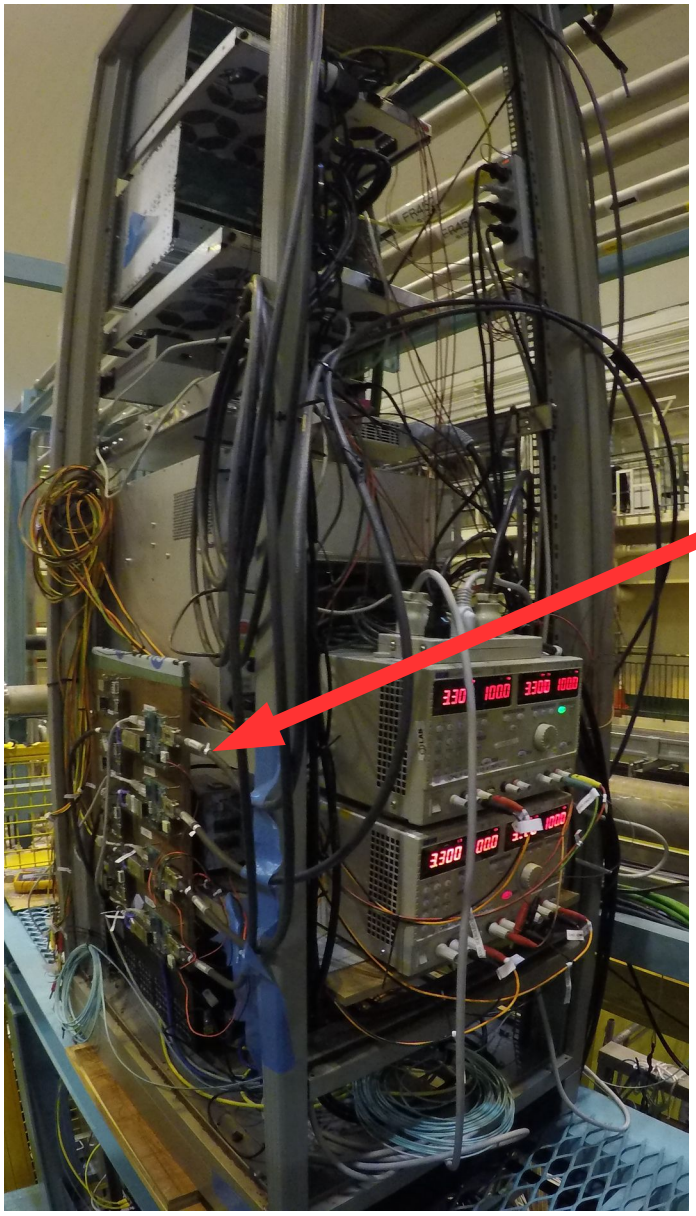


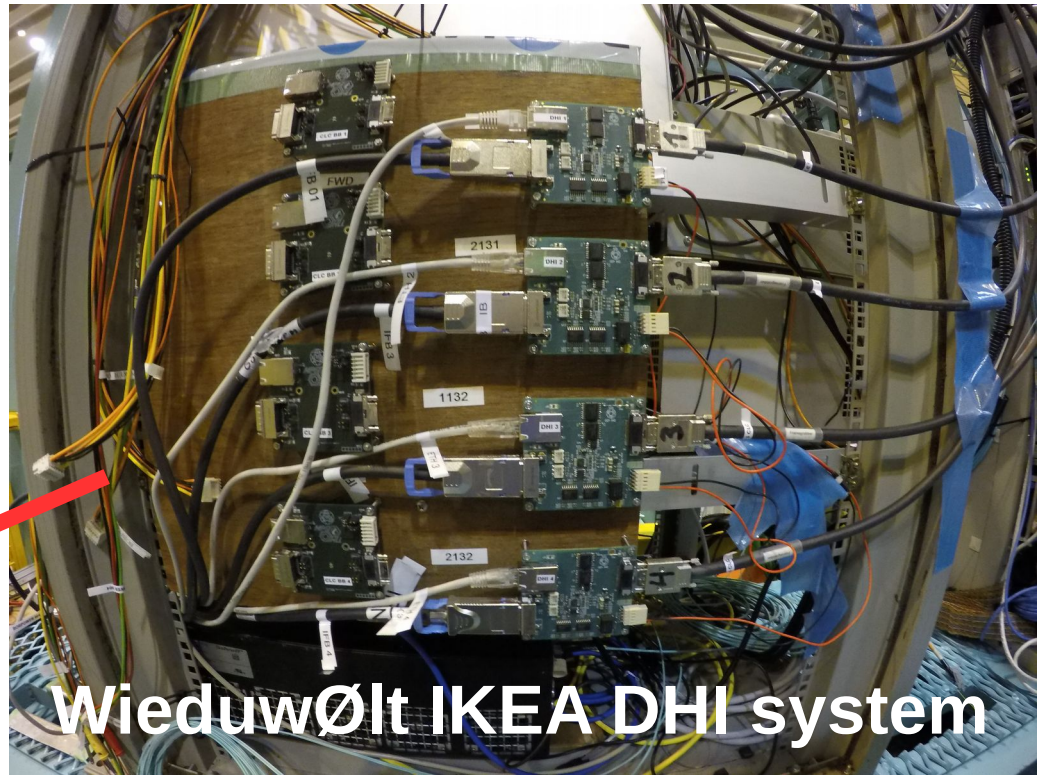


Top of Belle: PXD Rack



PXD Rack



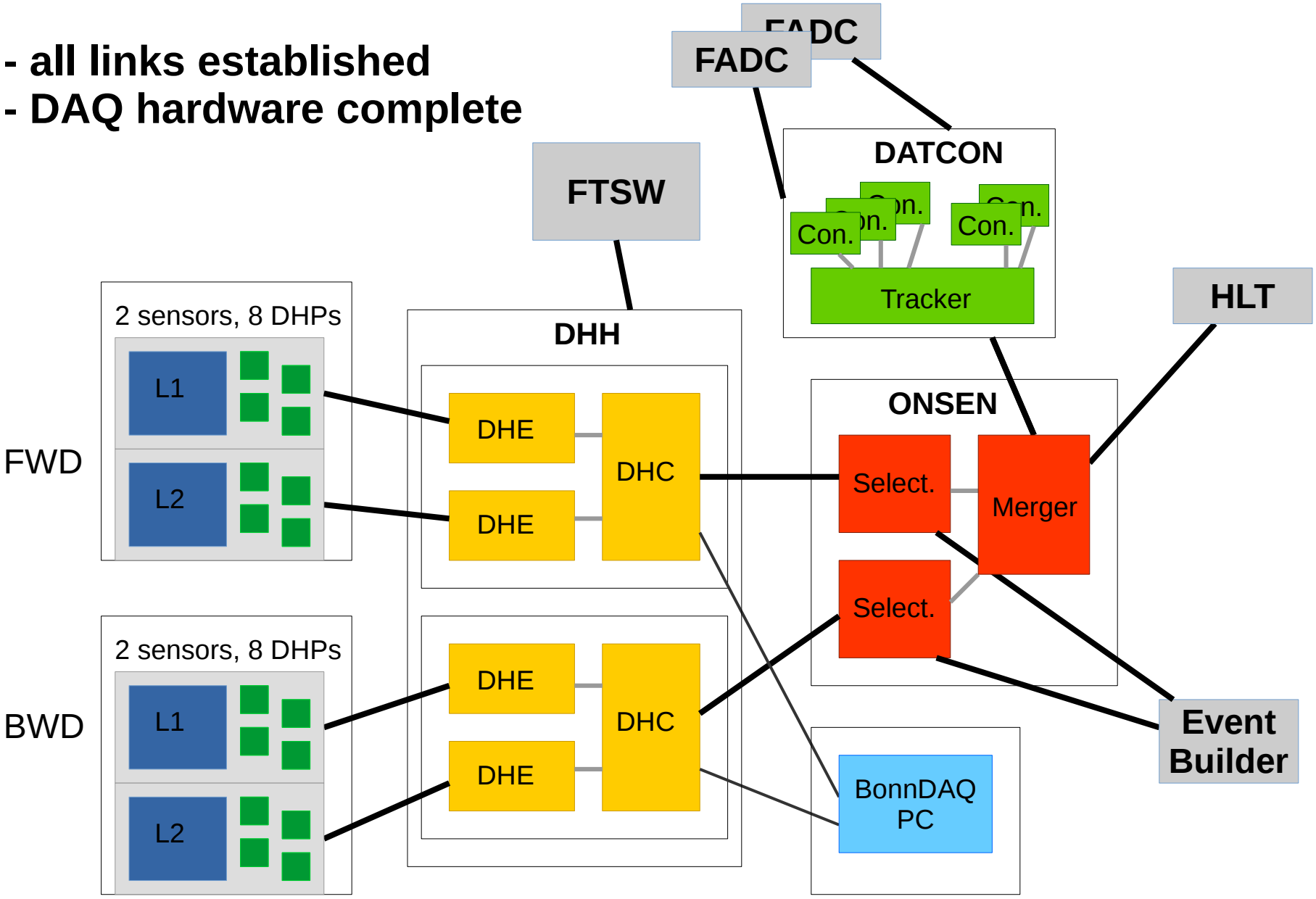


WieduwØlt IKEA DHI system

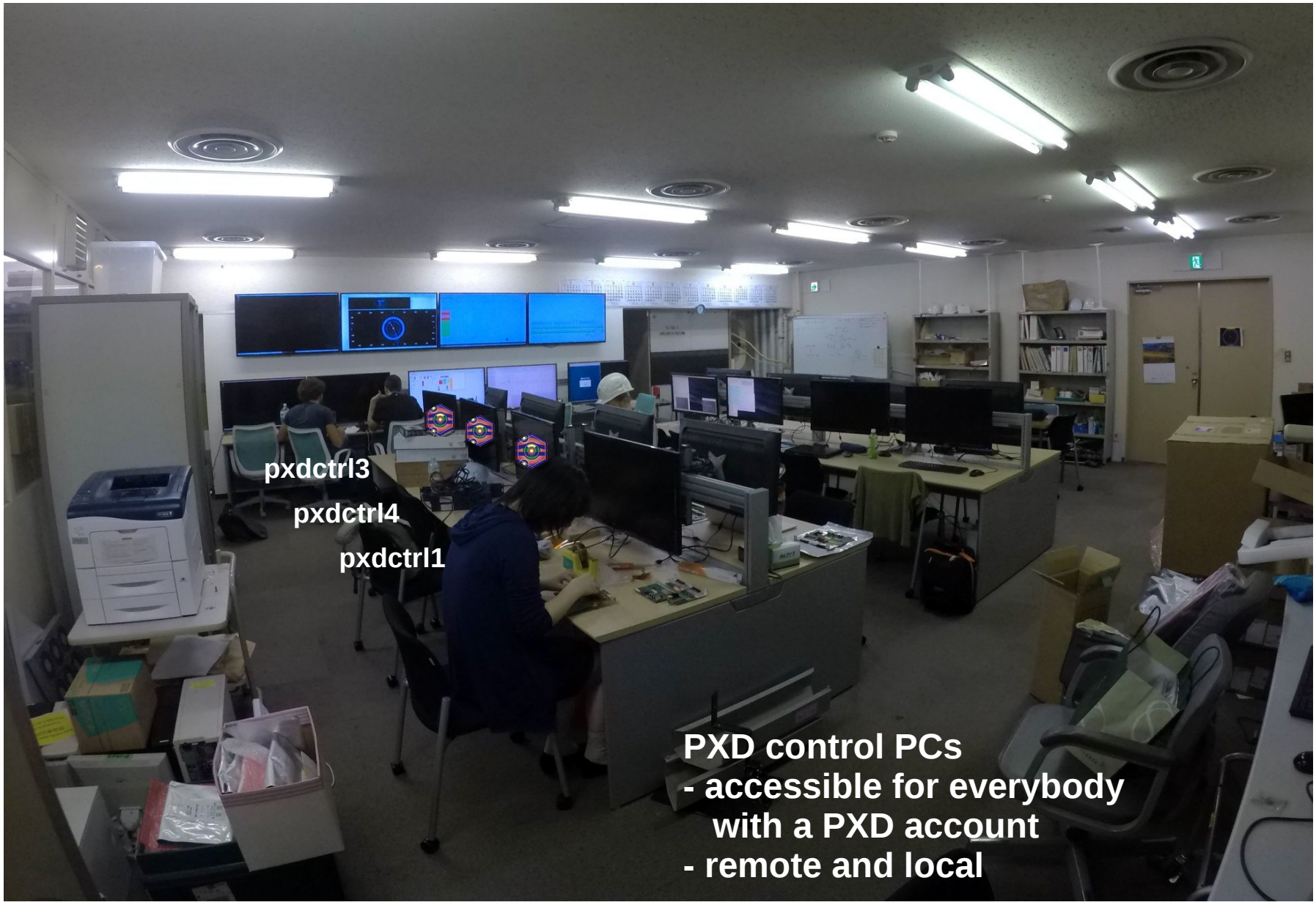
- Rack
  - Non-compliant standard
  - Impromptu borrow from ancient Belle storage
- Many systems not in final configuration
  - External bench PS needed for DHI + PS interlock

PXD Status and Integration

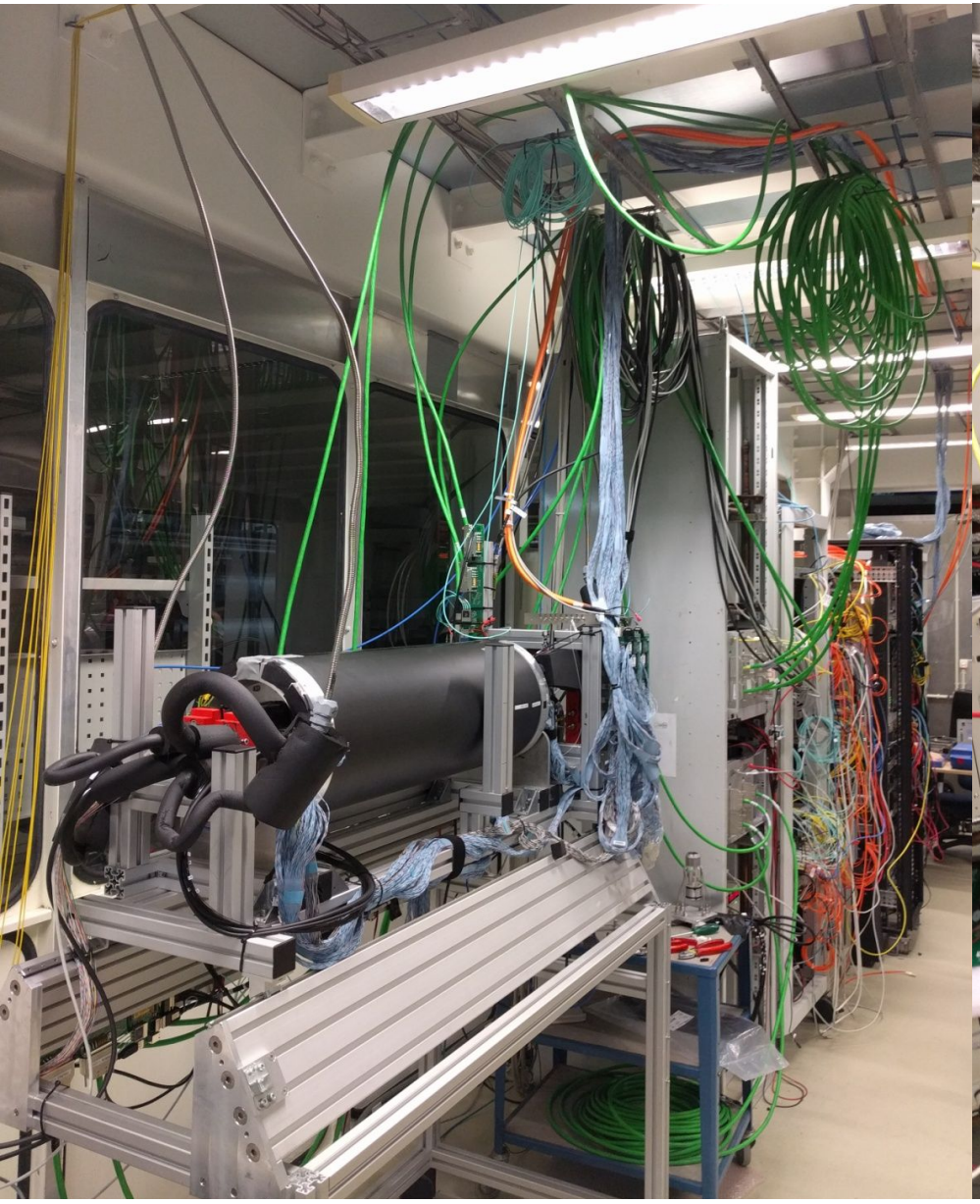
- all links established
- DAQ hardware complete

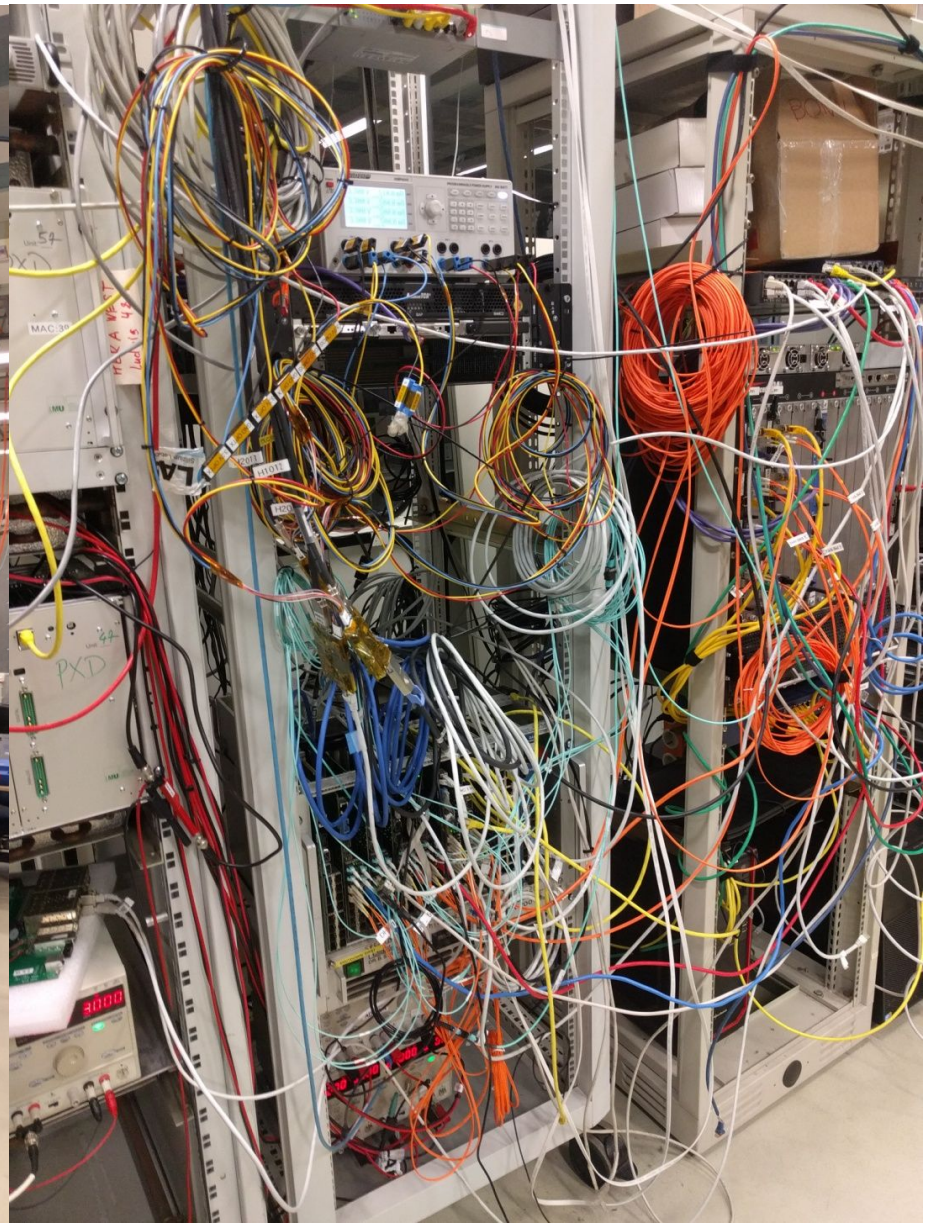


B3 Control Room



Final Test at DESY – August 2017





Final Test at DESY – August 2017

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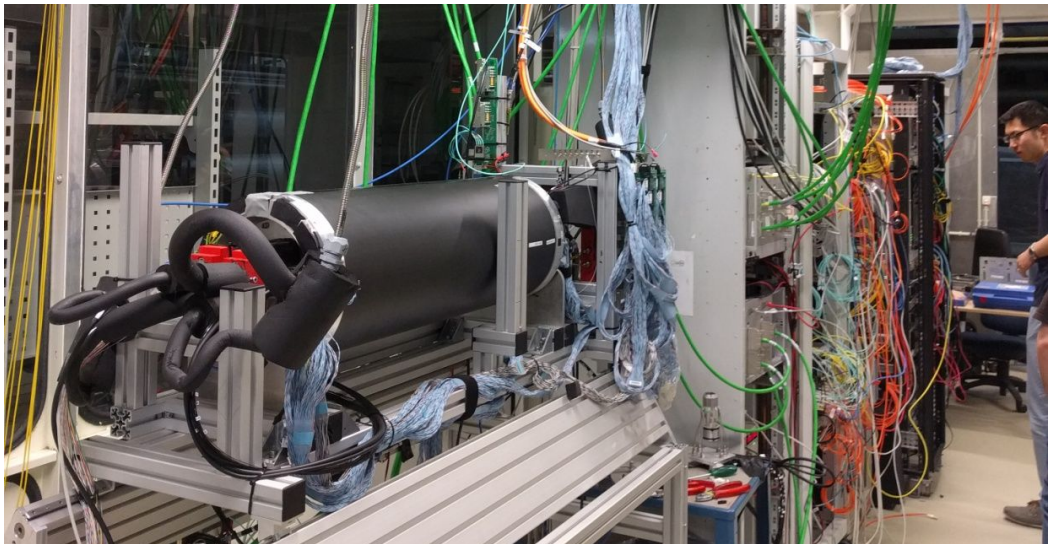
- Final Test of “all” BEAST components and Shipping preparation



- Many components were still missing e.g.:
  - One patch panel
    → one module went untested
  - ATCA DHH
  - Main PS + PS backplanes + controller
  - DHI (CLC Bbs)
  - Cables

PXD Status upon Arrival at KEK

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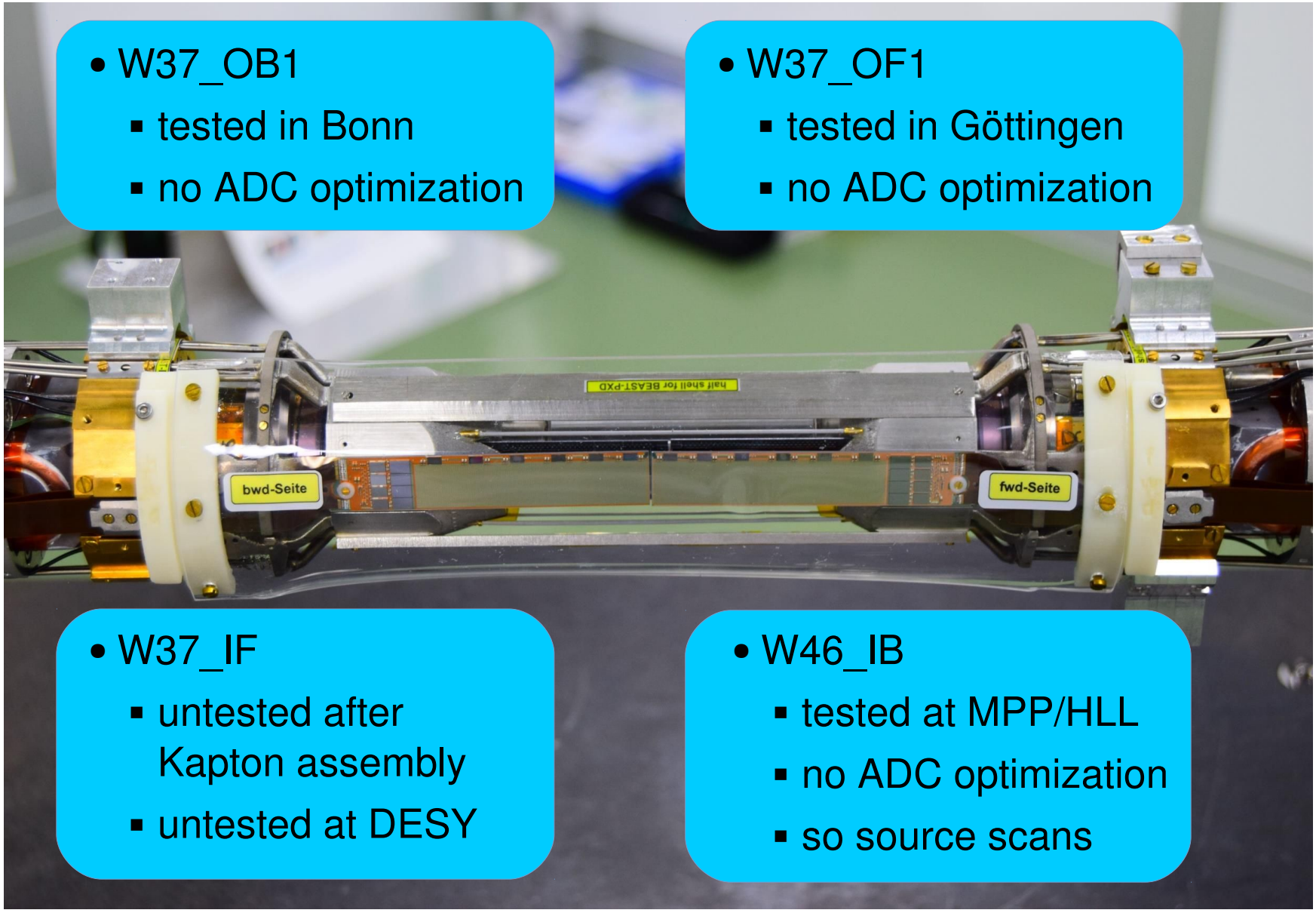
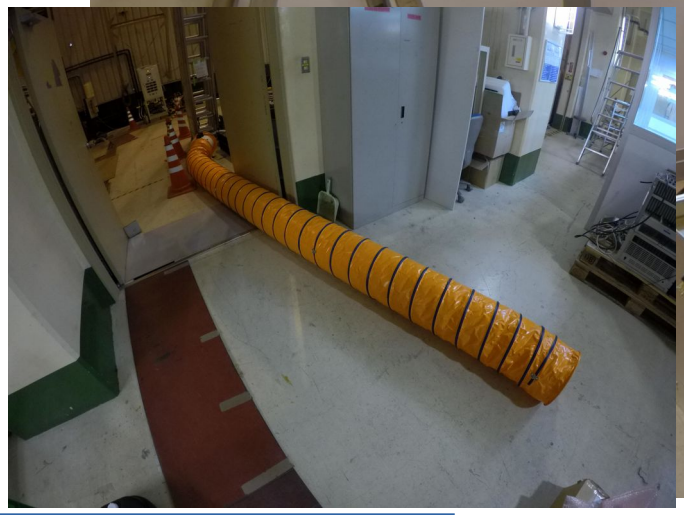


- W37_OB1
  - tested in Bonn
  - no ADC optimization
- W37_OF1
  - tested in Göttingen
  - no ADC optimization
- W37_IF
  - untested after Kapton assembly
  - untested at DESY
- W46_IB
  - tested at MPP/HLL
  - no ADC optimization
  - so source scans

B4 VXD clean room



- very limited space
- very limited tools
  (only what we brought
  → close to nothing)
- components missing

BEAST PXD Modules Testing at B4

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- Switched on DHPs only
  - High speed link stability tests
    → “First big temperature scare”

- Overall cooling time with open CO2 system
  - ~10 hours
    → extremely limited testing, basically one set of pedestals per module
    → high temperatures, unstable DHP behavior (current, links)
  - 2 days before insertion
    → only then patch panel short became apparent (first full test of PP)

- In the meantime many grounding/shielding problems
  - Patch panel / dock box / DHI “eco system” is not in order

https://elog.belle2.org/elog/Beast-II-Commissioning/

Test in Final Detector Position

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- Highspeed link tests
- Attempted Delay scans
- Pedestals tests
  - Local data taking very difficult with DHC + FTSW system

- Final hardware component DHI arrived beginning of December
  - Reason for stability problems became apparent
    → Grounding/Shielding issues
      → Sensing issues

- Since January DAQ tests with DHP test pattern

https://elog.belle2.org/elog/Beast-II-Commissioning/

PXD Module Summary

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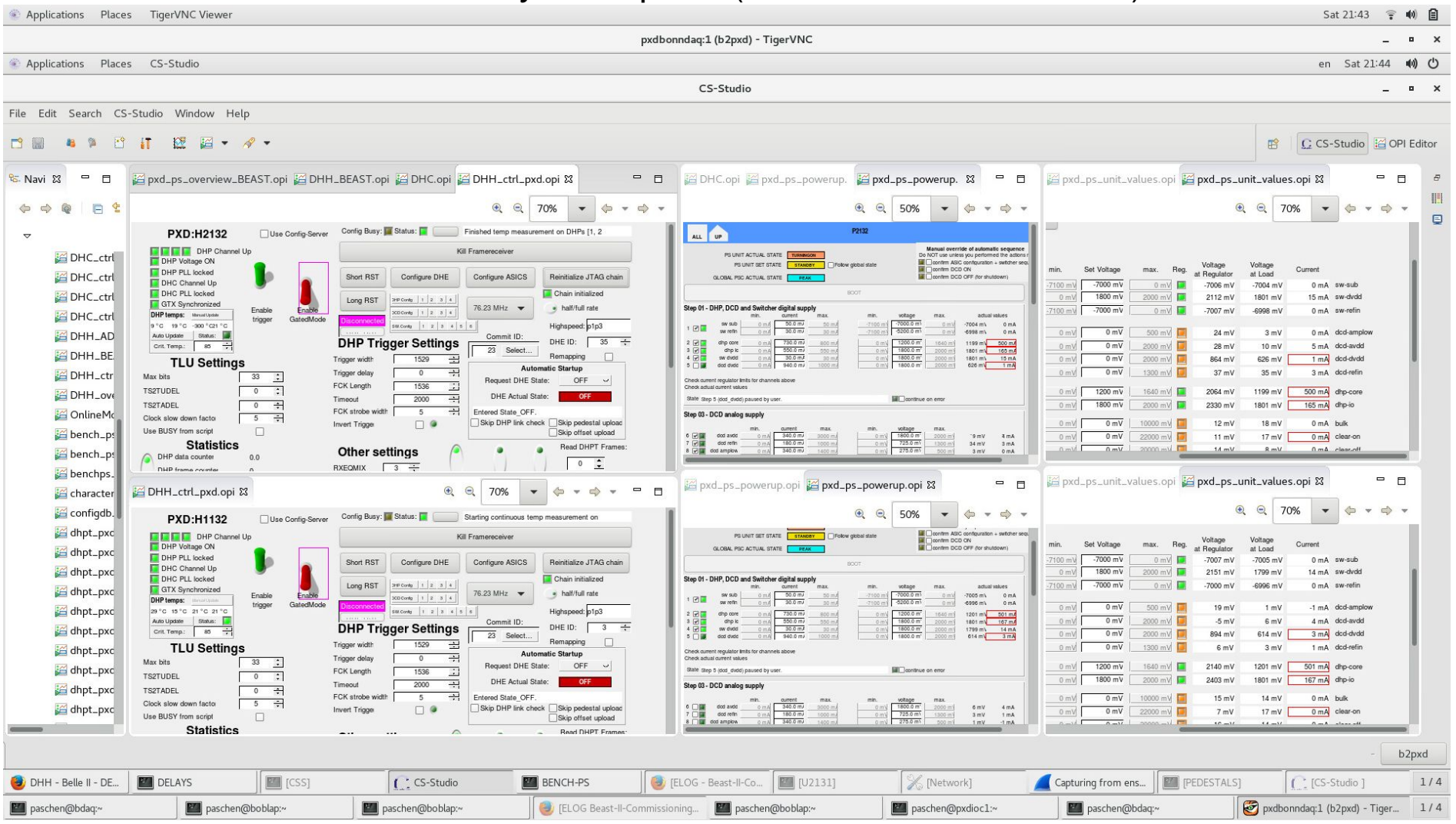
- So far Modules 100 % functional (surprisingly)
  - Links sufficiently stable
  - Matrices appear to be working
- Modules not optimized at all
  - No ADC optimization
  - No matrix working point data for two modules
  - Not final grounding scheme
- PXD local data + pedestals
  - Online Monitor has to be commissioned/developed
  - Scripts have to be developed for all optimization (with DHC + FTSW system)

PXD Slow Control Summary

- PXD Servers installed and running in “final system like” configuration
- Slow Control GUI still only for experts (even too much for them)



Outlook

- Lots of work until phase 2 necessary
  - Module optimization → scripts
  - Slow Control GUIs → shifter operation
- Last hardware missing
  - BNC cables to connect to VXD local hardwired interlock (VLHI)
  - Dockbox temperature monitoring readout system (installation in 2 weeks)
  - Maybe DHI modification still?
- Intense “workshop” at KEK in February to tackle these problems