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PXD DAQ, combined system tests

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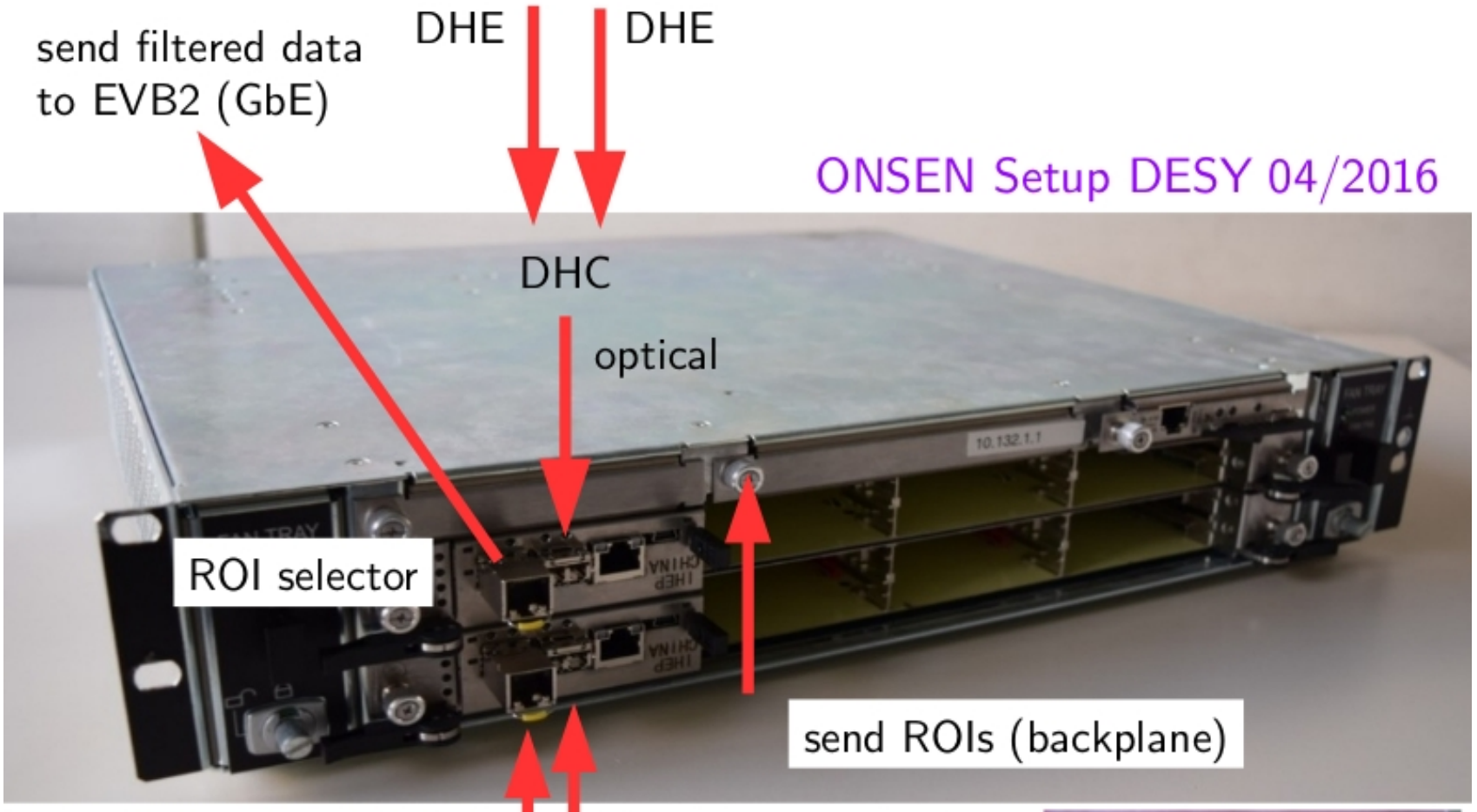
BPAC 10/2017

KEK

Outline

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

ONSEN setup in TB and at PERSY



in 2017: 2 selector AMCs (4 detector modules, 2 DHC)

PERSY

Permanent setup at DESY

PERSY setup at DESY

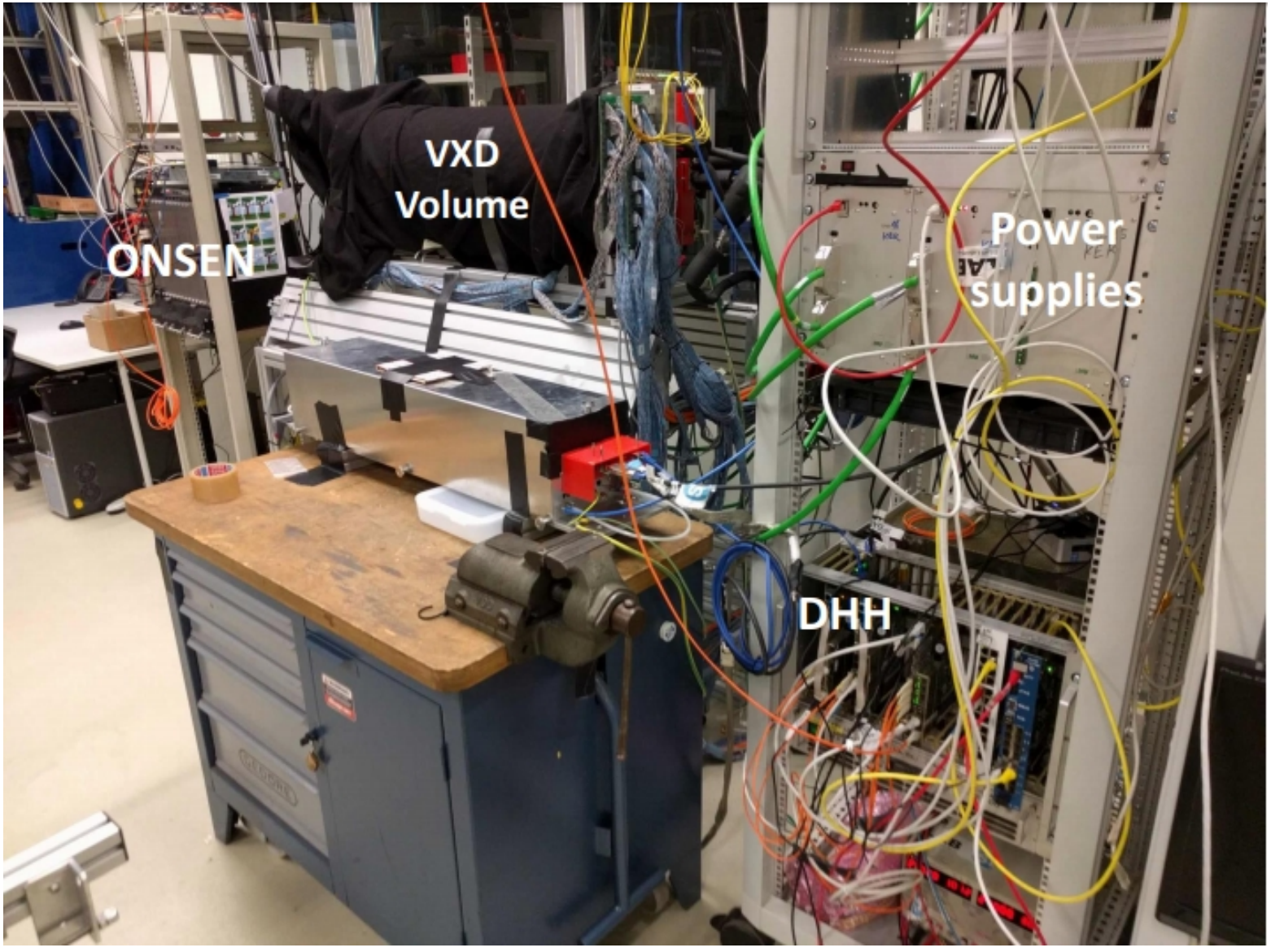


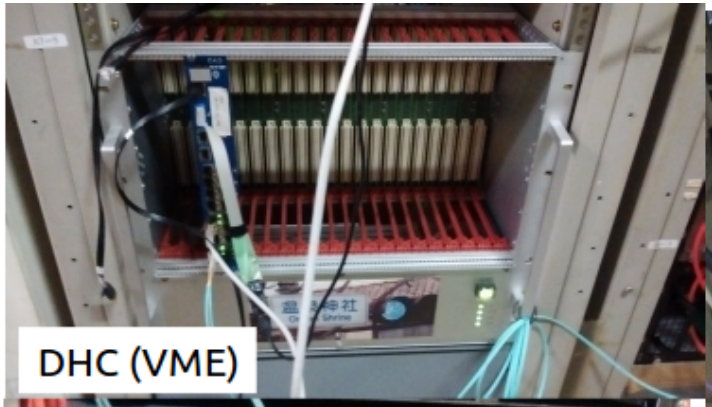
photo: Carlos Marinas

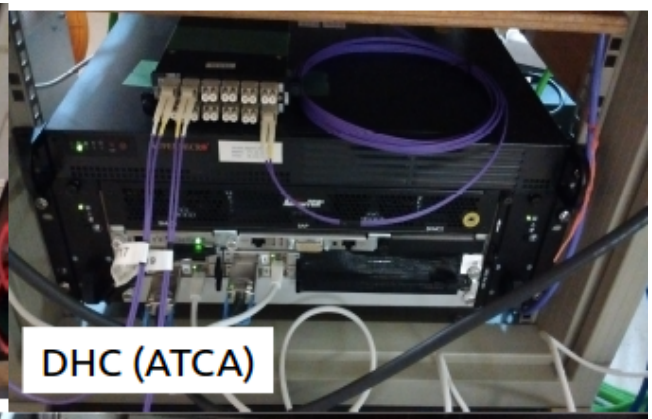
PERSY operation and results

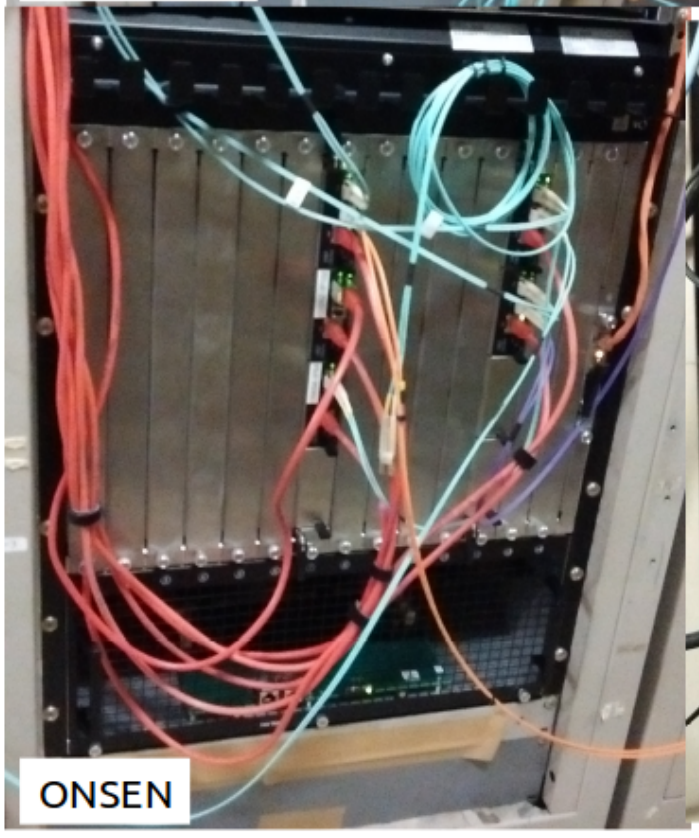
- 9 months operation
- 2+1 PXD modules operating (9 installed)
- full chain: (detector), DHPT, FTSW, DHE, DHC, ONSEN, HLT, (DATCON), EB2
- complete run control and slow control system (epics and global, nsm bridge)
- remote shift crew (often only remote):
  1 module operator (incl. DHC/DHE), 1 DAQ operator (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

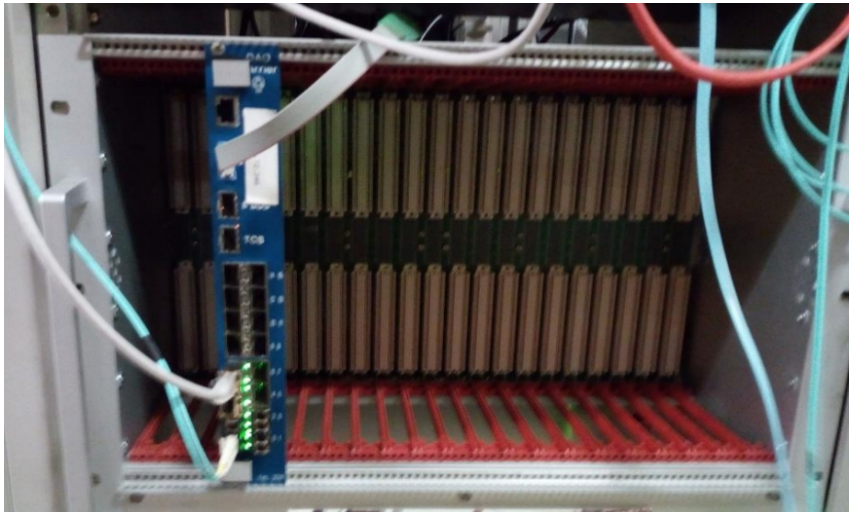
- phase 2 setup: 2 carrier boards, 1 merger AMC, 2 selector AMC installed in EHUT, 2 additional spare AMC
- all long optical fibres for phase 2 and phase 3 installed by a japanese company
- optical patch cables for phase 2 installed
  for 20 m: OM3, aqua (recommended at KEK)
  for 3 m: OM2, orange

- 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
  $\rightarrow$ 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



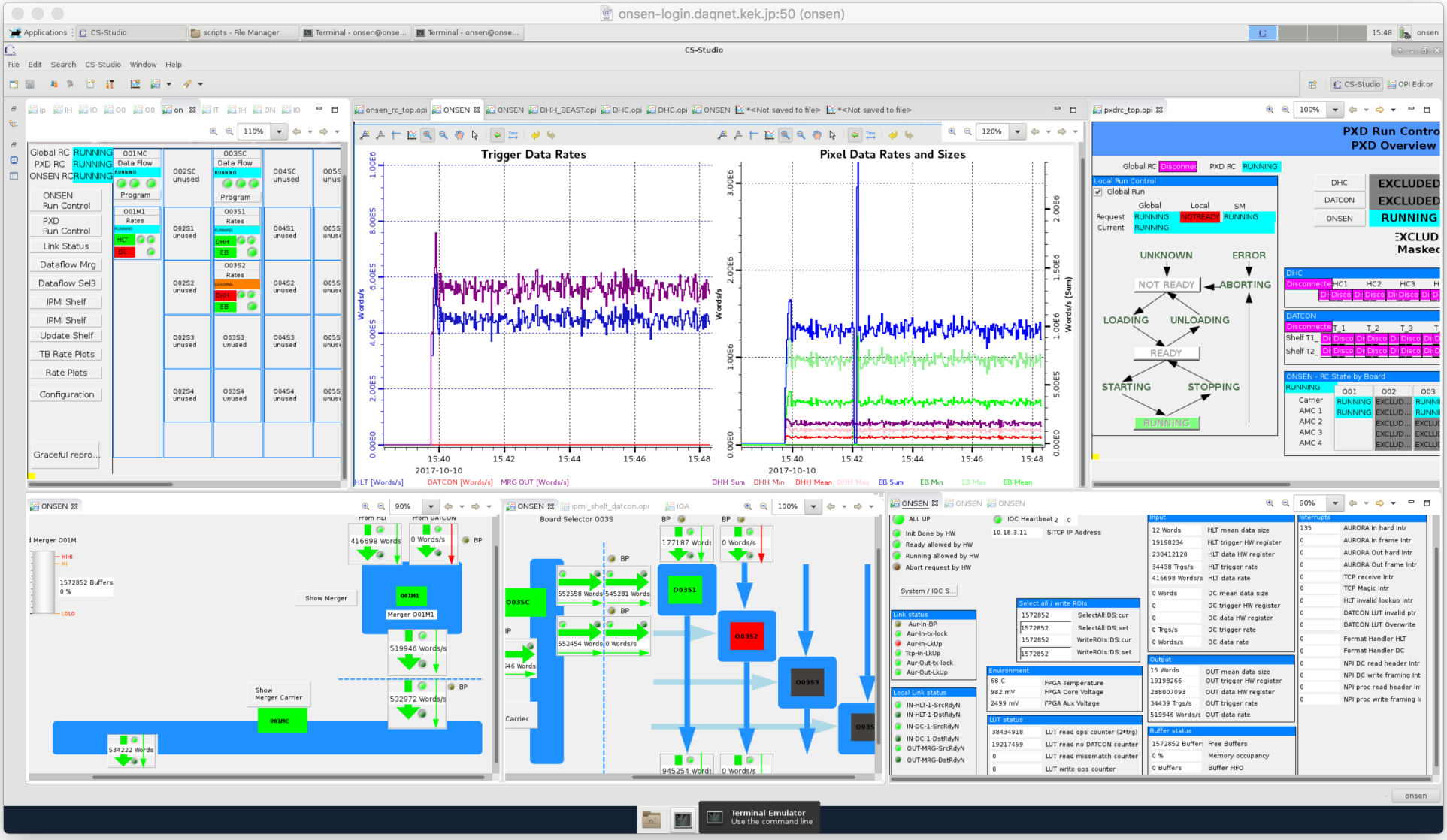
VME

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



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
  $\leq$40 kHz (significant milestone)
- DHPT testpatterns, 1 DHE
  $\leq$100 Hz, data integrity under study
- full chain + DATCON
  $\leq$1 kHz (untriggered, unsynchronized)