ATCA in COMPASS/Belle2/AMBER

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ATCA Workshop, 11-th May 2021
COMPASS iFDAQ

COMPASS DAQ:
- 300k channels
- 40kHz
- 1-2 GB/s in spill
- 300-500MB/s sustained
COMPASS Hardware

Virtex6 FPGA XC6VLX130
- 16x6.5 Gbps links, 4GB DDR3
- TCS interface
- Ethernet IPBus for control and monitoring
- Too few modules for migration to ATCA
- DAQ up time > 99%
Pixel Detector

40 half leaders
- Each 4x1.52 GB/s
- Each connect to one DHE card
- DHC multiplexer card
- DHI control card

Interconnection:
- 1 highspeed link
- Custom UCF protocol multiplexes
  - Trigger
  - Data
  - Ethernet (IPBus)
AMC Cards for Belle2 PXD

- Virtex6 XC6VLX130
- ARTIX 7
DHH System

DHH system:
- 24 FPGA cards
- IPBus for slow control
- CERN IPMC: power ON/OFF
- Data processing bandwidth 100 Gbps
DAQ Evolution Triggered to Free Running

**COMPASS iFDAQ**
- Detectors
  - Trigger Logic
  - CATCH HGESICA
  - Event Builder
  - DAQ MUX
  - PCs Storage 50 TB
  - CDR

**AMBER FriDAQ**
- Detectors
  - Digital Filter
  - Data Concentrator
  - Data Concentrator
  - Local Storage, 1-2 PB
  - HLT farm
  - CTA

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AMBER in ATCA

Strategy:
- Migrate to ATCA
  - Custom carrier ATCA card for COMPASS AMC FPGA cards
  - All FPGA cards have AMC standard

New card XKCU095
- AMC connector for Ethernet and time distribution system
- 32 GB DD4 RAM
- 60 x 16 Gbps
ATCA Experience

- Use of ATCA standard very limited
  - high cooling power, 12V power
  - Backplane high speed links not used
  - Interconnection: RTM for slow control and time distribution system,
  - High speed link via front panel
THANK YOU