TOP Feature Extraction

Progress Updates and Plans

Harsh Purwar

University of Hawaii at Manoa,
Honolulu, HI, USA

TOP Feature Extraction Group Meeting
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Feature extraction code revisions

Version	What's included
1	• Core feature extraction • Reformatting of data
2	• Core feature extraction • Reformatting of data • Pedestal subtraction for a single BS • Noise reduction based on a constant threshold value
3	• Core feature extraction • Reformatting of data • Pedestal subtraction for all BS • Noise reduction based on a constant threshold value • Register-based control for attaching raw waveforms, carrying out pedestal subtraction, etc.

Suitable for physics runs

Project status

- **Recently finished testing 2nd version of TOP Feature Extraction at UH.**
- Successfully tested version 1 at KEK (with 1 TOP FEE, s09a).
- Tested version 1 with all TOP FEEs to check if there is any significant impact on performance.
  - Tried running at various trigger rates – No BUSY until 10 kHz with *1 hit in each event* occupancy.
- Finished the script for reading pedestals in parallel from all TOP FEEs.
  - Yet to fully test it at KEK.
- **Next steps:**
  - Version 3 testing at UH
  - Test version 3 at KEK

Plan for the next few months

- Wrap up version 3 of TOP FE and get it into testing phase at UH – this week
- Test at KEK (1-2 weeks)
- Finalize pedestal DAQ script and inclusion in TOP Power-cycle & Config GUI (2 weeks)
- Full system DAQ tests at KEK using TOP RC GUI (2 weeks)
- **Ready for next beam operation in about 2 months**
- Training/information transfer, etc. (1-2 weeks)

TOP Feat Ext – Tests at KEK

Version 1

- No pedestal subtraction
- **Single TOP FEE**

Preparations for testing TOP FE at KEK
(version 1 – no pedestal subtraction)

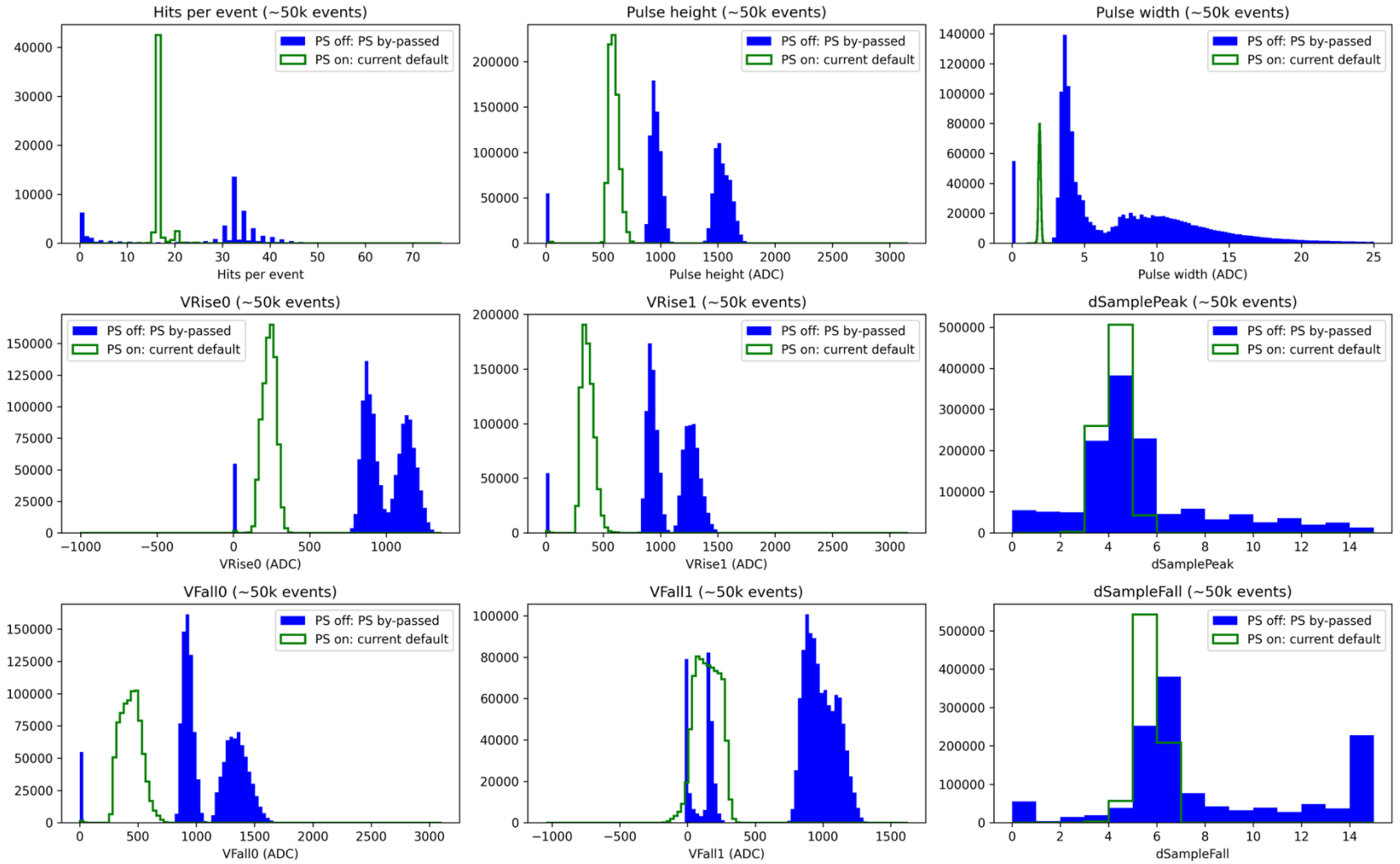
- To not disturb the existing TOP/DAQ setup, for testing TOP FE I made the following changes…
- Minor modifications made in the `pcie40_software` + TOP FE code (v1):
  - Branch: **`top-feature-extraction-kek-v1`**
  - Why?
    - Slightly different RL-9 OS/kernel versions
    - No need to fake the SCROD ID at KEK
    - Have a different IPC socket for testing purposes
- Compiled **`basf2`** on *rtop1* and *rtop2* with minor modification:
  - **`daq/rawdata/modules/src/DeSerializerPC.cc`** – Turn on **`NO_DATA_CHECK`** flag
- Compiled daq_eb (sw event builder) on *rtop1* and *rtop2* with minor modifications:
  - Using IPC socket: **`/tmp/pcie40_roproc_test`** for my tests
  - Similarly, using separate files for eb status/stats
  - Listening port was also modified to 5109

Testing procedure

1. Power-cycle & Configure TOP BS (one or more at a time) with firmware: **8C-93/84-23**
2. Prepare TTD with:
   ```
   ttaddr -65 –c; ttaddr -65 –a; ttaddr -65 –m
   ttaddr -65 –u pcie40b,s09a
   ```
3. Enable PS-bypass mode: **pcie40_regconfig --ch 0 --fee32 -w 0x4EF 0x1**
4. Start calibration pulser with:
   ```
   ssh topslc01
   ssh pulser bash set5kHz.sh
   ```
5. Start eb0_for_pcie40 with:
   ```
   eb0_for_pcie40 –l 5109 –i 1 –u /dev/shm/eb0_up_test –d /dev/shm/eb0_down_test
   ```
6. Start basf2 for dumping data to file with:
   ```
   basf2 ~/RecvStream1.py –o ~/test.sroot 0 5109 temp
   ```
7. Start DAQ software with: **pcie40_ulreset; sweb_receiver 0x03000002**
8. Start issuing triggers with: **resetft -65; trigft -65 aux 50000**

Comparison with expected results

Version 1 – No pedestal subtraction



TOP Feat Ext – Tests at UH

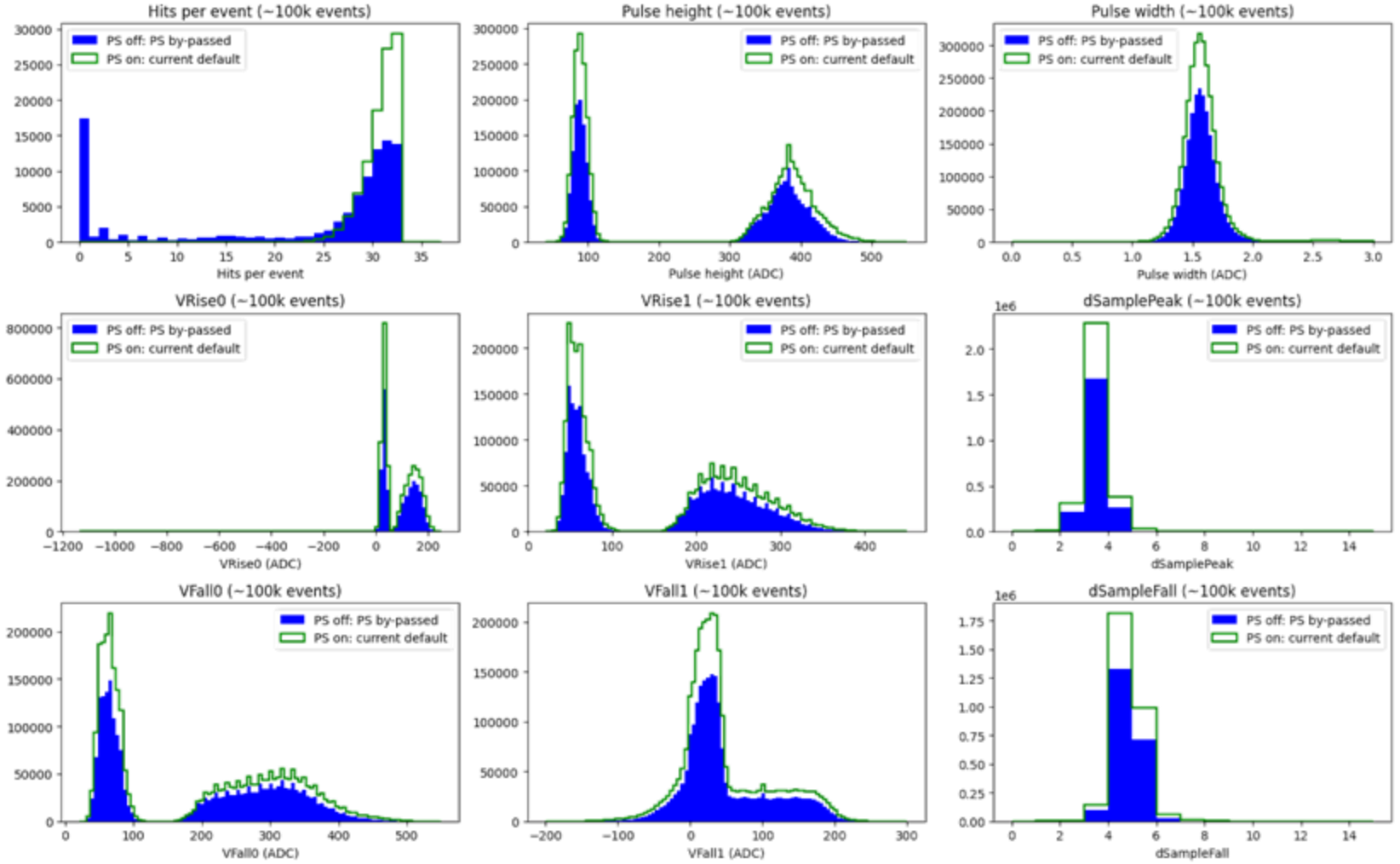
Version 2

- Pedestal subtraction
- Noise reduction
- Single TOP FEE

Comparison with expected results

Version 2 – at UHM

- Matches well w/ and w/o PS after pedestal subtraction has been implemented.
- The total number of events are very different; looks like we are rejecting more hits when PS is off.
- **Needs some more debugging!**



Full system performance tests at KEK

Version 1

- No pedestal subtraction
- 32 TOP FEEs (s01-s08) – full rtop1

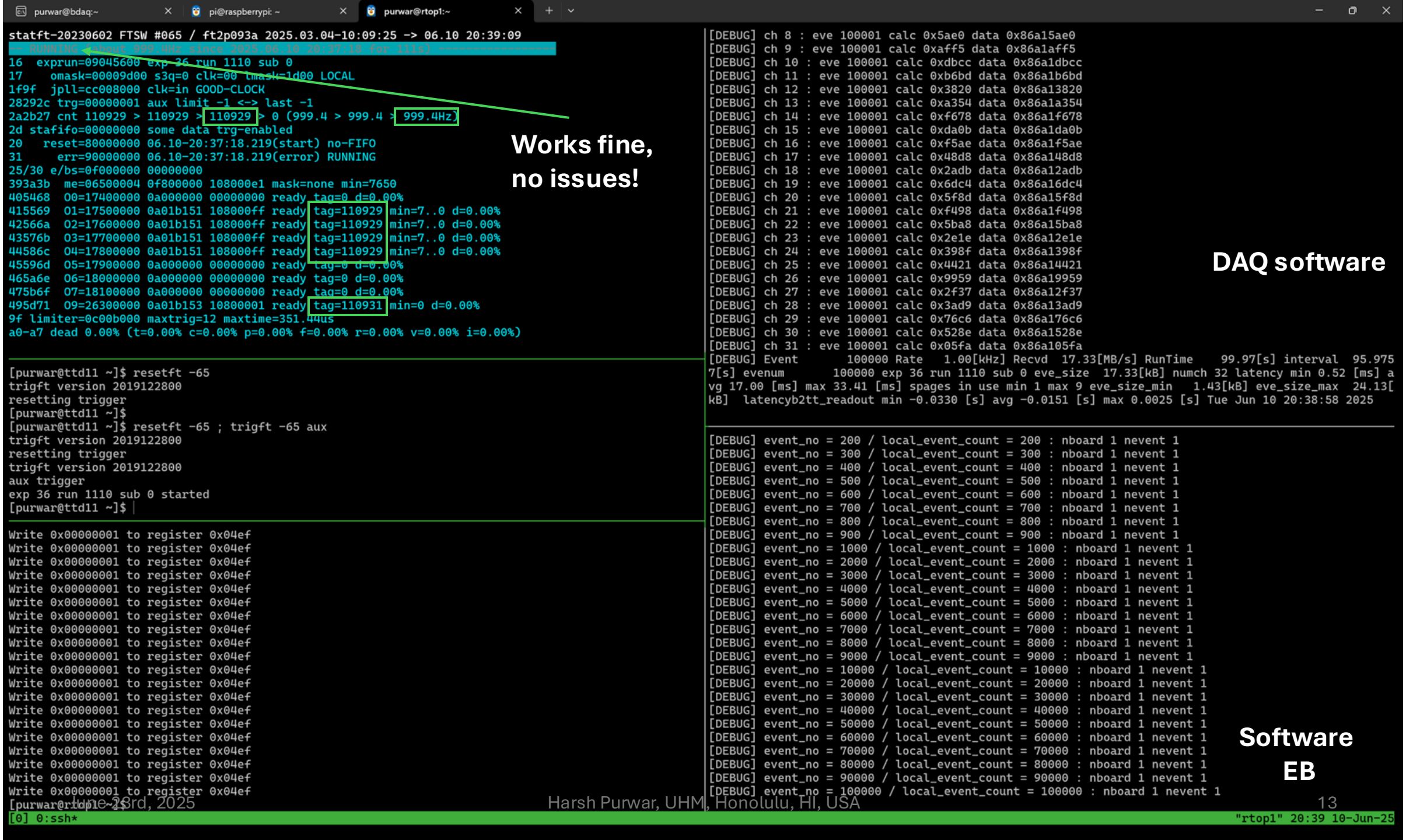
Testing procedure

1. Power-cycle & Configure TOP BS (one or more at a time) with firmware: **8C-93/86-23**
2. Prepare TTD with:
   ```
   ttaddr -65 –c; ttaddr -65 –a; ttaddr -65 –m
   ttaddr -65 –u pcie40a,s01-s08
   ```
3. Enable PS-bypass mode:
   ```
   for i in {0..31}; do pcie40_regconfig --ch $i --fee32 -w 0x4EF 0x1; done
   ```
4. Start calibration pulser with:
   ```
   ssh topslc01
   ssh pulser bash set1kHz.sh
   ```
5. Start eb0_for_pcie40 with:
   ```
   eb0_for_pcie40 –l 5109 –i 14 –u /dev/shm/eb0_up_test –d /dev/shm/eb0_down_test
   ```
6. Read in parallel from this port (like reading data for sending out to the HLTs):
   ```
   for i in {1..14}; do nc localhost 5109 & done
   ```
7. Start DAQ software with: `pcie40_ulreset; sweb_receiver 0x03000001`
8. Start issuing triggers with: `resetft -65; trigft -65 aux`

Trigger rate set to 1 kHz

Version 1

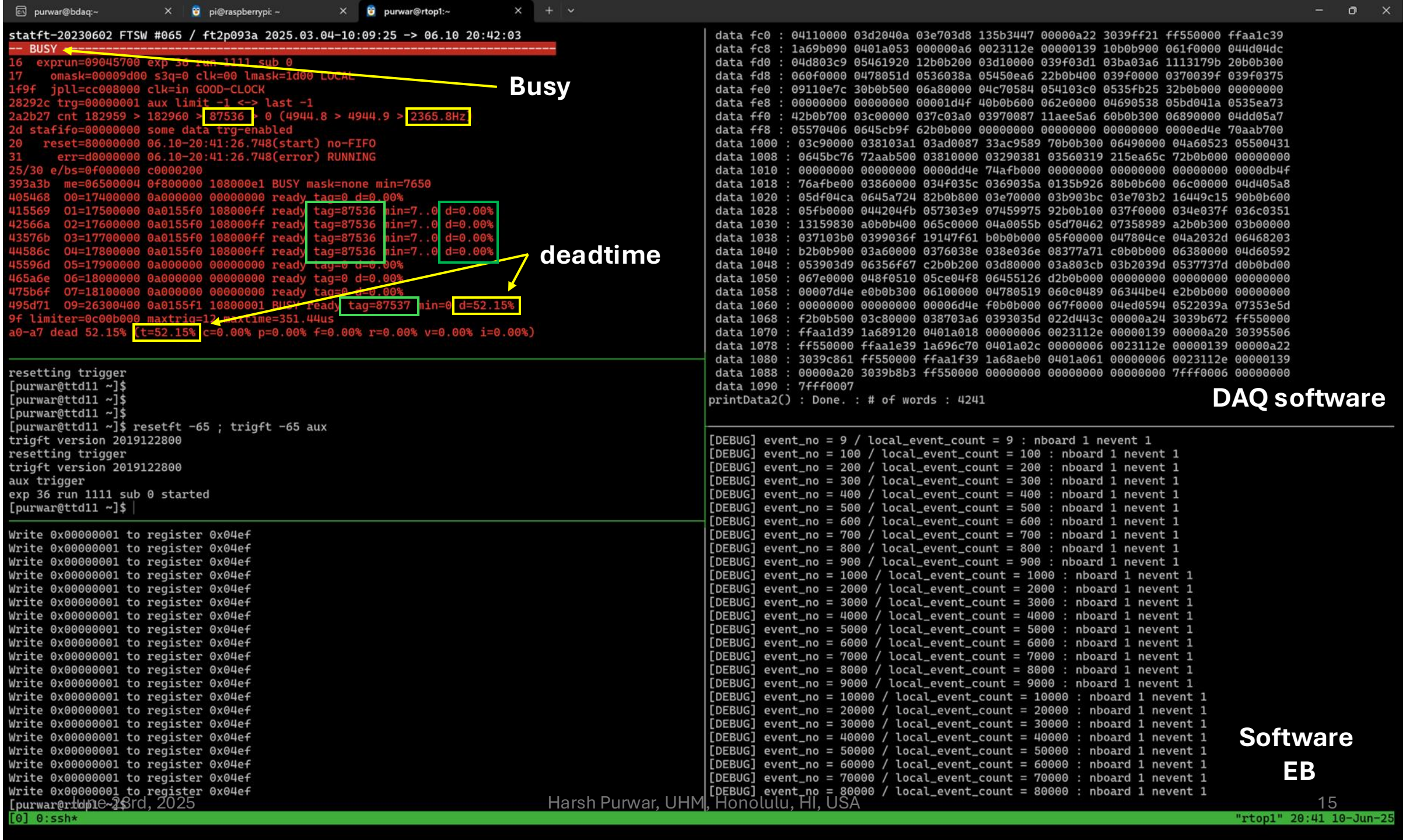
- 1 hit in each event

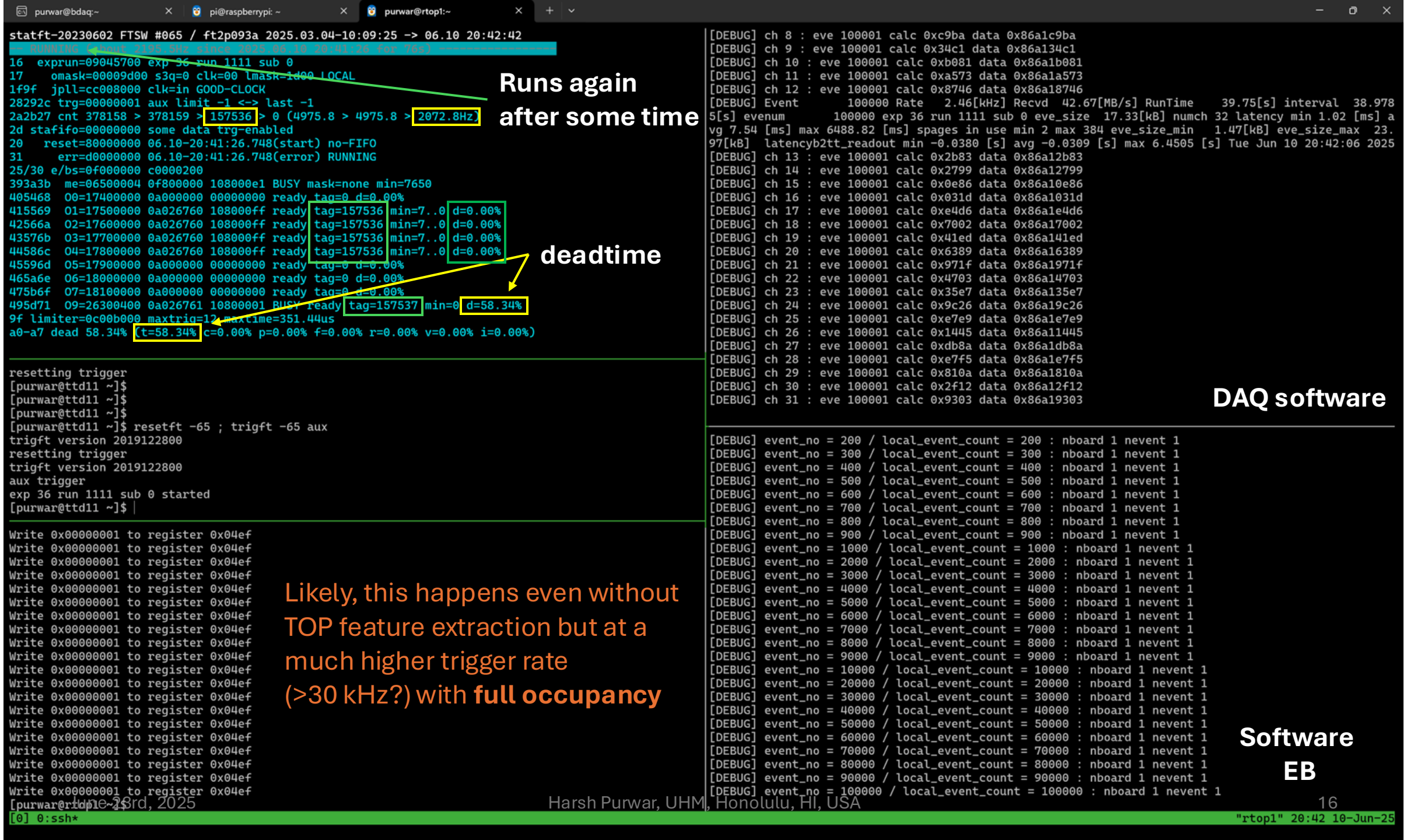

purwar@bdaq:~
pi@raspberrypi: ~
purwar@rtop1:~
statft-20230602 FTSW #065 / ft2p093a 2025.03.04-10:09:25 -> 06.10 20:39:09
-- RUNNING (about 999.4Hz since 2025.06.10 20:37:18 for 111s) ----------
16 exprun=09045600 exp 36 run 1110 sub 0
17 omask=00009d00 s3q=0 clk=00 tmask=1d00 LOCAL
1f9f jpll=cc008000 clk=in GOOD-CLOCK
28292c trg=00000001 aux limit -1 <-> last -1
2a2b27 cnt 110929 > 110929 > 110929 > 0 (999.4 > 999.4 > 999.4Hz)
2d stafifo=00000000 some data trg-enabled
20 reset=80000000 06.10-20:37:18.219(start) no-FIFO
31 err=90000000 06.10-20:37:18.219(error) RUNNING
25/30 e/bs=0f000000 00000000
393a3b me=06500004 0f800000 108000e1 mask=none min=7650
405468 O0=17400000 0a000000 00000000 ready tag=0 d=0.00%
415569 O1=17500000 0a01b151 108000ff ready tag=110929 min=7..0 d=0.00%
42566a O2=17600000 0a01b151 108000ff ready tag=110929 min=7..0 d=0.00%
43576b O3=17700000 0a01b151 108000ff ready tag=110929 min=7..0 d=0.00%
44586c O4=17800000 0a01b151 108000ff ready tag=110929 min=7..0 d=0.00%
45596d O5=17900000 0a000000 00000000 ready tag=0 d=0.00%
465a6e O6=18000000 0a000000 00000000 ready tag=0 d=0.00%
475b6f O7=18100000 0a000000 00000000 ready tag=0 d=0.00%
495d71 O9=26300000 0a01b153 10800001 ready tag=110931 min=0 d=0.00%
9f limiter=0c00b000 maxtrig=12 maxtime=351.44us
a0-a7 dead 0.00% (t=0.00% c=0.00% p=0.00% f=0.00% r=0.00% v=0.00% i=0.00%)
Works fine, no issues!
[purwar@ttd11 ~]$ resetft -65
trigft version 2019122800
resetting trigger
[purwar@ttd11 ~]$
[purwar@ttd11 ~]$ resetft -65 ; trigft -65 aux
trigft version 2019122800
resetting trigger
trigft version 2019122800
aux trigger
exp 36 run 1110 sub 0 started
[purwar@ttd11 ~]$
Write 0x00000001 to register 0x04ef
[purwar@rtop1 ~]$
[DEBUG] ch 8 : eve 100001 calc 0x5ae0 data 0x86a15ae0
[DEBUG] ch 9 : eve 100001 calc 0xaff5 data 0x86a1aff5
[DEBUG] ch 10 : eve 100001 calc 0xdbcc data 0x86a1dbcc
[DEBUG] ch 11 : eve 100001 calc 0xb6bd data 0x86a1b6bd
[DEBUG] ch 12 : eve 100001 calc 0x3820 data 0x86a13820
[DEBUG] ch 13 : eve 100001 calc 0xa354 data 0x86a1a354
[DEBUG] ch 14 : eve 100001 calc 0xf678 data 0x86a1f678
[DEBUG] ch 15 : eve 100001 calc 0xda0b data 0x86a1da0b
[DEBUG] ch 16 : eve 100001 calc 0xf5ae data 0x86a1f5ae
[DEBUG] ch 17 : eve 100001 calc 0x48d8 data 0x86a148d8
[DEBUG] ch 18 : eve 100001 calc 0x2adb data 0x86a12adb
[DEBUG] ch 19 : eve 100001 calc 0x6dc4 data 0x86a16dc4
[DEBUG] ch 20 : eve 100001 calc 0x5f8d data 0x86a15f8d
[DEBUG] ch 21 : eve 100001 calc 0xf498 data 0x86a1f498
[DEBUG] ch 22 : eve 100001 calc 0x5ba8 data 0x86a15ba8
[DEBUG] ch 23 : eve 100001 calc 0x2e1e data 0x86a12e1e
[DEBUG] ch 24 : eve 100001 calc 0x398f data 0x86a1398f
[DEBUG] ch 25 : eve 100001 calc 0x4421 data 0x86a14421
[DEBUG] ch 26 : eve 100001 calc 0x9959 data 0x86a19959
[DEBUG] ch 27 : eve 100001 calc 0x2f37 data 0x86a12f37
[DEBUG] ch 28 : eve 100001 calc 0x3ad9 data 0x86a13ad9
[DEBUG] ch 29 : eve 100001 calc 0x76c6 data 0x86a176c6
[DEBUG] ch 30 : eve 100001 calc 0x528e data 0x86a1528e
[DEBUG] ch 31 : eve 100001 calc 0x05fa data 0x86a105fa
[DEBUG] Event 100000 Rate 1.00[kHz] Recvd 17.33[MB/s] RunTime 99.97[s] interval 95.975
7[s] evenum 100000 exp 36 run 1110 sub 0 eve_size 17.33[kB] numch 32 latency min 0.52 [ms] a
vg 17.00 [ms] max 33.41 [ms] spages in use min 1 max 9 eve_size_min 1.43[kB] eve_size_max 24.13[
kB] latencyb2tt_readout min -0.0330 [s] avg -0.0151 [s] max 0.0025 [s] Tue Jun 10 20:38:58 2025
DAQ software
[DEBUG] event_no = 200 / local_event_count = 200 : nboard 1 nevent 1
[DEBUG] event_no = 300 / local_event_count = 300 : nboard 1 nevent 1
[DEBUG] event_no = 400 / local_event_count = 400 : nboard 1 nevent 1
[DEBUG] event_no = 500 / local_event_count = 500 : nboard 1 nevent 1
[DEBUG] event_no = 600 / local_event_count = 600 : nboard 1 nevent 1
[DEBUG] event_no = 700 / local_event_count = 700 : nboard 1 nevent 1
[DEBUG] event_no = 800 / local_event_count = 800 : nboard 1 nevent 1
[DEBUG] event_no = 900 / local_event_count = 900 : nboard 1 nevent 1
[DEBUG] event_no = 1000 / local_event_count = 1000 : nboard 1 nevent 1
[DEBUG] event_no = 2000 / local_event_count = 2000 : nboard 1 nevent 1
[DEBUG] event_no = 3000 / local_event_count = 3000 : nboard 1 nevent 1
[DEBUG] event_no = 4000 / local_event_count = 4000 : nboard 1 nevent 1
[DEBUG] event_no = 5000 / local_event_count = 5000 : nboard 1 nevent 1
[DEBUG] event_no = 6000 / local_event_count = 6000 : nboard 1 nevent 1
[DEBUG] event_no = 7000 / local_event_count = 7000 : nboard 1 nevent 1
[DEBUG] event_no = 8000 / local_event_count = 8000 : nboard 1 nevent 1
[DEBUG] event_no = 9000 / local_event_count = 9000 : nboard 1 nevent 1
[DEBUG] event_no = 10000 / local_event_count = 10000 : nboard 1 nevent 1
[DEBUG] event_no = 20000 / local_event_count = 20000 : nboard 1 nevent 1
[DEBUG] event_no = 30000 / local_event_count = 30000 : nboard 1 nevent 1
[DEBUG] event_no = 40000 / local_event_count = 40000 : nboard 1 nevent 1
[DEBUG] event_no = 50000 / local_event_count = 50000 : nboard 1 nevent 1
[DEBUG] event_no = 60000 / local_event_count = 60000 : nboard 1 nevent 1
[DEBUG] event_no = 70000 / local_event_count = 70000 : nboard 1 nevent 1
[DEBUG] event_no = 80000 / local_event_count = 80000 : nboard 1 nevent 1
[DEBUG] event_no = 90000 / local_event_count = 90000 : nboard 1 nevent 1
[DEBUG] event_no = 100000 / local_event_count = 100000 : nboard 1 nevent 1
Software EB
[0] 0:ssh*
"rtop1" 20:39 10-Jun-25

Trigger rate set to 5 kHz

Version 1

- 1 hit in each event


purwar@bdaq:~
pi@raspberrypi: ~
purwar@rtop1:~
statft-20230602 FTSW #065 / ft2p093a 2025.03.04-10:09:25 -> 06.10 20:42:03
-- BUSY
16 exprun=09045700 exp 36 run 1111 sub 0
17 omask=00009d00 s3q=0 clk=00 lmask=1d00 LOCAL
1f9f jpll=cc008000 clk=in GOOD-CLOCK
28292c trg=00000001 aux limit -1 <-> last -1
2a2b27 cnt 182959 > 182960 > 87536 > 0 (4944.8 > 4944.9 > 2365.8Hz)
2d stafifo=00000000 some data trg-enabled
20 reset=80000000 06.10-20:41:26.748(start) no-FIFO
31 err=d0000000 06.10-20:41:26.748(error) RUNNING
25/30 e/bs=0f000000 c0000200
393a3b me=06500004 0f800000 108000e1 BUSY mask=none min=7650
405468 O0=17400000 0a000000 00000000 ready tag=0 d=0.00%
415569 O1=17500000 0a0155f0 108000ff ready tag=87536 min=7..0 d=0.00%
42566a O2=17600000 0a0155f0 108000ff ready tag=87536 min=7..0 d=0.00%
43576b O3=17700000 0a0155f0 108000ff ready tag=87536 min=7..0 d=0.00%
44586c O4=17800000 0a0155f0 108000ff ready tag=87536 min=7..0 d=0.00%
45596d O5=17900000 0a000000 00000000 ready tag=0 d=0.00%
465a6e O6=18000000 0a000000 00000000 ready tag=0 d=0.00%
475b6f O7=18100000 0a000000 00000000 ready tag=0 d=0.00%
495d71 O9=26300400 0a0155f1 10800001 BUSY ready tag=87537 min=0 d=52.15%
9f limiter=0c00b000 maxtrig=12 maxtime=351.44us
a0-a7 dead 52.15% (t=52.15% c=0.00% p=0.00% f=0.00% r=0.00% v=0.00% i=0.00%)
Busy
deadtime
resetting trigger
[purwar@ttd11 ~]$
[purwar@ttd11 ~]$
[purwar@ttd11 ~]$
[purwar@ttd11 ~]$ resetft -65 ; trigft -65 aux
trigft version 2019122800
resetting trigger
trigft version 2019122800
aux trigger
exp 36 run 1111 sub 0 started
[purwar@ttd11 ~]$
Write 0x00000001 to register 0x04ef
[purwar@rtop1 ~]$
data fc0 : 04110000 03d2040a 03e703d8 135b3447 00000a22 3039ff21 ff550000 ffaa1c39
data fc8 : 1a69b090 0401a053 000000a6 0023112e 00000139 10b0b900 061f0000 044d04dc
data fd0 : 04d803c9 05461920 12b0b200 03d10000 039f03d1 03ba03a6 1113179b 20b0b300
data fd8 : 060f0000 0478051d 0536038a 05450ea6 22b0b400 039f0000 0370039f 039f0375
data fe0 : 09110e7c 30b0b500 06a80000 04c70584 054103c0 0535fb25 32b0b000 00000000
data fe8 : 00000000 00000000 00001d4f 40b0b600 062e0000 04690538 05bd041a 0535ea73
data ff0 : 42b0b700 03c00000 037c03a0 03970087 11aee5a6 60b0b300 06890000 04dd05a7
data ff8 : 05570406 0645cb9f 62b0b000 00000000 00000000 00000000 0000ed4e 70aab700
data 1000 : 03c90000 038103a1 03ad0087 33ac9589 70b0b300 06490000 04a60523 05500431
data 1008 : 0645bc76 72aab500 03810000 03290381 03560319 215ea65c 72b0b000 00000000
data 1010 : 00000000 00000000 0000dd4e 74afb000 00000000 00000000 0000db4f
data 1018 : 76afbe00 03860000 034f035c 0369035a 0135b926 80b0b600 06c00000 04d405a8
data 1020 : 05df04ca 0645a724 82b0b800 03e70000 03b903bc 03e703b2 16449c15 90b0b600
data 1028 : 05fb0000 044204fb 057303e9 07459975 92b0b100 037f0000 034e037f 036c0351
data 1030 : 13159830 a0b0b400 065c0000 04a0055b 05d70462 07358989 a2b0b300 03b00000
data 1038 : 037103b0 0399036f 19147f61 b0b0b000 05f00000 047804ce 04a2032d 06468203
data 1040 : b2b0b900 03a60000 0376038e 038e036e 08377a71 c0b0b000 06380000 04d60592
data 1048 : 053903d9 06356f67 c2b0b200 03d80000 03a803cb 03b2039d 0537737d d0b0bd00
data 1050 : 067e0000 048f0510 05ce04f8 06455126 d2b0b000 00000000 00000000 00000000
data 1058 : 00007d4e e0b0b300 06100000 04780519 060c0489 06344be4 e2b0b000 00000000
data 1060 : 00000000 00000000 00006d4e f0b0b000 067f0000 04ed0594 0522039a 07353e5d
data 1068 : f2b0b500 03c80000 038703a6 0393035d 022d443c 00000a24 3039b672 ff550000
data 1070 : ffaa1d39 1a689120 0401a018 00000006 0023112e 00000139 00000a20 30395506
data 1078 : ff550000 ffaa1e39 1a696c70 0401a02c 00000006 0023112e 00000139 00000a22
data 1080 : 3039c861 ff550000 ffaa1f39 1a68aeb0 0401a061 00000006 0023112e 00000139
data 1088 : 00000a20 3039b8b3 ff550000 00000000 00000000 00000000 7fff0006 00000000
data 1090 : 7fff0007
printData2() : Done. : # of words : 4241
DAQ software
[DEBUG] event_no = 9 / local_event_count = 9 : nboard 1 nevent 1
[DEBUG] event_no = 100 / local_event_count = 100 : nboard 1 nevent 1
[DEBUG] event_no = 200 / local_event_count = 200 : nboard 1 nevent 1
[DEBUG] event_no = 300 / local_event_count = 300 : nboard 1 nevent 1
[DEBUG] event_no = 400 / local_event_count = 400 : nboard 1 nevent 1
[DEBUG] event_no = 500 / local_event_count = 500 : nboard 1 nevent 1
[DEBUG] event_no = 600 / local_event_count = 600 : nboard 1 nevent 1
[DEBUG] event_no = 700 / local_event_count = 700 : nboard 1 nevent 1
[DEBUG] event_no = 800 / local_event_count = 800 : nboard 1 nevent 1
[DEBUG] event_no = 900 / local_event_count = 900 : nboard 1 nevent 1
[DEBUG] event_no = 1000 / local_event_count = 1000 : nboard 1 nevent 1
[DEBUG] event_no = 2000 / local_event_count = 2000 : nboard 1 nevent 1
[DEBUG] event_no = 3000 / local_event_count = 3000 : nboard 1 nevent 1
[DEBUG] event_no = 4000 / local_event_count = 4000 : nboard 1 nevent 1
[DEBUG] event_no = 5000 / local_event_count = 5000 : nboard 1 nevent 1
[DEBUG] event_no = 6000 / local_event_count = 6000 : nboard 1 nevent 1
[DEBUG] event_no = 7000 / local_event_count = 7000 : nboard 1 nevent 1
[DEBUG] event_no = 8000 / local_event_count = 8000 : nboard 1 nevent 1
[DEBUG] event_no = 9000 / local_event_count = 9000 : nboard 1 nevent 1
[DEBUG] event_no = 10000 / local_event_count = 10000 : nboard 1 nevent 1
[DEBUG] event_no = 20000 / local_event_count = 20000 : nboard 1 nevent 1
[DEBUG] event_no = 30000 / local_event_count = 30000 : nboard 1 nevent 1
[DEBUG] event_no = 40000 / local_event_count = 40000 : nboard 1 nevent 1
[DEBUG] event_no = 50000 / local_event_count = 50000 : nboard 1 nevent 1
[DEBUG] event_no = 60000 / local_event_count = 60000 : nboard 1 nevent 1
[DEBUG] event_no = 70000 / local_event_count = 70000 : nboard 1 nevent 1
[DEBUG] event_no = 80000 / local_event_count = 80000 : nboard 1 nevent 1
Software EB
[0] 0:ssh*
"rtop1" 20:41 10-Jun-25



Likely, this happens even without TOP feature extraction but at a much higher trigger rate (>30 kHz?) with **full occupancy**

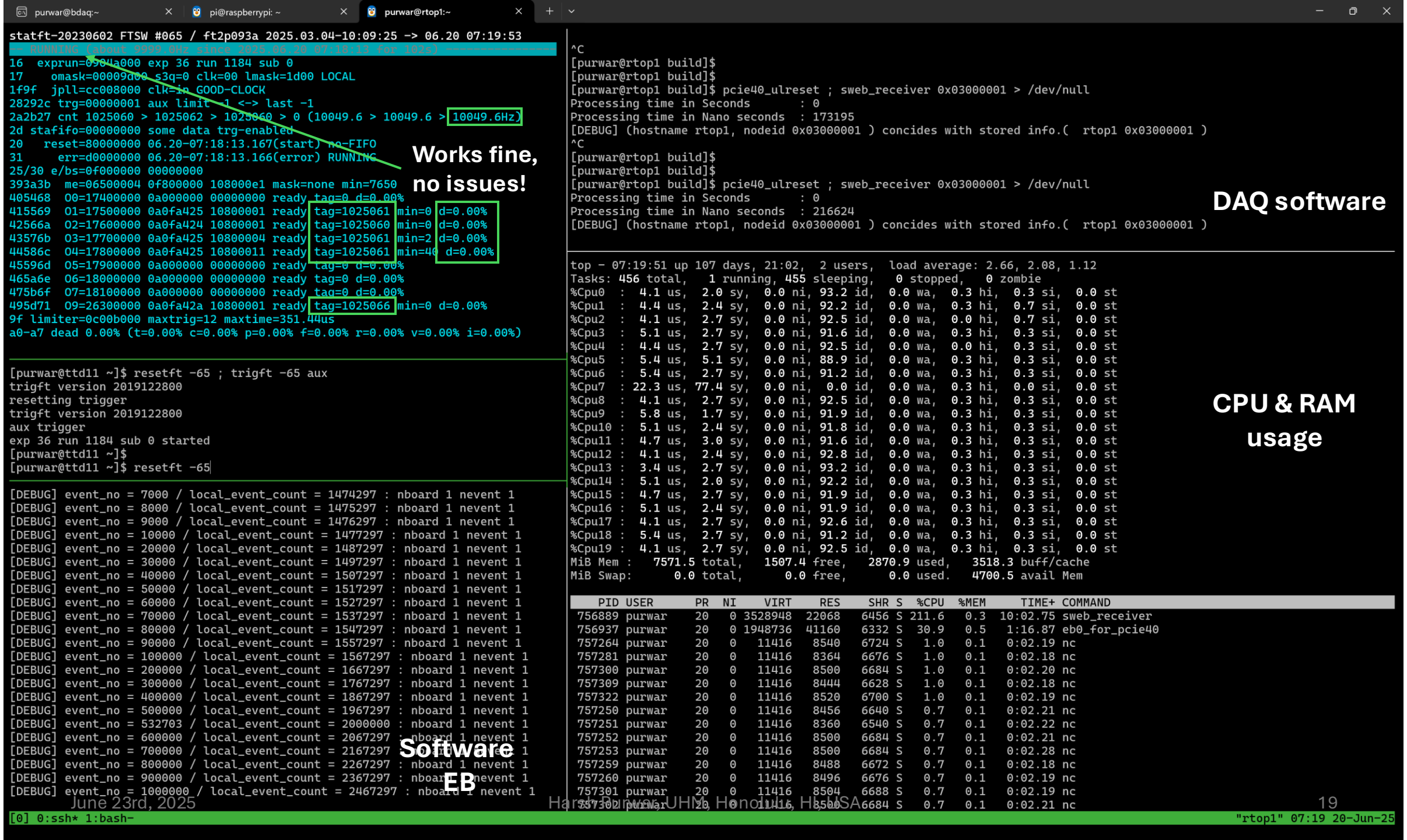
Testing procedure - Updated

1. Power-cycle & Configure TOP BS (one or more at a time) with firmware: **8C-93/86-23**
2. Prepare TTD with:
   ```
   ttaddr -65 –c; ttaddr -65 –a; ttaddr -65 –m
   ttaddr -65 –u pcie40a,s01-s08
   ```
3. Enable PS-bypass mode:
   ```
   for i in {0..31}; do pcie40_regconfig --ch $i --fee32 -w 0x4EF 0x1; done
   ```
4. Start calibration pulser with:
   ```
   ssh topslc01
   ssh pulser bash set1kHz.sh
   ```
5. Start eb0_for_pcie40 with:
   ```
   eb0_for_pcie40 –l 5109 –i 14 –u /dev/shm/eb0_up_test –d /dev/shm/eb0_down_test
   ```
6. Read in parallel from this port (like reading data for sending out to the HLTs):
   ```
   for i in {1..14}; do nc localhost 5109 > /dev/null & done     OR     ~/ncOpen.sh
   ```
7. Start DAQ software with: **pcie40_ulreset; sweb_receiver 0x03000001**
8. Start issuing triggers with: **resetft -65; trigft -65 aux**

Trigger rate set to 10 kHz

Version 1

- 1 hit in each event


purwar@bdaq:~
pi@raspberrypi: ~
purwar@rtop1:~
statft-20230602 FTSW #065 / ft2p093a 2025.03.04-10:09:25 -> 06.20 07:19:53
RUNNING (about 9999.0Hz since 2025.06.20 07:18.13 for 102s)
16 exprun=0904a000 exp 36 run 1184 sub 0
17 omask=00009d00 s3q=0 clk=00 lmask=1d00 LOCAL
1f9f jpll=cc008000 clk=in GOOD-CLOCK
28292c trg=00000001 aux limit -1 <-> last -1
2a2b27 cnt 1025060 > 1025062 > 1025060 > 0 (10049.6 > 10049.6 > 10049.6Hz)
2d stafifo=00000000 some data trg-enabled
20 reset=80000000 06.20-07:18:13.167(start) no-FIFO
31 err=d0000000 06.20-07:18:13.166(error) RUNNING
25/30 e/bs=0f000000 00000000
393a3b me=06500004 0f800000 108000e1 mask=none min=7650
405468 O0=17400000 0a000000 00000000 ready tag=0 d=0.00%
415569 O1=17500000 0a0fa425 10800001 ready tag=1025061 min=0 d=0.00%
42566a O2=17600000 0a0fa424 10800001 ready tag=1025060 min=0 d=0.00%
43576b O3=17700000 0a0fa425 10800004 ready tag=1025061 min=2 d=0.00%
44586c O4=17800000 0a0fa425 10800011 ready tag=1025061 min=40 d=0.00%
45596d O5=17900000 0a000000 00000000 ready tag=0 d=0.00%
465a6e O6=18000000 0a000000 00000000 ready tag=0 d=0.00%
475b6f O7=18100000 0a000000 00000000 ready tag=0 d=0.00%
495d71 O9=26300000 0a0fa42a 10800001 ready tag=1025066 min=0 d=0.00%
9f limiter=0c00b000 maxtrig=12 maxtime=351.44us
a0-a7 dead 0.00% (t=0.00% c=0.00% p=0.00% f=0.00% r=0.00% v=0.00% i=0.00%)
Works fine, no issues!
[purwar@ttd11 ~]$ resetft -65 ; trigft -65 aux
trigft version 2019122800
resetting trigger
trigft version 2019122800
aux trigger
exp 36 run 1184 sub 0 started
[purwar@ttd11 ~]$
[purwar@ttd11 ~]$ resetft -65
[DEBUG] event_no = 7000 / local_event_count = 1474297 : nboard 1 nevent 1
[DEBUG] event_no = 8000 / local_event_count = 1475297 : nboard 1 nevent 1
[DEBUG] event_no = 9000 / local_event_count = 1476297 : nboard 1 nevent 1
[DEBUG] event_no = 10000 / local_event_count = 1477297 : nboard 1 nevent 1
[DEBUG] event_no = 20000 / local_event_count = 1487297 : nboard 1 nevent 1
[DEBUG] event_no = 30000 / local_event_count = 1497297 : nboard 1 nevent 1
[DEBUG] event_no = 40000 / local_event_count = 1507297 : nboard 1 nevent 1
[DEBUG] event_no = 50000 / local_event_count = 1517297 : nboard 1 nevent 1
[DEBUG] event_no = 60000 / local_event_count = 1527297 : nboard 1 nevent 1
[DEBUG] event_no = 70000 / local_event_count = 1537297 : nboard 1 nevent 1
[DEBUG] event_no = 80000 / local_event_count = 1547297 : nboard 1 nevent 1
[DEBUG] event_no = 90000 / local_event_count = 1557297 : nboard 1 nevent 1
[DEBUG] event_no = 100000 / local_event_count = 1567297 : nboard 1 nevent 1
[DEBUG] event_no = 200000 / local_event_count = 1667297 : nboard 1 nevent 1
[DEBUG] event_no = 300000 / local_event_count = 1767297 : nboard 1 nevent 1
[DEBUG] event_no = 400000 / local_event_count = 1867297 : nboard 1 nevent 1
[DEBUG] event_no = 500000 / local_event_count = 1967297 : nboard 1 nevent 1
[DEBUG] event_no = 532703 / local_event_count = 2000000 : nboard 1 nevent 1
[DEBUG] event_no = 600000 / local_event_count = 2067297 : nboard 1 nevent 1
[DEBUG] event_no = 700000 / local_event_count = 2167297 : nboard 1 nevent 1
[DEBUG] event_no = 800000 / local_event_count = 2267297 : nboard 1 nevent 1
[DEBUG] event_no = 900000 / local_event_count = 2367297 : nboard 1 nevent 1
[DEBUG] event_no = 1000000 / local_event_count = 2467297 : nboard 1 nevent 1
Software EB
^C
[purwar@rtop1 build]$
[purwar@rtop1 build]$
[purwar@rtop1 build]$ pcie40_ulreset ; sweb_receiver 0x03000001 > /dev/null
Processing time in Seconds : 0
Processing time in Nano seconds : 173195
[DEBUG] (hostname rtop1, nodeid 0x03000001) concides with stored info.(rtop1 0x03000001)
^C
[purwar@rtop1 build]$
[purwar@rtop1 build]$
[purwar@rtop1 build]$ pcie40_ulreset ; sweb_receiver 0x03000001 > /dev/null
Processing time in Seconds : 0
Processing time in Nano seconds : 216624
[DEBUG] (hostname rtop1, nodeid 0x03000001) concides with stored info.(rtop1 0x03000001)
DAQ software
top - 07:19:51 up 107 days, 21:02, 2 users, load average: 2.66, 2.08, 1.12
Tasks: 456 total, 1 running, 455 sleeping, 0 stopped, 0 zombie
%Cpu0 : 4.1 us, 2.0 sy, 0.0 ni, 93.2 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu1 : 4.4 us, 2.4 sy, 0.0 ni, 92.2 id, 0.0 wa, 0.3 hi, 0.7 si, 0.0 st
%Cpu2 : 4.1 us, 2.7 sy, 0.0 ni, 92.5 id, 0.0 wa, 0.0 hi, 0.7 si, 0.0 st
%Cpu3 : 5.1 us, 2.7 sy, 0.0 ni, 91.6 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu4 : 4.4 us, 2.7 sy, 0.0 ni, 92.5 id, 0.0 wa, 0.0 hi, 0.3 si, 0.0 st
%Cpu5 : 5.4 us, 5.1 sy, 0.0 ni, 88.9 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu6 : 5.4 us, 2.7 sy, 0.0 ni, 91.2 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu7 : 22.3 us, 77.4 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.3 hi, 0.0 si, 0.0 st
%Cpu8 : 4.1 us, 2.7 sy, 0.0 ni, 92.5 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu9 : 5.8 us, 1.7 sy, 0.0 ni, 91.9 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu10 : 5.1 us, 2.4 sy, 0.0 ni, 91.8 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu11 : 4.7 us, 3.0 sy, 0.0 ni, 91.6 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu12 : 4.1 us, 2.4 sy, 0.0 ni, 92.8 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu13 : 3.4 us, 2.7 sy, 0.0 ni, 93.2 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu14 : 5.1 us, 2.0 sy, 0.0 ni, 92.2 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu15 : 4.7 us, 2.7 sy, 0.0 ni, 91.9 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu16 : 5.1 us, 2.4 sy, 0.0 ni, 91.9 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu17 : 4.1 us, 2.7 sy, 0.0 ni, 92.6 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu18 : 5.4 us, 2.7 sy, 0.0 ni, 91.2 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu19 : 4.1 us, 2.7 sy, 0.0 ni, 92.5 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
MiB Mem : 7571.5 total, 1507.4 free, 2870.9 used, 3518.3 buff/cache
MiB Swap: 0.0 total, 0.0 free, 0.0 used. 4700.5 avail Mem
CPU & RAM usage
PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
756889 purwar 20 0 3528948 22068 6456 S 211.6 0.3 10:02.75 sweb_receiver
756937 purwar 20 0 1948736 41160 6332 S 30.9 0.5 1:16.87 eb0_for_pcie40
757264 purwar 20 0 11416 8540 6724 S 1.0 0.1 0:02.19 nc
757281 purwar 20 0 11416 8364 6676 S 1.0 0.1 0:02.18 nc
757300 purwar 20 0 11416 8500 6684 S 1.0 0.1 0:02.20 nc
757309 purwar 20 0 11416 8444 6628 S 1.0 0.1 0:02.18 nc
757322 purwar 20 0 11416 8520 6700 S 1.0 0.1 0:02.19 nc
757250 purwar 20 0 11416 8456 6640 S 0.7 0.1 0:02.21 nc
757251 purwar 20 0 11416 8360 6540 S 0.7 0.1 0:02.22 nc
757252 purwar 20 0 11416 8500 6684 S 0.7 0.1 0:02.21 nc
757253 purwar 20 0 11416 8500 6684 S 0.7 0.1 0:02.28 nc
757259 purwar 20 0 11416 8488 6672 S 0.7 0.1 0:02.18 nc
757260 purwar 20 0 11416 8496 6676 S 0.7 0.1 0:02.19 nc
757301 purwar 20 0 11416 8504 6688 S 0.7 0.1 0:02.19 nc
757302 purwar 20 0 11416 8500 6684 S 0.7 0.1 0:02.21 nc
[0] 0:ssh* 1:bash-
"rtop1" 07:19 20-Jun-25

Trigger rate set to 15 kHz

Version 1

- 1 hit in each event

```
statft-20230602 FTSW #065 / ft2p093a 2025.03.04-10:09:25 -> 06.20 07:21:12
-- ERROR (at 2025.06.20 07:21:12 while not runnning) ------------------------
16  exprun=0904a100 exp 36 run 1185 sub 0
17    omask=00009d00 s3q=0 clk=00 lmask=1d00 LOCAL
1f9f  jpll=cc008000 clk=in GOOD-CLOCK
28292c trg=00000001 aux limit -1 <-> last -1
2a2b27 cnt 300528 > 300532 > 209573 > 0 (15026.4 > 16696.2 > 11642.9Hz)
2d stafifo=00000000 some data trg-enabled
20   reset=80000000 06.20-07:20:54.720(start) no-FIFO
31     err=d0000002 06.20-07:21:12.718(error) ERROR(running) src=1
25/30 e/bs=0f800000 80000000 mask=none
393a3b  me=0650000c 0f800000 1b100002 mask=none ttlost(d)=1
405468  O0=17400000 0a000000 00000000 ready tag=0 d=0.00%
415569  O1=17500008 1b100008 1b100008 ttlost(d)=3 d=0.06%
42566a  O2=17600000 0a0332a5 108000ff ready tag=209573 min=7..0 d=20.83%
43576b  O3=17700000 0a0332a5 108000ff ready tag=209573 min=7..0 d=0.00%
44586c  O4=17800000 0a0332a5 108000ff ready tag=209573 min=7..0 d=0.00%
45596d  O5=17900000 0a000000 00000000 ready tag=0 d=0.00%
465a6e  O6=18000000 0a000000 00000000 ready tag=0 d=0.00%
475b6f  O7=18100000 0a000000 00000000 ready tag=0 d=0.00%
495d71  O9=26300000 0a00005a 10800001 ready tag=90 min=0 d=0.00%
9f limiter=0c00b000 maxtrig=12 maxtime=351.44us
a0-a7 dead 20.88% (t=20.88% c=0.00% p=0.00% f=0.00% r=0.00% v=0.00% i=0.00%)
```

```
[purwar@ttd11 ~]$
[purwar@ttd11 ~]$ resetft -65 ; trigft -65 aux
trigft version 2019122800
resetting trigger
trigft version 2019122800
aux trigger
exp 36 run 1185 sub 0 started
[purwar@ttd11 ~]$
```

```
[DEBUG] event_no = 700 / local_event_count = 700 : nboard 1 nevent 1
[DEBUG] event_no = 800 / local_event_count = 800 : nboard 1 nevent 1
[DEBUG] event_no = 900 / local_event_count = 900 : nboard 1 nevent 1
[DEBUG] event_no = 1000 / local_event_count = 1000 : nboard 1 nevent 1
[DEBUG] event_no = 2000 / local_event_count = 2000 : nboard 1 nevent 1
[DEBUG] event_no = 3000 / local_event_count = 3000 : nboard 1 nevent 1
[DEBUG] event_no = 4000 / local_event_count = 4000 : nboard 1 nevent 1
[DEBUG] event_no = 5000 / local_event_count = 5000 : nboard 1 nevent 1
[DEBUG] event_no = 6000 / local_event_count = 6000 : nboard 1 nevent 1
[DEBUG] event_no = 7000 / local_event_count = 7000 : nboard 1 nevent 1
[DEBUG] event_no = 8000 / local_event_count = 8000 : nboard 1 nevent 1
[DEBUG] event_no = 9000 / local_event_count = 9000 : nboard 1 nevent 1
[DEBUG] event_no = 10000 / local_event_count = 10000 : nboard 1 nevent 1
[DEBUG] event_no = 20000 / local_event_count = 20000 : nboard 1 nevent 1
[DEBUG] event_no = 30000 / local_event_count = 30000 : nboard 1 nevent 1
[DEBUG] event_no = 40000 / local_event_count = 40000 : nboard 1 nevent 1
[DEBUG] event_no = 50000 / local_event_count = 50000 : nboard 1 nevent 1
[DEBUG] event_no = 60000 / local_event_count = 60000 : nboard 1 nevent 1
[DEBUG] event_no = 70000 / local_event_count = 70000 : nboard 1 nevent 1
[DEBUG] event_no = 80000 / local_event_count = 80000 : nboard 1 nevent 1
[DEBUG] event_no = 90000 / local_event_count = 90000 : nboard 1 nevent 1
[DEBUG] event_no = 100000 / local_event_count = 100000 : nboard 1 nevent 1
[DEBUG] event_no = 200000 / local_event_count = 200000 : nboard 1 nevent 1
```

```
Processing time in Nano seconds  : 173195
[DEBUG] (hostname rtop1, nodeid 0x03000001 ) concides with stored info.(  rtop1 0x03000001 )
^C
[purwar@rtop1 build]$
[purwar@rtop1 build]$
[purwar@rtop1 build]$ pcie40_ulreset ; sweb_receiver 0x03000001 > /dev/null
Processing time in Seconds       : 0
Processing time in Nano seconds  : 216624
[DEBUG] (hostname rtop1, nodeid 0x03000001 ) concides with stored info.(  rtop1 0x03000001 )
^C
[purwar@rtop1 build]$
[purwar@rtop1 build]$ pcie40_ulreset ; sweb_receiver 0x03000001 > /dev/null
Processing time in Seconds       : 0
Processing time in Nano seconds  : 169635
[DEBUG] (hostname rtop1, nodeid 0x03000001 ) concides with stored info.(  rtop1 0x03000001 )
```

```
top - 07:21:10 up 107 days, 21:03,  2 users,  load average: 2.34, 2.07, 1.20
Tasks: 456 total,   1 running, 455 sleeping,   0 stopped,   0 zombie
%Cpu0  :  7.9 us,  4.3 sy,  0.0 ni, 86.8 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu1  :  5.7 us,  3.4 sy,  0.0 ni, 89.9 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu2  :  6.7 us,  3.4 sy,  0.0 ni, 89.2 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu3  :  7.4 us,  3.0 sy,  0.0 ni, 88.9 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu4  :  6.4 us,  3.0 sy,  0.0 ni, 89.6 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu5  :  5.7 us,  4.0 sy,  0.0 ni, 89.2 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu6  :  7.4 us,  3.0 sy,  0.0 ni, 89.2 id,  0.0 wa,  0.0 hi,  0.3 si,  0.0 st
%Cpu7  : 21.9 us, 77.8 sy,  0.0 ni,  0.0 id,  0.0 wa,  0.3 hi,  0.0 si,  0.0 st
%Cpu8  :  6.7 us,  2.7 sy,  0.0 ni, 89.9 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu9  :  7.0 us,  3.3 sy,  0.0 ni, 89.0 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu10 :  7.0 us,  3.0 sy,  0.0 ni, 89.6 id,  0.0 wa,  0.0 hi,  0.3 si,  0.0 st
%Cpu11 :  6.0 us,  3.4 sy,  0.0 ni, 89.9 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu12 :  6.7 us,  3.7 sy,  0.0 ni, 89.0 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu13 :  6.1 us,  3.7 sy,  0.0 ni, 89.6 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu14 :  5.7 us,  3.4 sy,  0.0 ni, 89.9 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu15 :  6.7 us,  3.3 sy,  0.0 ni, 89.3 id,  0.0 wa,  0.0 hi,  0.7 si,  0.0 st
%Cpu16 :  7.4 us,  3.4 sy,  0.0 ni, 88.6 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu17 :  4.4 us,  3.7 sy,  0.0 ni, 91.6 id,  0.0 wa,  0.0 hi,  0.3 si,  0.0 st
%Cpu18 :  7.1 us,  3.4 sy,  0.0 ni, 89.2 id,  0.0 wa,  0.0 hi,  0.3 si,  0.0 st
%Cpu19 :  6.7 us,  4.0 sy,  0.0 ni, 88.6 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
MiB Mem :   7571.5 total,   1479.7 free,   2898.4 used,   3518.5 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   4673.0 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
 758197 purwar    20   0 3528948  22600   6452 S 234.8   0.3   0:45.17 sweb_receiver
 758242 purwar    20   0 1948584  40144   5800 S  36.4   0.5   0:06.32 eb0_for_pcie40
 758544 purwar    20   0   11416   8480   6664 S   1.3   0.1   0:00.22 nc
 758545 purwar    20   0   11416   8368   6548 S   1.3   0.1   0:00.24 nc
 758558 purwar    20   0   11416   8400   6712 S   1.3   0.1   0:00.24 nc
 758607 purwar    20   0   11416   8488   6672 S   1.3   0.1   0:00.21 nc
 758542 purwar    20   0   11416   8400   6584 S   1.0   0.1   0:00.23 nc
 758546 purwar    20   0   11416   8440   6624 S   1.0   0.1   0:00.24 nc
 758560 purwar    20   0   11416   8488   6668 S   1.0   0.1   0:00.20 nc
 758581 purwar    20   0   11416   8416   6596 S   1.0   0.1   0:00.21 nc
 758582 purwar    20   0   11416   8496   6676 S   1.0   0.1   0:00.23 nc
 758596 purwar    20   0   11416   8488   6672 S   1.0   0.1   0:00.21 nc
 758620 purwar    20   0   11416   8480   6660 S   1.0   0.1   0:00.21 nc
 758632 purwar    20   0   11416   8508   6688 S   1.0   0.1   0:00.21 nc
 745715 purwar    20   0  235400   4908   3768 R   0.7   0.1   0:11.98 top
```

```
[0] 0:ssh* 1:bash-                                                    "rtop1" 07:21 20-Jun-25
```

purwar@bdaq:~ | pi@raspberrypi: ~ | purwar@rtop1:~

```
statft-20230602 FTSW #065 / ft2p093a 2025.03.04-10:09:25 -> 06.20 07:22:10
-- RUNNING (about 11723.8Hz since 2025.06.20 07:22:08 for 4s)
16  exprun=0904a300 exp 36 run 1187 sub 0
17    omask=00009d00 s3q=0 clk=00 lmask=1d00 LOCAL
1f9f  jpll=cc008000 clk=in GOOD-CLOCK
28292c trg=00000001 aux limit -1 <-> last -1
2a2b27 cnt 63303 > 63306 > 49414 > 0 (15825.8 > 15826.5 > 12353.5Hz)
2d stafifo=00000000 some data trg-enabled
20   reset=80000000 06.20-07:22:08.595(start) no-FIFO
31     err=d0000000 06.20-07:22:08.595(error) RUNNING
25/30 e/bs=0f000000 00000000
393a3b  me=06500004 0f800000 108000e1 mask=none min=7650
405468  O0=17400000 0a000000 00000000 ready tag=0 d=0.00%
415569  O1=17500000 0a00c0fc 10800004 ready tag=49404 min=2 d=0.28%
42566a  O2=17600000 0a00c078 10800010 ready tag=49272 min=4 d=22.60%
43576b  O3=17700000 0a00c100 10800010 ready tag=49408 min=4 d=0.00%
44586c  O4=17800000 0a00c0fa 10800010 ready tag=49402 min=4 d=0.00%
45596d  O5=17900000 0a000000 00000000 ready tag=0 d=0.00%
465a6e  O6=18000000 0a000000 00000000 ready tag=0 d=0.00%
475b6f  O7=18100000 0a000000 00000000 ready tag=0 d=0.00%
495d71  O9=26300000 0a000066 10800001 ready tag=102 min=0 d=0.00%
9f limiter=0c00b000 maxtrig=12 maxtime=351.44us
a0-a7 dead 22.82% (t=22.82% c=0.00% p=0.00% f=0.00% r=0.00% v=0.00% i=0.00%)
```

```
exp 36 run 1186 sub 0 started
[purwar@ttd11 ~]$ resetft -65 ; trigft -65 aux
trigft version 2019122800
resetting trigger
trigft version 2019122800
aux trigger
exp 36 run 1187 sub 0 started
[purwar@ttd11 ~]$
```

```
[DEBUG] event_no = 200 / local_event_count = 219411 : nboard 1 nevent 1
[DEBUG] event_no = 300 / local_event_count = 219511 : nboard 1 nevent 1
[DEBUG] event_no = 400 / local_event_count = 219611 : nboard 1 nevent 1
[DEBUG] event_no = 500 / local_event_count = 219711 : nboard 1 nevent 1
[DEBUG] event_no = 600 / local_event_count = 219811 : nboard 1 nevent 1
[DEBUG] event_no = 700 / local_event_count = 219911 : nboard 1 nevent 1
[DEBUG] event_no = 800 / local_event_count = 220011 : nboard 1 nevent 1
[DEBUG] event_no = 900 / local_event_count = 220111 : nboard 1 nevent 1
[DEBUG] event_no = 1000 / local_event_count = 220211 : nboard 1 nevent 1
[DEBUG] event_no = 2000 / local_event_count = 221211 : nboard 1 nevent 1
[DEBUG] event_no = 3000 / local_event_count = 222211 : nboard 1 nevent 1
[DEBUG] event_no = 4000 / local_event_count = 223211 : nboard 1 nevent 1
[DEBUG] event_no = 5000 / local_event_count = 224211 : nboard 1 nevent 1
[DEBUG] event_no = 6000 / local_event_count = 225211 : nboard 1 nevent 1
[DEBUG] event_no = 7000 / local_event_count = 226211 : nboard 1 nevent 1
[DEBUG] event_no = 8000 / local_event_count = 227211 : nboard 1 nevent 1
[DEBUG] event_no = 9000 / local_event_count = 228211 : nboard 1 nevent 1
[DEBUG] event_no = 10000 / local_event_count = 229211 : nboard 1 nevent 1
[DEBUG] event_no = 20000 / local_event_count = 239211 : nboard 1 nevent 1
[DEBUG] event_no = 30000 / local_event_count = 249211 : nboard 1 nevent 1
[DEBUG] event_no = 40000 / local_event_count = 259211 : nboard 1 nevent 1
[DEBUG] event_no = 50000 / local_event_count = 269211 : nboard 1 nevent 1
[DEBUG] event_no = 60000 / local_event_count = 279211 : nboard 1 nevent 1
```

```
Processing time in Nano seconds  : 173195
[DEBUG] (hostname rtop1, nodeid 0x03000001 ) concides with stored info.(  rtop1 0x03000001 )
^C
[purwar@rtop1 build]$
[purwar@rtop1 build]$
[purwar@rtop1 build]$ pcie40_ulreset ; sweb_receiver 0x03000001 > /dev/null
Processing time in Seconds       : 0
Processing time in Nano seconds  : 216624
[DEBUG] (hostname rtop1, nodeid 0x03000001 ) concides with stored info.(  rtop1 0x03000001 )
^C
[purwar@rtop1 build]$
[purwar@rtop1 build]$ pcie40_ulreset ; sweb_receiver 0x03000001 > /dev/null
Processing time in Seconds       : 0
Processing time in Nano seconds  : 169635
[DEBUG] (hostname rtop1, nodeid 0x03000001 ) concides with stored info.(  rtop1 0x03000001 )
```

```
top - 07:22:10 up 107 days, 21:04,  2 users,  load average: 2.19, 2.06, 1.25
Tasks: 454 total,   1 running, 453 sleeping,   0 stopped,   0 zombie
%Cpu0  :  6.4 us,  3.4 sy,  0.0 ni, 89.6 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu1  :  7.6 us,  3.3 sy,  0.0 ni, 88.1 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu2  :  6.4 us,  4.0 sy,  0.0 ni, 88.9 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu3  :  7.0 us,  3.7 sy,  0.0 ni, 88.3 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu4  :  6.4 us,  3.0 sy,  0.0 ni, 90.2 id,  0.0 wa,  0.0 hi,  0.3 si,  0.0 st
%Cpu5  :  6.7 us,  2.7 sy,  0.0 ni, 89.9 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu6  :  6.0 us,  4.0 sy,  0.0 ni, 89.3 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu7  :  6.7 us,  3.7 sy,  0.0 ni, 89.0 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu8  :  6.1 us,  3.7 sy,  0.0 ni, 89.6 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu9  : 21.3 us, 78.3 sy,  0.0 ni,  0.0 id,  0.0 wa,  0.3 hi,  0.0 si,  0.0 st
%Cpu10 :  6.7 us,  4.0 sy,  0.0 ni, 89.0 id,  0.0 wa,  0.0 hi,  0.3 si,  0.0 st
%Cpu11 :  6.1 us,  3.4 sy,  0.0 ni, 89.9 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu12 :  6.4 us,  4.0 sy,  0.0 ni, 88.9 id,  0.0 wa,  0.0 hi,  0.7 si,  0.0 st
%Cpu13 :  6.0 us,  3.3 sy,  0.0 ni, 89.6 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu14 :  6.7 us,  3.7 sy,  0.0 ni, 88.9 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu15 :  7.3 us,  3.7 sy,  0.0 ni, 88.3 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu16 :  7.4 us,  2.3 sy,  0.0 ni, 89.6 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu17 :  6.8 us,  3.4 sy,  0.0 ni, 89.5 id,  0.0 wa,  0.0 hi,  0.3 si,  0.0 st
%Cpu18 :  6.6 us,  3.3 sy,  0.0 ni, 89.0 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu19 :  5.4 us,  3.0 sy,  0.0 ni, 91.2 id,  0.0 wa,  0.0 hi,  0.3 si,  0.0 st
MiB Mem :   7571.5 total,   1490.5 free,   2887.6 used,   3518.5 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   4683.8 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
 758197 purwar    20   0 3528948  22600   6452 S 235.5   0.3   1:59.81 sweb_receiver
 758242 purwar    20   0 1948584  40144   5800 S  36.9   0.5   0:08.23 eb0_for_pcie40
 758546 purwar    20   0   11416   8440   6624 S   1.3   0.1   0:00.30 nc
 758581 purwar    20   0   11416   8416   6596 S   1.3   0.1   0:00.27 nc
 758542 purwar    20   0   11416   8400   6584 S   1.0   0.1   0:00.28 nc
 758544 purwar    20   0   11416   8480   6664 S   1.0   0.1   0:00.26 nc
 758545 purwar    20   0   11416   8368   6548 S   1.0   0.1   0:00.29 nc
 758560 purwar    20   0   11416   8488   6668 S   1.0   0.1   0:00.26 nc
 758582 purwar    20   0   11416   8496   6676 S   1.0   0.1   0:00.28 nc
 758596 purwar    20   0   11416   8488   6672 S   1.0   0.1   0:00.26 nc
 758607 purwar    20   0   11416   8488   6672 S   1.0   0.1   0:00.26 nc
 758611 purwar    20   0   11416   8500   6684 S   1.0   0.1   0:00.26 nc
 758620 purwar    20   0   11416   8480   6660 S   1.0   0.1   0:00.27 nc
 758630 purwar    20   0   11416   8448   6628 S   1.0   0.1   0:00.26 nc
 758632 purwar    20   0   11416   8504   6688 S   1.0   0.1   0:00.26 nc
```

[0] 0:ssh* 1:bash- "rtop1" 07:22 20-Jun-25

purwar@bdaq:~ | pi@raspberrypi: ~ | purwar@rtop1:~

```
statft-20230602 FTSW #065 / ft2p093a 2025.03.04-10:09:25 -> 06.20 07:22:41
-- RUNNING (about 11653.4Hz since 2025.06.20 07:22:08 for 34s)
16  exprun=0904a300 exp 36 run 1187 sub 0
17    omask=00009d00 s3q=0 clk=00 lmask=1d00 LOCAL
1f9f  jpll=cc008000 clk=in GOOD-CLOCK
28292c trg=00000001 aux limit -1 <-> last -1
2a2b27 cnt 513743 > 513746 > 399094 > 0 (15110.1 > 15110.2 > 11738.1Hz)
2d stafifo=00000000 some data trg-enabled
20   reset=80000000 06.20-07:22:08.595(start) no-FIFO
31     err=d0000000 06.20-07:22:08.595(error) RUNNING
25/30 e/bs=0f000000 00000000
393a3b  me=06500004 0f800000 108000e1 mask=none min=7650
405468  O0=17400000 0a000000 00000000 ready tag=0 d=0.00%
415569  O1=17500000 0a0616f1 10800004 ready tag=399089 min=2 d=0.03%
42566a  O2=17600000 0a06166b 10800010 ready tag=398955 min=4 d=23.17%
43576b  O3=17700000 0a0616f3 10800091 ready tag=399091 min=740 d=0.00%
44586c  O4=17800000 0a0616f4 10800004 ready tag=399092 min=2 d=0.00%
45596d  O5=17900000 0a000000 00000000 ready tag=0 d=0.00%
465a6e  O6=18000000 0a000000 00000000 ready tag=0 d=0.00%
475b6f  O7=18100000 0a000000 00000000 ready tag=0 d=0.00%
495d71  O9=26300000 0a000066 10800001 ready tag=102 min=0 d=0.00%
9f limiter=0c00b000 maxtrig=12 maxtime=351.44us
a0-a7 dead 23.19% (t=23.19% c=0.00% p=0.00% f=0.00% r=0.00% v=0.00% i=0.00%)
```

```
exp 36 run 1186 sub 0 started
[purwar@ttd11 ~]$ resetft -65 ; trigft -65 aux
trigft version 2019122800
resetting trigger
trigft version 2019122800
aux trigger
exp 36 run 1187 sub 0 started
[purwar@ttd11 ~]$
```

```
[DEBUG] event_no = 4000 / local_event_count = 223211 : nboard 1 nevent 1
[DEBUG] event_no = 5000 / local_event_count = 224211 : nboard 1 nevent 1
[DEBUG] event_no = 6000 / local_event_count = 225211 : nboard 1 nevent 1
[DEBUG] event_no = 7000 / local_event_count = 226211 : nboard 1 nevent 1
[DEBUG] event_no = 8000 / local_event_count = 227211 : nboard 1 nevent 1
[DEBUG] event_no = 9000 / local_event_count = 228211 : nboard 1 nevent 1
[DEBUG] event_no = 10000 / local_event_count = 229211 : nboard 1 nevent 1
[DEBUG] event_no = 20000 / local_event_count = 239211 : nboard 1 nevent 1
[DEBUG] event_no = 30000 / local_event_count = 249211 : nboard 1 nevent 1
[DEBUG] event_no = 40000 / local_event_count = 259211 : nboard 1 nevent 1
[DEBUG] event_no = 50000 / local_event_count = 269211 : nboard 1 nevent 1
[DEBUG] event_no = 60000 / local_event_count = 279211 : nboard 1 nevent 1
[DEBUG] event_no = 70000 / local_event_count = 289211 : nboard 1 nevent 1
[DEBUG] event_no = 80000 / local_event_count = 299211 : nboard 1 nevent 1
[DEBUG] event_no = 80789 / local_event_count = 300000 : nboard 1 nevent 1
[DEBUG] event_no = 90000 / local_event_count = 309211 : nboard 1 nevent 1
[DEBUG] event_no = 100000 / local_event_count = 319211 : nboard 1 nevent 1
[DEBUG] event_no = 180789 / local_event_count = 400000 : nboard 1 nevent 1
[DEBUG] event_no = 200000 / local_event_count = 419211 : nboard 1 nevent 1
[DEBUG] event_no = 280789 / local_event_count = 500000 : nboard 1 nevent 1
[DEBUG] event_no = 300000 / local_event_count = 519211 : nboard 1 nevent 1
[DEBUG] event_no = 380789 / local_event_count = 600000 : nboard 1 nevent 1
[DEBUG] event_no = 400000 / local_event_count = 619211 : nboard 1 nevent 1
```

```
Processing time in Nano seconds  : 173195
[DEBUG] (hostname rtop1, nodeid 0x03000001 ) concides with stored info.(  rtop1 0x03000001 )
^C
[purwar@rtop1 build]$
[purwar@rtop1 build]$
[purwar@rtop1 build]$ pcie40_ulreset ; sweb_receiver 0x03000001 > /dev/null
Processing time in Seconds       : 0
Processing time in Nano seconds  : 216624
[DEBUG] (hostname rtop1, nodeid 0x03000001 ) concides with stored info.(  rtop1 0x03000001 )
^C
[purwar@rtop1 build]$
[purwar@rtop1 build]$ pcie40_ulreset ; sweb_receiver 0x03000001 > /dev/null
Processing time in Seconds       : 0
Processing time in Nano seconds  : 169635
[DEBUG] (hostname rtop1, nodeid 0x03000001 ) concides with stored info.(  rtop1 0x03000001 )
```

```
top - 07:22:40 up 107 days, 21:05,  2 users,  load average: 3.16, 2.32, 1.36
Tasks: 456 total,   2 running, 454 sleeping,   0 stopped,   0 zombie
%Cpu0  :  6.7 us,  5.4 sy,  0.0 ni, 86.9 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu1  :  6.4 us,  6.0 sy,  0.0 ni, 86.9 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu2  :  6.7 us,  3.7 sy,  0.0 ni, 89.0 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu3  :  7.0 us,  3.7 sy,  0.0 ni, 88.6 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu4  :  6.7 us,  3.4 sy,  0.0 ni, 89.2 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu5  :  7.0 us,  4.0 sy,  0.0 ni, 88.0 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu6  :  6.0 us,  3.7 sy,  0.0 ni, 89.3 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu7  :  7.6 us,  4.0 sy,  0.0 ni, 87.8 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu8  :  7.3 us,  4.0 sy,  0.0 ni, 88.0 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu9  : 22.9 us, 76.7 sy,  0.0 ni,  0.0 id,  0.0 wa,  0.3 hi,  0.0 si,  0.0 st
%Cpu10 :  7.0 us,  3.3 sy,  0.0 ni, 89.3 id,  0.0 wa,  0.0 hi,  0.3 si,  0.0 st
%Cpu11 :  7.7 us,  6.0 sy,  0.0 ni, 85.7 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu12 :  7.0 us,  3.7 sy,  0.0 ni, 88.6 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu13 :  7.1 us,  3.4 sy,  0.0 ni, 88.9 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu14 :  6.4 us,  2.7 sy,  0.0 ni, 90.2 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu15 :  8.4 us,  3.0 sy,  0.0 ni, 88.0 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu16 :  7.7 us,  2.7 sy,  0.0 ni, 89.0 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu17 :  6.7 us,  3.3 sy,  0.0 ni, 89.3 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu18 :  6.7 us,  4.0 sy,  0.0 ni, 88.6 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu19 :  6.0 us,  3.0 sy,  0.0 ni, 90.4 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
MiB Mem :   7571.5 total,   1497.7 free,   2880.3 used,   3518.6 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   4691.1 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
 758197 purwar    20   0 3528948  22600   6452 S 236.5   0.3   3:10.69 sweb_receiver
 758242 purwar    20   0 1948584  41144   6312 R  36.9   0.5   0:19.25 eb0_for_pcie40
 758542 purwar    20   0   11416   8400   6584 S   1.3   0.1   0:00.59 nc
 758544 purwar    20   0   11416   8480   6664 S   1.3   0.1   0:00.58 nc
 758607 purwar    20   0   11416   8488   6672 S   1.3   0.1   0:00.57 nc
 758611 purwar    20   0   11416   8500   6684 S   1.3   0.1   0:00.57 nc
 758620 purwar    20   0   11416   8480   6660 S   1.3   0.1   0:00.58 nc
 758545 purwar    20   0   11416   8368   6548 S   1.0   0.1   0:00.61 nc
 758558 purwar    20   0   11416   8400   6712 S   1.0   0.1   0:00.59 nc
 758560 purwar    20   0   11416   8488   6668 S   1.0   0.1   0:00.57 nc
 758581 purwar    20   0   11416   8416   6596 S   1.0   0.1   0:00.58 nc
 758582 purwar    20   0   11416   8496   6676 S   1.0   0.1   0:00.59 nc
 758630 purwar    20   0   11416   8448   6628 S   1.0   0.1   0:00.56 nc
 758632 purwar    20   0   11416   8508   6688 S   1.0   0.1   0:00.57 nc
 758546 purwar    20   0   11416   8440   6624 S   0.7   0.1   0:00.60 nc
```

[0] 0:ssh* 1:bash- "rtop1" 07:22 20-Jun-25

15 kHz, original DAQ software

- 1 hit in each event
- No TOP Feat Ext, PS on (not bypassed, current default)
- No waveforms

purwar@bdaq:~ | pi@raspberrypi: ~ | purwar@rtop1:~

```
statft-20230602 FTSW #065 / ft2p093a 2025.03.04-10:09:25 -> 06.20 07:36:27
-- RUNNING (about 11634.2Hz since 2025.06.20 07:35:44 for 45s)
16  exprun=0904a500 exp 36 run 1189 sub 0
17    omask=00009d00 s3q=0 clk=00 lmask=1d00 LOCAL
1f9f  jpll=cc008000 clk=in GOOD-CLOCK
28292c trg=00000001 aux limit -1 <-> last -1
2a2b27 cnt 680458 > 680462 > 528819 > 0 (15121.3 > 15121.4 > 11751.5Hz)
2d stafifo=00000000 some data trg-enabled
20   reset=80000000 06.20-07:35:44.318(start) no-FIFO
31     err=90000000 06.20-07:35:44.318(error) RUNNING
25/30 e/bs=0f000000 00000000
393a3b  me=06500004 0f800000 108000e1 mask=none min=7650
405468  O0=17400000 0a000000 00000000 ready tag=0 d=0.00%
415569  O1=17500000 0a0811b3 10800030 ready tag=528819 min=54 d=0.04%
42566a  O2=17600000 0a08112b 10800010 ready tag=528683 min=4 d=23.11%
43576b  O3=17700000 0a0811ae 10800010 ready tag=528814 min=4 d=0.00%
44586c  O4=17800000 0a0811b2 10800008 ready tag=528818 min=3 d=0.00%
45596d  O5=17900000 0a000000 00000000 ready tag=0 d=0.00%
465a6e  O6=18000000 0a000000 00000000 ready tag=0 d=0.00%
475b6f  O7=18100000 0a000000 00000000 ready tag=0 d=0.00%
495d71  O9=26300000 0a00007f 10800001 ready tag=127 min=0 d=0.00%
9f limiter=0c00b000 maxtrig=12 maxtime=351.44us
a0-a7 dead 23.15% (t=23.15% c=0.00% p=0.00% f=0.00% r=0.00% v=0.00% i=0.00%)
```

```
exp 36 run 1188 sub 0 started
[purwar@ttd11 ~]$ resetft -65 ; trigft -65 aux
trigft version 2019122800
resetting trigger
trigft version 2019122800
aux trigger
exp 36 run 1189 sub 0 started
[purwar@ttd11 ~]$
```

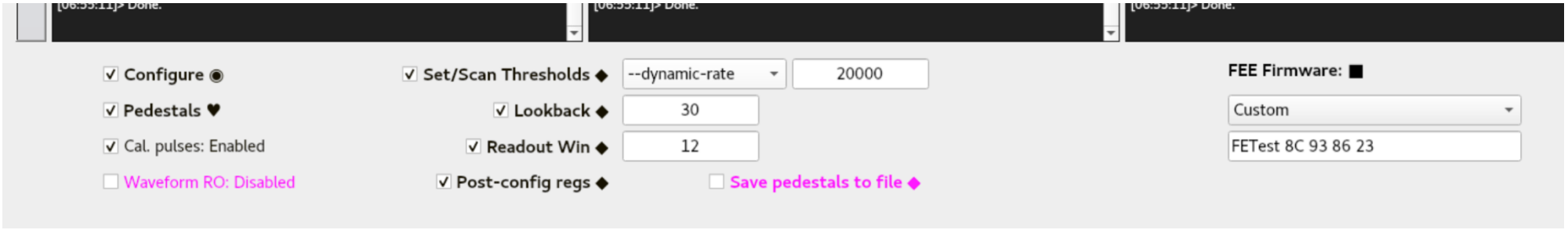
```
[DEBUG] event_no = 6000 / local_event_count = 229042 : nboard 1 nevent 1
[DEBUG] event_no = 7000 / local_event_count = 230042 : nboard 1 nevent 1
[DEBUG] event_no = 8000 / local_event_count = 231042 : nboard 1 nevent 1
[DEBUG] event_no = 9000 / local_event_count = 232042 : nboard 1 nevent 1
[DEBUG] event_no = 10000 / local_event_count = 233042 : nboard 1 nevent 1
[DEBUG] event_no = 20000 / local_event_count = 243042 : nboard 1 nevent 1
[DEBUG] event_no = 30000 / local_event_count = 253042 : nboard 1 nevent 1
[DEBUG] event_no = 40000 / local_event_count = 263042 : nboard 1 nevent 1
[DEBUG] event_no = 50000 / local_event_count = 273042 : nboard 1 nevent 1
[DEBUG] event_no = 60000 / local_event_count = 283042 : nboard 1 nevent 1
[DEBUG] event_no = 70000 / local_event_count = 293042 : nboard 1 nevent 1
[DEBUG] event_no = 76958 / local_event_count = 300000 : nboard 1 nevent 1
[DEBUG] event_no = 80000 / local_event_count = 303042 : nboard 1 nevent 1
[DEBUG] event_no = 90000 / local_event_count = 313042 : nboard 1 nevent 1
[DEBUG] event_no = 100000 / local_event_count = 323042 : nboard 1 nevent 1
[DEBUG] event_no = 176958 / local_event_count = 400000 : nboard 1 nevent 1
[DEBUG] event_no = 200000 / local_event_count = 423042 : nboard 1 nevent 1
[DEBUG] event_no = 276958 / local_event_count = 500000 : nboard 1 nevent 1
[DEBUG] event_no = 300000 / local_event_count = 523042 : nboard 1 nevent 1
[DEBUG] event_no = 376958 / local_event_count = 600000 : nboard 1 nevent 1
[DEBUG] event_no = 400000 / local_event_count = 623042 : nboard 1 nevent 1
[DEBUG] event_no = 476958 / local_event_count = 700000 : nboard 1 nevent 1
[DEBUG] event_no = 500000 / local_event_count = 723042 : nboard 1 nevent 1
```

```
[DEBUG] ch 17 : eve 500001 calc 0x8c42 data 0xa1218c42
[DEBUG] ch 18 : eve 500001 calc 0x74fa data 0xa12174fa
[DEBUG] ch 19 : eve 500001 calc 0x69f1 data 0xa12169f1
[DEBUG] ch 20 : eve 500001 calc 0xc76e data 0xa121c76e
[DEBUG] ch 21 : eve 500001 calc 0x47e6 data 0xa12147e6
[DEBUG] ch 22 : eve 500001 calc 0x93b9 data 0xa12193b9
[DEBUG] ch 23 : eve 500001 calc 0x8fdc data 0xa1218fdc
[DEBUG] ch 24 : eve 500001 calc 0x1b3c data 0xa1211b3c
[DEBUG] ch 25 : eve 500001 calc 0xb4af data 0xa121b4af
[DEBUG] ch 26 : eve 500001 calc 0x8269 data 0xa1218269
[DEBUG] ch 27 : eve 500001 calc 0x8556 data 0xa1218556
[DEBUG] ch 28 : eve 500001 calc 0xd676 data 0xa121d676
[DEBUG] ch 29 : eve 500001 calc 0xc3a5 data 0xa121c3a5
[DEBUG] ch 30 : eve 500001 calc 0x21fb data 0xa12121fb
[DEBUG] ch 31 : eve 500001 calc 0x42ea data 0xa12142ea
```

```
top - 07:36:28 up 107 days, 21:19,  2 users,  load average: 2.41, 1.24, 1.01
Tasks: 455 total,   1 running, 454 sleeping,   0 stopped,   0 zombie
%Cpu0  :  5.7 us,  3.3 sy,  0.0 ni, 90.3 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu1  :  4.3 us,  4.0 sy,  0.0 ni, 90.7 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu2  :  5.0 us,  3.7 sy,  0.0 ni, 90.7 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu3  :  4.1 us,  4.4 sy,  0.0 ni, 90.9 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu4  :  5.4 us,  3.4 sy,  0.0 ni, 90.9 id,  0.0 wa,  0.0 hi,  0.3 si,  0.0 st
%Cpu5  : 23.3 us, 76.4 sy,  0.0 ni,  0.0 id,  0.0 wa,  0.3 hi,  0.0 si,  0.0 st
%Cpu6  :  5.4 us,  3.7 sy,  0.0 ni, 90.3 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu7  :  4.4 us,  3.7 sy,  0.0 ni, 91.2 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu8  :  4.7 us,  3.0 sy,  0.0 ni, 91.6 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu9  :  5.7 us,  3.7 sy,  0.0 ni, 90.3 id,  0.0 wa,  0.0 hi,  0.3 si,  0.0 st
%Cpu10 :  5.7 us,  3.0 sy,  0.0 ni, 90.6 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu11 :  5.0 us,  3.7 sy,  0.0 ni, 91.0 id,  0.0 wa,  0.0 hi,  0.3 si,  0.0 st
%Cpu12 :  5.4 us,  3.0 sy,  0.0 ni, 90.6 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu13 :  5.6 us,  3.3 sy,  0.0 ni, 90.0 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
%Cpu14 :  4.7 us,  4.0 sy,  0.0 ni, 90.7 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu15 :  5.7 us,  6.3 sy,  0.0 ni, 87.3 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu16 :  6.4 us,  2.7 sy,  0.0 ni, 90.3 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu17 :  4.4 us,  3.7 sy,  0.0 ni, 91.3 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu18 :  4.7 us,  3.7 sy,  0.0 ni, 91.0 id,  0.0 wa,  0.3 hi,  0.3 si,  0.0 st
%Cpu19 :  4.3 us,  3.7 sy,  0.0 ni, 91.0 id,  0.0 wa,  0.3 hi,  0.7 si,  0.0 st
MiB Mem :   7571.5 total,   1484.7 free,   2880.7 used,   3531.2 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   4690.7 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
 762183 purwar    20   0 3528940  20772   6388 S 206.3   0.3   3:05.07 sweb_receiver
 762239 purwar    20   0 1948592  40884   6316 S  36.9   0.5   0:24.12 eb0_for_pcie40
 762611 purwar    20   0   11416   8512   6692 S   1.3   0.1   0:00.68 nc
 762618 purwar    20   0   11416   8500   6684 S   1.3   0.1   0:00.70 nc
 762537 purwar    20   0   11416   8500   6684 S   1.0   0.1   0:00.70 nc
 762538 purwar    20   0   11416   8460   6644 S   1.0   0.1   0:00.68 nc
 762545 purwar    20   0   11416   8452   6632 S   1.0   0.1   0:00.69 nc
 762550 purwar    20   0   11416   8464   6644 S   1.0   0.1   0:00.69 nc
 762572 purwar    20   0   11416   8380   6688 S   1.0   0.1   0:00.71 nc
 762598 purwar    20   0   11416   8376   6688 S   1.0   0.1   0:00.69 nc
 762605 purwar    20   0   11416   8476   6660 S   1.0   0.1   0:00.68 nc
 762628 purwar    20   0   11416   8524   6704 S   1.0   0.1   0:00.68 nc
 762632 purwar    20   0   11416   8524   6704 S   1.0   0.1   0:00.68 nc
 762548 purwar    20   0   11416   8432   6616 S   0.7   0.1   0:00.70 nc
 762549 purwar    20   0   11416   8484   6668 S   0.7   0.1   0:00.69 nc
```

```
[0] 0:ssh* 1:bash-                                                    "rtop1" 07:36 20-Jun-25
```



Near physics run occupancies

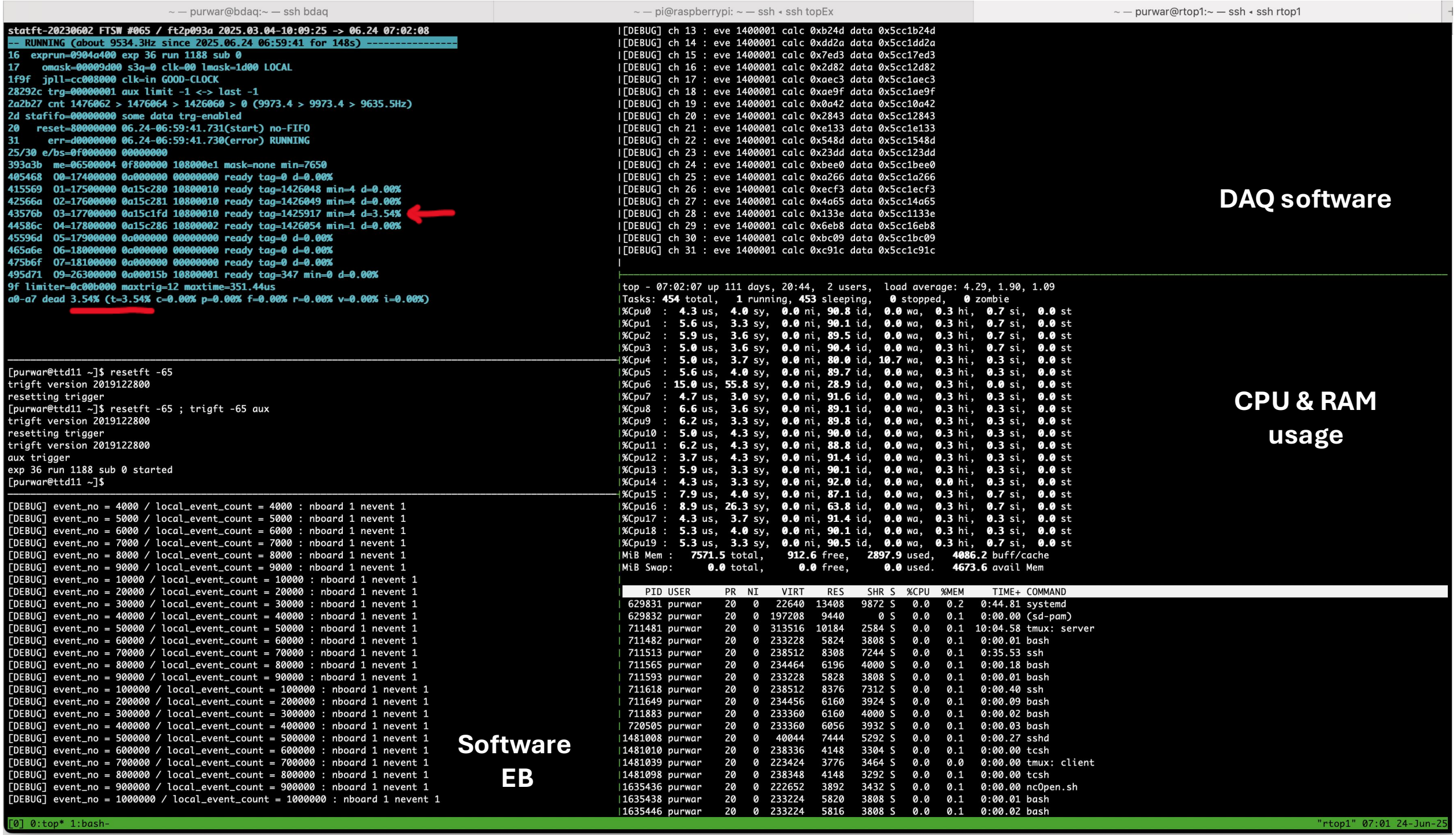
Set --dynamic-rate = 20,000

About 4 hits per event (?)

Does all events have hits?

10 kHz, original DAQ software

- --dynamic-rate = 20,000 (4 hits per event – Martin?)
- No TOP Feat Ext, PS on (not bypassed, current default)
- No waveforms


~ — purwar@bdaq:~ — ssh bdaq
~ — pi@raspberrypi: ~ — ssh ◂ ssh topEx
~ — purwar@rtop1:~ — ssh ◂ ssh rtop1
statft-20230602 FTSW #065 / ft2p093a 2025.03.04-10:09:25 -> 06.24 07:02:08
-- RUNNING (about 9534.3Hz since 2025.06.24 06:59:41 for 148s) ----------
16 exprun=0904a400 exp 36 run 1188 sub 0
17 omask=00009d00 s3q=0 clk=00 lmask=1d00 LOCAL
1f9f jpll=cc008000 clk=in GOOD-CLOCK
28292c trg=00000001 aux limit -1 <-> last -1
2a2b27 cnt 1476062 > 1476064 > 1426060 > 0 (9973.4 > 9973.4 > 9635.5Hz)
2d stafifo=00000000 some data trg-enabled
20 reset=80000000 06.24-06:59:41.731(start) no-FIFO
31 err=d0000000 06.24-06:59:41.730(error) RUNNING
25/30 e/bs=0f000000 00000000
393a3b me=06500004 0f800000 108000e1 mask=none min=7650
405468 O0=17400000 0a000000 00000000 ready tag=0 d=0.00%
415569 O1=17500000 0a15c280 10800010 ready tag=1426048 min=4 d=0.00%
42566a O2=17600000 0a15c281 10800010 ready tag=1426049 min=4 d=0.00%
43576b O3=17700000 0a15c1fd 10800010 ready tag=1425917 min=4 d=3.54%
44586c O4=17800000 0a15c286 10800002 ready tag=1426054 min=1 d=0.00%
45596d O5=17900000 0a000000 00000000 ready tag=0 d=0.00%
465a6e O6=18000000 0a000000 00000000 ready tag=0 d=0.00%
475b6f O7=18100000 0a000000 00000000 ready tag=0 d=0.00%
495d71 O9=26300000 0a00015b 10800001 ready tag=347 min=0 d=0.00%
9f limiter=0c00b000 maxtrig=12 maxtime=351.44us
a0-a7 dead 3.54% (t=3.54% c=0.00% p=0.00% f=0.00% r=0.00% v=0.00% i=0.00%)
[purwar@ttd11 ~]$ resetft -65
trigft version 2019122800
resetting trigger
[purwar@ttd11 ~]$ resetft -65 ; trigft -65 aux
trigft version 2019122800
resetting trigger
trigft version 2019122800
aux trigger
exp 36 run 1188 sub 0 started
[purwar@ttd11 ~]$
[DEBUG] event_no = 4000 / local_event_count = 4000 : nboard 1 nevent 1
[DEBUG] event_no = 5000 / local_event_count = 5000 : nboard 1 nevent 1
[DEBUG] event_no = 6000 / local_event_count = 6000 : nboard 1 nevent 1
[DEBUG] event_no = 7000 / local_event_count = 7000 : nboard 1 nevent 1
[DEBUG] event_no = 8000 / local_event_count = 8000 : nboard 1 nevent 1
[DEBUG] event_no = 9000 / local_event_count = 9000 : nboard 1 nevent 1
[DEBUG] event_no = 10000 / local_event_count = 10000 : nboard 1 nevent 1
[DEBUG] event_no = 20000 / local_event_count = 20000 : nboard 1 nevent 1
[DEBUG] event_no = 30000 / local_event_count = 30000 : nboard 1 nevent 1
[DEBUG] event_no = 40000 / local_event_count = 40000 : nboard 1 nevent 1
[DEBUG] event_no = 50000 / local_event_count = 50000 : nboard 1 nevent 1
[DEBUG] event_no = 60000 / local_event_count = 60000 : nboard 1 nevent 1
[DEBUG] event_no = 70000 / local_event_count = 70000 : nboard 1 nevent 1
[DEBUG] event_no = 80000 / local_event_count = 80000 : nboard 1 nevent 1
[DEBUG] event_no = 90000 / local_event_count = 90000 : nboard 1 nevent 1
[DEBUG] event_no = 100000 / local_event_count = 100000 : nboard 1 nevent 1
[DEBUG] event_no = 200000 / local_event_count = 200000 : nboard 1 nevent 1
[DEBUG] event_no = 300000 / local_event_count = 300000 : nboard 1 nevent 1
[DEBUG] event_no = 400000 / local_event_count = 400000 : nboard 1 nevent 1
[DEBUG] event_no = 500000 / local_event_count = 500000 : nboard 1 nevent 1
[DEBUG] event_no = 600000 / local_event_count = 600000 : nboard 1 nevent 1
[DEBUG] event_no = 700000 / local_event_count = 700000 : nboard 1 nevent 1
[DEBUG] event_no = 800000 / local_event_count = 800000 : nboard 1 nevent 1
[DEBUG] event_no = 900000 / local_event_count = 900000 : nboard 1 nevent 1
[DEBUG] event_no = 1000000 / local_event_count = 1000000 : nboard 1 nevent 1
Software EB
[DEBUG] ch 13 : eve 1400001 calc 0xb24d data 0x5cc1b24d
[DEBUG] ch 14 : eve 1400001 calc 0xdd2a data 0x5cc1dd2a
[DEBUG] ch 15 : eve 1400001 calc 0x7ed3 data 0x5cc17ed3
[DEBUG] ch 16 : eve 1400001 calc 0x2d82 data 0x5cc12d82
[DEBUG] ch 17 : eve 1400001 calc 0xaec3 data 0x5cc1aec3
[DEBUG] ch 18 : eve 1400001 calc 0xae9f data 0x5cc1ae9f
[DEBUG] ch 19 : eve 1400001 calc 0x0a42 data 0x5cc10a42
[DEBUG] ch 20 : eve 1400001 calc 0x2843 data 0x5cc12843
[DEBUG] ch 21 : eve 1400001 calc 0xe133 data 0x5cc1e133
[DEBUG] ch 22 : eve 1400001 calc 0x548d data 0x5cc1548d
[DEBUG] ch 23 : eve 1400001 calc 0x23dd data 0x5cc123dd
[DEBUG] ch 24 : eve 1400001 calc 0xbee0 data 0x5cc1bee0
[DEBUG] ch 25 : eve 1400001 calc 0xa266 data 0x5cc1a266
[DEBUG] ch 26 : eve 1400001 calc 0xecf3 data 0x5cc1ecf3
[DEBUG] ch 27 : eve 1400001 calc 0x4a65 data 0x5cc14a65
[DEBUG] ch 28 : eve 1400001 calc 0x133e data 0x5cc1133e
[DEBUG] ch 29 : eve 1400001 calc 0x6eb8 data 0x5cc16eb8
[DEBUG] ch 30 : eve 1400001 calc 0xbc09 data 0x5cc1bc09
[DEBUG] ch 31 : eve 1400001 calc 0xc91c data 0x5cc1c91c
DAQ software
top - 07:02:07 up 111 days, 20:44, 2 users, load average: 4.29, 1.90, 1.09
Tasks: 454 total, 1 running, 453 sleeping, 0 stopped, 0 zombie
%Cpu0 : 4.3 us, 4.0 sy, 0.0 ni, 90.8 id, 0.0 wa, 0.3 hi, 0.7 si, 0.0 st
%Cpu1 : 5.6 us, 3.3 sy, 0.0 ni, 90.1 id, 0.0 wa, 0.3 hi, 0.7 si, 0.0 st
%Cpu2 : 5.9 us, 3.6 sy, 0.0 ni, 89.5 id, 0.0 wa, 0.3 hi, 0.7 si, 0.0 st
%Cpu3 : 5.0 us, 3.6 sy, 0.0 ni, 90.4 id, 0.0 wa, 0.3 hi, 0.7 si, 0.0 st
%Cpu4 : 5.0 us, 3.7 sy, 0.0 ni, 80.0 id, 10.7 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu5 : 5.6 us, 4.0 sy, 0.0 ni, 89.7 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu6 : 15.0 us, 55.8 sy, 0.0 ni, 28.9 id, 0.0 wa, 0.3 hi, 0.0 si, 0.0 st
%Cpu7 : 4.7 us, 3.0 sy, 0.0 ni, 91.6 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu8 : 6.6 us, 3.6 sy, 0.0 ni, 89.1 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu9 : 6.2 us, 3.3 sy, 0.0 ni, 89.8 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu10 : 5.0 us, 4.3 sy, 0.0 ni, 90.0 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu11 : 6.2 us, 4.3 sy, 0.0 ni, 88.8 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu12 : 3.7 us, 4.3 sy, 0.0 ni, 91.4 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu13 : 5.9 us, 3.3 sy, 0.0 ni, 90.1 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu14 : 4.3 us, 3.3 sy, 0.0 ni, 92.0 id, 0.0 wa, 0.0 hi, 0.3 si, 0.0 st
%Cpu15 : 7.9 us, 4.0 sy, 0.0 ni, 87.1 id, 0.0 wa, 0.3 hi, 0.7 si, 0.0 st
%Cpu16 : 8.9 us, 26.3 sy, 0.0 ni, 63.8 id, 0.0 wa, 0.3 hi, 0.7 si, 0.0 st
%Cpu17 : 4.3 us, 3.7 sy, 0.0 ni, 91.4 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu18 : 5.3 us, 4.0 sy, 0.0 ni, 90.1 id, 0.0 wa, 0.3 hi, 0.3 si, 0.0 st
%Cpu19 : 5.3 us, 3.3 sy, 0.0 ni, 90.5 id, 0.0 wa, 0.3 hi, 0.7 si, 0.0 st
MiB Mem : 7571.5 total, 912.6 free, 2897.9 used, 4086.2 buff/cache
MiB Swap: 0.0 total, 0.0 free, 0.0 used. 4673.6 avail Mem
CPU & RAM usage
PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
629831 purwar 20 0 22640 13408 9872 S 0.0 0.2 0:44.81 systemd
629832 purwar 20 0 197208 9440 0 S 0.0 0.1 0:00.00 (sd-pam)
711481 purwar 20 0 313516 10184 2584 S 0.0 0.1 10:04.58 tmux: server
711482 purwar 20 0 233228 5824 3808 S 0.0 0.1 0:00.01 bash
711513 purwar 20 0 238512 8308 7244 S 0.0 0.1 0:35.53 ssh
711565 purwar 20 0 234464 6196 4000 S 0.0 0.1 0:00.18 bash
711593 purwar 20 0 233228 5828 3808 S 0.0 0.1 0:00.01 bash
711618 purwar 20 0 238512 8376 7312 S 0.0 0.1 0:00.40 ssh
711649 purwar 20 0 234456 6160 3924 S 0.0 0.1 0:00.09 bash
711883 purwar 20 0 233360 6160 4000 S 0.0 0.1 0:00.02 bash
720505 purwar 20 0 233360 6056 3932 S 0.0 0.1 0:00.03 bash
1481008 purwar 20 0 40044 7444 5292 S 0.0 0.1 0:00.27 sshd
1481010 purwar 20 0 238336 4148 3304 S 0.0 0.1 0:00.00 tcsh
1481039 purwar 20 0 223424 3776 3464 S 0.0 0.0 0:00.00 tmux: client
1481098 purwar 20 0 238348 4148 3292 S 0.0 0.1 0:00.00 tcsh
1635436 purwar 20 0 222652 3892 3432 S 0.0 0.1 0:00.00 ncOpen.sh
1635438 purwar 20 0 233224 5820 3808 S 0.0 0.1 0:00.01 bash
1635446 purwar 20 0 233224 5816 3808 S 0.0 0.1 0:00.02 bash
[0] 0:top* 1:bash-
"rtop1" 07:01 24-Jun-25

TOP Feat Ext, Trigger rate 10 kHz

- --dynamic-rate = 20,000 (4 hits per event – Martin?)
- PS off (bypassed)
- No waveforms sent out from ROPC

~ — purwar@bdaq:~ — ssh bdaq | ~ — pi@raspberrypi: ~ — ssh ◂ ssh topEx | ~ — purwar@rtop1:~ — ssh ◂ ssh rtop1

```
statft-20230602 FTSW #065 / ft2p093a 2025.03.04-10:09:25 -> 06.24 07:23:20
-- RUNNING (about 9999.9Hz since 2025.06.24 07:20:21 for 180s) ----------------
16  exprun=0904a600 exp 36 run 1190 sub 0
17    omask=00009d00 s3q=0 clk=00 lmask=1d00 LOCAL
1f9f  jpll=cc008000 clk=in GOOD-CLOCK
28292c trg=00000001 aux limit -1 <-> last -1
2a2b27 cnt 1801934 > 1801936 > 1801934 > 0 (10010.7 > 10010.8 > 10010.7Hz)
2d stafifo=00000000 some data trg-enabled
20   reset=80000000 06.24-07:20:21.439(start) no-FIFO
31     err=90000000 06.24-07:20:21.438(error) RUNNING
25/30 e/bs=0f000000 00000000
393a3b  me=06500004 0f800000 108000e1 mask=none min=7650
405468  O0=17400000 0a000000 00000000 ready tag=0 d=0.00%
415569  O1=17500000 0a1b7ecf 10800040 ready tag=1801935 min=6 d=0.00%
42566a  O2=17600000 0a1b7ecf 10800080 ready tag=1801935 min=7 d=0.00%
43576b  O3=17700000 0a1b7ed0 108000bd ready tag=1801936 min=75..20 d=0.00%
44586c  O4=17800000 0a1b7ecf 10800042 ready tag=1801935 min=61 d=0.00%
45596d  O5=17900000 0a000000 00000000 ready tag=0 d=0.00%
465a6e  O6=18000000 0a000000 00000000 ready tag=0 d=0.00%
475b6f  O7=18100000 0a000000 00000000 ready tag=0 d=0.00%
495d71  O9=26300000 0a1b7ed3 10800001 ready tag=1801939 min=0 d=0.00%
9f limiter=0c00b000 maxtrig=12 maxtime=351.44us
a0-a7 dead 0.00% (t=0.00% c=0.00% p=0.00% f=0.00% r=0.00% v=0.00% i=0.00%)
```

```
[purwar@ttd11 ~]$ ttaddr -65 -p | grep tt
1=17500 reg=1b200008 1b200008 ttlost(d)=3
 3=17504 3b200000  ttlost(d)=me [s01d]
[purwar@ttd11 ~]$ resetft -65 ; trigft -65 aux
trigft version 2019122800
resetting trigger
trigft version 2019122800
aux trigger
exp 36 run 1190 sub 0 started
[purwar@ttd11 ~]$
```

```
[DEBUG] event_no = 9000 / local_event_count = 655713 : nboard 1 nevent 1
[DEBUG] event_no = 10000 / local_event_count = 656713 : nboard 1 nevent 1
[DEBUG] event_no = 20000 / local_event_count = 666713 : nboard 1 nevent 1
[DEBUG] event_no = 30000 / local_event_count = 676713 : nboard 1 nevent 1
[DEBUG] event_no = 40000 / local_event_count = 686713 : nboard 1 nevent 1
[DEBUG] event_no = 50000 / local_event_count = 696713 : nboard 1 nevent 1
[DEBUG] event_no = 53287 / local_event_count = 700000 : nboard 1 nevent 1
[DEBUG] event_no = 60000 / local_event_count = 706713 : nboard 1 nevent 1
[DEBUG] event_no = 70000 / local_event_count = 716713 : nboard 1 nevent 1
[DEBUG] event_no = 80000 / local_event_count = 726713 : nboard 1 nevent 1
[DEBUG] event_no = 90000 / local_event_count = 736713 : nboard 1 nevent 1
[DEBUG] event_no = 100000 / local_event_count = 746713 : nboard 1 nevent 1
[DEBUG] event_no = 153287 / local_event_count = 800000 : nboard 1 nevent 1
[DEBUG] event_no = 200000 / local_event_count = 846713 : nboard 1 nevent 1
[DEBUG] event_no = 253287 / local_event_count = 900000 : nboard 1 nevent 1
[DEBUG] event_no = 300000 / local_event_count = 946713 : nboard 1 nevent 1
[DEBUG] event_no = 353287 / local_event_count = 1000000 : nboard 1 nevent 1
[DEBUG] event_no = 400000 / local_event_count = 1046713 : nboard 1 nevent 1
[DEBUG] event_no = 500000 / local_event_count = 1146713 : nboard 1 nevent 1
[DEBUG] event_no = 600000 / local_event_count = 1246713 : nboard 1 nevent 1
[DEBUG] event_no = 700000 / local_event_count = 1346713 : nboard 1 nevent 1
[DEBUG] event_no = 800000 / local_event_count = 1446713 : nboard 1 nevent 1
[DEBUG] event_no = 900000 / local_event_count = 1546713 : nboard 1 nevent 1
[DEBUG] event_no = 1000000 / local_event_count = 1646713 : nboard 1 nevent 1
[DEBUG] event_no = 1353287 / local_event_count = 2000000 : nboard 1 nevent 1
```

Software EB

```
[DEBUG] ch 13 : eve 1800001 calc 0x323c data 0x7741323c
[DEBUG] ch 14 : eve 1800001 calc 0x5cc1 data 0x77415cc1
[DEBUG] ch 15 : eve 1800001 calc 0x49a7 data 0x774149a7
[DEBUG] ch 16 : eve 1800001 calc 0xaa41 data 0x7741aa41
[DEBUG] ch 17 : eve 1800001 calc 0x96a8 data 0x774196a8
[DEBUG] ch 18 : eve 1800001 calc 0x70f0 data 0x774170f0
[DEBUG] ch 19 : eve 1800001 calc 0xd1ce data 0x7741d1ce
[DEBUG] ch 20 : eve 1800001 calc 0xb6f6 data 0x7741b6f6
[DEBUG] ch 21 : eve 1800001 calc 0x229d data 0x7741229d
[DEBUG] ch 22 : eve 1800001 calc 0x09bf data 0x774109bf
[DEBUG] ch 23 : eve 1800001 calc 0x9712 data 0x77419712
[DEBUG] ch 24 : eve 1800001 calc 0x4962 data 0x77414962
[DEBUG] ch 25 : eve 1800001 calc 0x5fc9 data 0x77415fc9
[DEBUG] ch 26 : eve 1800001 calc 0x0a7d data 0x77410a7d
[DEBUG] ch 27 : eve 1800001 calc 0x5fba data 0x77415fba
[DEBUG] ch 28 : eve 1800001 calc 0x445d data 0x7741445d
[DEBUG] ch 29 : eve 1800001 calc 0x9f0e data 0x77419f0e
[DEBUG] ch 30 : eve 1800001 calc 0xafd8 data 0x7741afd8
[DEBUG] ch 31 : eve 1800001 calc 0x56d5 data 0x774156d5
```

DAQ software

```
top - 07:23:18 up 111 days, 21:06,  2 users,  load average: 5.51, 2.87, 1.61
Tasks: 455 total,   1 running, 454 sleeping,   0 stopped,   0 zombie
%Cpu(s): 20.4 us,  8.1 sy,  0.0 ni, 70.5 id,  0.0 wa,  0.4 hi,  0.6 si,  0.0 st
MiB Mem :   7571.5 total,    895.6 free,   2910.5 used,   4090.5 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   4660.9 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
 629831 purwar    20   0   22640  13408   9872 S   0.0   0.2   0:44.94 systemd
 629832 purwar    20   0  197208   9440      0 S   0.0   0.1   0:00.00 (sd-pam)
 711481 purwar    20   0  313516  80828   2584 S   0.0   1.0  10:05.69 tmux: server
 711482 purwar    20   0  233228   5824   3808 S   0.0   0.1   0:00.01 bash
 711513 purwar    20   0  238512   8308   7244 S   0.0   0.1   0:35.66 ssh
 711565 purwar    20   0  234464   7240   4000 S   0.0   0.1   0:00.28 bash
 711593 purwar    20   0  233228   5828   3808 S   0.0   0.1   0:00.01 bash
 711618 purwar    20   0  238512   8376   7312 S   0.0   0.1   0:00.40 ssh
 711649 purwar    20   0  234456   6160   3924 S   0.0   0.1   0:00.09 bash
 711883 purwar    20   0  233360   6160   4000 S   0.0   0.1   0:00.02 bash
 720505 purwar    20   0  233360   6056   3932 S   0.0   0.1   0:00.03 bash
1481008 purwar    20   0   40044   7444   5292 S   0.0   0.1   0:00.75 sshd
1481010 purwar    20   0  238336   4148   3304 S   0.0   0.1   0:00.00 tcsh
1481039 purwar    20   0  223424   3776   3464 S   0.0   0.0   0:00.00 tmux: client
1481098 purwar    20   0  238348   4152   3292 S   0.0   0.1   0:00.00 tcsh
1639411 purwar    20   0  222652   3876   3420 S   0.0   0.0   0:00.00 ncOpen.sh
1639413 purwar    20   0  233224   5816   3804 S   0.0   0.1   0:00.02 bash
1639421 purwar    20   0  233224   5812   3804 S   0.0   0.1   0:00.01 bash
1639429 purwar    20   0  233224   5800   3788 S   0.0   0.1   0:00.01 bash
1639437 purwar    20   0  233224   5816   3808 S   0.0   0.1   0:00.01 bash
1639444 purwar    20   0  233224   5784   3772 S   0.0   0.1   0:00.02 bash
1639451 purwar    20   0  233224   5788   3776 S   0.0   0.1   0:00.02 bash
1639458 purwar    20   0  233224   5816   3804 S   0.0   0.1   0:00.01 bash
1639465 purwar    20   0  233224   5820   3808 S   0.0   0.1   0:00.01 bash
1639472 purwar    20   0  233224   5820   3812 S   0.0   0.1   0:00.02 bash
1639479 purwar    20   0  233224   5820   3800 S   0.0   0.1   0:00.01 bash
1639486 purwar    20   0  233224   5816   3808 S   0.0   0.1   0:00.01 bash
1639507 purwar    20   0  233224   5816   3804 S   0.0   0.1   0:00.02 bash
1639556 purwar    20   0  233224   5816   3804 S   0.0   0.1   0:00.02 bash
1639623 purwar    20   0  233224   5816   3808 S   0.0   0.1   0:00.01 bash
1639651 purwar    20   0  223424   3844   3532 S   0.0   0.0   0:00.00 tmux: client
```

CPU & RAM usage

[0] 0:top* 1:bash- "rtop1" 07:23 24-Jun-25

TOP Feat Ext, Trigger rate 20 kHz

- --dynamic-rate = 20,000 (4 hits per event – Martin?)
- PS off (bypassed)
- No waveforms sent out from ROPC

~ — purwar@bdaq:~ — ssh bdaq | ~ — pi@raspberrypi: ~ — ssh ◂ ssh topEx | ~ — purwar@rtop1:~ — ssh ◂ ssh rtop1

```
statft-20230602 FTSW #065 / ft2p093a 2025.03.04-10:09:25 -> 06.24 08:23:44
-- RUNNING (about 19999.2Hz since 2025.06.24 08:21:54 for 111s) ---------------
16  exprun=0904ae00 exp 36 run 1198 sub 0
17    omask=00009d00 s3q=0 clk=00 lmask=1d00 LOCAL
1f9f  jpll=cc008000 clk=in GOOD-CLOCK
28292c trg=00000001 aux limit -1 <-> last -1
2a2b27 cnt 2212582 > 2212586 > 2212582 > 0 (19933.2 > 19933.2 > 19933.2Hz)
2d stafifo=00000000 some data trg-enabled
20   reset=80000000 06.24-08:21:54.702(start) no-FIFO
31     err=d0000000 06.24-08:21:54.701(error) RUNNING
25/30 e/bs=0f000000 00000000
393a3b  me=06500004 0f800000 108000e1 mask=none min=7650
405468  00=17400000 0a000000 00000000 ready tag=0 d=0.00%
415569  01=17500000 0a21c2e4 10800024 ready tag=2212580 min=52 d=0.00%
42566a  02=17600000 0a21c2e3 10800001 ready tag=2212579 min=0 d=0.00%
43576b  03=17700000 0a21c2e5 10800041 ready tag=2212581 min=60 d=0.00%
44586c  04=17800000 0a21c2e4 10800002 ready tag=2212580 min=1 d=0.00%
45596d  05=17900000 0a000000 00000000 ready tag=0 d=0.00%
465a6e  06=18000000 0a000000 00000000 ready tag=0 d=0.00%
475b6f  07=18100000 0a000000 00000000 ready tag=0 d=0.00%
495d71  09=26300000 0a20faf0 10800001 ready tag=2161392 min=0 d=0.00%
9f limiter=0c00b000 maxtrig=12 maxtime=351.44us
a0-a7 dead 0.00% (t=0.00% c=0.00% p=0.00% f=0.00% r=0.00% v=0.00% i=0.00%)
```

```
trigft version 2019122800
resetting trigger
[purwar@ttd11 ~]$
[purwar@ttd11 ~]$ resetft -65 ; trigft -65 aux
trigft version 2019122800
resetting trigger
trigft version 2019122800
aux trigger
exp 36 run 1198 sub 0 started
[purwar@ttd11 ~]$
```

```
[DEBUG] event_no = 5000 / local_event_count = 5000 : nboard 1 nevent 1
[DEBUG] event_no = 6000 / local_event_count = 6000 : nboard 1 nevent 1
[DEBUG] event_no = 7000 / local_event_count = 7000 : nboard 1 nevent 1
[DEBUG] event_no = 8000 / local_event_count = 8000 : nboard 1 nevent 1
[DEBUG] event_no = 9000 / local_event_count = 9000 : nboard 1 nevent 1
[DEBUG] event_no = 10000 / local_event_count = 10000 : nboard 1 nevent 1
[DEBUG] event_no = 20000 / local_event_count = 20000 : nboard 1 nevent 1
[DEBUG] event_no = 30000 / local_event_count = 30000 : nboard 1 nevent 1
[DEBUG] event_no = 40000 / local_event_count = 40000 : nboard 1 nevent 1
[DEBUG] event_no = 50000 / local_event_count = 50000 : nboard 1 nevent 1
[DEBUG] event_no = 60000 / local_event_count = 60000 : nboard 1 nevent 1
[DEBUG] event_no = 70000 / local_event_count = 70000 : nboard 1 nevent 1
[DEBUG] event_no = 80000 / local_event_count = 80000 : nboard 1 nevent 1
[DEBUG] event_no = 90000 / local_event_count = 90000 : nboard 1 nevent 1
[DEBUG] event_no = 100000 / local_event_count = 100000 : nboard 1 nevent 1
[DEBUG] event_no = 200000 / local_event_count = 200000 : nboard 1 nevent 1
[DEBUG] event_no = 300000 / local_event_count = 300000 : nboard 1 nevent 1
[DEBUG] event_no = 400000 / local_event_count = 400000 : nboard 1 nevent 1
[DEBUG] event_no = 500000 / local_event_count = 500000 : nboard 1 nevent 1
[DEBUG] event_no = 600000 / local_event_count = 600000 : nboard 1 nevent 1
[DEBUG] event_no = 700000 / local_event_count = 700000 : nboard 1 nevent 1
[DEBUG] event_no = 800000 / local_event_count = 800000 : nboard 1 nevent 1
[DEBUG] event_no = 900000 / local_event_count = 900000 : nboard 1 nevent 1
[DEBUG] event_no = 1000000 / local_event_count = 1000000 : nboard 1 nevent 1
[DEBUG] event_no = 2000000 / local_event_count = 2000000 : nboard 1 nevent 1
```

```
[DEBUG] ch 0 : eve 2100001 calc 0x5eb5 data 0x0b215eb5
[DEBUG] ch 1 : eve 2100001 calc 0x80cd data 0x0b2180cd
[DEBUG] ch 2 : eve 2100001 calc 0x0d5e data 0x0b210d5e
[DEBUG] ch 3 : eve 2100001 calc 0x91f4 data 0x0b2191f4
[DEBUG] ch 4 : eve 2100001 calc 0x7dda data 0x0b217dda
[DEBUG] ch 5 : eve 2100001 calc 0x901b data 0x0b21901b
[DEBUG] ch 6 : eve 2100001 calc 0xb20a data 0x0b21b20a
[DEBUG] ch 7 : eve 2100001 calc 0xb760 data 0x0b21b760
[DEBUG] ch 8 : eve 2100001 calc 0xd355 data 0x0b21d355
[DEBUG] ch 9 : eve 2100001 calc 0x75e2 data 0x0b2175e2
[DEBUG] ch 10 : eve 2100001 calc 0x5905 data 0x0b215905
[DEBUG] ch 11 : eve 2100001 calc 0x6c15 data 0x0b216c15
[DEBUG] ch 12 : eve 2100001 calc 0x68dc data 0x0b2168dc
[DEBUG] ch 13 : eve 2100001 calc 0xe1d6 data 0x0b21e1d6
[DEBUG] ch 14 : eve 2100001 calc 0xf96b data 0x0b21f96b
[DEBUG] ch 15 : eve 2100001 calc 0xef78 data 0x0b21ef78
[DEBUG] ch 16 : eve 2100001 calc 0x257f data 0x0b21257f
[DEBUG] ch 17 : eve 2100001 calc 0xe995 data 0x0b21e995
[DEBUG] ch 18 : eve 2100001 calc 0xbb75 data 0x0b21bb75
[DEBUG] ch 19 : eve 2100001 calc 0xc5a5 data 0x0b21c5a5
[DEBUG] ch 20 : eve 2100001 calc 0x7cf9 data 0x0b217cf9
[DEBUG] ch 21 : eve 2100001 calc 0x9c68 data 0x0b219c68
[DEBUG] ch 22 : eve 2100001 calc 0xbb7f data 0x0b21bb7f
[DEBUG] ch 23 : eve 2100001 calc 0x7a89 data 0x0b217a89
[DEBUG] ch 24 : eve 2100001 calc 0xd493 data 0x0b21d493
[DEBUG] ch 25 : eve 2100001 calc 0x3ea8 data 0x0b213ea8
[DEBUG] ch 26 : eve 2100001 calc 0xbca0 data 0x0b21bca0
[DEBUG] ch 27 : eve 2100001 calc 0xcf17 data 0x0b21cf17
[DEBUG] ch 28 : eve 2100001 calc 0x2877 data 0x0b212877
[DEBUG] ch 29 : eve 2100001 calc 0xd802 data 0x0b21d802
[DEBUG] ch 30 : eve 2100001 calc 0x6ae4 data 0x0b216ae4
[DEBUG] ch 31 : eve 2100001 calc 0xd648 data 0x0b21d648
[DEBUG] ch 0 : eve 2200001 calc 0x0d12 data 0x91c10d12
[DEBUG] ch 1 : eve 2200001 calc 0x1f4e data 0x91c11f4e
[DEBUG] ch 2 : eve 2200001 calc 0x865d data 0x91c1865d
[DEBUG] ch 3 : eve 2200001 calc 0x0c29 data 0x91c10c29
[DEBUG] ch 4 : eve 2200001 calc 0x18bb data 0x91c118bb
[DEBUG] ch 5 : eve 2200001 calc 0xb8e8 data 0x91c1b8e8
[DEBUG] ch 6 : eve 2200001 calc 0x0f19 data 0x91c10f19
[DEBUG] ch 7 : eve 2200001 calc 0xddf8 data 0x91c1ddf8
[DEBUG] ch 8 : eve 2200001 calc 0xb2d3 data 0x91c1b2d3
[DEBUG] ch 9 : eve 2200001 calc 0xb753 data 0x91c1b753
[DEBUG] ch 10 : eve 2200001 calc 0xe9f3 data 0x91c1e9f3
[DEBUG] ch 11 : eve 2200001 calc 0x8a3d data 0x91c18a3d
[DEBUG] ch 12 : eve 2200001 calc 0x2830 data 0x91c12830
[DEBUG] ch 13 : eve 2200001 calc 0x8b2b data 0x91c18b2b
[DEBUG] ch 14 : eve 2200001 calc 0xa7ad data 0x91c1a7ad
[DEBUG] ch 15 : eve 2200001 calc 0xa0ee data 0x91c1a0ee
[DEBUG] ch 16 : eve 2200001 calc 0x7ad1 data 0x91c17ad1
[DEBUG] ch 17 : eve 2200001 calc 0x7af9 data 0x91c17af9
[DEBUG] ch 18 : eve 2200001 calc 0x37e6 data 0x91c137e6
[DEBUG] ch 19 : eve 2200001 calc 0x7d27 data 0x91c17d27
[DEBUG] ch 20 : eve 2200001 calc 0xe3a4 data 0x91c1e3a4
[DEBUG] ch 21 : eve 2200001 calc 0xd2d5 data 0x91c1d2d5
[DEBUG] ch 22 : eve 2200001 calc 0xc794 data 0x91c1c794
[DEBUG] ch 23 : eve 2200001 calc 0x6421 data 0x91c16421
[DEBUG] ch 24 : eve 2200001 calc 0x2b68 data 0x91c12b68
[DEBUG] ch 25 : eve 2200001 calc 0xcb15 data 0x91c1cb15
[DEBUG] ch 26 : eve 2200001 calc 0x4887 data 0x91c14887
[DEBUG] ch 27 : eve 2200001 calc 0xf447 data 0x91c1f447
[DEBUG] ch 28 : eve 2200001 calc 0x227d data 0x91c1227d
[DEBUG] ch 29 : eve 2200001 calc 0xd929 data 0x91c1d929
[DEBUG] ch 30 : eve 2200001 calc 0xe360 data 0x91c1e360
[DEBUG] ch 31 : eve 2200001 calc 0x9ed4 data 0x91c19ed4
```

[0] 0:ssh* 1:bash- "rtop1" 08:23 24-Jun-25

TOP Feat Ext, Trigger rate 30 kHz

- --dynamic-rate = 20,000 (4 hits per event – Martin?)
- PS off (bypassed)
- No waveforms sent out from ROPC

~ — purwar@bdaq:~ — ssh bdaq | ~ — pi@raspberrypi: ~ — ssh ◂ ssh topEx | ~ — purwar@rtop1:~ — ssh ◂ ssh rtop1

```
statft-20230602 FTSW #065 / ft2p093a 2025.03.04-10:09:25 -> 06.24 08:39:10
-- BUSY ------------------------------------------------------------------
16  exprun=0904b100 exp 36 run 1201 sub 0
17    omask=00009d00 s3q=0 clk=00 lmask=1d00 LOCAL
1f9f  jpll=cc008000 clk=in GOOD-CLOCK
28292c trg=00000001 aux limit -1 <-> last -1
2a2b27 cnt 2192286 > 2192292 > 1568 > 0 (30031.3 > 30031.4 > 21.5Hz)
2d stafifo=00000000 some data trg-enabled
20   reset=80000000 06.24-08:37:58.196(start) no-FIFO
31     err=d0000000 06.24-08:37:58.195(error) RUNNING
25/30 e/bs=0f000000 c0000200
393a3b  me=06500004 0f800000 108000e1 BUSY mask=none min=7650
405468  O0=17400000 0a000000 00000000 ready tag=0 d=0.00%
415569  O1=17500000 0a000613 10800020 ready tag=1555 min=5 d=0.00%
42566a  O2=17600000 0a000612 10800080 ready tag=1554 min=7 d=0.00%
43576b  O3=17700000 0a000614 10800040 ready tag=1556 min=6 d=0.00%
44586c  O4=17800000 0a000616 10800006 ready tag=1558 min=21 d=0.00%
45596d  O5=17900000 0a000000 00000000 ready tag=0 d=0.00%
465a6e  O6=18000000 0a000000 00000000 ready tag=0 d=0.00%
475b6f  O7=18100000 0a000000 00000000 ready tag=0 d=0.00%
495d71  O9=26300400 0a00003f 10800001 BUSY ready tag=63 min=0 d=99.93%
9f limiter=0c00b000 maxtrig=12 maxtime=351.44us
a0-a7 dead 99.93% (t=99.93% c=0.00% p=0.00% f=0.00% r=0.00% v=0.00% i=0.00%)
```

```
trigft version 2019122800
resetting trigger
[purwar@ttd11 ~]$ resetft -65 ; trigft -65 aux
trigft version 2019122800
resetting trigger
trigft version 2019122800
aux trigger
exp 36 run 1201 sub 0 started
[purwar@ttd11 ~]$
[purwar@ttd11 ~]$
```

```
[DEBUG] set tcp_keepalive_intvl to 3
new m_fp = 89dfc20
[INFO] accepted from 127.0.0.1
[DEBUG] enable SO_KEEPALIVE on 30
[DEBUG] set tcp_keepalive_time to 3
[DEBUG] set tcp_keepalive_intvl to 3
new m_fp = 89dfe00
[INFO] accepted from 127.0.0.1
[INFO] sorted client[0] fd:5 remote:127.0.0.1
[INFO] sorted client[1] fd:7 remote:127.0.0.1
[INFO] sorted client[2] fd:9 remote:127.0.0.1
[INFO] sorted client[3] fd:11 remote:127.0.0.1
[INFO] sorted client[4] fd:13 remote:127.0.0.1
[INFO] sorted client[5] fd:15 remote:127.0.0.1
[INFO] sorted client[6] fd:17 remote:127.0.0.1
[INFO] sorted client[7] fd:19 remote:127.0.0.1
[INFO] sorted client[8] fd:21 remote:127.0.0.1
[INFO] sorted client[9] fd:23 remote:127.0.0.1
[INFO] sorted client[10] fd:25 remote:127.0.0.1
[INFO] sorted client[11] fd:27 remote:127.0.0.1
[INFO] sorted client[12] fd:29 remote:127.0.0.1
[INFO] sorted client[13] fd:31 remote:127.0.0.1
[INFO] all downstreams are connected.
[DEBUG] ready to process data
[DEBUG] reading event 0
```

```
| data 127 : 4e047e84 23055795 09061196 3006fea4 3004b1a3 d203ceb3 27040eb4 01012000
| data 12f : 4c014c21 5e135843 a6138043 a613bd53 c913be53 b0138e63 a913a763 d213d073
| data 137 : ae13c173 7013a683 b913b783 c913c993 9813b993 d113bea3 d013d5a3 d113d3b3
| data 13f : b013beb3 02012000 48014861 5e2386c3 8623a6c3 9e238ed3 9123a7d3 a6238ee3
| data 147 : 86238ce3 a3238ef3 b623a2f3 49014901 75138c03 8e239703 92239813 a6238e13
| data 14f : b3239723 a723a723 be23ae33 a723a233 03012000 48014861 5d3381c3 ad33bdc3
| data 157 : ce33c0d3 d033b6d3 c733bfe3 d633b8e3 ca33bef3 b933b1f3 49014901 8123bc03
| data 15f : ba33bc03 ba33b013 bd33bf13 a3339f23 ae33b023 9c33a333 9f339933 04012000
| data 167 : 42014261 5e437dc3 9e4381c3 9943b1d3 98438fd3 a143ade3 c943bde3 bf43b8f3
| data 16f : b143aef3 43014301 61339103 98438803 9e439e13 af43a213 b943a623 c243b123
| data 177 : bd43bd33 9f43a233 05012000 42014261 8e53a1c3 d253e1c3 e253c8d3 ce53c7d3
| data 17f : d653c6e3 ba53a2e3 ca53b2f3 cd53c6f3 43014301 c043d803 cf53a903 c153a613
| data 187 : b6538e13 d053d123 d153c023 c053bc33 d153c633 7473616c 2477ab08 02781500
| data 18f : 00012000 4c014c21 c803de43 19040744 0e040654 1204f953 e903e963 fe030164
| data 197 : 0e041874 2e045974 5c04d584 5e05f685 5c069096 47064695 fd03b2a3 ca03e7a3
| data 19f : 0f0429b4 460412b4 01012000 4c014c21 8513c143 ce13df43 f513cd53 e913de53
| data 1a7 : f613ea63 e113e163 b713e073 f713e073 8113b383 e713e083 e313e093 ec13e193
| data 1af : 0d14fda3 f613cfa3 ff13f6b3 f113d9b3 7473616c 2477ab09 02791500 00012000
| data 1b7 : 4c014c41 60037583 a403ca83 f8032e94 d9044d95 e905e8a5 df052fa5 1e048eb3
| data 1bf : 6d038eb3 8803b2c3 b0039fc3 9b0391d3 920368d3 a203a2e3 a5038fe3 8e0384f3
| data 1c7 : 98039ef3 01012000 4c014c41 52137e83 b1138983 73138093 98138e93 961390a3
| data 1cf : b113b0a3 9e1382b3 981391b3 52136cc3 9d1389c3 ae139ad3 991396d3 9d13b0e3
| data 1d7 : a3138fe3 90138ef3 a01399f3 7473616c 2477ab0a 027a1500 00012000 4c014c41
| data 1df : 3903c883 21044684 cf044e95 aa05ee95 ad05e6a4 cc0378a3 7d03aab3 c203e2b3
| data 1e7 : 8f039ec3 9f0381c3 8e037ad3 9d03a0d3 b1039de3 a30398e3 98038df3 7e0372f3
| data 1ef : 01012000 4c014c41 4f136683 80137083 8d137f93 7e137e93 9e1396a3 b913b0a3
| data 1f7 : 9c138fb3 6e136ab3 391369c3 961393c3 77136dd3 811391d3 a0138ee3 9d1383e3
| data 1ff : 9e1396f3 811370f3 7473616c 2477ab0b 027b1500 00012000 4c014c21 9803b243
| data 207 : d903b843 cf03b853 a603b153 b303b163 b303b963 d803c773 c803c973 d6032f84
| data 20f : 1f054e85 b8050e96 f1057695 45049ea3 690380a3 cf03f9b3 e603d0b3 [FATAL] rtop1 ch=21 : Feature extracted event size(76 words) is larger than the original event size(16 words). errflag 1 Exiting..: /home/usr/purwar/software/Pcie40Applications/subevent.cpp int Subevent::feedData2TO
Pfunc() 548
|01012000
| data 217 : 4c014c21 76139e43 b113b343 c713c053 d913d253 b613b263 e213cd63 d913ca73
| data 21f : c913b273 4f137e83 ca13d783 b613b593 e113d393 d013d7a3 c713c6a3 c713b2b3
| data 227 : ca13afb3 7473616c 2477ab0c 027c1500 00012000 4c014c41 a203c783 1a044284
| data 22f : c1041895 b805ef95 ff05c1a5 0f05cca3 98039eb3 af03c9b3 ac03a7c3 b00382c3
| data 237 : 930397d3 8503a2d3 b103b2e3 d603cce3 b903acf3 a203aef3 01012000 4c014c41
| data 23f : 4f137683 af13b283 b013ad93 b1139b93 ae13b3a3 c113bda3 96139eb3 b313a7b3
| data 247 : 60136ec3 ae138ec3 b2139ed3 d813c6d3 9e13b0e3 b813a0e3 b713b0f3 d71396f3
| data 24f : 7473616c 2477ab0d 027d1500 00012000 4c014c21 ca03e243 d703e143 f703f953
| data 257 : f003f653 ed03f963 e103c463 dd03e273 c603ae73 b303de83 2a045984 b9043795
| data 25f : d7050c96 2f0607a6 5605f0a3 b7039fb3 c303d7b3 01012000 4c014c21 81139843
| data 267 : b813b643 b313b653 aa13b753 bf13b163 c213b263 d713ce73 b613b673 77139783
| data 26f : b913b183 9e139f93 cd13b993 be13bfa3 c813afa3 c713b9b3 b313b0b3 7473616c
| data 277 : 2477ab0e 027e1500 00012000 4c014c41 6a039c83 3f046d84 f1043c95 c005e395
| data 27f : 070640a5 2d0499a3 7d039db3 c903cdb3 b403cfc3 c803b7c3 b403b2d3 b603acd3
| data 287 : b703a7e3 a603b1e3 b103b1f3 a903b0f3 01012000 4c014c41 3c137083 7e138283
| data 28f : b113c293 b813ac93 6e1380a3 ad13b3a3 b613afb3 8e1392b3 691383c3 b8139fc3
| data 297 : b2138dd3 991386d3 9813a6e3 b013a6e3 ba139af3 b2139ef3 7473616c 2477ab0f
| data 29f : 027f1500 00012000 4c014c21 b003e243 06040f44 12042054 12041154 e803fe63
| data 2a7 : 0104f663 15041374 18040f74 f1032c84 cf04f284 7805d995 67066096 2206dfa4
| data 2af : 0904e1a3 f503feb3 110413b4 01012000 4c014c21 c313de43 e613f943 0614de53
| data 2b7 : f613ee53 1214f263 e213e363 f613fe73 18140e74 9813cd83 ce13ed83 e713e293
| data 2bf : 11140d94 0e14f8a3 f813f9a3 f213d6b3 e913d6b3 7473616c 3412cdab 17d287d9
| data 2c7 : 0001e359 ff550000
|Next chunk
|
|Printing chunks : link 23 : ...
| data 000 : ffaa1700 17d17ec9 00000000 6859e556 0904b100 17d32ff0 1fa00204 00000000
| data 007 : 7725ec07 00020000 2377ab00 02100d00 00012000 c700c700 b073c603 b1038e03
| data 007 : 7725ec07 00020000 2377ab00 02100d00 00012000 c700c700 b073c603 b1038e03  data 00f : c503b213 eb030e14 9004b624 61059225 f905c335 7b05
|3134 6e037143 b203e043
| data 017 : f603de53 b3039953 ac039963 a603af63  data 017 : f603de53 b3039953 ac039963 a603af63 a8039873 b7039773 01012000 c700c700
|[purwar@rtop1 build]$
```

[FATAL] rtop1 ch-21 : Feature extracted event size(76 words) is larger than the original event size(16 words).

TOP Pedestal data RO

Using sweb_receiver

-- Successful after Vasily’s firmware modifications at UH

-- Running tests at KEK now.

Reading pedestal data from TOP FEE

at UH Test Bench

- Power-cycle TOP BS with firmware: *8C-93/86-23*
- Configure it. This reads in new pedestals and saves it to the SCROD memory
- Enable sending pedestal data from SCROD memory to PCIe40 via b2link:

```
pcie40_regconfig --ch ___ --fee32 –w 0x182D 0x4
```

- Prepare PCIe40 to read data with *ID for TOP 0x03000001*

```
sweb_receiver 0x03000001
```

- Start software event builder with,

```
eb0+1tx_for_pcie40 -l 5101 -i 1
```

- Start basf2 to incoming read data from the IPC port (5101)

```
basf2 RecvPeds2Root.py -o testPed.sroot 0 5101 temp
```

- Send FTSW triggers (local): *num trig out > 8192*

```
trigft -13 pulse 2000 8400
```

Combined all these steps into a single bash script

Plan to integrate this in TOP Power-cycle and Config GUI

Reading pedestal data from TOP FEE

at KEK

- Power-cycle TOP BS with firmware: *8C-93/86-23*
- Configure it. This reads in new pedestals and saves it to the SCROD memory
- Enable sending pedestal data from SCROD memory to PCIe40 via b2link:

```
pcie40_regconfig --ch ___ --fee32 –w 0x182D 0x4
```

- Configure TTD using ttaddr and nsm commands.
- Load and then start a new local run.
- Copy file back to rtop* from store (HLT).
- Unpack and extract pedestal values.

Combining all these steps into a single bash script

Plan to integrate this in TOP Power-cycle and Config GUI

New unpacker for pedestal data

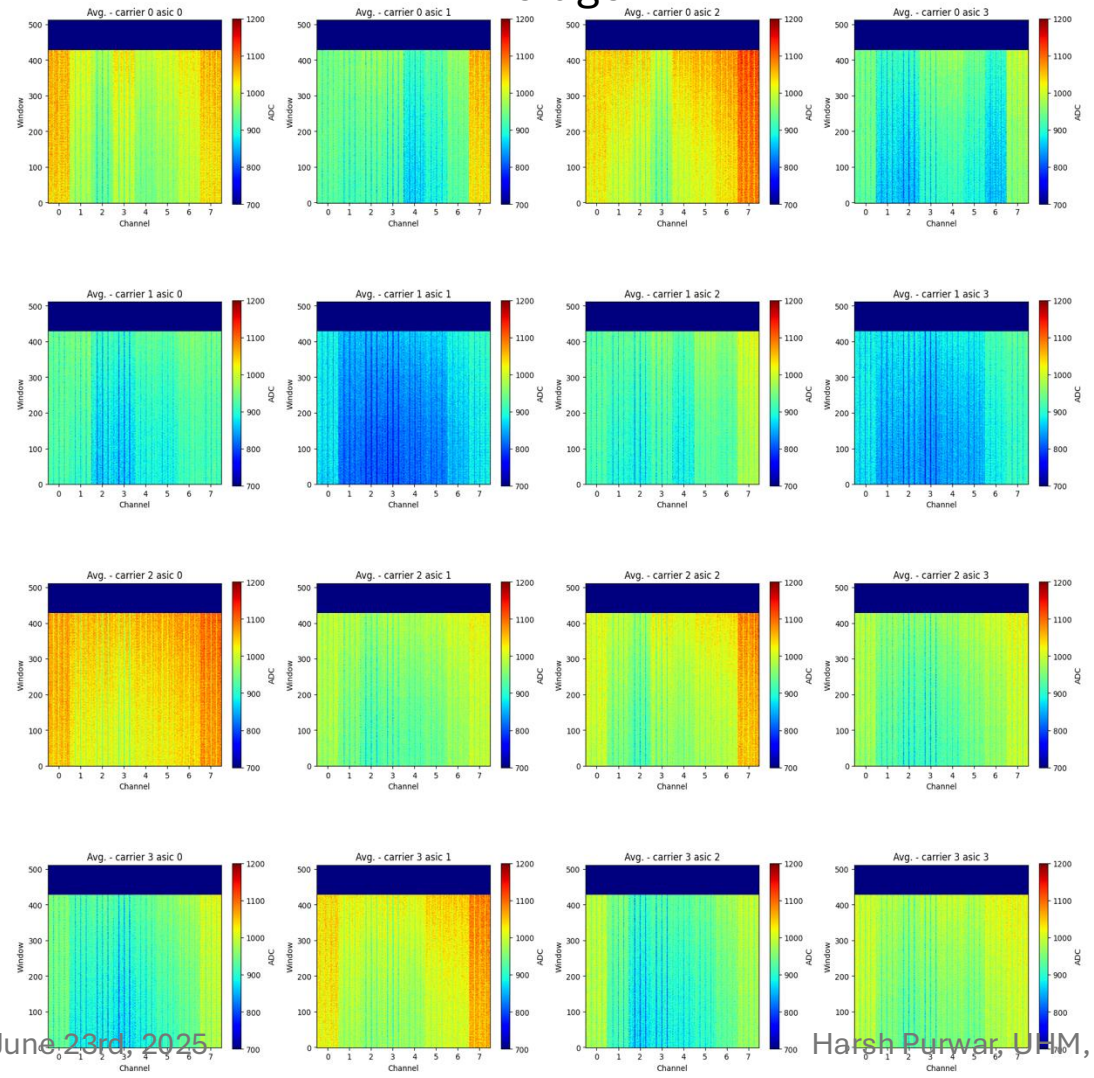
- Previously the pedestal data used to be unpacked with the peddump.c code
- This expects the file has only the B2Link header, footer and pedestal data.
- Don’t know how to remove PCIe40 header/footer from within basf2, so instead **I wrote a small unpacker for pedestal data in python**, works fine.
- Steps (1-3 included in the bash script):
  1. Read pedestals from TOP FEEs and dump them in a root file.
  2. Then convert root to binary file/format.
  3. Run python unpacker to unpack and dump these into a txt & binary file.
  4. Use one of the 2 files to read pedestals and do feature extraction.

- Running with multiple BS have some inconsistent behavior, will try to debug and fix this.
- Also, need to slightly modify the python unpacker to correctly unpack pedestal data from multiple FEEs.

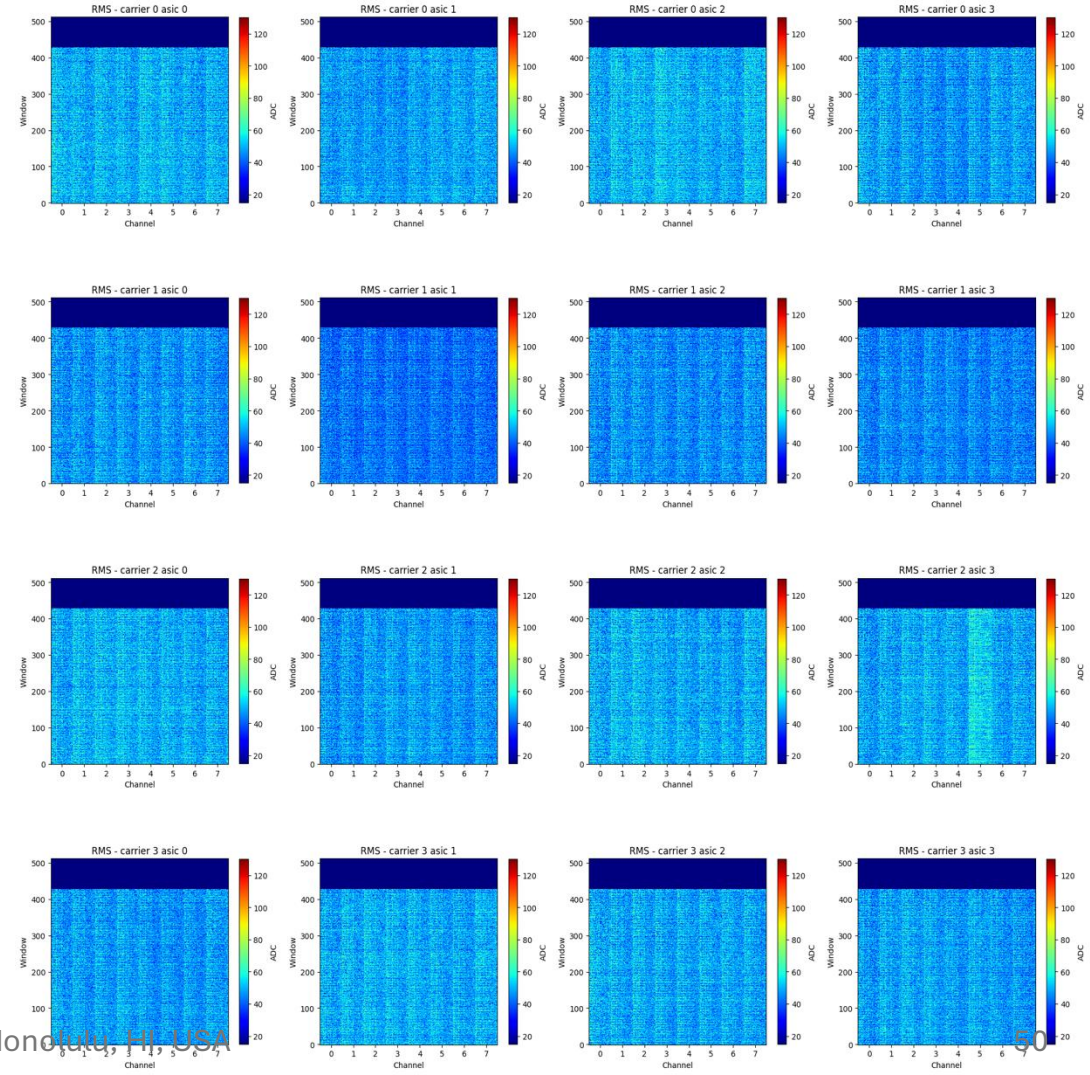
Pedestal values for BS-3 (UH)

BS-3 → ch 7 → SCORD ID: 7

Average



RMS

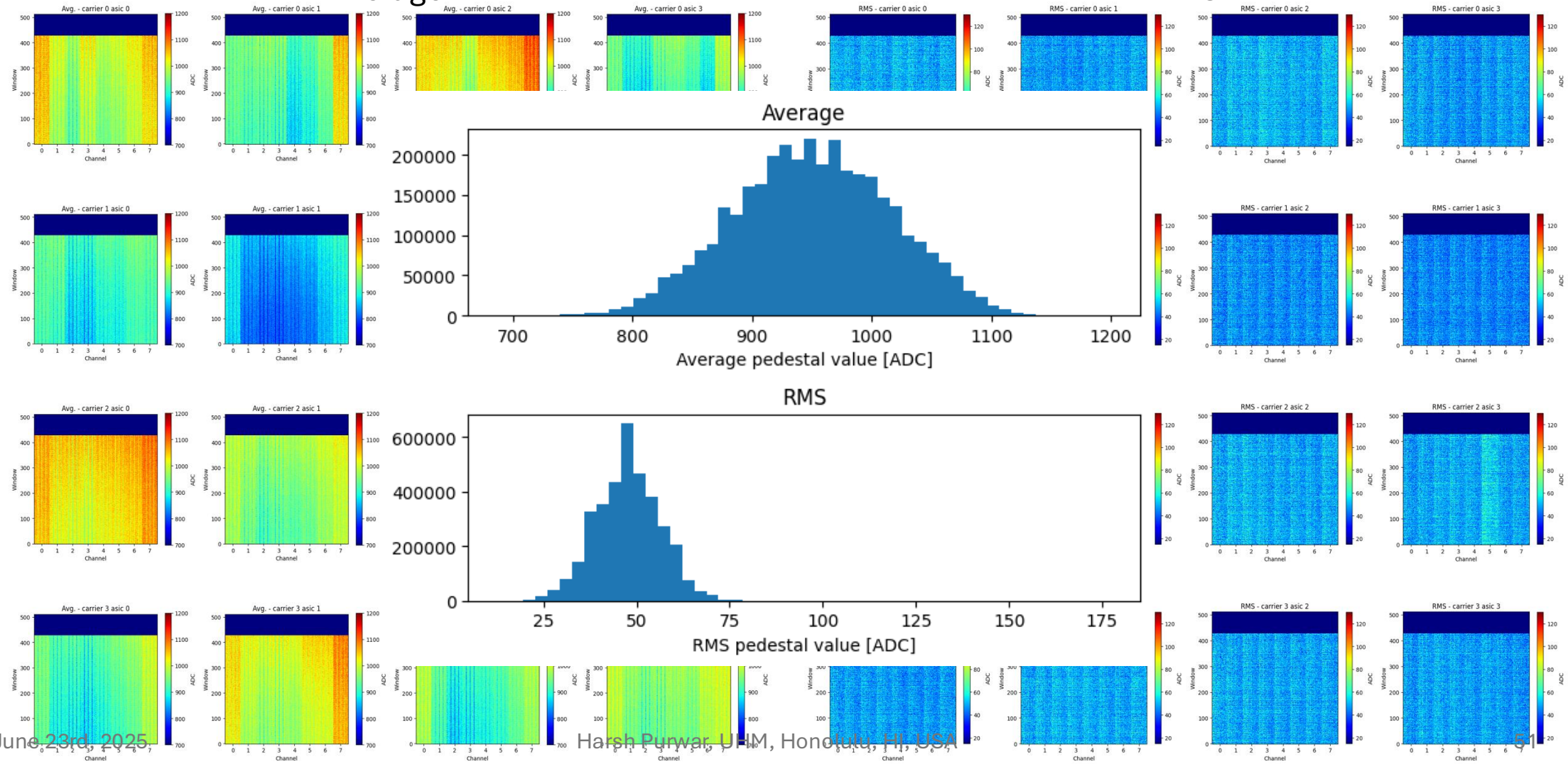


Pedestal values for BS-3 (UH)

BS-3 → ch 7 → SCORD ID: 7

Average

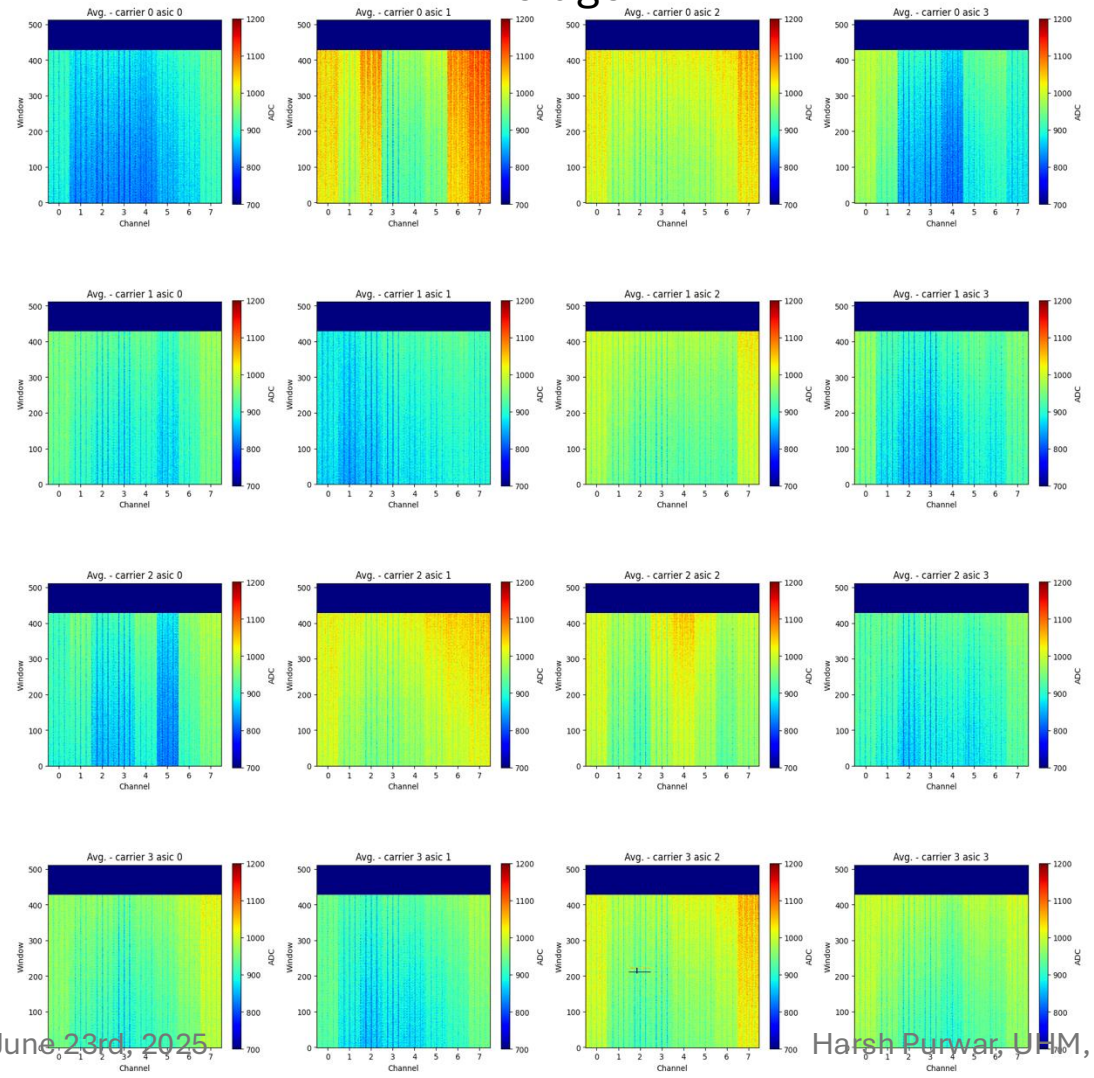
RMS



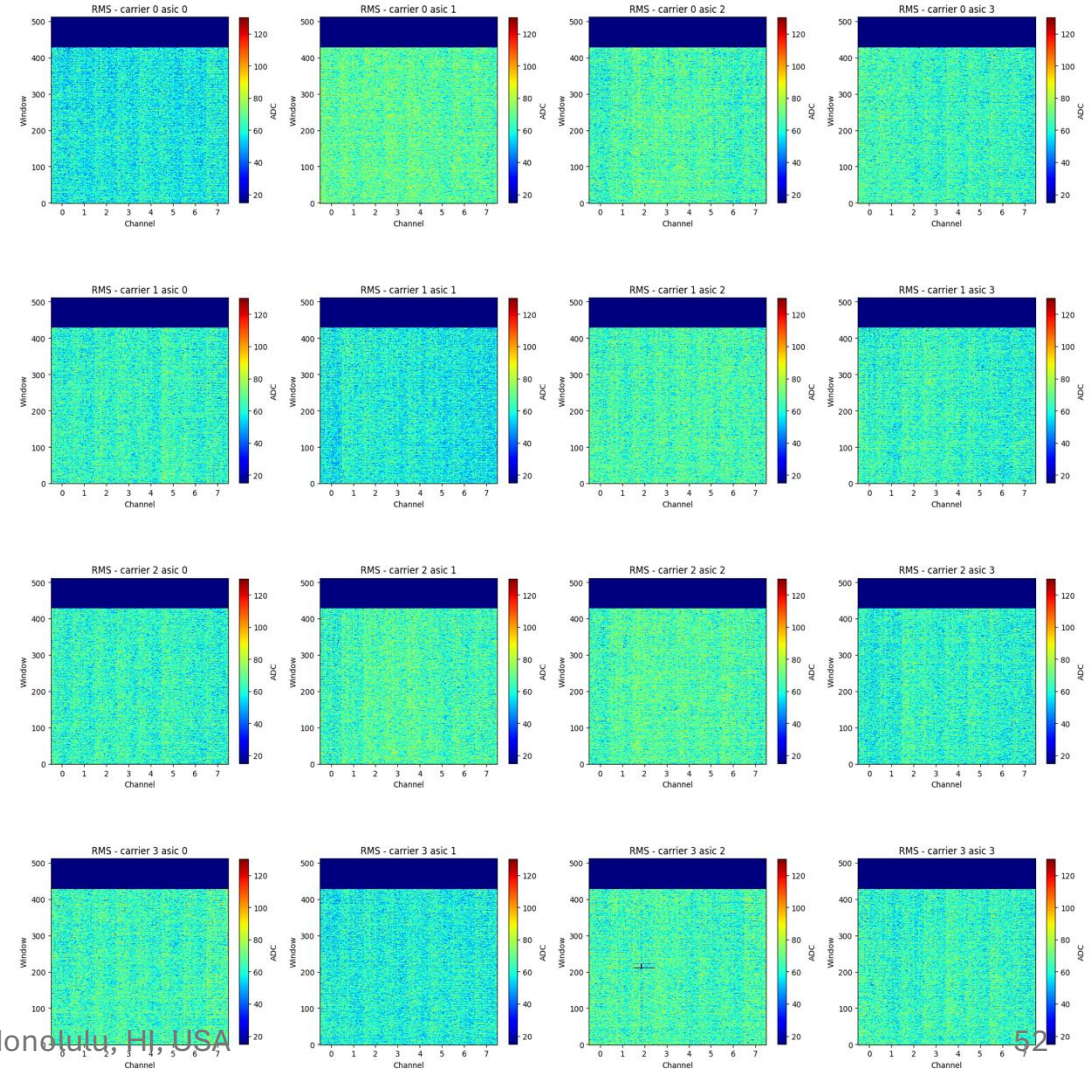
Pedestal values for BS-5 (UH)

BS-5 → ch 11 → SCORD ID: 100

Average



RMS

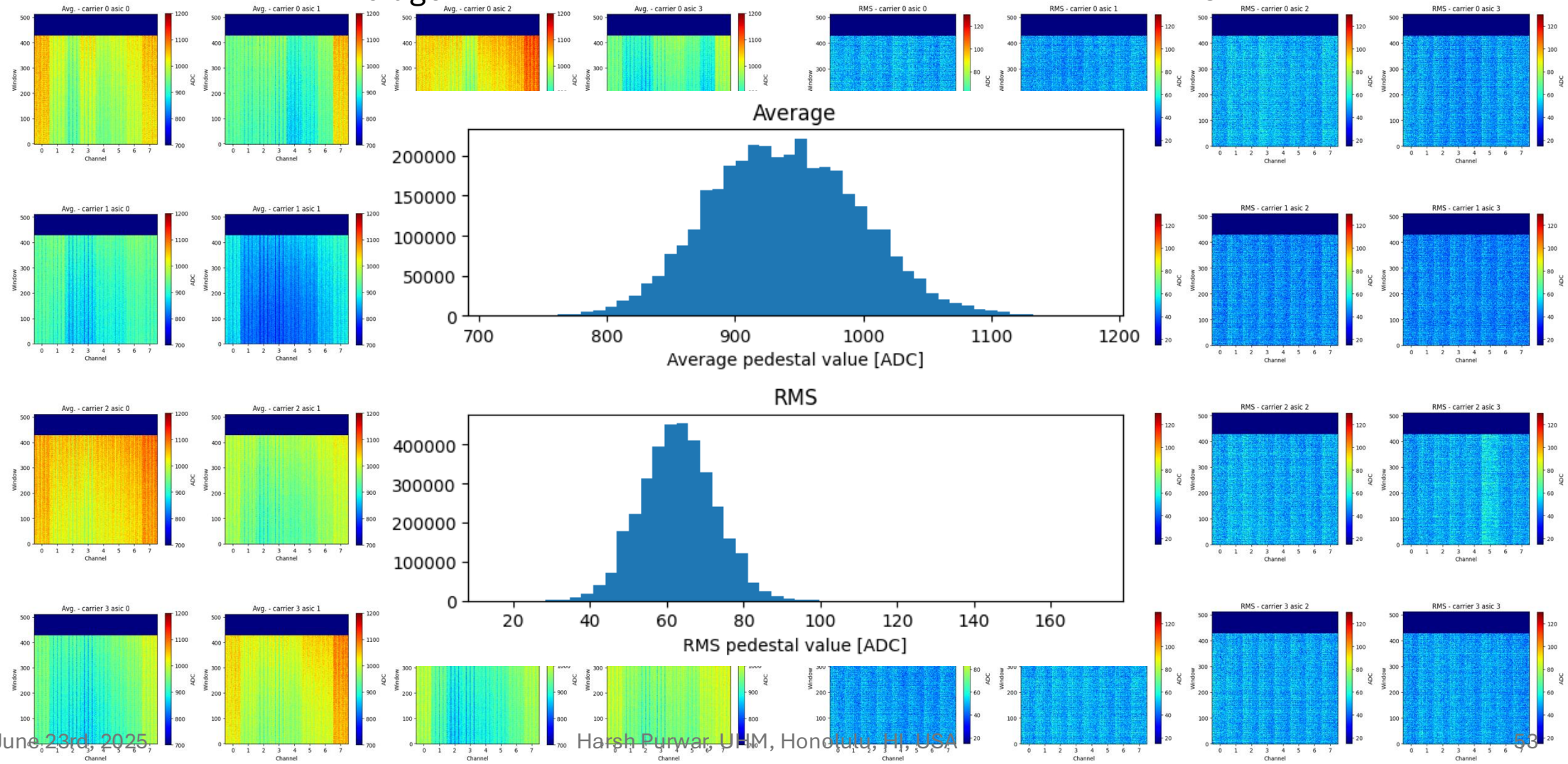


Pedestal values for BS-5 (UH)

BS-5 → ch 11 → SCORD ID: 100

Average

RMS



TT_TAG Error while reading pedestals

```
 data 200 : 03610366 03620353 037c0380 03650377 036d0375 035b037a 0376037c 03650375
 data 208 : 03450351 0352034c 03660356 037f037a 03700358 037a0381 03670368 0377037a
 data 210 : 03790356 03760382 037c037c 0385039a 03840391 0378037a 03810376 037b0373
 data 218 : 037a035a 039703a5 037f0384 03750380 03780385 036f0372 03630381 03910393
 data 220 : 036b035e 0358035d 0365035e 036e0373 035b0378 036a0373 036b0389 036a0376
 data 228 : 03520331 036c035e 0382037e 03700381 03810369 0395038d 03930395 03820386
 data 230 : 03520331 035d0364 0360034d 036e037c 036d0371 03820397 03830385 036b036b
 data 238 : 0384036c 0398038a 037f0382 039c0380 03930396 0382037b 036d0383 03740380
 data 240 : 00011644 ff550000 00000000 00000000 00000000 7fff0006 00000000 7fff0007
 data 248 :
printData2() : Done. : # of words : 584
[DEBUG] Event           2 Rate   2.09[kHz] Recvd   4.89[MB/s] RunTime     0.00[s] interval   0.0005[s] evenum           2 exp 0 run 7 sub 0 eve_size   2.34[kB] numch 1 latency min 0.96 [ms] avg 0.
96 [ms] max 0.96 [ms] spages in use min 1 max 1 eve_size_min   2.06[kB] eve_size_max   2.06[kB]  latencyb2tt_readout min 500.0000 [s] avg 15091.9797 [s] max 15091.9797 [s] Thu May  8 10:58:03 2025
[DEBUG] Event           3 Rate  35.85[kHz] Recvd  83.74[MB/s] RunTime     0.00[s] interval   0.0000[s] evenum           3 exp 0 run 7 sub 0 eve_size   2.34[kB] numch 1 latency min 0.96 [ms] avg 0.
98 [ms] max 0.98 [ms] spages in use min 1 max 1 eve_size_min   2.06[kB] eve_size_max   2.06[kB]  latencyb2tt_readout min 500.0000 [s] avg 15091.9793 [s] max 15091.9793 [s] Thu May  8 10:58:03 2025
[DEBUG] Event           4 Rate  34.38[kHz] Recvd  80.31[MB/s] RunTime     0.00[s] interval   0.0000[s] evenum           4 exp 0 run 7 sub 0 eve_size   2.34[kB] numch 1 latency min 0.96 [ms] avg 1.
03 [ms] max 1.03 [ms] spages in use min 1 max 1 eve_size_min   2.06[kB] eve_size_max   2.06[kB]  latencyb2tt_readout min 500.0000 [s] avg 15091.9788 [s] max 15091.9788 [s] Thu May  8 10:58:03 2025
[DEBUG] Event         100 Rate 561.58[kHz] Recvd 1311.85[MB/s] RunTime     0.00[s] interval   0.0002[s] evenum         100 exp 0 run 7 sub 0 eve_size   2.34[kB] numch 1 latency min 0.96 [ms] avg 1
.15 [ms] max 1.33 [ms] spages in use min 1 max 1 eve_size_min   2.06[kB] eve_size_max   2.06[kB]  latencyb2tt_readout min 500.0000 [s] avg 15091.9548 [s] max 15091.9783 [s] Thu May  8 10:58:03 2025
[DEBUG] Event         200 Rate   1.61[kHz] Recvd   3.77[MB/s] RunTime     0.06[s] interval   0.0001[s] evenum         200 exp 0 run 7 sub 0 eve_size   2.34[kB] numch 1 latency min 0.10 [ms] avg 3.
03 [ms] max 63.67 [ms] spages in use min 1 max 2 eve_size_min   2.06[kB] eve_size_max   2.06[kB]  latencyb2tt_readout min 500.0000 [s] avg 15091.9542 [s] max 15091.9816 [s] Thu May  8 10:58:03 2025
[DEBUG] Event         300 Rate   1.57[kHz] Recvd   3.67[MB/s] RunTime     0.13[s] interval   0.0637[s] evenum         300 exp 0 run 7 sub 0 eve_size   2.34[kB] numch 1 latency min 0.10 [ms] avg 5.
36 [ms] max 63.79 [ms] spages in use min 1 max 2 eve_size_min   2.06[kB] eve_size_max   2.06[kB]  latencyb2tt_readout min 500.0000 [s] avg 15091.9526 [s] max 15091.9836 [s] Thu May  8 10:58:03 2025
[DEBUG] Event         400 Rate   1.57[kHz] Recvd   3.66[MB/s] RunTime     0.19[s] interval   0.0639[s] evenum         400 exp 0 run 7 sub 0 eve_size   2.34[kB] numch 1 latency min 0.10 [ms] avg 7.
93 [ms] max 63.91 [ms] spages in use min 1 max 2 eve_size_min   2.06[kB] eve_size_max   2.06[kB]  latencyb2tt_readout min 500.0000 [s] avg 15091.9512 [s] max 15091.9856 [s] Thu May  8 10:58:03 2025
[DEBUG] Event        1000 Rate   2.34[kHz] Recvd   5.47[MB/s] RunTime     0.45[s] interval   0.2561[s] evenum        1000 exp 0 run 7 sub 0 eve_size   2.34[kB] numch 1 latency min 0.10 [ms] avg 9.
60 [ms] max 63.95 [ms] spages in use min 1 max 2 eve_size_min   2.06[kB] eve_size_max   2.06[kB]  latencyb2tt_readout min 500.0000 [s] avg 15091.9578 [s] max 15091.9936 [s] Thu May  8 10:58:03 2025
[DEBUG] Event        2000 Rate   1.96[kHz] Recvd   4.57[MB/s] RunTime     0.96[s] interval   0.5113[s] evenum        2000 exp 0 run 7 sub 0 eve_size   2.34[kB] numch 1 latency min 0.09 [ms] avg 7.
88 [ms] max 63.91 [ms] spages in use min 1 max 2 eve_size_min   2.06[kB] eve_size_max   2.06[kB]  latencyb2tt_readout min 500.0000 [s] avg 15091.9562 [s] max 15091.9941 [s] Thu May  8 10:58:04 2025
[DEBUG] Event        3000 Rate   1.96[kHz] Recvd   4.57[MB/s] RunTime     1.47[s] interval   0.5115[s] evenum        3000 exp 0 run 7 sub 0 eve_size   2.34[kB] numch 1 latency min 0.09 [ms] avg 8.
41 [ms] max 63.91 [ms] spages in use min 1 max 2 eve_size_min   2.06[kB] eve_size_max   2.06[kB]  latencyb2tt_readout min 500.0000 [s] avg 15091.9564 [s] max 15091.9946 [s] Thu May  8 10:58:04 2025
[DEBUG] Event        4000 Rate   1.96[kHz] Recvd   4.57[MB/s] RunTime     1.98[s] interval   0.5112[s] evenum        4000 exp 0 run 7 sub 0 eve_size   2.34[kB] numch 1 latency min 0.06 [ms] avg 6.
92 [ms] max 63.95 [ms] spages in use min 1 max 2 eve_size_min   2.06[kB] eve_size_max   2.06[kB]  latencyb2tt_readout min 500.0000 [s] avg 15091.9546 [s] max 15091.9931 [s] Thu May  8 10:58:05 2025
Subevent: link 11: TT_TAG error flag raised

                                                    8192
 data   0 :  00000004  EB40000B  00800007  00380000  00000000  00002000  00000204  00002000
 data   1 :  FFAA0B00  FFFFFFFF  FFFFFFFF  FFFFFFF2  00000700  25B662A0  0401A064  00000005   Regular TOP data
 data   2 :  012904B4  00000040  00000A0C  FFFFFFFF  FFFF4E22  FF550204  00000000  00000000
 data   3 :  00380002  0000000B  42424242  00000000  00000000  00002000  00000700  00002000

[FATAL] daqupsvr ch=11 : Mismatch between TT tag in data and in chunk DMA headers. Exiting..: /home/purwar/software/Pcie40Applications/subevent.cpp void Subevent::assembleSubEvent() 189
Printing chunks : link 11 : ...
 data 000 : ffaa0b00 ffffffff ffffffff fffffff2 00000700 25b662a0 0401a064 00000005
 data 007 : 012904b4 00000040 00000a0c ffffffff ffff4e22 ff550204
Next chunk
```

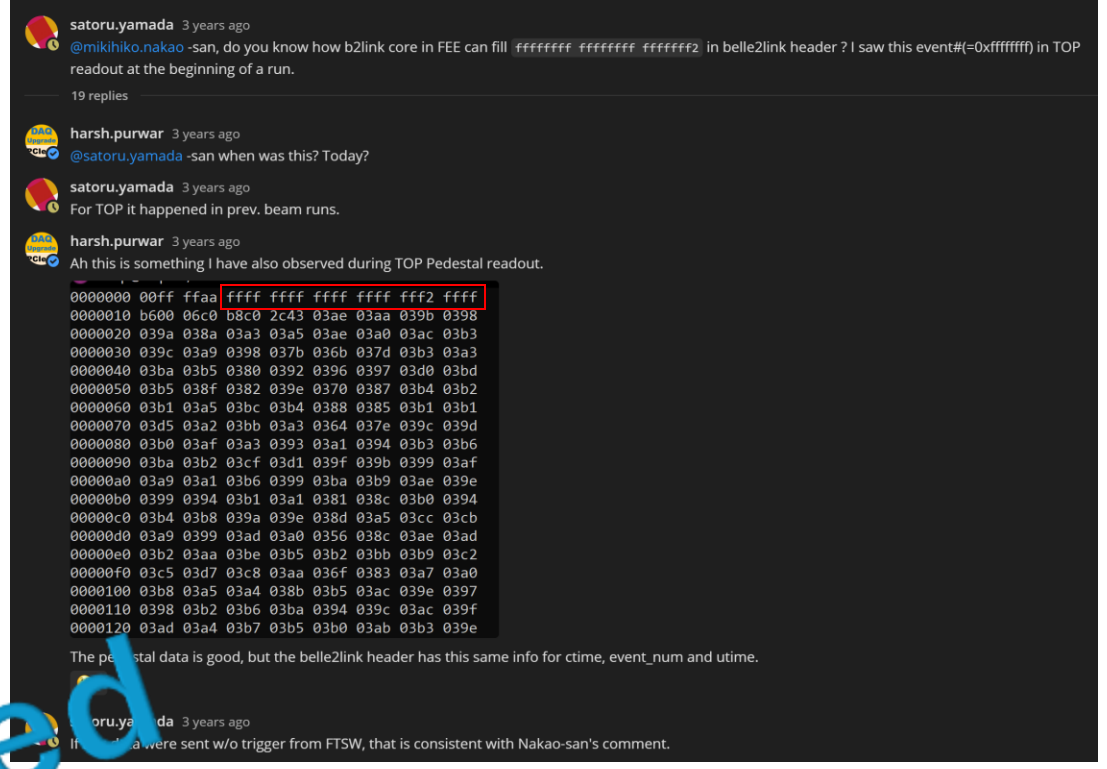
Resolved

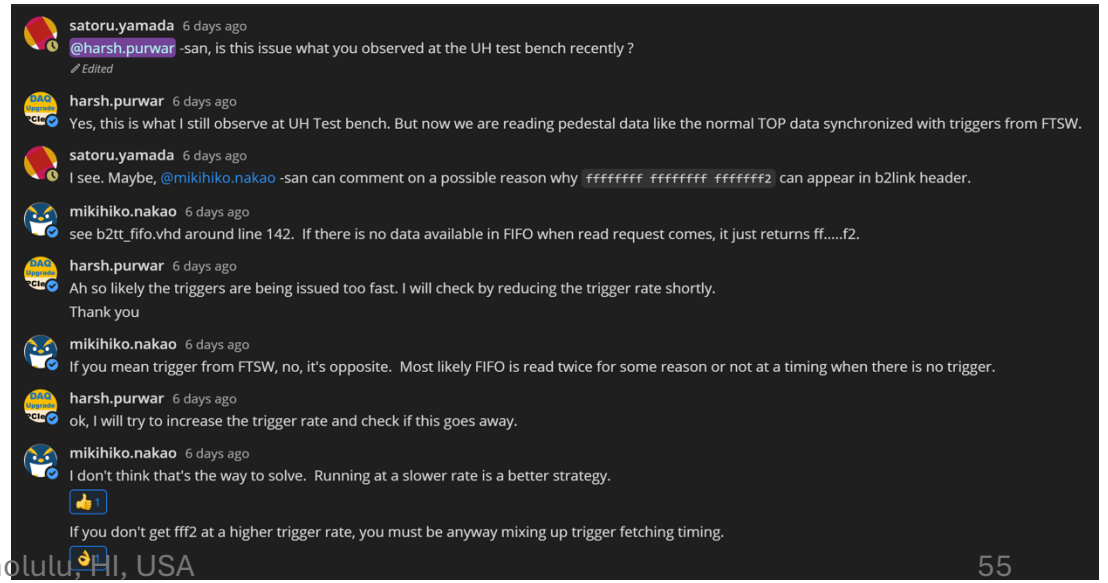
TT_Tag Error

First observed 3 years ago!

- Few years back when I was trying to read pedestals using sw triggers, I observed this issue during pedestal data RO & Yamada-san as well during his DAQ tests at KEK.
- After discussion with Nakao-san, we agreed that this is because there weren't any triggers issued by the FTSW (sw triggers are generated in the SCROD).
- But after recent changes to TOP firmware (B2C 93/84-23), we now can read pedestals synced with the triggers from FTSW.
- While doing so, I was getting inconsistent behavior, my script to read pedestals worked sometimes and failed sometimes.

Resolved





TT_Tag error

- Turns out it was because of this issue where ctime, utime, & event# are incorrect (`ffff...`) – DAQ sw raises a **TT_Tag Error.**
- Note the trigger/event number: 0x2000 = 8192 (pedestal data is from 0 – 8191)
- Also, look at the TOP data – It is regular TOP data.
- Looks like we are switching from pedestal RO mode to regular data readout mode automatically after sending 8192 pedestal data events.
- ***Vasily, could there be a bug in the TOP firmware, since this functionality was recently added?***

Resolved

DAQ software – sweb_receiver

```
Subevent: link 11: TT_TAG error flag raised
                                                                8192
 data   0 :  00000004  EB40000B  00800007  00380000  00000000  00002000  00000204  00002000
 data   1 :  FFAA0B00  FFFFFFFF  FFFFFFFF  FFFFFFF2  00002700  6A8B1B20  0401A064  00000005
 data   2 :  02850710  000000A0  00000A04  FFFFFFFF  FFFF48A6  FF550204  00000000  00000000
 data   3 :  00380002  0000000B  42424242  00000000  00000000  00002000  00002700  00002000

[FATAL] daqupsvr ch=11 : Mismatch between TT tag in data and in chunk DMA headers. Exiting..
: /home/purwar/software/Pcie40Applications/subevent.cpp void Subevent::assembleSubEvent() 189
Printing chunks : link 11 : ...                                          Regular TOP data
 data 000 : ffaa0b00 ffffffff ffffffff fffffff2 00002700 6a8b1b20 0401a064 00000005
 data 007 : 02850710 000000a0 00000a04 ffffffff ffff48a6 ff550204
```

Status of TOP FTSW #13

```
sta      0210921 FTSW #013 / ft2p094a 2025.05.27-07:09:31 -> 05.28 11:47:50
-- USY-----------------------------------------------------------------------
          n=00002b00 exp 0 run 43 sub 0
      omask=000098ff s3q=0 clk=00 lmask=18ff LOCAL
1f9f  jpll=cc008000 clk=in GOOD-CLOCK
28292c trg=00021034 pulse 1000.590 Hz 528e3 limit -1 <-> last -1
2a2b27 cnt 35662 > 35662 > 8788 > 8789 (990.6 > 990.6 > 244.1Hz)
2d stafifo=00000000 some data trg-enabled
20   reset=80000000 05.28-11:47:38.547(start) no-FIFO
31     err=d0000000 05.28-11:47:38.541(error) RUNNING
25/30 e/bs=0f000000 c0000100
393a3b  me=01300004 0f800000 10800100 BUSY mask=none min=8
485c70  08=03040400 0a002255 00000000 BUSY ready tag=8789 d=75.36%
4a5e72  010=01310000 0a002354 0a002354 ready tag=9044 d=0.00%
9f limiter=0c00b000 maxtrig=12 maxtime=351.44us
a0-a7 dead 75.36% (t=75.36% c=0.00% p=0.00% f=0.00% r=0.00% v=0.00% i=0.00%)
```

PCIe40
TOP FE

Thank you for your attention.

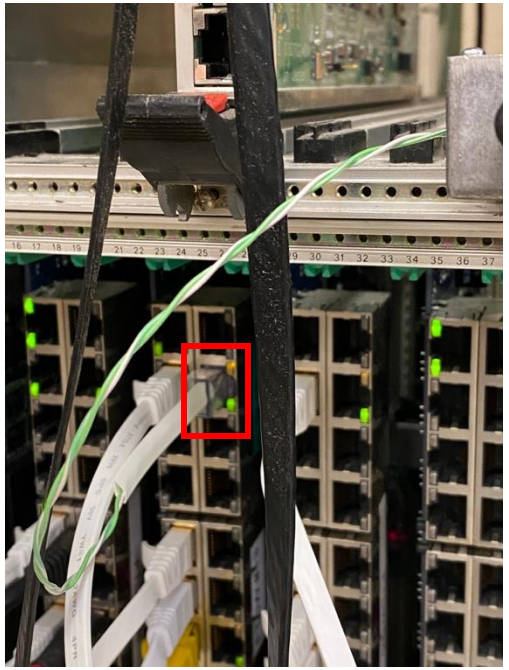
Any questions/comments?

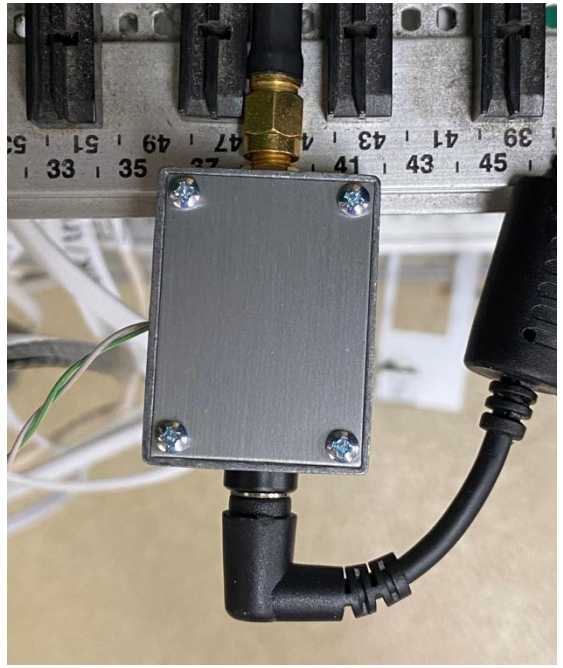
Backup slides

Upgrade of TOP Test Bench at Varner Lab

- Until now, the fast pulser was not synchronized with the FTSW (or triggers)
- This injected pulses randomly – provided a more realistic scenario

- After the upgrade, we can now sync pulser and FTSW triggers, and this ensures hits in every event
- We could still inject pulses randomly
- Current default is ~25% occupancy (hits in 2 out of 8 channels)
- Possible to run at full occupancy as well.





B2L, HSLB, COPPER/PCIe40 data formats

New data format for RawCOPPER hdr. and trl. (ver. alpha-200809)

- Remove COPPER header/trailer (which is currently removed on a readout PC.)
- Position in header will be removed to reduce header size.
- Error information in trailer (which link, what kind of error)
- XOR checksum (less CPU power to re-calculate on host servers or HLT)

1 Number of total words
2 0x7f7f | Format ver.(8bit) | Number of words in this block (8bit)
3 exp no. (10bit=1024), run no.(22bit=4194304 including subrun)
4 event number(32bit)
5 From B2link FEE header 2 (TT-ctime | Trig-type)
6 From B2link FEE header 2 (TT-utime)
7 Node ID
8 b2link CRC error bit (4) | |truncation mask (truncated or not) / type of data (compressed,calibration, …)
9 Position of ch0 data
10 Posiont of ch1 data
…
56 Position of ch48 data

1word=32bits

RawCopper Header (56words)

Detector buffer(slot 0)

Detector buffer(slot 1)

B2link (FEE/HSLB) header and trailer

Detector buffer(slot 47)

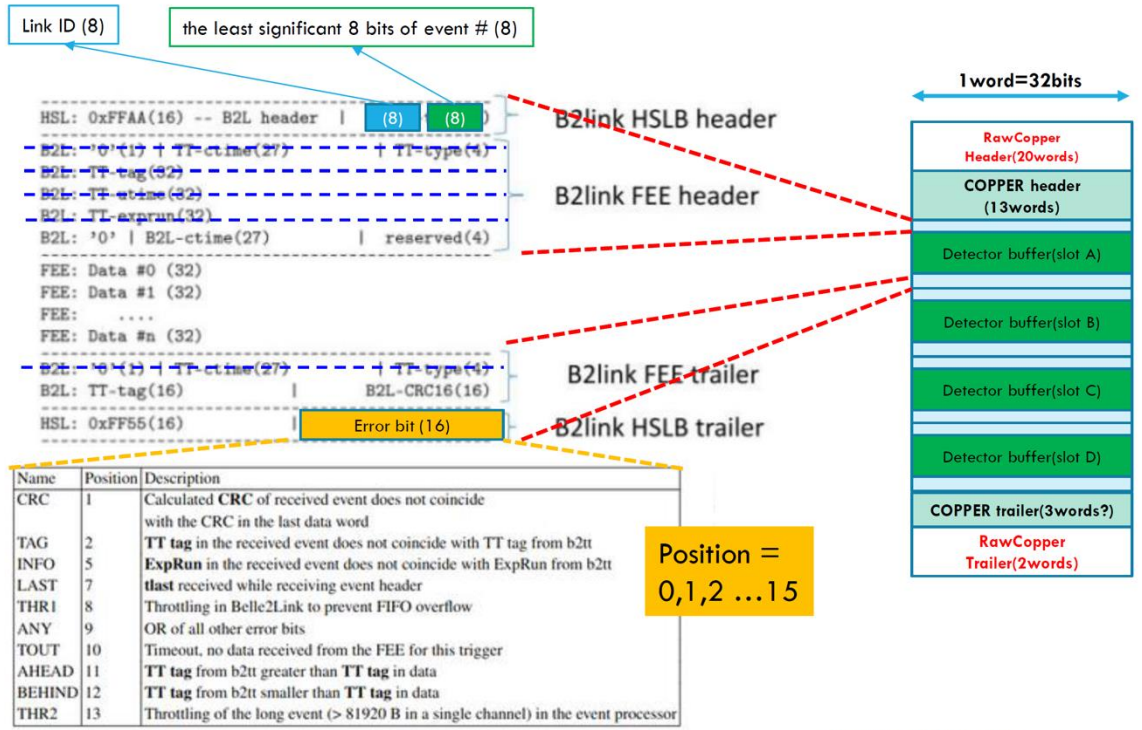
RawCopper Trailer(4words)

1 Error bit
2 Error slots
3 XOR checksum
4 termination word of this block = 0x7fff0006

12/6/2024 VER.1.2 OF NEW PCIE40 DATA FORMAT 2

New data format for B2L/HSLB hdr. and trl. (ver. alpha-200809)

- Basically unchanged
- Added some info in ffaa header and ff55 trailer



Name	Position	Description
CRC	1	Calculated **CRC** of received event does not coincide with the CRC in the last data word
TAG	2	**TT tag** in the received event does not coincide with TT tag from b2tt
INFO	5	**ExpRun** in the received event does not coincide with ExpRun from b2tt
LAST	7	**tlast** received while receiving event header
THR1	8	Throttling in Belle2Link to prevent FIFO overflow
ANY	9	OR of all other error bits
TOUT	10	Timeout, no data received from the FEE for this trigger
AHEAD	11	**TT tag** from b2tt greater than **TT tag** in data
BEHIND	12	**TT tag** from b2tt smaller than **TT tag** in data
THR2	13	Throttling of the long event (> 81920 B in a single channel) in the event processor

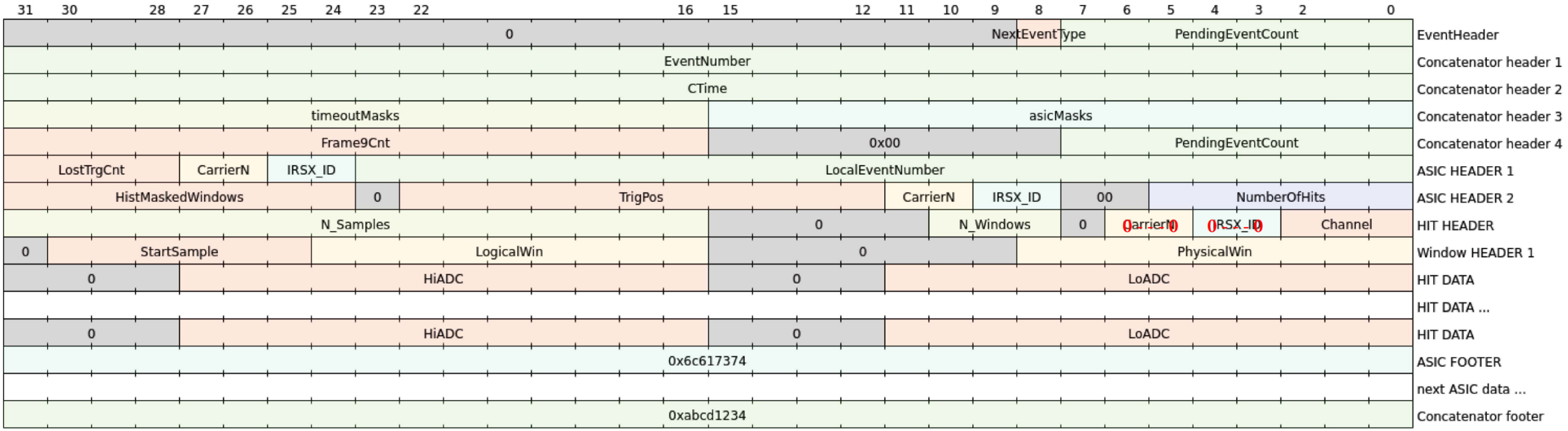
Position = 0,1,2 …15

Table VII: Error word in the DMA header and the last word of the event

VER.1.2 OF NEW PCIE40 DATA FORMAT 3

Raw data format

Note: Hit header bits 3, 4, 5 and 6 are always 0.



TOP Production Data Format

Production Debugging 4.1

2.2 **Belle 2 TOP Data Format (Production Data)**

Note that the data listed below does NOT include protocol headers; trigger type, ctime, utime, and trgtag are included in Belle2Link headers.

Word	Bits 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00	Hit
0	Type (=0x04) | Version (=0x01) | 0xA | SCROD _ID	N/A
1	EXTRA | NumWordsBonus | Phase(0-8) | NumWordsCore	
2	SKI | RSVD(0000) | ctime (11 LSBs) | Revo9 Counter	
3	ASIC Masks (TimeoutMasks | Register Masks) | eventQueueDepth | eventNumberByte	
4	Carr | IRSX | Channel | Window | 0xB | tFine | **WF** | **H/S** | **Heap Window**	1
5	vPeak | Integral	1
6	vRise0 | vRise1	1
7	vFall0 | vFall1	1
8	SampleRise | dSampPeak | dSampFall | **HeaderChecksum**	1
	. . .	
N*(5+EXTRA)+4	SD_type | Slow data | 1 0 1 | Nhits	N
	RAW HITS APPENDED HERE.	

= status bits

= reserved (0 for now)

= unsigned

= signed

Waveform Flag Heap/Stack Flag

Sum of all 16-bit values in "hit header" = 0x0000

"1 0 1 x" = 0xC or 0xD

Event size = (N*5+2) * 4 bytes e.g., for an event with 20 hits --> 408 bytes

at 30 kHz trigger rate, this gives 11.67 Mb/s

8000 is max words

NumWordsCore from hits alone, max is (13*MAX_HITS) = 3328

Max remainder then is 4672, so we should hae 13 bits reserved for it? Per raw hit, we have 18 words, so we can do a max of... 259 word

*Check with Luca on maximum number of hits per channel.

**Waveforms at the very end. Start with some kind. https://www.phys.hawaii.edu/repos/belle2/itop

***Waveform header, waveforms, waveform footer.

Slow data types

5	FPGA temperatures
9	board temperatures
1	Humidity sensor
24	FPGA power values
10	FW/SW versions
128	Trigger scalers
1	pedestal measurement (10-bin average)
178	subtotal