Threshold scans with no source

Nikhef VELO Meeting
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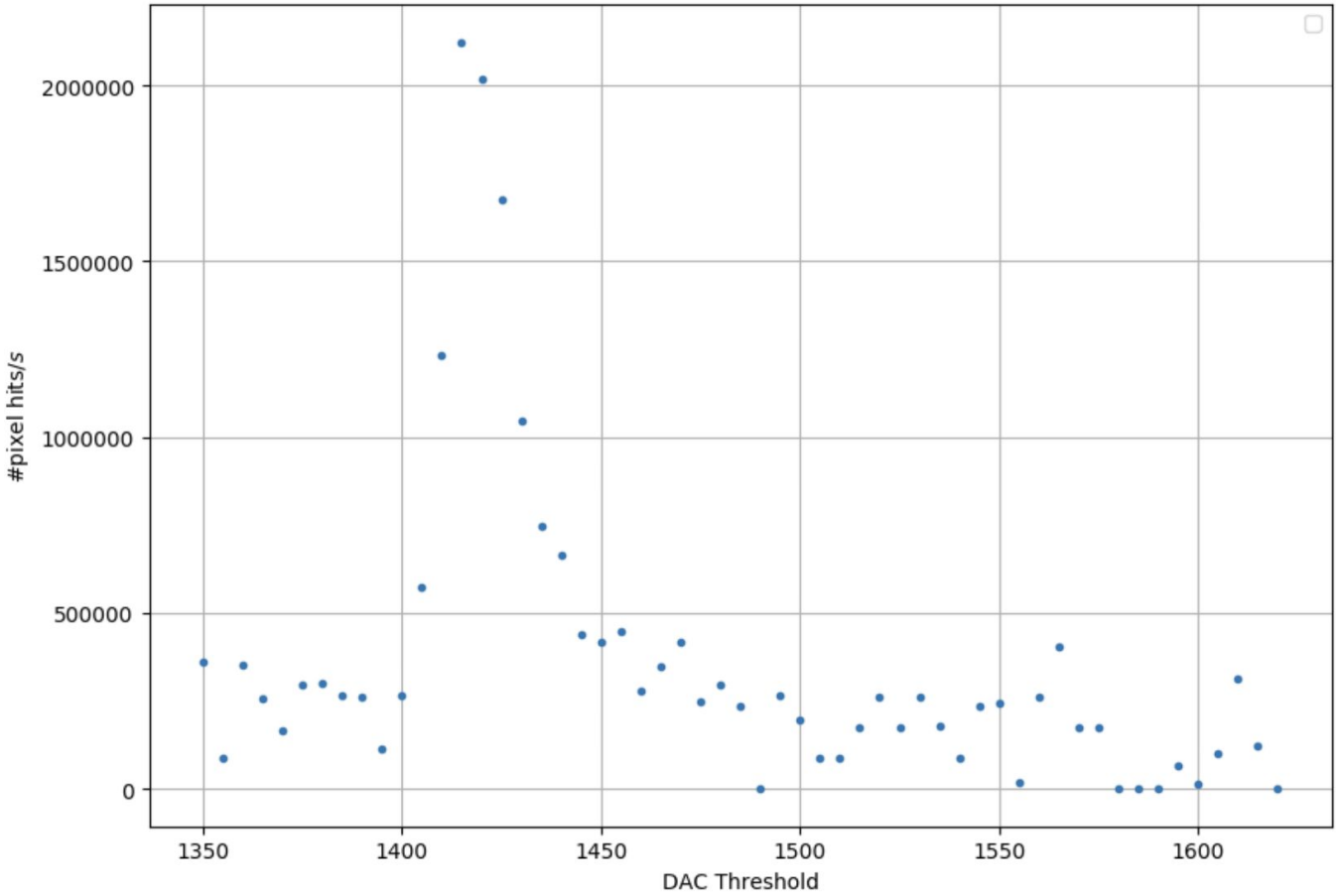
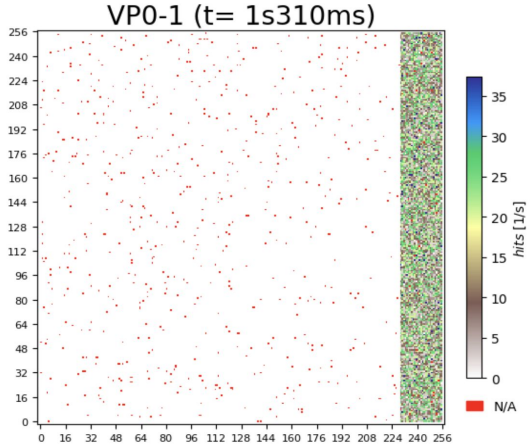
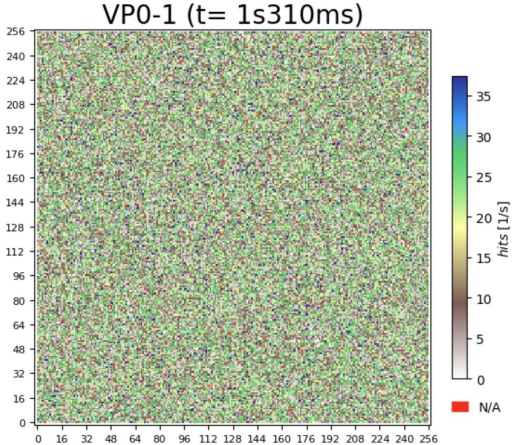
We were here:


2000000
1500000
1000000
500000
0
#pixel hits/s
1350
1400
1450
1500
1550
1600
DAC Threshold

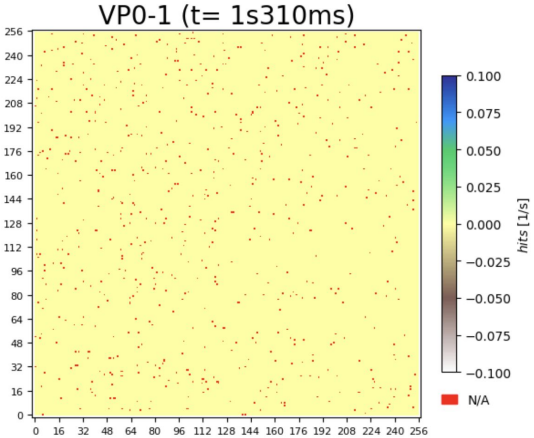
Looking at the single acquisitions at a low threshold there are different cases:



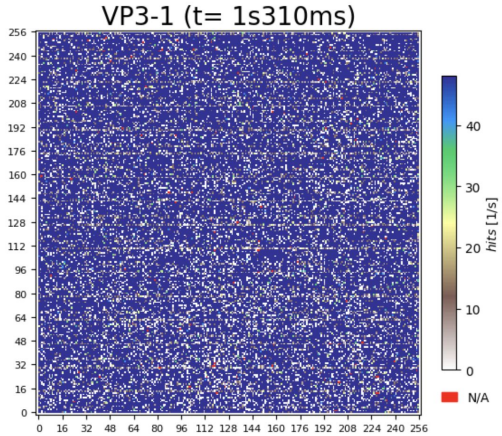
Partially bad scan



Completely bad scan



No hits



Good scan

0 hits when the DAC settings are all zeros (not clear why this happens)

```
smiSM_FE:2023.06.29 14:53:12.812 - <MODULE0::MODULE0> in state <NOT_READY>
smiSM_FE:2023.06.29 14:53:12.812 - <FE> in state <NOT_READY>
smiSM_Module0:2023.06.29 14:53:12.960 - <MODULE0_OPB> in state <NOT_READY>
WCCOAui3:2023.06.29 14:53:12.957["/home/velo/Velo_MiniDAQ/wincc/Velo_FSM/dim_writer/dim_decoding_tot
WCCOAui3:["settings = 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0"]
WCCOAui3:2023.06.29 14:53:13.791["Threshold: 1425, shutter: 1s310ms, Acquisition n. 5"]
WCCOAui3:2023.06.29 14:53:22.189["/home/velo/Velo_MiniDAQ/wincc/Velo_FSM/dim_writer/dim_decoding_tot
WCCOAui3:2023.06.29 14:53:22.920["Threshold: 1425, shutter: 1s310ms, Acquisition n. 6"]
WCCOAui5:2023.06.29 14:53:29.255["Param panel"]["velo:DAQ_Domain_VELO"]["NOT_READY"]["Configure"]["M
WCCOAui5:      1: "int PART_ID = 0"
```

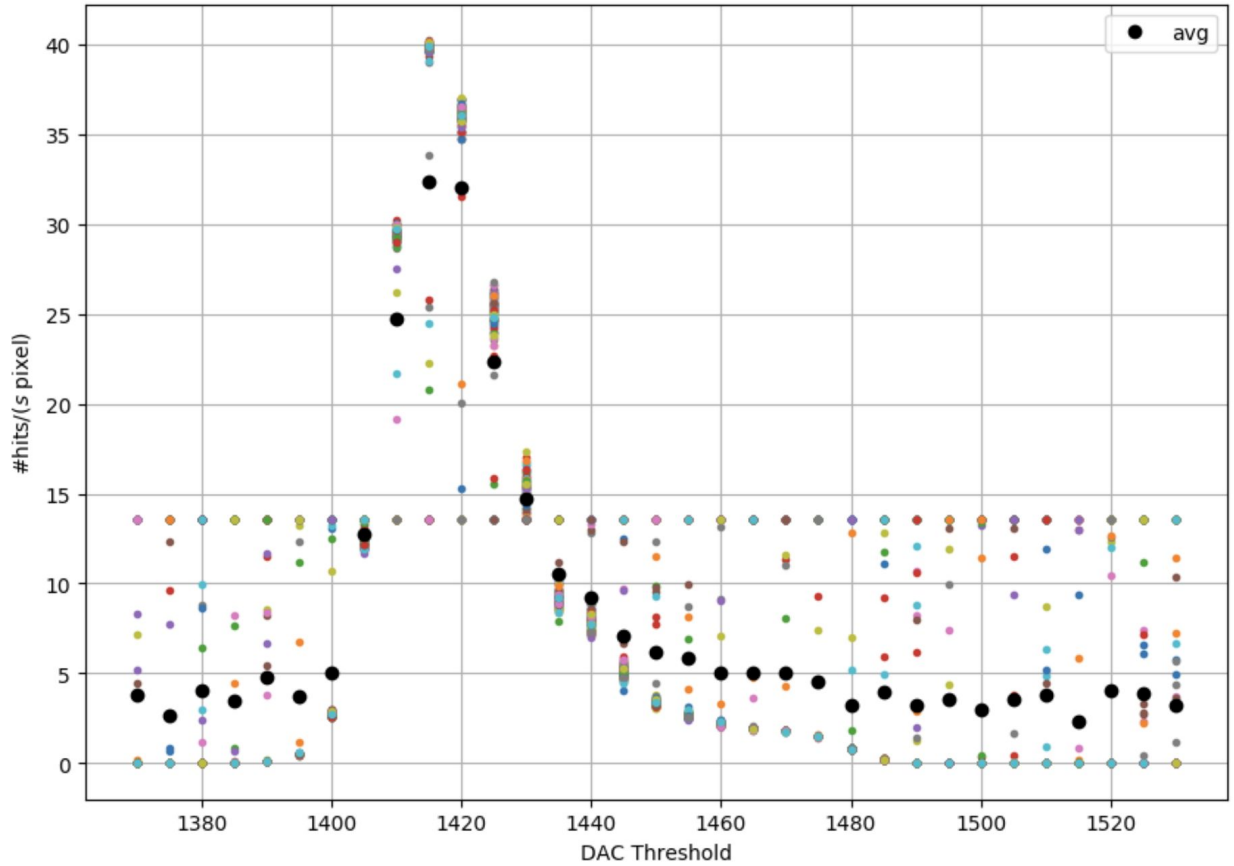
These scans can be cut out because also the masked pixels record 0 hits.

Bad scans always have the same mean number of hits in the 32th column of the ASIC:

```
Analyzing thr = 1550
Check thr = 1550, acq = 1 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 4 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 6 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 10 ->  nhits = 9.07583455093, means[-1] = 17.0341796875
Check thr = 1550, acq = 11 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 12 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 18 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 23 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 27 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 31 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 36 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 45 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 46 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 47 ->  nhits = 10.3566526457, means[-1] = 17.0341796875
Check thr = 1550, acq = 48 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 49 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 50 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 51 ->  nhits = 9.34116276166, means[-1] = 17.0341796875
Check thr = 1550, acq = 52 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 56 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 57 ->  nhits = 13.5408124851, means[-1] = 17.0341796875
Check thr = 1550, acq = 63 ->  nhits = 10.3058793163, means[-1] = 17.0341796875
```

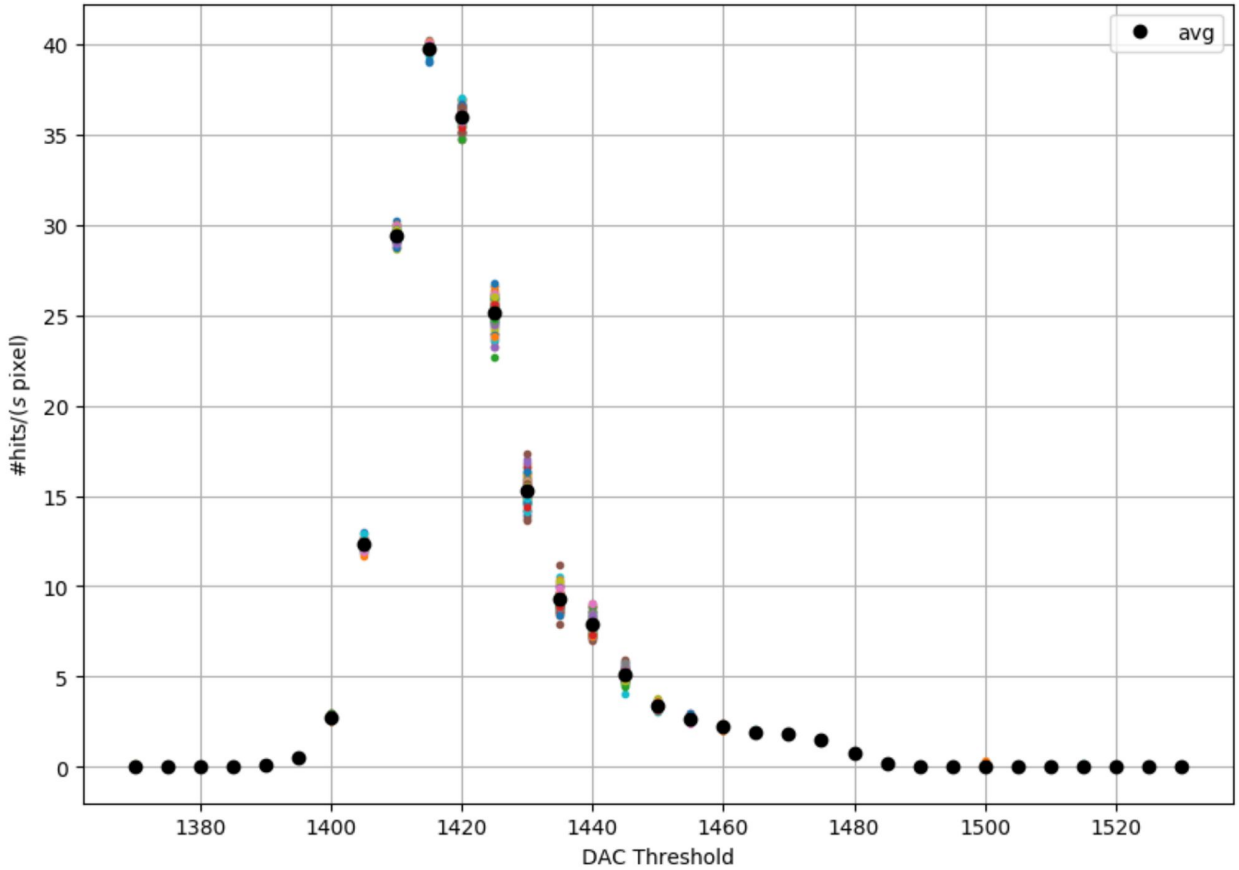
Before

VP0-1

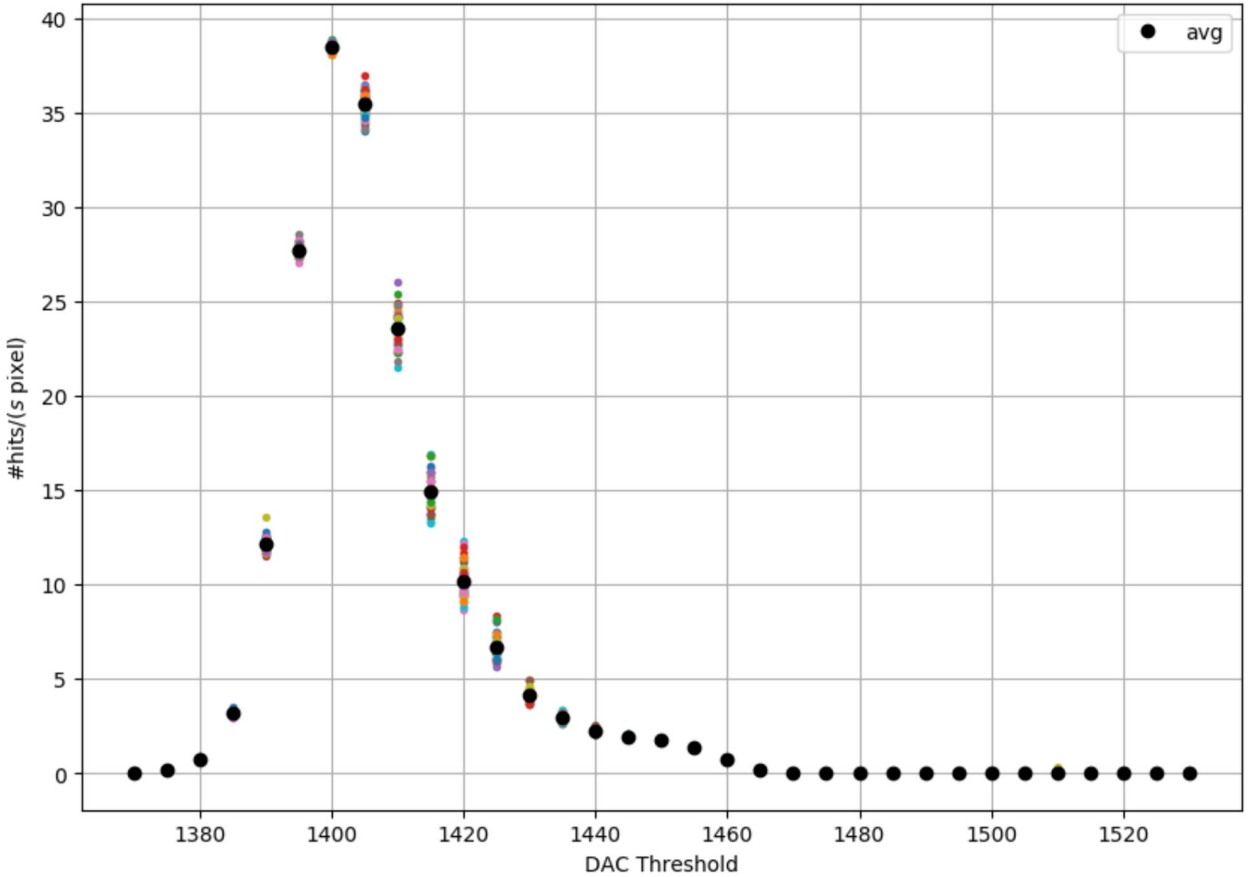

avg
#hits/(s pixel)
DAC Threshold
0
5
10
15
20
25
30
35
40
1380
1400
1420
1440
1460
1480
1500
1520

After

VP0-1


avg
#hits/(s pixel)
DAC Threshold
0
5
10
15
20
25
30
35
40
1380
1400
1420
1440
1460
1480
1500
1520

VP3-1


avg
#hits/(s pixel)
DAC Threshold
0
5
10
15
20
25
30
35
40
1380
1400
1420
1440
1460
1480
1500
1520

Conclusions

- Position of noise peak changes from VP0-1 to VP3-1
- These data will be used as reference for the scans with the source
- Need cooling to take again the scan (I didn’t upload the equalization ((((:)