DHI, DHH for Phase 3 and DHH Upgrade
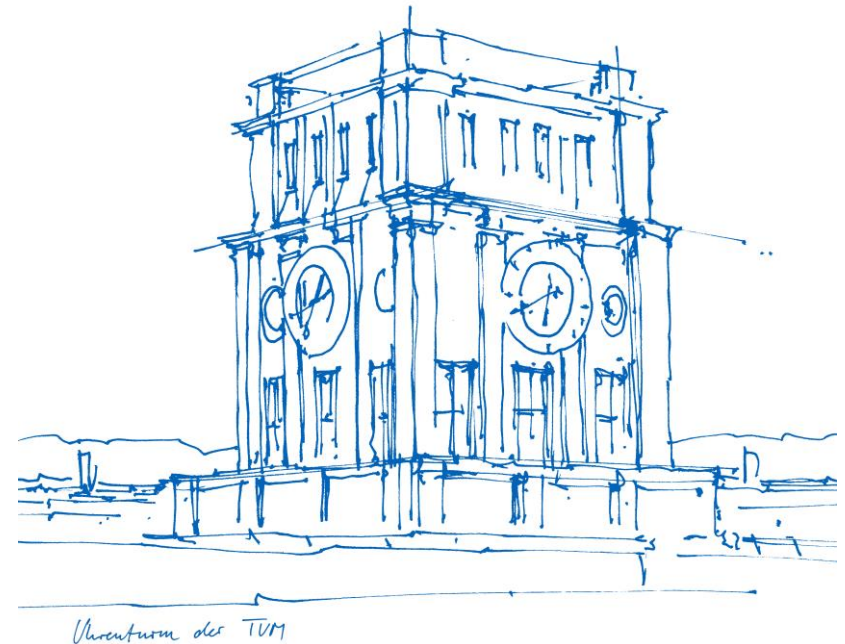
Igor Konorov

Institute for Hadronic Structure and Fundamental Symmetries (E18)
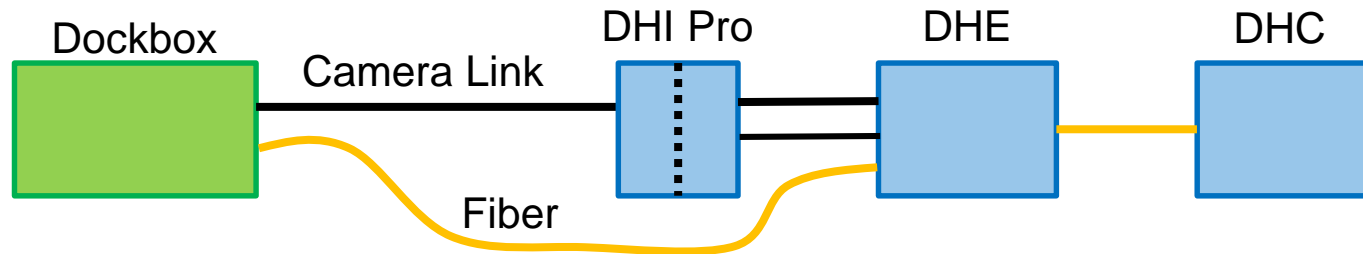
TUM Department of Physics

Technical University of Munich
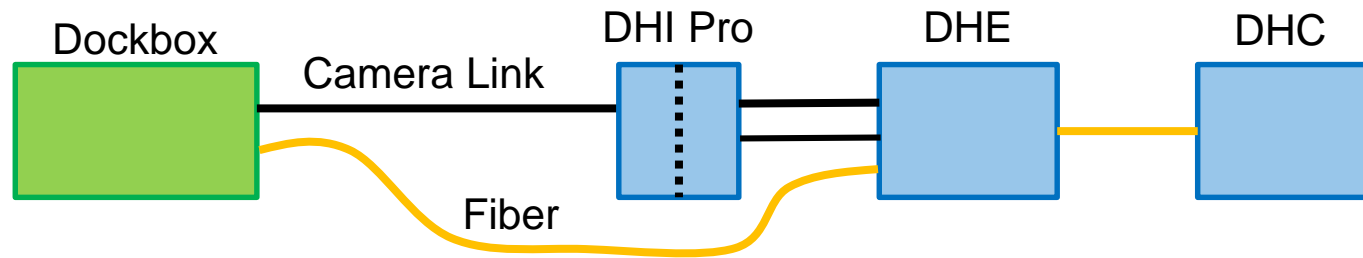
DEPFET Workshop 22.01.2018, DESY

DHI Prototype @ Phase 2

Dockbox   Camera Link   **DHI Pro**   **DHE**   **DHC**

Fiber

DHI Phase 2 – Phase 3

PHASE 2

Dockbox   DHI Pro   DHE   DHC

Camera Link

Fiber

PHASE 3

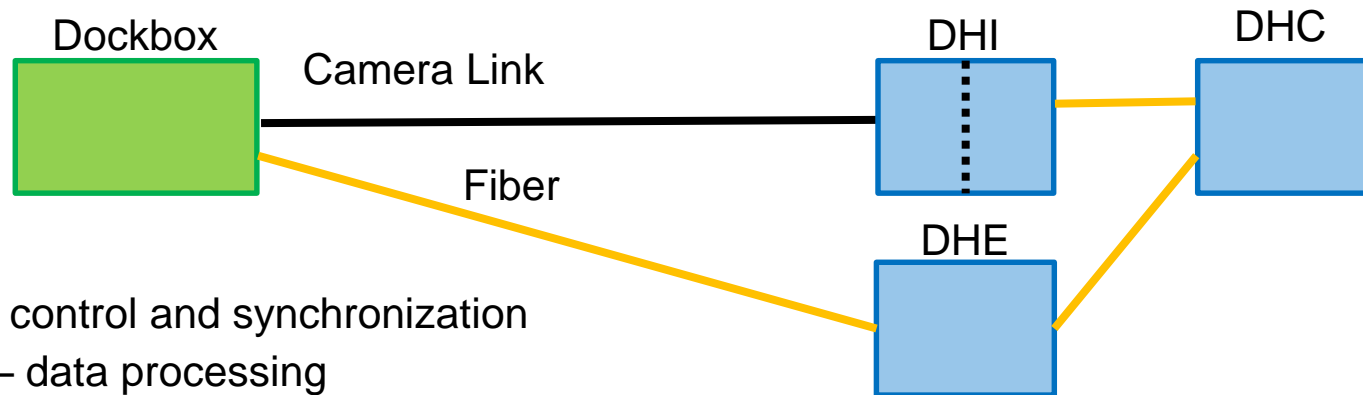Dockbox   DHI   DHC

Camera Link

Fiber

DHE

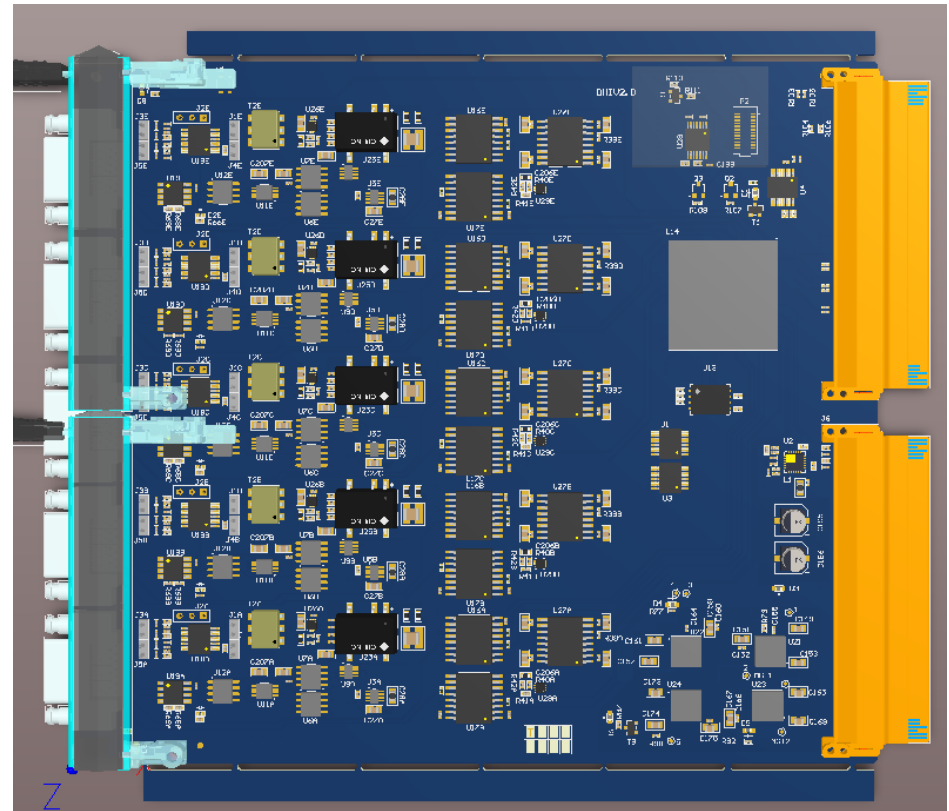DHI – control and synchronization

DHE – data processing

DHI

Status

- 12 modules are in production
- Production was scheduled for beginning of January but delayed due to missing DC/DC LTM4622
- DIGIKEY run out of stock, delivery 26 weeks
- ARROW USA has in stock but ordering requires custom clearance
- Stock at RS ? Ordering in progress
- Backup solution : piggy back PCB with another type of DC/DC converter

Firmware changes

- Small change of DHE firmware
  - Remove JTAG, SPI interface, Manchester encoder
- Assemble DHI firmware
  - UCF ⇔ 5 x (IPBUS + JTAG + SPI)

- If no bugs delivery time to DESY end of February
- DHI dummy will be delivered to DESY beginning of February for cable arrangements

Delivery to DESY for Final Detector Test

In end of January we ship DHH system for half shell to DESY, except DHI :

- ATCA shelf
- 4 DHCC
- 4 DHRTM
- 20 DHE
- 4 DHC
- 0 DHI

To be Done for Phase 3

Missing Hardware

8 x DHI modules

Short of DHE/DHC modules because quite few were damaged

- Production of 20 more modules scheduled for middle of February

DHE/DHC firmware changes

DHE

- Remapping
- Row wise hits sorting for clustering algorithm
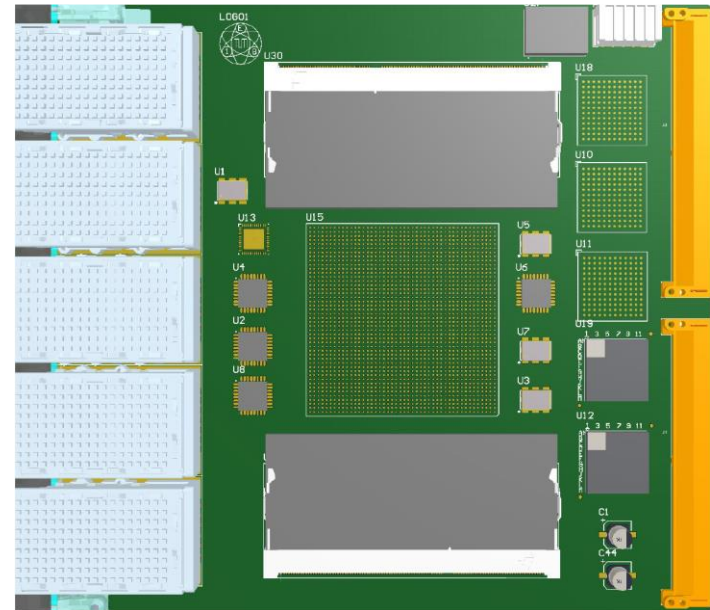- Clustering algorithm

DHC

- Round Robin event distribution to 4 ONSEN modules

DHH Upgrade : DHU

Module being developed for Belle2 DAQ upgrade and DHH upgrade

Technical parameters :

- Double width AMC card
- XCKU095-1FFVB2104
    - 1.2 M logic cells
    - 60 Mbit Block RAM
    - 64 x 16Gb/s
- 2 x 16 GB DDR4 SODIMM,
- AMC connector Interfaces
    - B2TT
    - Ethernet(IPBUS)
    - 15 x 16Gb/s
- Front panel interfaces
    48(60) x 16Gb/s

    Module will substitute 5 DHE and 1 DHC => 8 DHQ
    First two prototypes will be ready by May 2018

Summary

Phase 3

- Production of DHI modules is on hold because of missing DC/DC converter
- If there are no bugs DHIs will be delivered to DESY in end of February
- New firmware to be developed for DHI

- DHH system for half shell will be delivered to DESY next week
- Integration of remapping and clustering algorithm in DHE firmware

DHH Upgrade

- DHU module is in development, first prototype will be ready in May 2018

THANK YOU