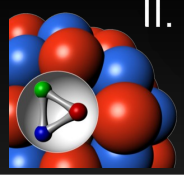

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JUSTUS-LIEBIG-UNIVERSITÄT GIESSEN

Status of PTDAQ and Results of MAMI Test

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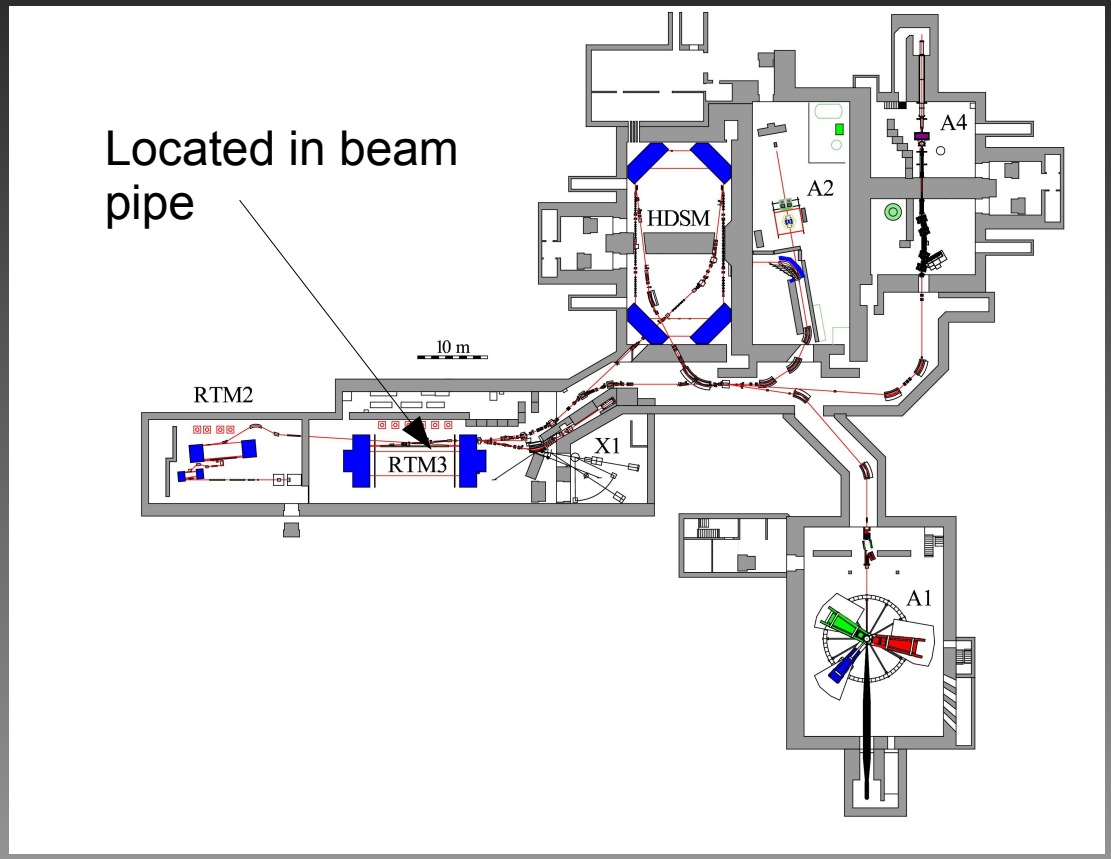
HGS-HIRe for FAIR
Helmholtz Graduate School for Hadron and Ion Research

HIC for FAIR
Helmholtz International Center

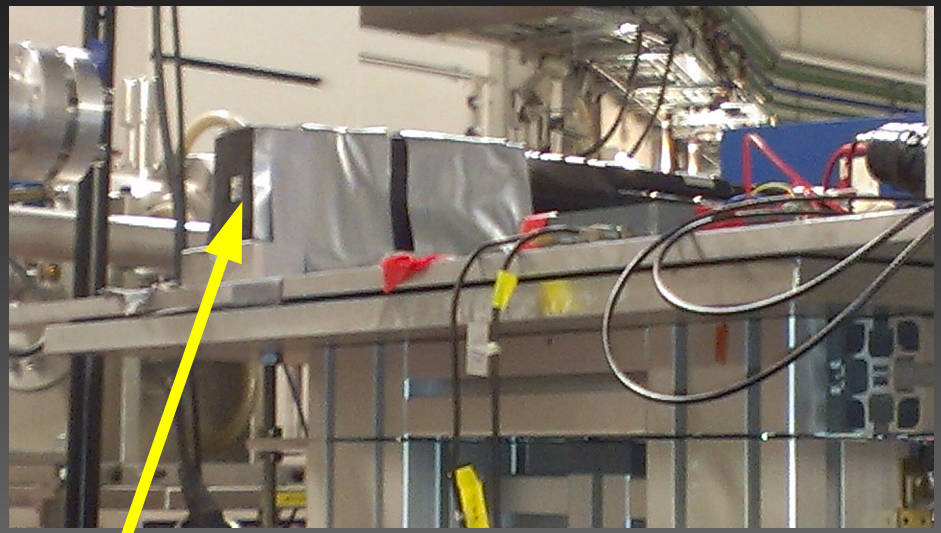
Parasitic Beam Test @ MAMI

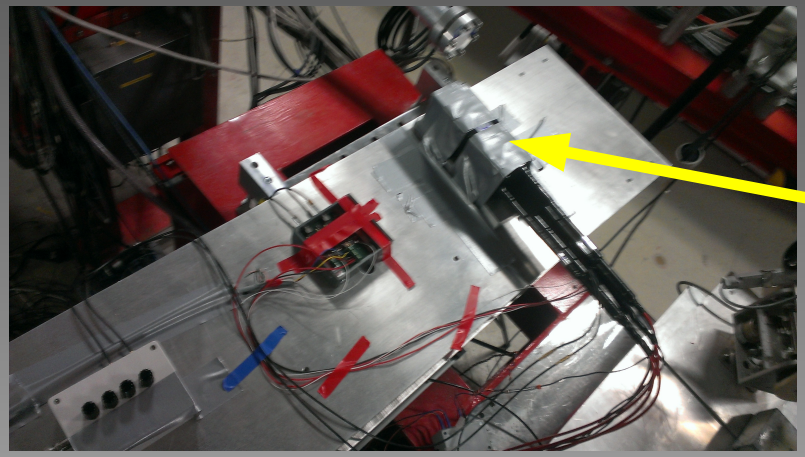
- Beam parameter
  - 210 MeV electrons
  - 0.003 - 2 MHz event rate



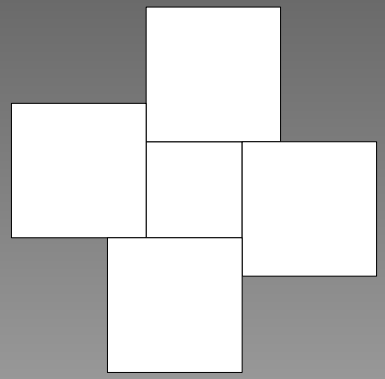
Parasitic Beam Test @ MAMI

- Detector:
  - 1 mini PWO crystal
    - 2 HAMAMATSU SI-PM
  - 4 $\overline{\text{P}}$ANDA crystals



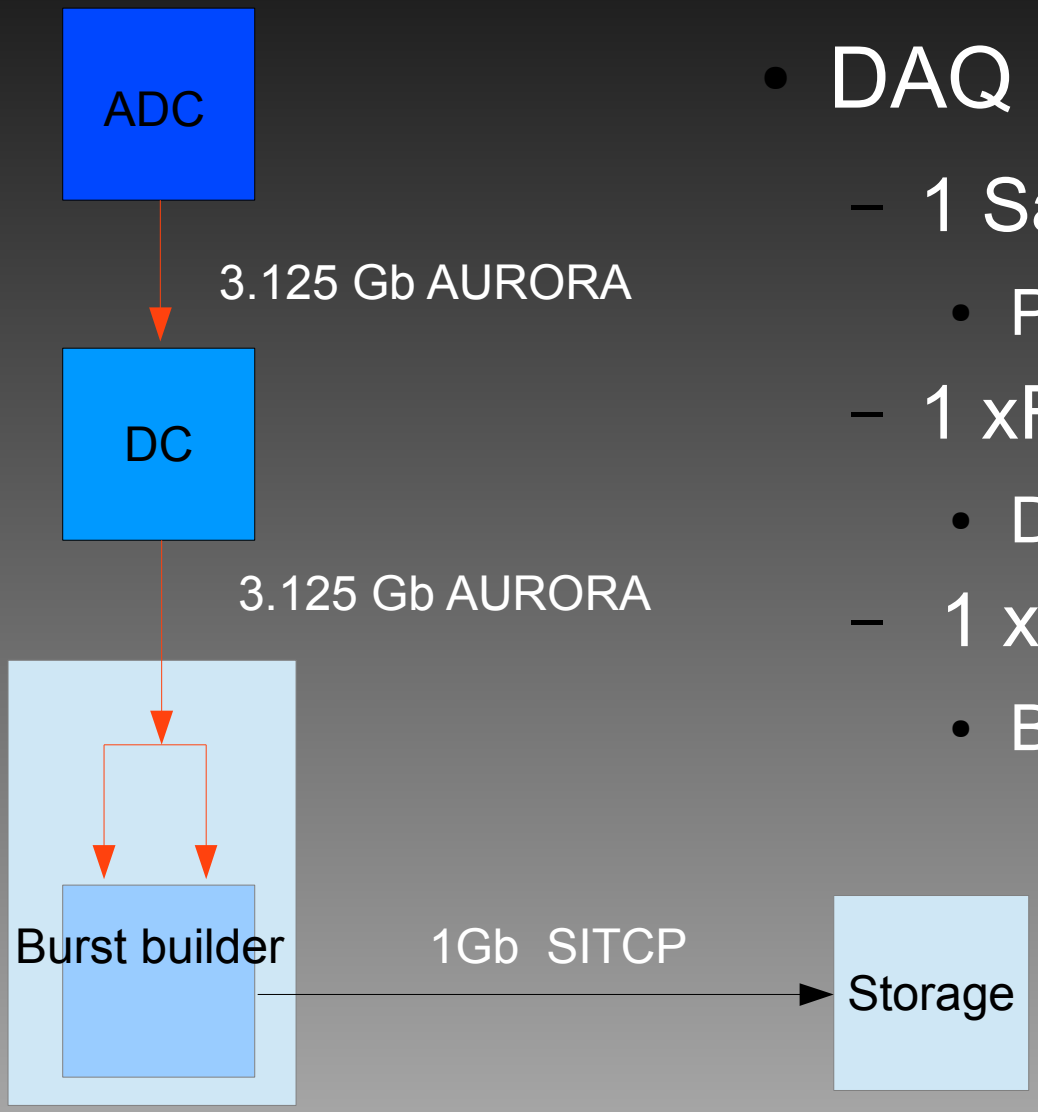


Detector

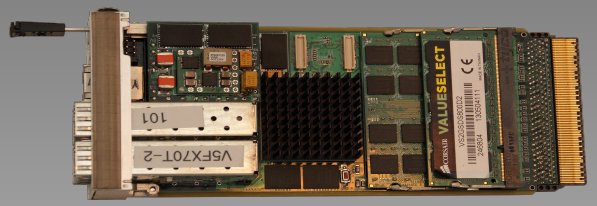


Detector matrix

PTDAQ Chain



- DAQ chain
  - 1 Sampling ADC (Uppsala)
    - Pile-up mode
  - 1 xFP version 2
    - Data concentrator
  - 1 xFP version 3
    - Burst-builder



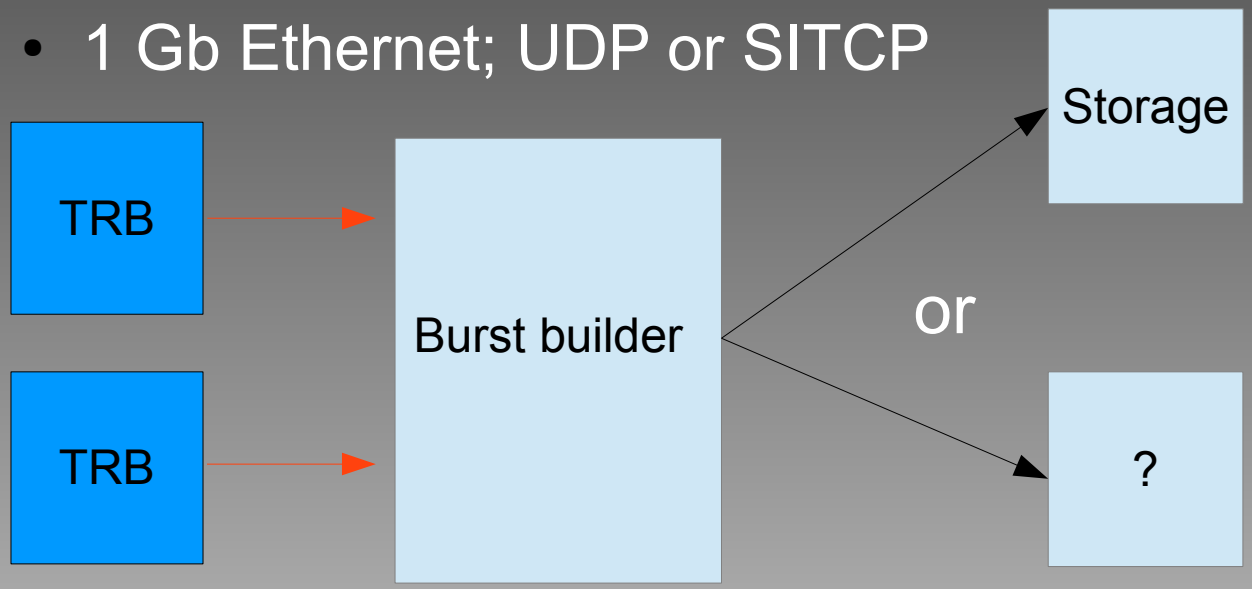
xFP board

Results

- Stable Connection between DC and xFP
- 2-Input burst building successful
  - for ~ 15 * 10^6 events
  - Data rate of ~ 1 Gbit/s from xFP to PC

Whats Next?

- SODA connection test
  - 2 TRBv3
    - 1 Gb Ethernet; Transport protocol (P. Schakel)
  - 1 CN
    - 1 Gb Ethernet; UDP or SITCP



Whats Next?

- SODA connection test
  - 2 TRBv3
    - 1 Gb Ethernet; Transport protocol (P. Schakel)
  - 1 CN
    - 1 Gb Ethernet; UDP or SITCP
- Participation on beam tests, if possible?
  - Need informations
    - What DC?
    - What transport protocol?

Backup

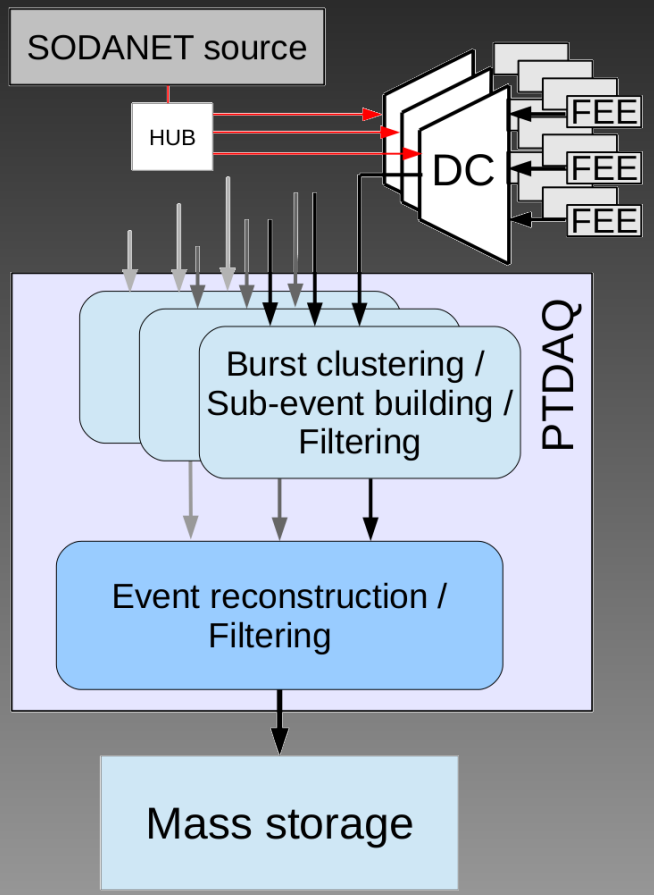
Prototype Trigger-less Data Acquisition (PTDAQ)

First step of the pre-assembly DAQ:

- Small but scalable start version
- Parts of the final functionalities
- Similar hardware to the final DAQ

Functionalities:

- Digitized data received from front end electronics (FEE) is synchronized at the data concentrator (DC)
- Sub-event building and first filter algorithms
- Event building and second stage filter algorithms



PTDAQ can be used for testing:

- Synchronization of data acquisition (SODANET)
- Sub detector prototypes
- Reconstruction algorithms
  - FPGA based Helix tracking

Hardware Components

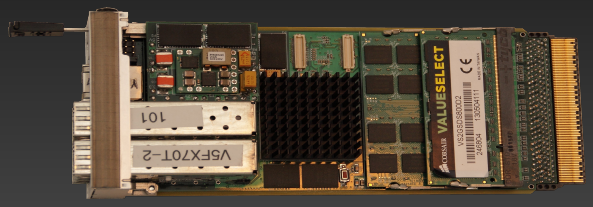
PTDAQ setup:

- µTCA shelf
- 4 xTCA compliant boards
- 9 data concentrator boards

PTDAQ setup with 4 xTCA compliant boards and a shelf controller in a µTCA shelf

xTCA compliant board:

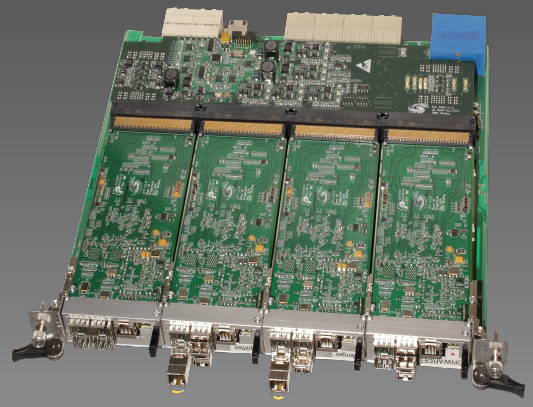
- Xilinx Virtex 5FX70T-2
- 2 x 2 GB DDR2
- 4 x SFP+ cages
- 6.25 Gbit/s optical interfaces
- AMC form factor
- 1 Gbit Ethernet



xTCA compliant board used as a main hardware component of the PTDAQ.

Compute Node:

- Xilinx Virtex 4
- ATCA based carrier board
- Up to 4 xTCA compialt boards



ATCA based Compute Node. Will be used in the upgrade of the PTDAQ. Developed in cooperation between IHEP Beijing and JLU Gießen

Status &Outlook

Status:

- One board setup
  - Connection for of up to 4 DCs
  - Tested with simulated DCs

Outlook

- Tests with different types of DCs
- Test different kinds of detectors with beam
- Upgrade to ATCA based Compute Node DAQ using carrier boards and xTCA compliant boards