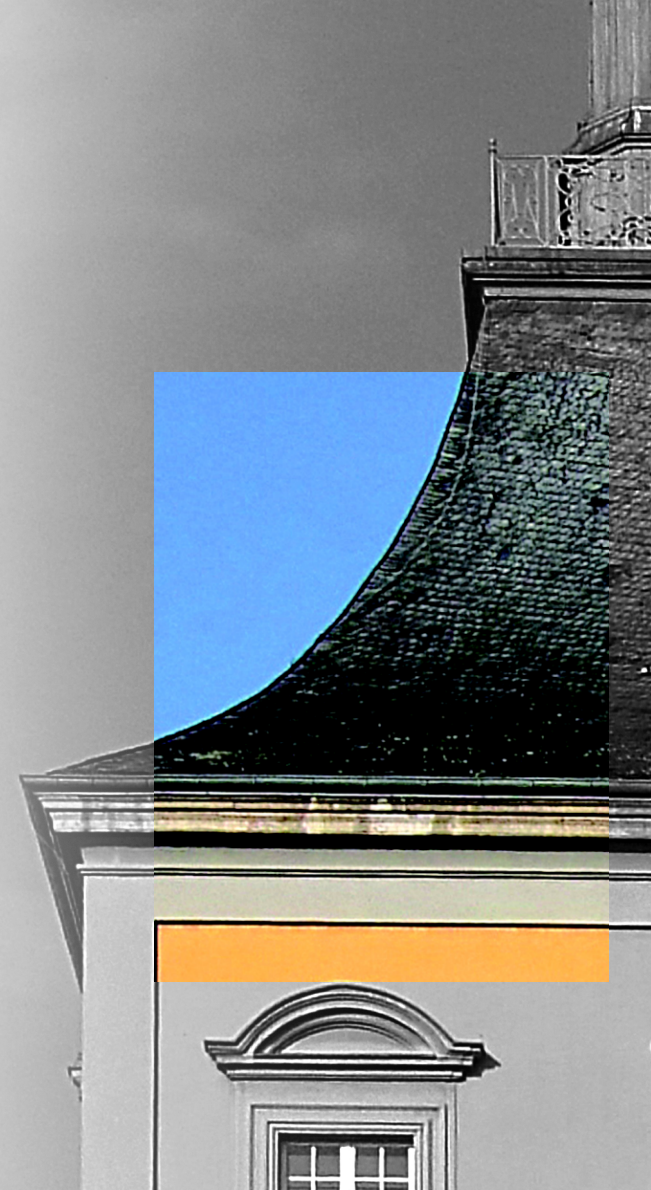


Bonn Plans for EUDAQ Integration

Beam Telescopes Development Meeting,
07.06.2018

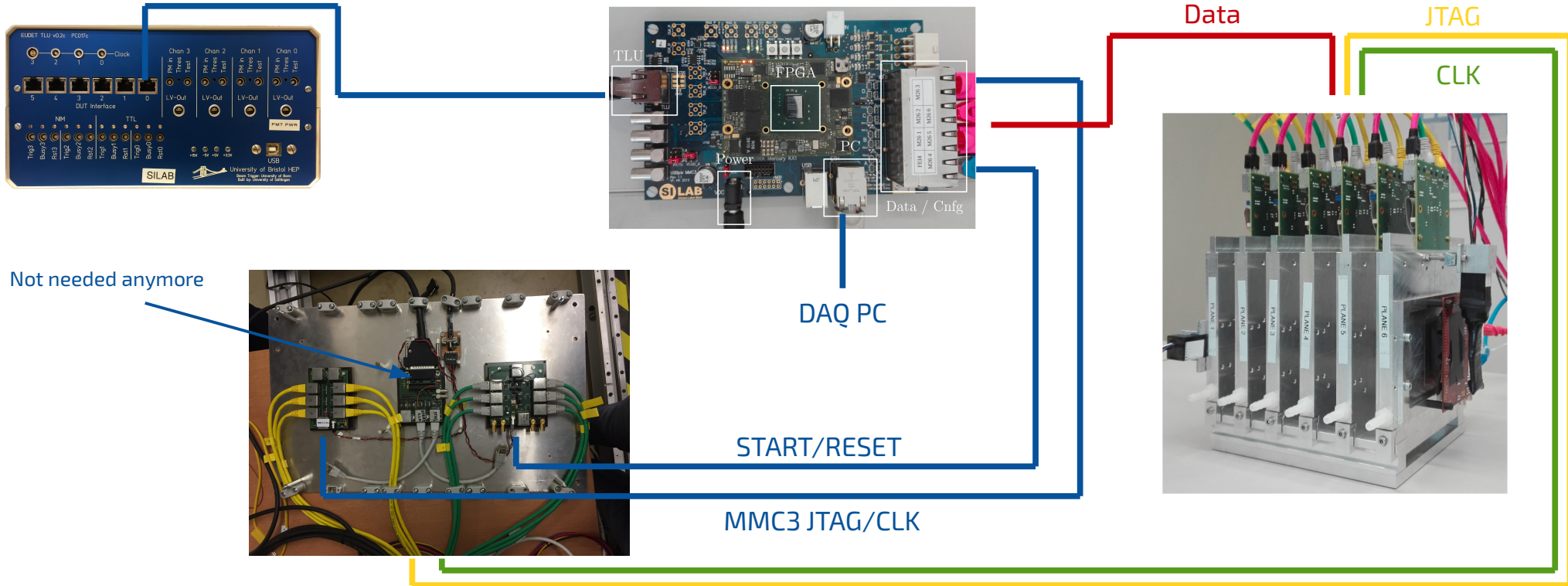
Y. Dieter, D.-L. Pohl

Physikalisches Institut der Universität Bonn



PYMOSA HARDWARE

- Components: Mimosa26 telescope, clock distributor board, MMC3, TLU



LEGACY MODE AND NEW FAST MODE

- EUDAQ1: Based on ,event-based' raw data; only one trigger per event
- **1. Legacy mode** to easy transition to pymosa readout for EUDAQ1.7/2
 - Implement optional TLU VETO/BUSY signal for our continuous trigger-less Mimosa26 readout → behaves like old triggered data taking
 - Events build in real-time from producer; only events with trigger are send
 - Maybe we even fake the produced data to look like old readout that no new converter is needed (drop in solution)
 - Use time stamps to decrease dead time to 115 us → double trigger rate to 8.5 kHz
- **2. Fast, dead-time less mode** (20 kHz and above):
 - Would not need pymosa changes; „only“ EUDAQ data analysis changes
 - Likely will require EUDAQ2 (?); „trigger range per event“ feature would help

MIMOSA26 TUNING

- Observation @ CERN: Not straight forward to use other Mimosa26 telescope (e.g. ACONITE instead of ANEMONE)
 - Obviously: different threshold values in config file for different telescope
 - Noisy pixels are different
 - Problem: Different config file format (EUDAQ vs our system)
- Possible solution: Add new telescope config files
 - No general solution
- Better approach: Bandwidth based Mimosa26 Tuning

```

41  ILVDSTX: '00101000'
42  IPIX: '00110010'
43  IPwrSWBias: '00001010'
44  IVDREF1A: '10001100'
45  IVDREF1B: '10110011'
46  IVDREF1C: '10100000'
47  IVDREF1D: '10111010'
48  IVDREF2: '01100010'
49  IVTST1: '10000000'

```


MIMOSA26 TUNING

- Mimosa26 Bandwidth Tuning:
 - Allow maximum data size (raw data) per second per plane
 - If higher than limit: Increase threshold (global, regional) and (or) disable column
 - Detailed algorithm has to be discussed
- Advantage: lowest achievable threshold possible with readout system
- Drawback: No comparison between other threshold settings

@ 4 kHz mean trigger rate:
200 kB / plane / s (of raw
data)

```
41  ILVDSTX: '00101000'  
42  IPIX: '00110010'  
43  IPwrSWBias: '00001010'  
44  IVDREF1A: '10001100'  
45  IVDREF1B: '10110011'  
46  IVDREF1C: '10100000'  
47  IVDREF1D: '10111010'  
48  IVDREF2: '01100010'  
49  IVTST1: '10000000'
```