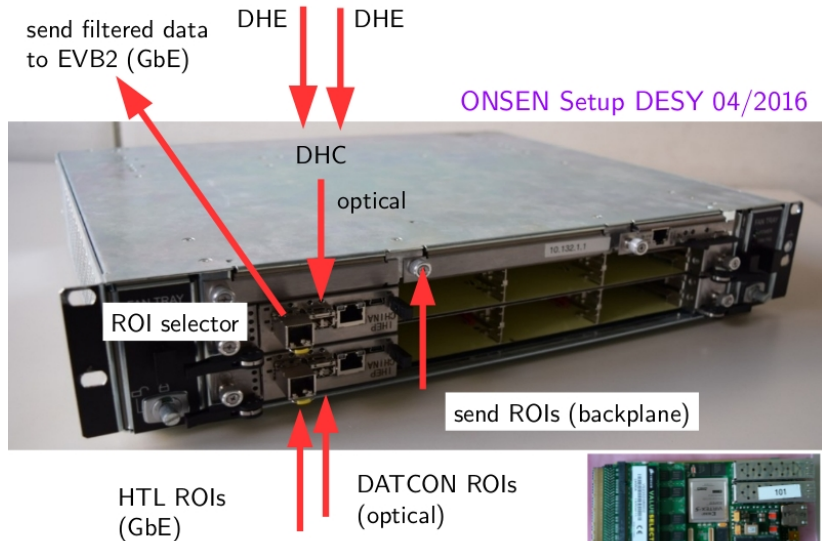


PXD DAQ, combined system tests
Jens Sören Lange (Giessen), for PXD DAQ group
BPAC 10/2017
KEK

- PERSY
- Ongoing tests at KEK, preparation for phase 2

ONSEN setup in TB and at PERSY



2017: 2 selector AMC (4 detector modules. 2 DHC)

PERSY

Permanent setup at DESY

PERSY setup at DESY

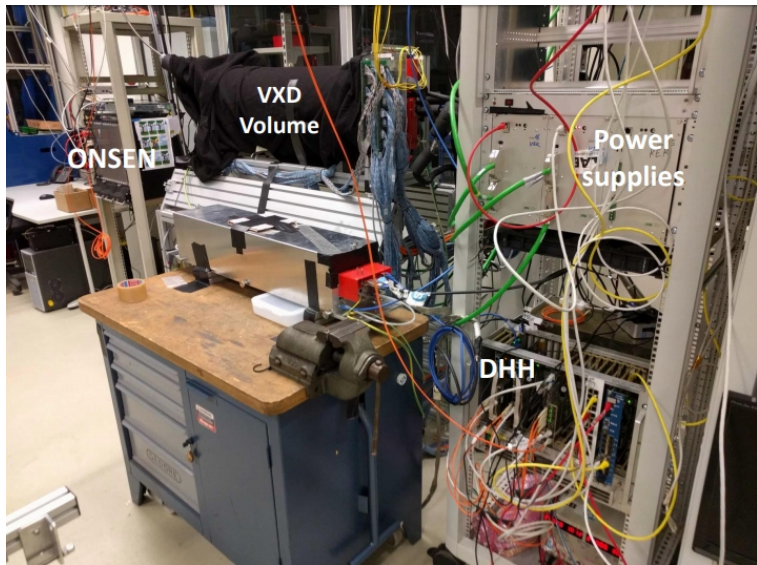


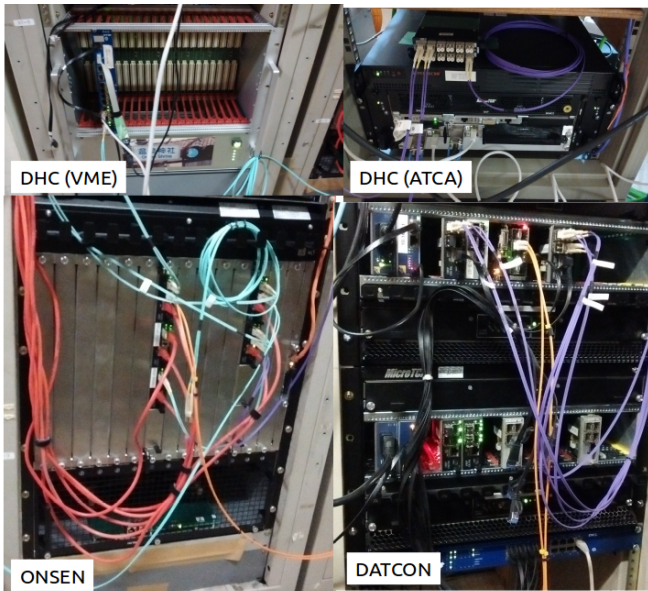
photo: Carlos Marinas

PERSY operation and results

- 9 months operation
- 2+1 PXD modules operating (9 installed)
- full chain: (detector), DHPT, FTSW, DHE, DHC, ONSEN, HLT, (DATCON), EB2
- complete run control and slow control system (epics and global, nsm bridge)
- remote shift crew (often only remote):
1 module operator (incl. DHC/DHE), 1 DAQ operator (ONSEN)
- mostly DHPT testpatterns
(no laser, no radioactive source, due to cooling)
some runs with switcher operation (noise)

Test at KEK

Test at KEK



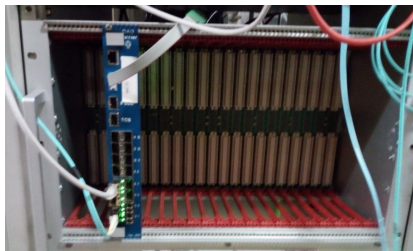
Hardware at KEK, ONSEN

- phase 2 setup: 2 carrier boards, 1 merger AMC, 2 selector AMC installed in EHUT, 2 additional spare AMC
- all long optical fibres for phase 2 and phase 3 installed by a japanese company
- optical patch cables for phase 2 installed for 20 m: OM3, aqua (recommended at KEK) for 3 m: OM2, orange
- ATCA shelf was deformed when shipped didn't fit into 19" rack anymore KEK purchased new ATCA shelf but dual star topology instead of full mesh → minor firmware changes
- all SFP+/RJ45 converters for phase 3 purchased



Hardware at KEK, DHH

- 1 VME DHC, no DHE connected
- 1 ATCA DHC, 3 ATCA DHE
- optical fibres from detector, installed, but not connected yet
- some DHC firmware issues: uses B2TT firmware version v0.42 (no busy to FTSW), v0.52 would generate busy, but needs debugging inside DHC



VME



ATCA, rear transition module

Hardware at KEK, DATCON



- First installation at KEK :
 - 2 chassis are here, we will start with only one
 - 3 FADC V4 and 2 FADC V3 meaning 5 optical links connected on 2 concentrator boards
 - P and N side tracking made on one DHE.
- Before PHASE2 :
 - Use of the two chassis and two DHE to get as close as possible as PHASE3 configuration

40 kHz Test at KEK

The screenshot displays the PXD DAQ control interface, showing various monitoring and control panels. The top left panel shows the PXD Run Control Overview, including a table of PXD Run Control parameters and a status indicator. The top middle panel displays Trigger Data Rates and Pixel Data Rates and Sizes plots. The top right panel shows the PXD Run Control Overview, including a status indicator and a table of PXD Run Control parameters. The bottom left panel shows the Board Selector and a diagram of the PXD Run Control architecture. The bottom middle panel shows the Board Selector and a table of Board Parameters. The bottom right panel shows the Board Parameters table.

Global AC RUN/STOP

Global AC RUN/STOP	Global AC RUN/STOP	Global AC RUN/STOP	Global AC RUN/STOP	Global AC RUN/STOP
Global AC RUN/STOP	Global AC RUN/STOP	Global AC RUN/STOP	Global AC RUN/STOP	Global AC RUN/STOP
Global AC RUN/STOP	Global AC RUN/STOP	Global AC RUN/STOP	Global AC RUN/STOP	Global AC RUN/STOP

Trigger Data Rates

Pixel Data Rates and Sizes

PXD Run Control Overview

Board Selector

Board Parameters

Board	Parameter	Value
001	HE2 mean data size	1512000
001	HE2 trigger hit register	28412218
001	HE2 data hit register	34418
001	HE2 trigger hit rate	412408
001	HE2 data hit rate	412408
001	SC mean data size	0
001	SC trigger hit register	0
001	SC data hit register	0
001	SC trigger rate	0
001	SC data rate	0
001	OUT mean data size	1512000
001	OUT trigger hit register	28412218
001	OUT data hit register	34418
001	OUT trigger rate	412408
001	OUT data rate	412408

KEK test results (status 14.10.2017)

- many people involved:
VXD detector crew, KEK DAQ group, PXD DAQ crew
- full chain, but empty events (only DHC header/trailer), no DHE, no detector
 ≤ 40 kHz (significant milestone)
- DHPT testpatterns, 1 DHE
 ≤ 100 Hz, data integrity under study
- full chain + DATCON
 ≤ 1 kHz (untriggered, unsynchronized)