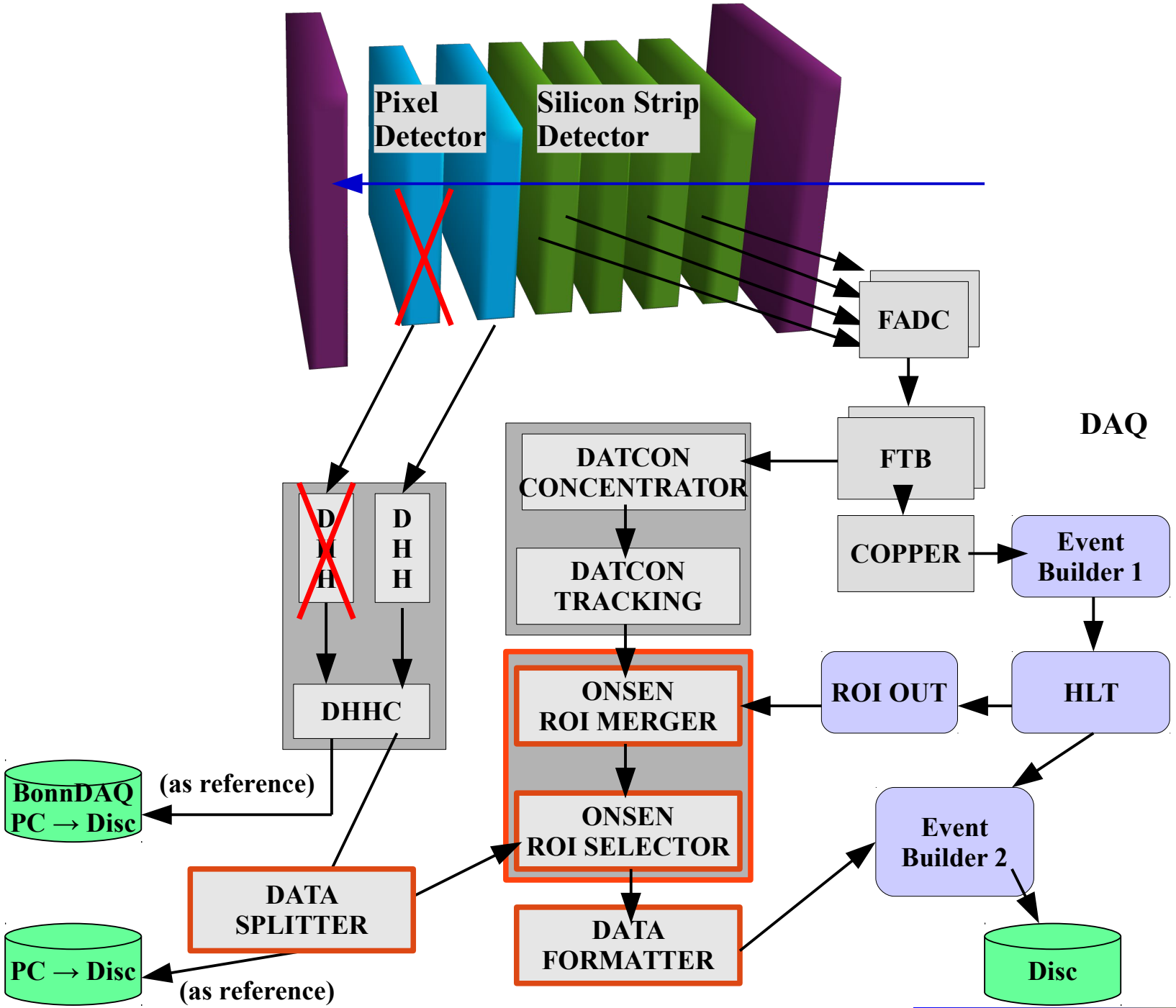
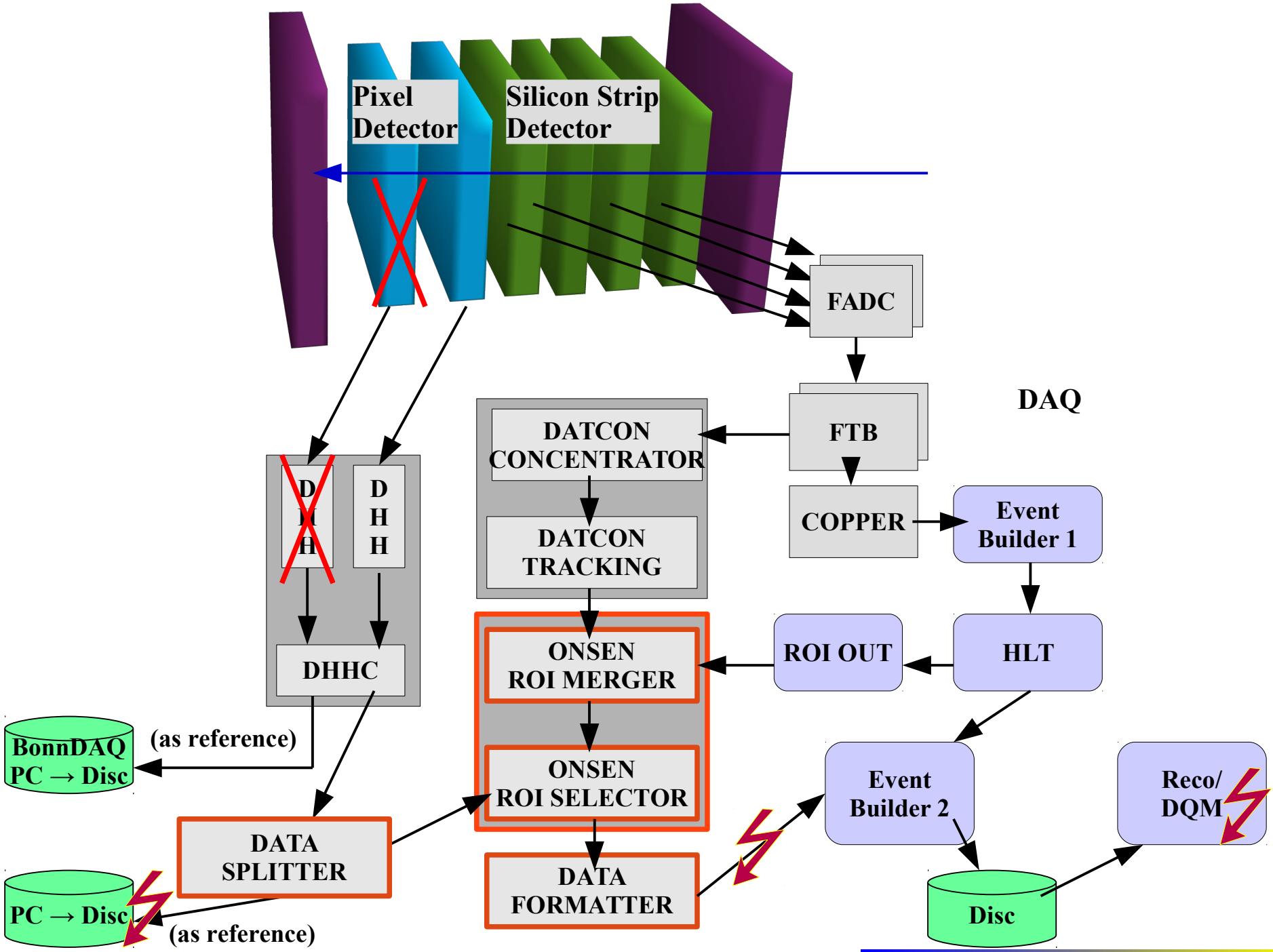
DESY Test Jan 2014 – Setup

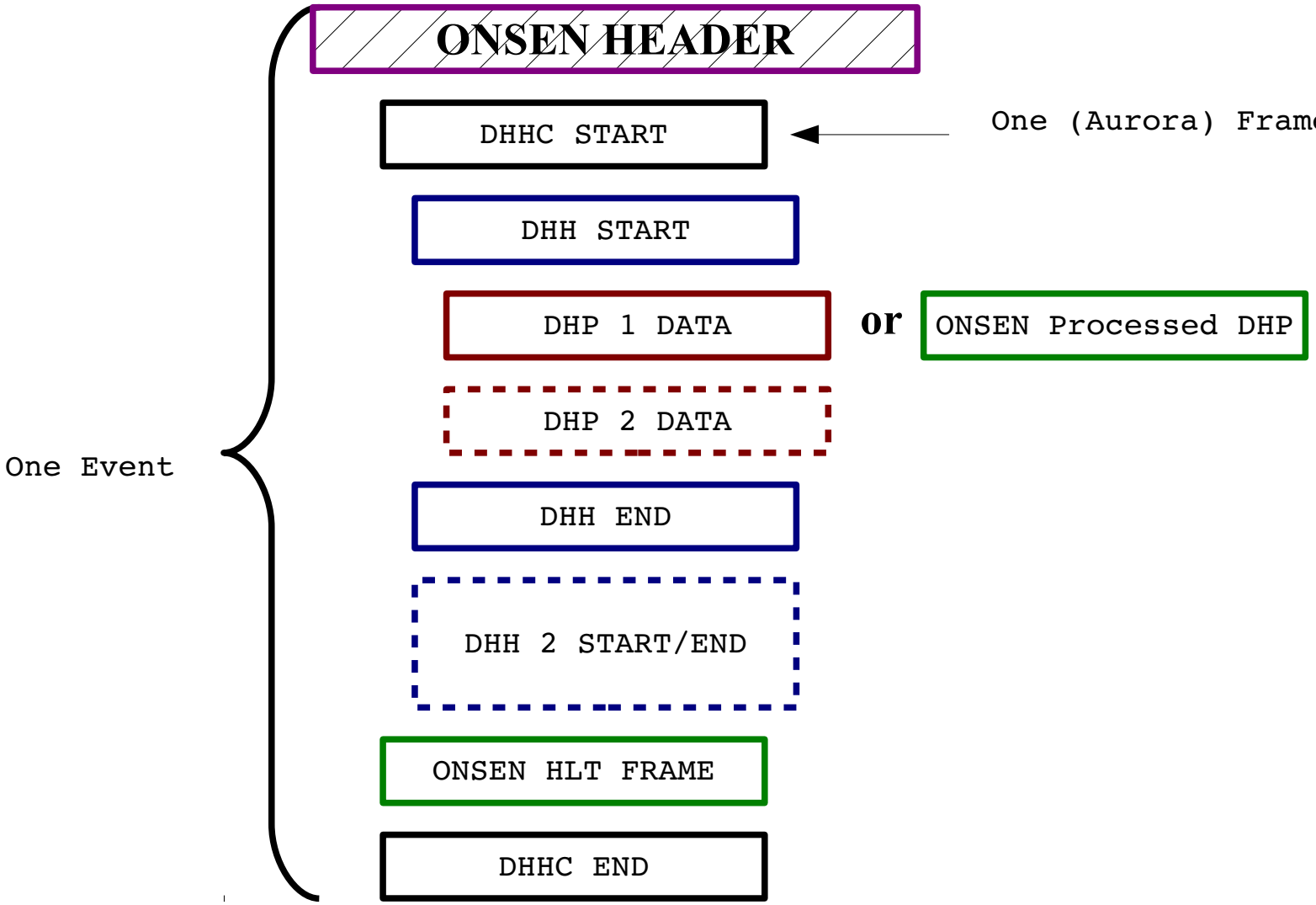


DESY Test Jan 2014 – Setup



Data Format

- We use “DHH/DHHC” data format as output of ONSEN, too
- Output/Splitter Node adds header with frame sizes (no “frames” in TCP/IP)

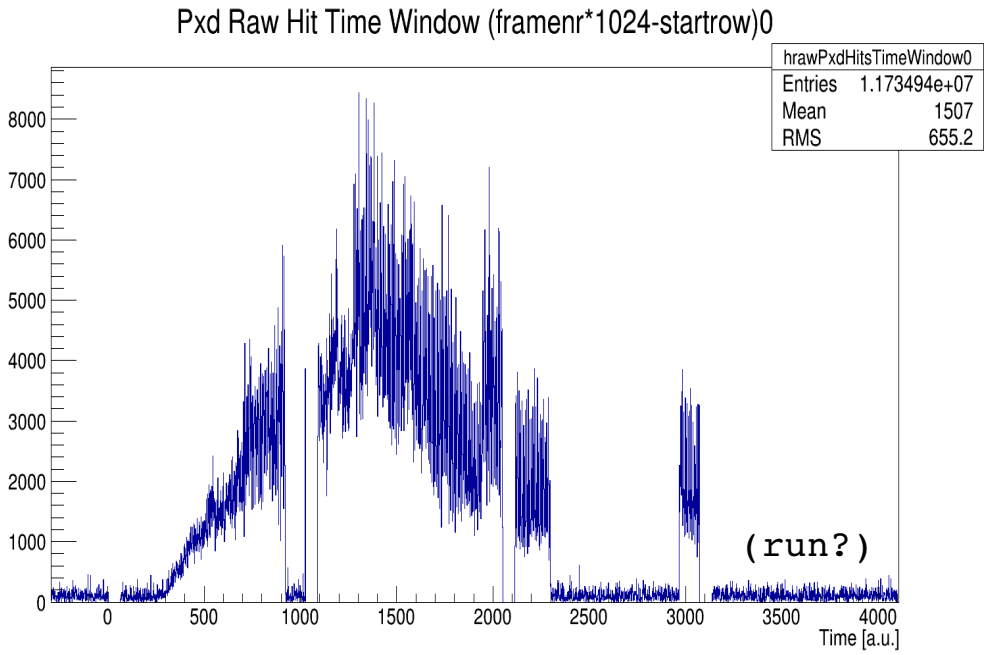


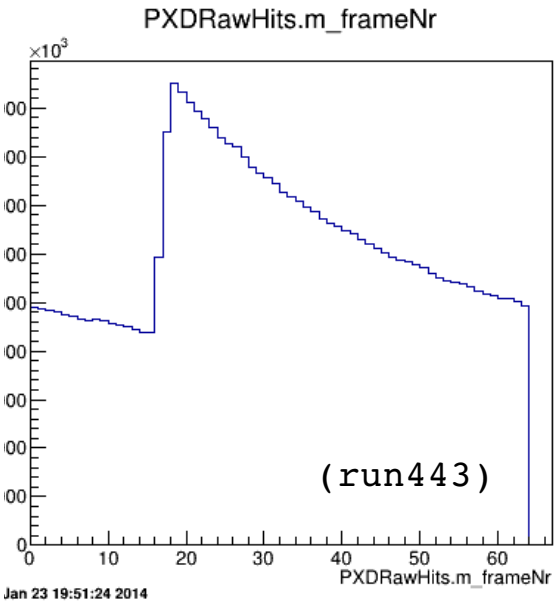
Software

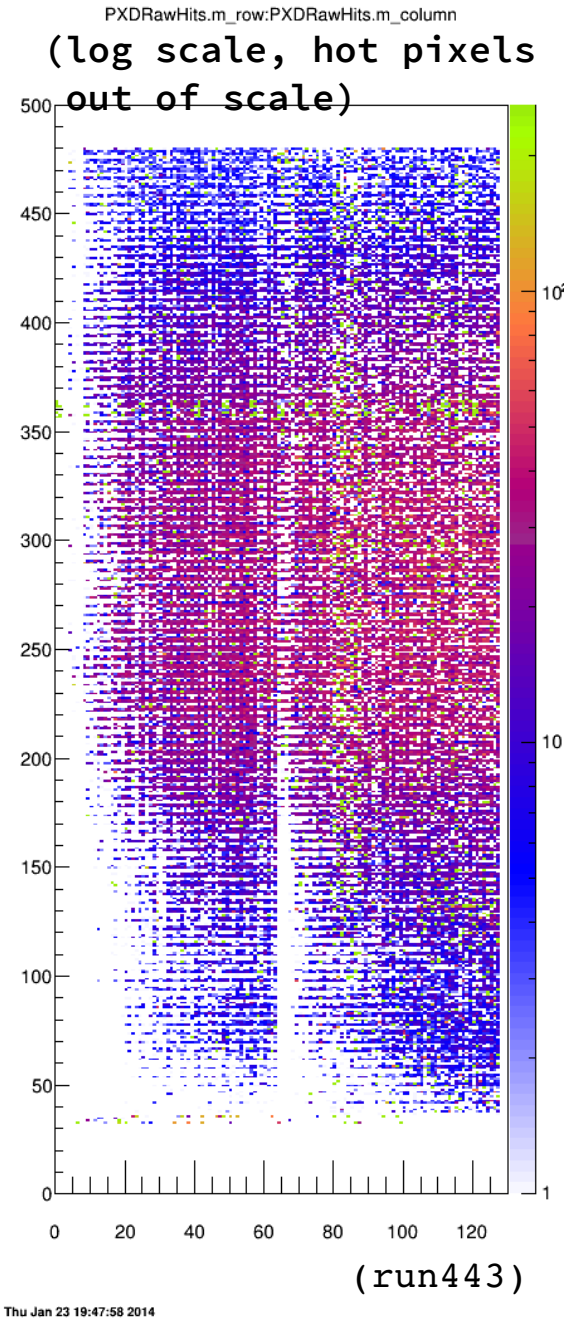
- Input Module
  - To read data from hardware without event builder (and writ to root object RawPXD)
  - Data format is compatible before and after ROI processing, allows for “easy” bypass
- Unpacker
  - Code already used for October and (partly) in May test
  - Checking for many many different things which can go wrong on hardware/ firmware or event building (event number mismatch between EVTB, DHHC, DHH; event structure errors, CRC errors, ...)
  - Important feature: PXDRawHits are still filled, even so errors are detected!!!
  - (necessary for debugging, but means no correlations etc... if trigger nr is wrong)
  - some error types can be “ignored”...
- “Result”:
  - no CRC errors detected (beside some broken firmware version)
  - => data flow from DHH (where checksum is calculated) up to root file (where the unpacker checks it) is working without errors. (no bitflips on Aurora etc...)

Software

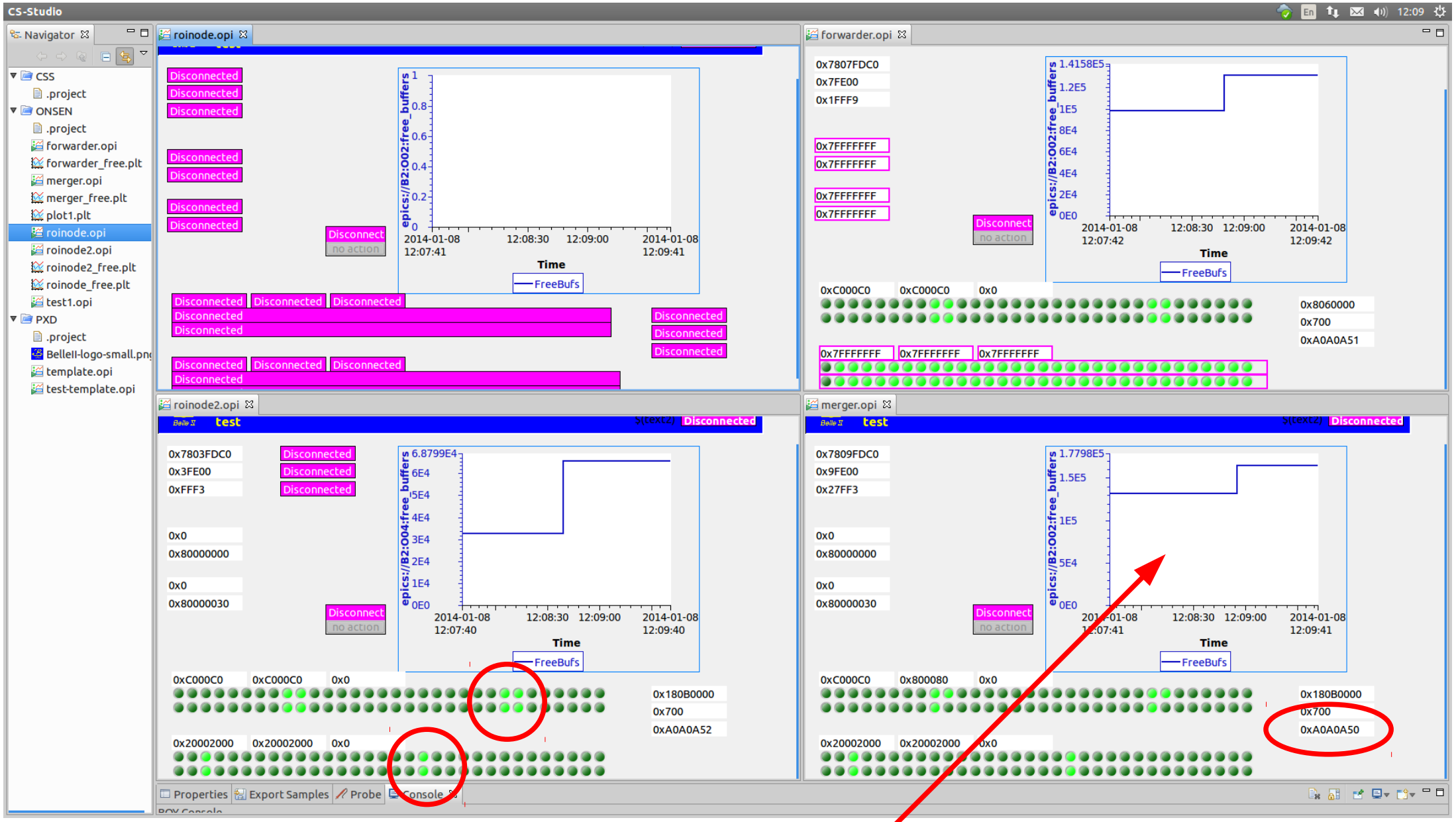
- raw DQM
  - some basic histograms
  - event sizes, basic hit-maps, trigger row & timing





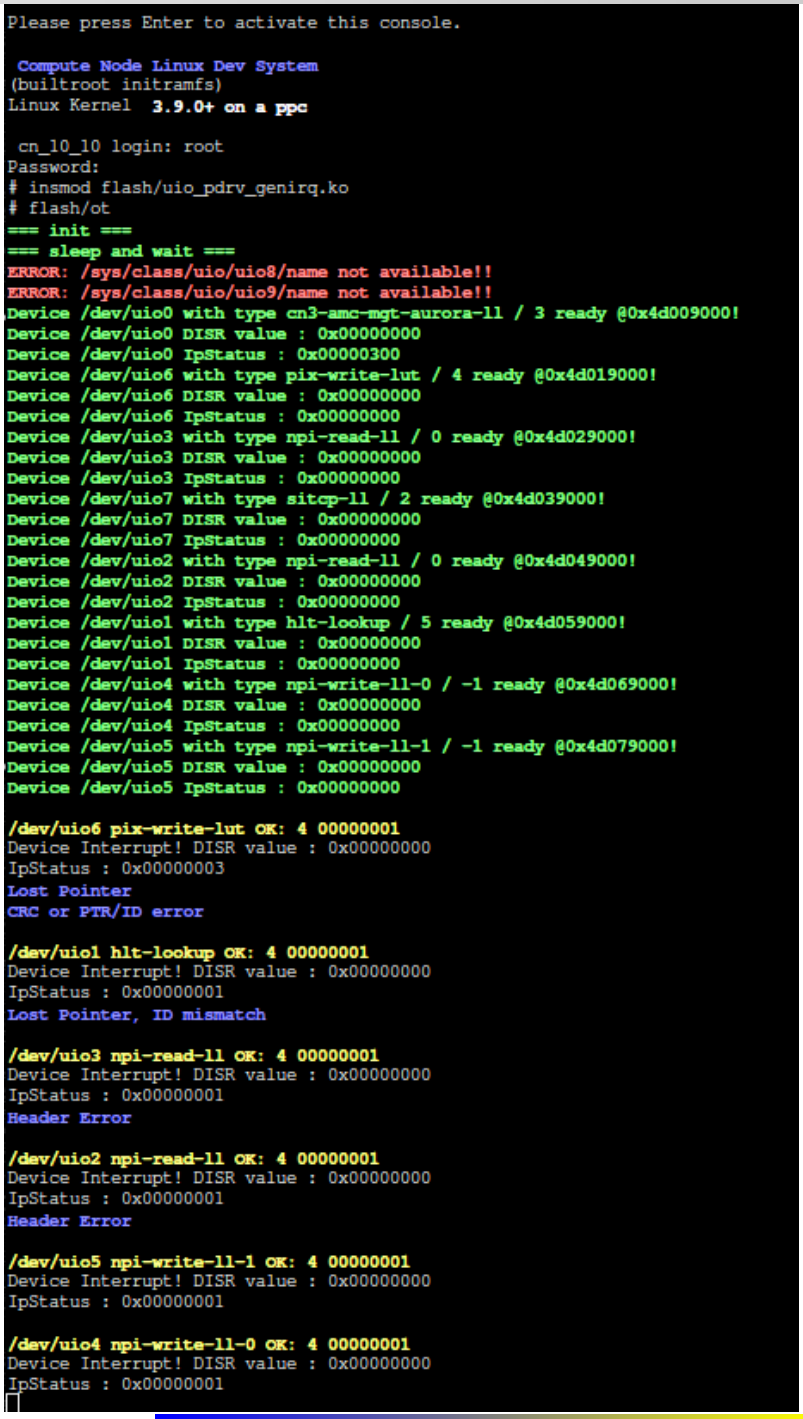


“Similar“ Firmware -> Same things to monitor:



EPICS or not EPICS

- EPICS IOC runs on top of Linux (as a system service)
- Linux (kernel 3.12+) is working on the current firmware (if we want...).
- Not used during this test as it takes much longer to start Linux and EPICS than just the embedded program.
- Interrupt handlers for errors are existing and supported in software.
- EPICs interface still rudimentary
- No real advantage (at the moment)
- Initiialization is not done by EPICS a.t.m.
- Run control missing (depending on the abort reason, FPGA reprogramming needed, but this cannot be done from software)



Basic Monitor

/bin/bash 21:04

/bin/bash 120x24

```
= DHHC ROI Core 3.125Gb Crc Aout = W 00000000 R 00000000
Keys: reinit (s)itcp (y/l)ut (d)ump (c)ls ...
PR: 00000000 00000000 1801A640 0001A640 0000699D 00000000 00000000 00000000
RL: 00065700 00000000 40002B7E 5FBA8000 C0002B7E 5FD88000 40002B7E 0000043C
WL: 00008394 00000000 FFFFFFFF 54D80000 400041C9 00000000 FFFFFFFF 80000000
R1: 00000000 0000000A 00000000  R2: 00000000 0000000A 00000000
W1: 00000000 00000000 00000000  W2: 00000000 00000000 00000000
A1: 00C000C0 00C000C0 00000000  A2: 20002000 20002000 00000000
SI: 08060000 00000700 0A0A0A52
ROI:00D4D403
20030000 40000000 20038000 40000001 00000000 FFFFFFFF 20048000 40000003
00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF
00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF
00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF
DUMP $00000000:
C168F000 FC7F5B78 3B000020 68000FF9 38404000 78544BA6 4D00256C 3840EFEF
```

/bin/bash 119x24

```
= AURORA 3.125 DHHC <-> SiTCP =
Keys: reinit (s)itcp (d)ump (c)ls...
PR: 04006A6A 00000000 0005B240 0007AEC0 00007FF9 00896CA6 6CAD6CA6 20000080
FF: 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
R2: 00000000 0000000A 00000000  W2: 00000000 00000000 00000000
AU: 00C000C0 00800080 00000000
SI: 180B0001 00000700 0A0A0A51
```

/bin/bash 120x18

```
= SPLITTER 3.125 -> 3.125 + SiTCP =
Keys: reinit (s)itcp (d)ump (c)ls...
SysMon: 54'C  930mV 2499mV
PR: 04006E76 00000000 00010700 00030340 00007FF9 008941D3 41DA41D3 20000080
FF: 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
R2: 00000000 0000000A 00000000  W2: 00000000 00000000 00000000
AU: 00C000C0 00C000C0 00000000
SI: 180B0001 00000700 0A0A0A54
```

/bin/bash 119x17

```
= Mörtschörnode 3.125 backplane, 1.5 DatCon = W 00000000 R 00000000
Keys: reinit (s)itcp (y/l)ut (d)ump (c)ls...
PR: 00000000 00000000 1801FDC0 0001FE00 00007FE8 00000000 00000000 00000000
RL: 000057C6 00002BE3 FFFFFFFF 5FC80000 C0002BDB 7FFFFF00 FFFFFFFF 0100001C
WL: 00000000 00000000 00000000 00000000 00000000 00000000 00000000 80000000
R1: 00000000 0000000A 00000000  R2: 00000000 0000000A 00000000
W1: 00000000 00000000 00000000  W2: 00000000 00000000 00000000
A1: 00C000C0 00000000 00000000  A2: 20002000 20002000 00000000
SI: 180B0001 00000700 0A0A0A50
00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF
00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF
00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF
00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF 00000000 FFFFFFFF
DUMP $00000000:
7FA57F9B 937ADBF7 EF7FBFF5 FFEDBBEE 97FF6FF8 F5E9ED6D EF74FDFD FF3EEDF7
```

/bin/bash 120x15

```
$ hexdump -C dhhc_frame_test_006.dat |less
hexdump: dhhc_frame_test_006.dat: No such file or directory
onsen@belle-onsen ~ (  )
$ nc 10.10.10.84 24 | pv > dhhc_frame_test_006.dat
^C04MB 0:13:18 [   0B/s] [                                    <=>                 ]

onsen@belle-onsen ~ (  )
$ nc 10.10.10.84 24 | pv > dhhc_frame_test_174.dat
hex   0B 0:00:19 [   0B/s] [<=>
d   0B 0:00:20 [   0B/s] [<=>
^C82kB 0:01:55 [   0B/s] [                                    <=>                 ]

onsen@belle-onsen ~ (  )
$ nc 10.10.10.84 24 | pv > dhhc_frame_test_175.dat
4.1MB 0:04:24 [25.2kB/s] [                                    <=>                 ]
```

/bin/bash 119x16

```
File /home/onsen/aktuell/urlaub_linux_merger_backplaneout_oram_np2.bit found.
Programming Bitstream -- /home/onsen/aktuell/urlaub_linux_merger_backplaneout_oram_np2.bit
Fpga Programming Progress ......10....20....30....40....50....60....70....80....90.....Done
------------------------------------------------------------------------
ESN 00001295CC7A01 found.
File /home/onsen/aktuell/urlaub_linux_roicore_dhhc_aurora_only_more_frames.bit found.
Programming Bitstream -- /home/onsen/aktuell/urlaub_linux_roicore_dhhc_aurora_only_more_frames.bit
Fpga Programming Progress ......10....20....30....40....50....60....70....80....90.....Done
------------------------------------------------------------------------
ESN 000014D2D85601 found.
File /home/onsen/urlaub_linux_splitter_dhhc/urlaub.runs/impl_3/download.bit found.
Programming Bitstream -- /home/onsen/urlaub_linux_splitter_dhhc/urlaub.runs/impl_3/download.bit
Fpga Programming Progress ......10....20....30....40....50....60....70....80....90.....Done
------------------------------------------------------------------------
onsen@belle-onsen ~ (  )
$
```