AGIPD Offline Correction

Detector group

Based on data sample: /gpfs/exfel/exp/SPB/202030/p900119/raw

Release : 2.8.3

April 30, 2020

Extended version

CHAPTER

ONE

INPUT OF THE CALIBRATION PIPELINE

in-folder	"/gpfs/exfel/exp/SPB/202030/-p900119/raw"	the folder to read data from, required
run	84	runs to process, required
out-folder	"/gpfs/exfel/d/proc/SPB/202030/-p900119/r0084"	the folder to output to, required
calfile	""	path to calibration file. Leave empty if all data should come from DB
sequences	[-1]	sequences to correct, set to -1 for all, range allowed
mem-cells	0	number of memory cells used, set to 0 to automatically infer
interlaced	False	whether data is in interlaced layout
overwrite	True	set to True if existing data should be overwritten
cluster-profile	"noDB"	one
max-pulses	[0, 500, 1]	range list [st, end, step] of maximum pulse indices. 3 allowed maximum list input elements.
local-input	False	one
bias-voltage	300	one
cal-db-interface	"tcp://max-exfl016:8015#8045"	the database interface to use
use-dir-creation-date	True	use the creation data of the input dir for database queries
sequences-per-node	1	number of sequence files per cluster node if run as slurm job, set to 0 to not run SLURM parallel
photon-energy	9.2	photon energy in keV
index-v	2	version of RAW index type
nodb	False	if set only file-based constants will be used
blc-noise-threshold	5000	above this mean signal intensity now baseline correction via noise is attempted
corr-asic-diag	False	if set, diagonal drop offs on ASICs are correted
melt-snow	""	if set to "none" snowy pixels are identified and resolved to NaN, if set to "interpolate", the value is interpolated from neighbouring pixels

cal-db-timeout	300000	in milli seconds
max-cells-db-dark	0	set to a value different than 0 to use this value for dark data DB queries
max-cells-db	0	set to a value different than 0 to use this value for DB queries
chunk-size-idim	1	chunking size of imaging dimension, adjust if user software is sensitive to this.
creation-date-offset	"00:00:00"	add an offset to creation date, e.g. to get different constants
instrument	"SPB"	the instrument the detector is installed at, required
force-hg-if-below	1000	set to a value other than 0 to force a pixel into high gain if it's high gain offset subtracted value is below this threshold
force-mg-if-below	1000	set to a value other than 0 to force a pixel into medium gain if it's medium gain offset subtracted value is below this threshold
mask-noisy-adc	0.25	set to a value other than 0 and below 1 to mask entire ADC if fraction of noisy pixels is above
acq-rate	0.0	the detector acquisition rate, use 0 to try to auto-determine
gain-setting	0.1	the gain setting, use 0.1 to try to auto-determine
h5path-ctrl	"/CONTROL/-SPB_IRU_AGIPD1M1/MDL/-FPGA_COMP_TEST"	path to control information
karabo-da-control	"AGIPD1MCTRL00"	karabo DA for control infromation
only-offset	False	Apply only Offset correction. if False, Offset is applied by Default. if True, Offset is only applied.
rel-gain	False	do relative gain correction based on PC data
xray-gain	False	do relative gain correction based on xray data
blc-noise	False	if set, baseline correction via noise peak location is attempted
blc-stripes	True	if set, baseline corrected via stripes
blc-hmatch	False	if set, base line correction via histogram matching is attempted
match-asics	False	if set, inner ASIC borders are matched to the same signal level
adjust-mg-baseline	False	adjust medium gain baseline to match highest high gain value
dont-zero-nans	False	do not zero NaN values in corrected data
dont-zero-orange	False	do not zero very negative and very large values
blc-set-min	False	Shift to 0 negative medium gain pixels after offset corr

CHAPTER

TWO

AGIPD OFFLINE CORRECTION, SEQUENCES = 0-3

Author: European XFEL Detector Group, Version: 1.0

Offline Calibration for the AGIPD Detector

```
Connecting to profile slurm_prof_9b576fdf-f5a8-492b-be1a-8769350b548a_0-3
Using 2020-03-08 06:47:13+01:00 as creation time
Working in IL Mode: False. Actual cells in use are: 0
Outputting to /gpfs/exfel/d/proc/SPB/202030/p900119/r0084
Detector in use is SPB_DET_AGIPD1M-1
```

```
Gain setting: 0
```

2.1 Processed Files

```
Processing a total of 64 sequence files in chunks of 32
```

#	module	# module	file
0	Q1M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00000.h5
1		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00001.h5
2		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00002.h5
3		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00003.h5
4	Q1M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00000.h5
5		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00001.h5
6		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00002.h5
7		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00003.h5
8	Q1M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00000.h5
9		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00001.h5
10		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00002.h5
11		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00003.h5
12	Q1M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00000.h5
13		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00001.h5
14		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00002.h5
15		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00003.h5
16	Q2M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00000.h5
17		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00001.h5
18		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00002.h5
19		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00003.h5
20	Q2M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00000.h5
21		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00001.h5
22		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00002.h5
23		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00003.h5
24	Q2M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00000.h5
25		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00001.h5
26		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00002.h5
27		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00003.h5
28	Q2M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00000.h5
29		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00001.h5
30		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00002.h5
31		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00003.h5
32	Q3M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00000.h5
33		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00001.h5
34		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00002.h5
35		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00003.h5
36	Q3M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00000.h5
37		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00001.h5
38		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00002.h5
39		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00003.h5
40	Q3M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00000.h5
41		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00001.h5
42		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00002.h5
43		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00003.h5
44	Q3M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00000.h5
45		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00001.h5
46		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00002.h5
47		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00003.h5
48	Q4M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00000.h5
49		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00001.h5
50		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00002.h5
51		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00003.h5
52	Q4M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00000.h5
53		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00001.h5
54		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00002.h5
55		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00003.h5
56	Q4M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00000.h5
57		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00001.h5
58		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00002.h5
59		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00003.h5

```
A range of 500 pulse indices is selected: from 0 to 500 with a step of 1
Running 32 tasks parallel
Running 32 tasks parallel
```

```
Constants were injected on:
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
```

```
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
```

```
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
```

```
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
```

```
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
```

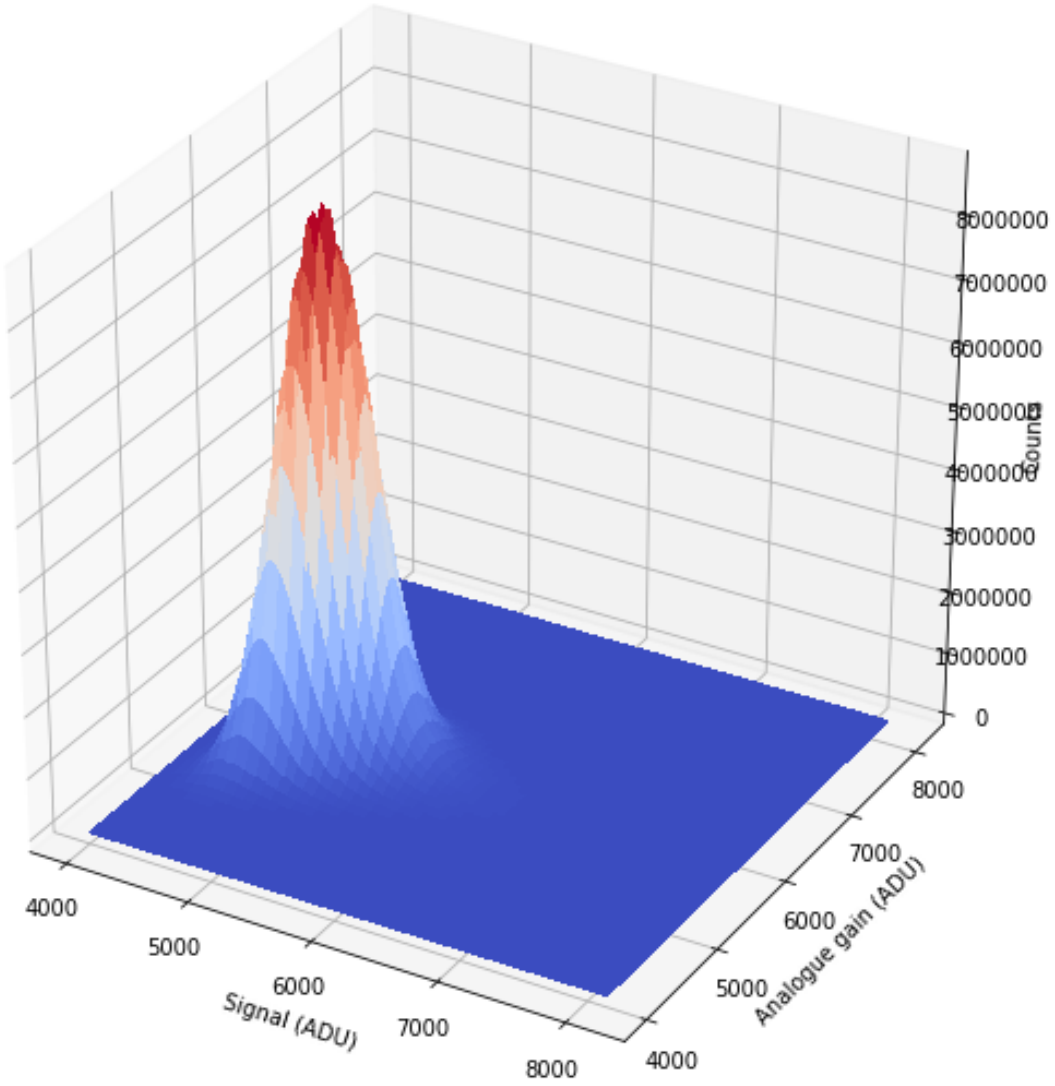
```
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. None
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
```

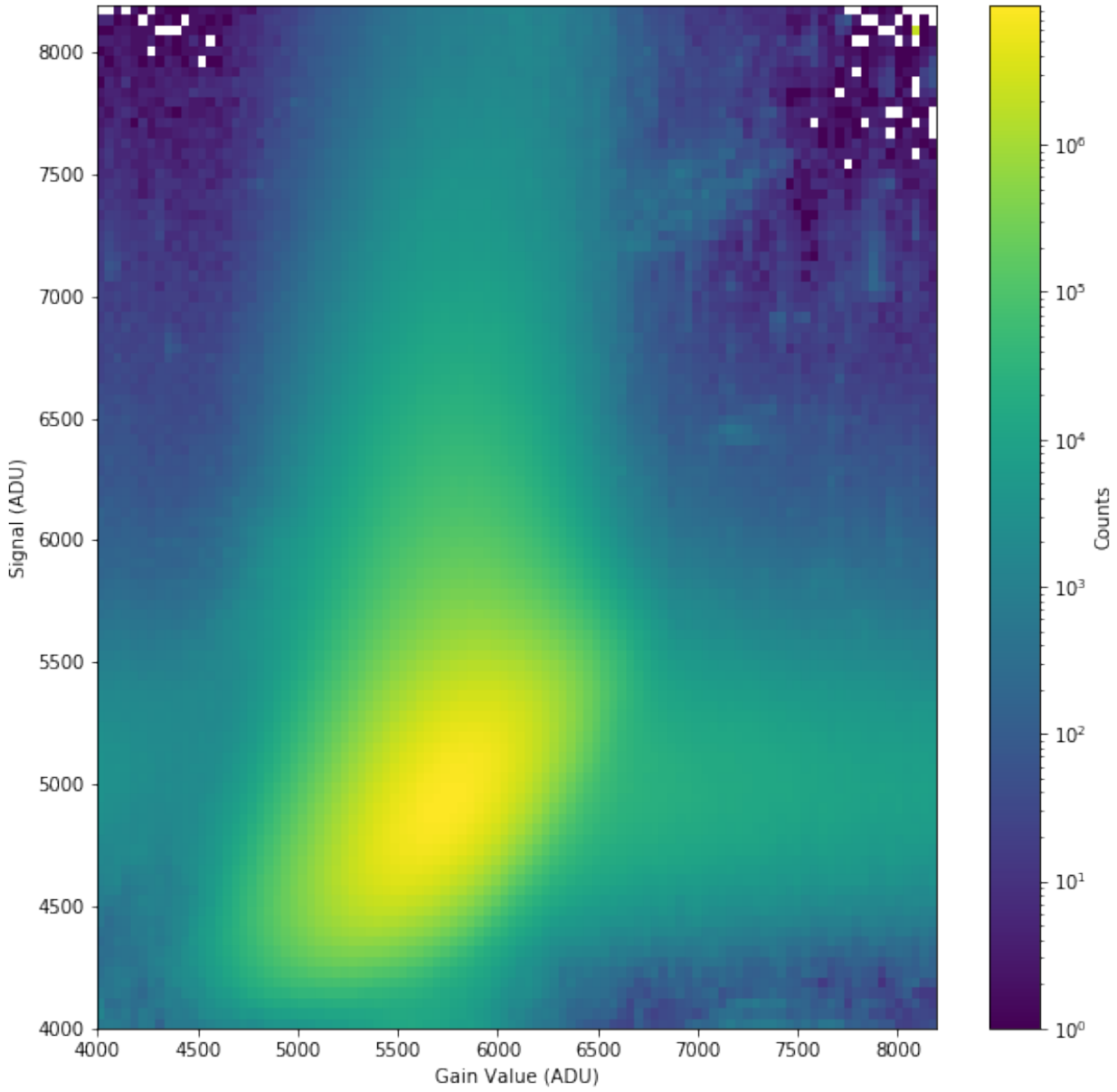
```
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
```

```
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
```

2.2 Signal vs. Analogue Gain

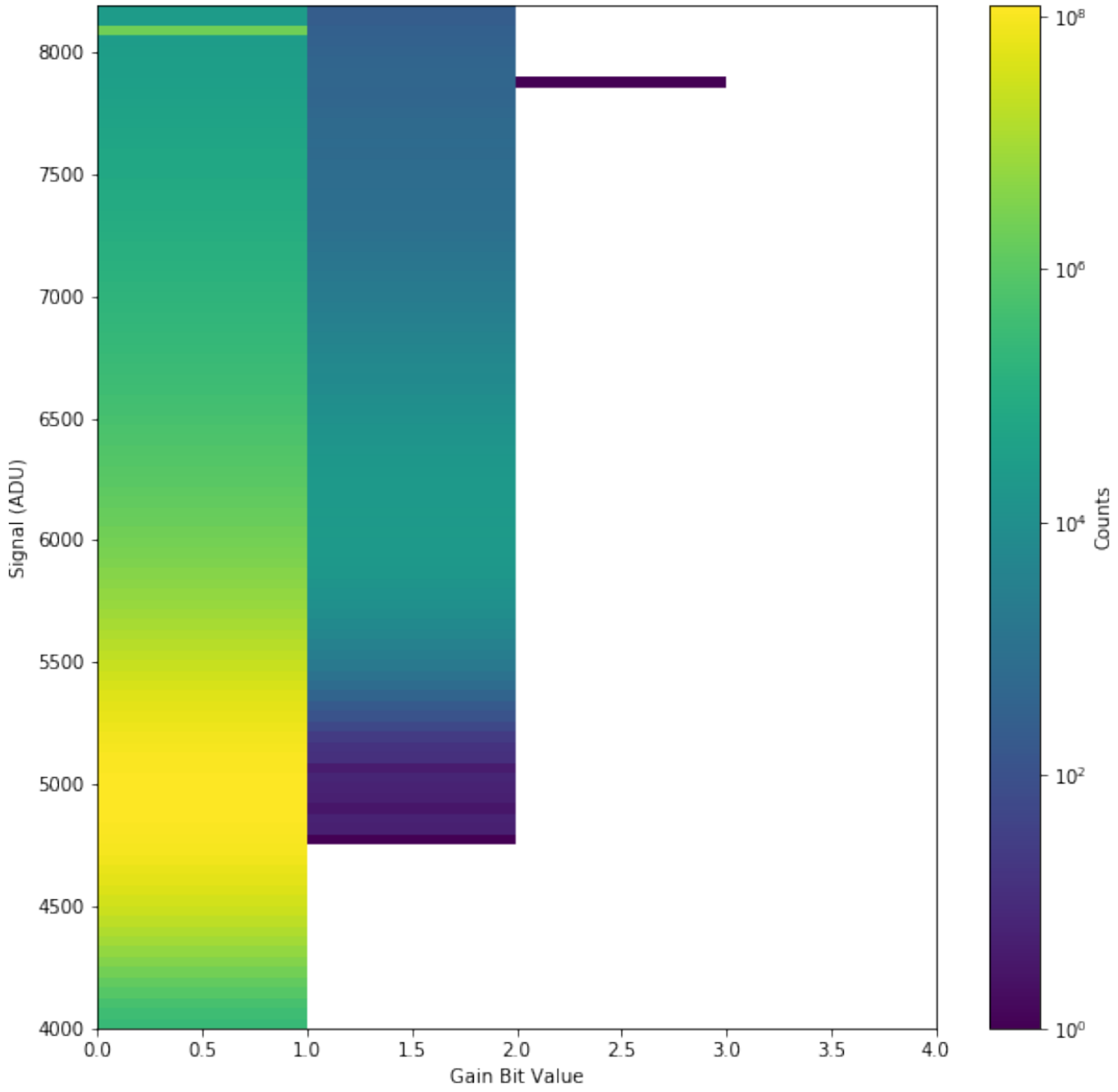
The following plot shows plots signal vs. gain for the first 128 images.

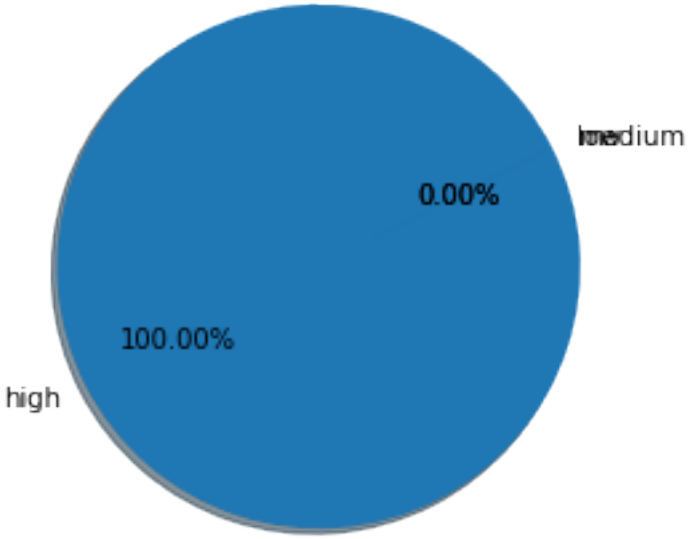

8000000
7000000
6000000
5000000
4000000
3000000
2000000
1000000
0
Count
4000
5000
6000
7000
8000
Signal (ADU)
4000
5000
6000
7000
8000
Analogue gain (ADU)



2.3 Signal vs. Digitized Gain

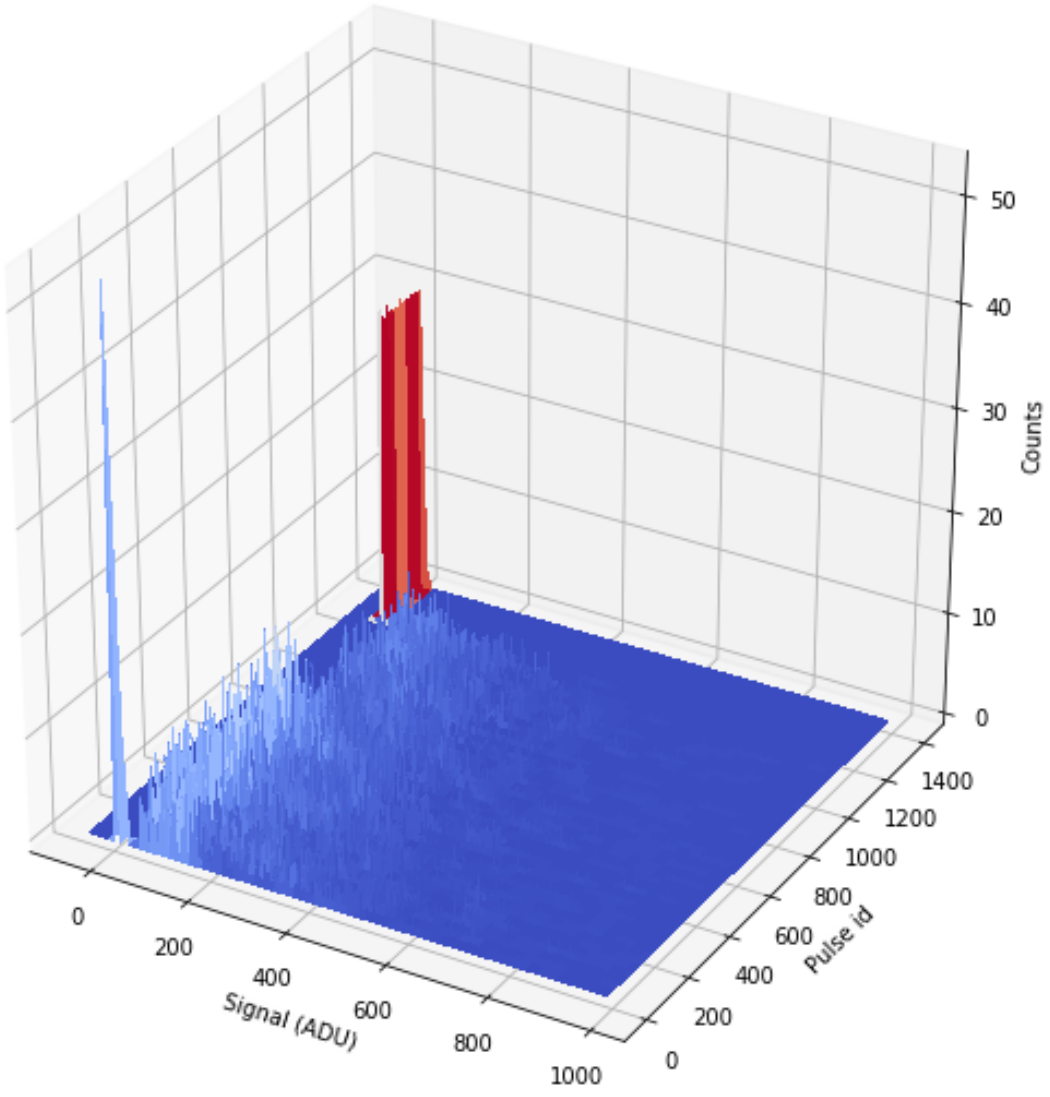
The following plot shows plots signal vs. digitized gain for the first 128 images.

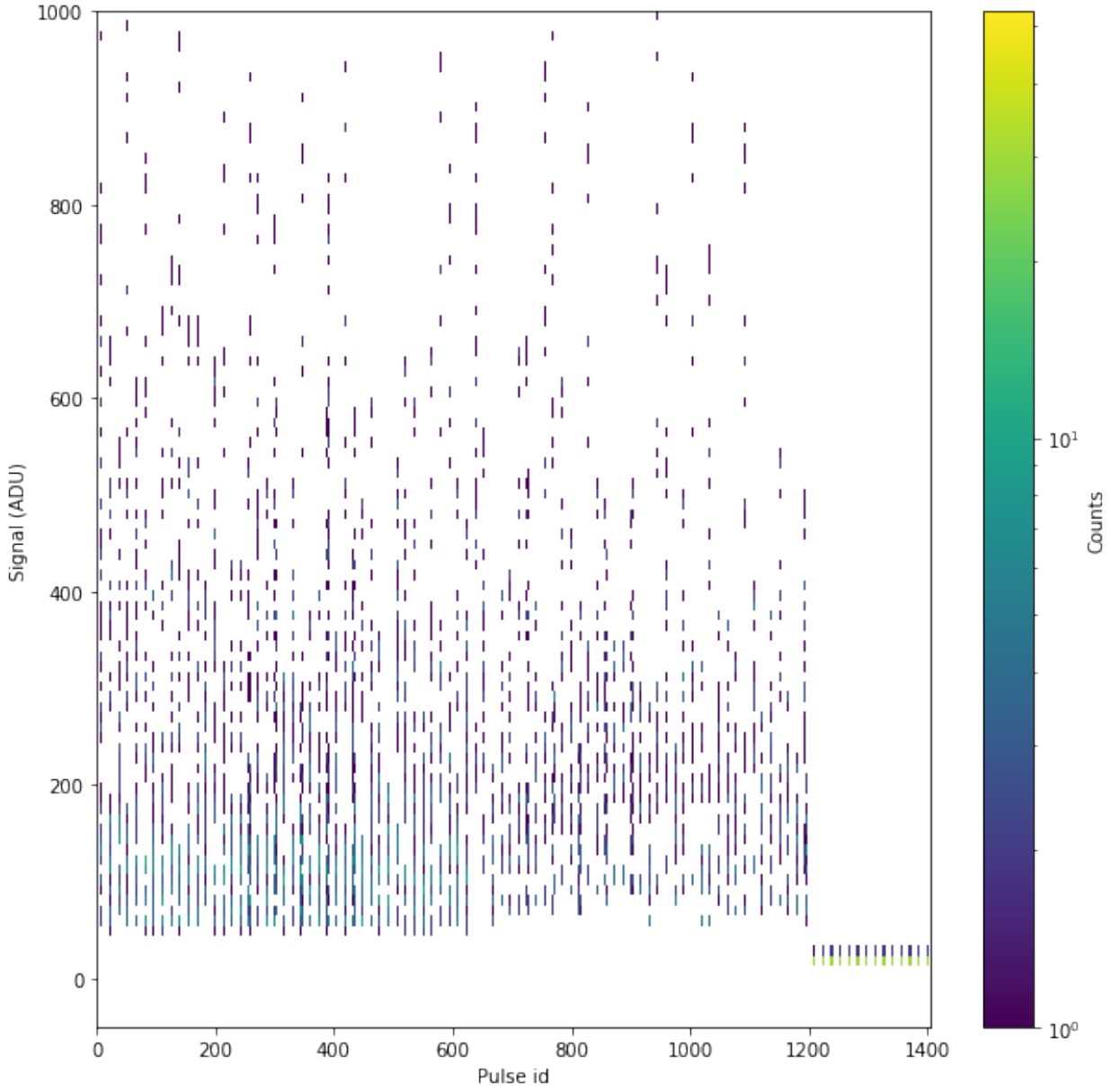

Signal (ADU)
8000
7500
7000
6500
6000
5500
5000
4500
4000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Gain Bit Value
Counts
10^8
10^6
10^4
10^2
10^0

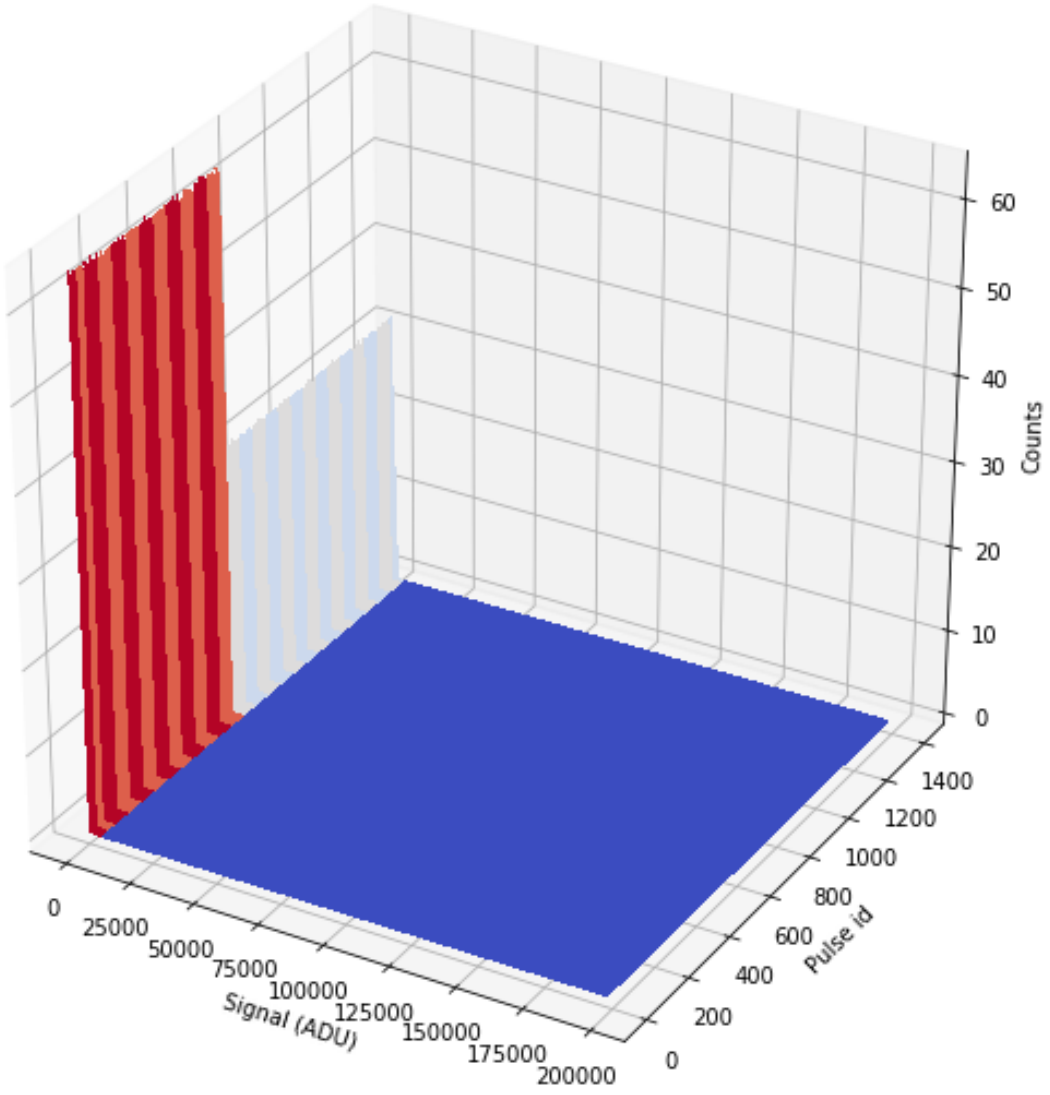


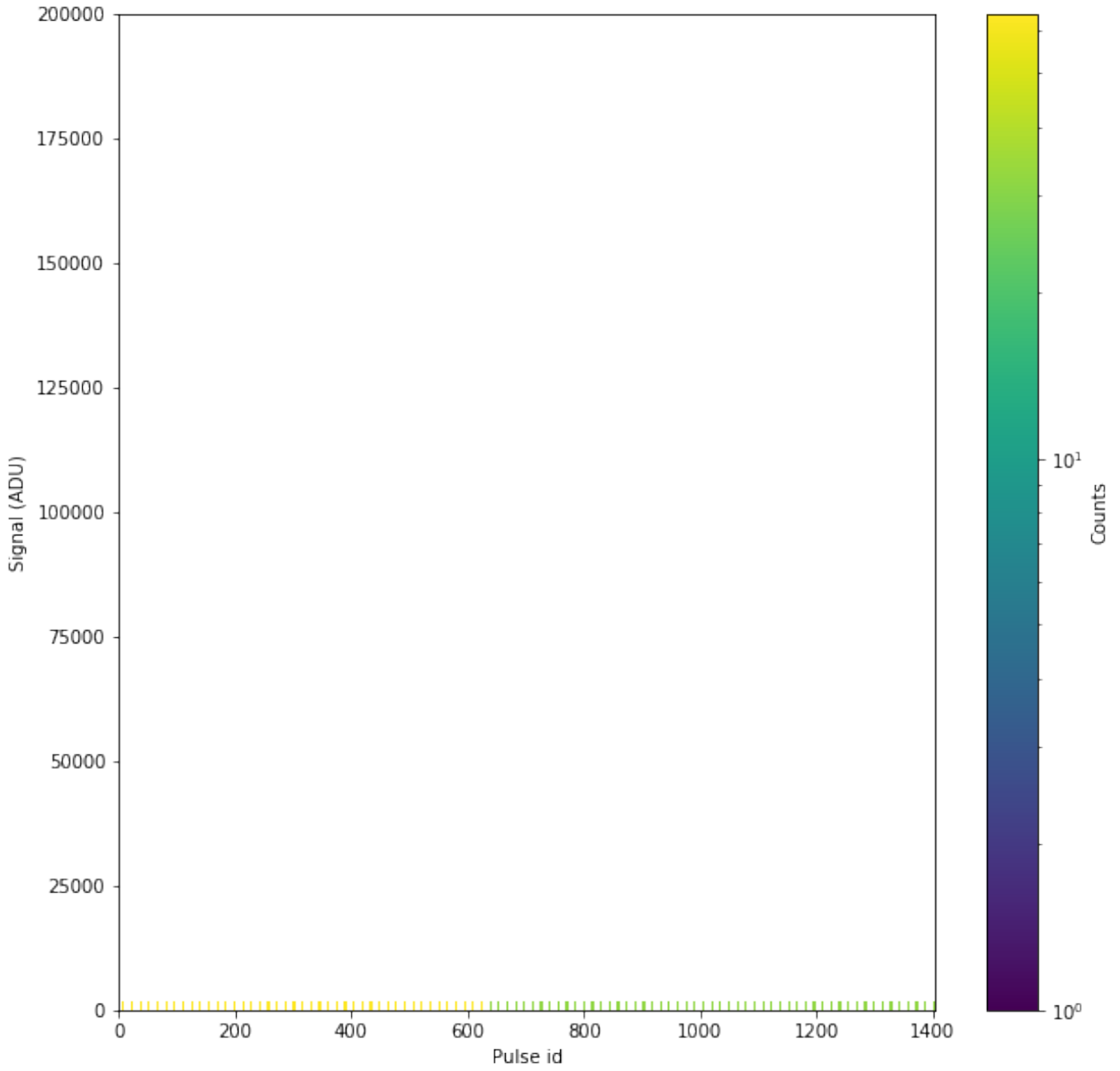
2.4 Mean Intensity per Pulse

The following plots show the mean signal for each pulse in a detailed and expanded intensity region.


Signal (ADU)
0
200
400
600
800
1000
Pulse id
0
200
400
600
800
1000
1200
1400
Counts
0
10
20
30
40
50

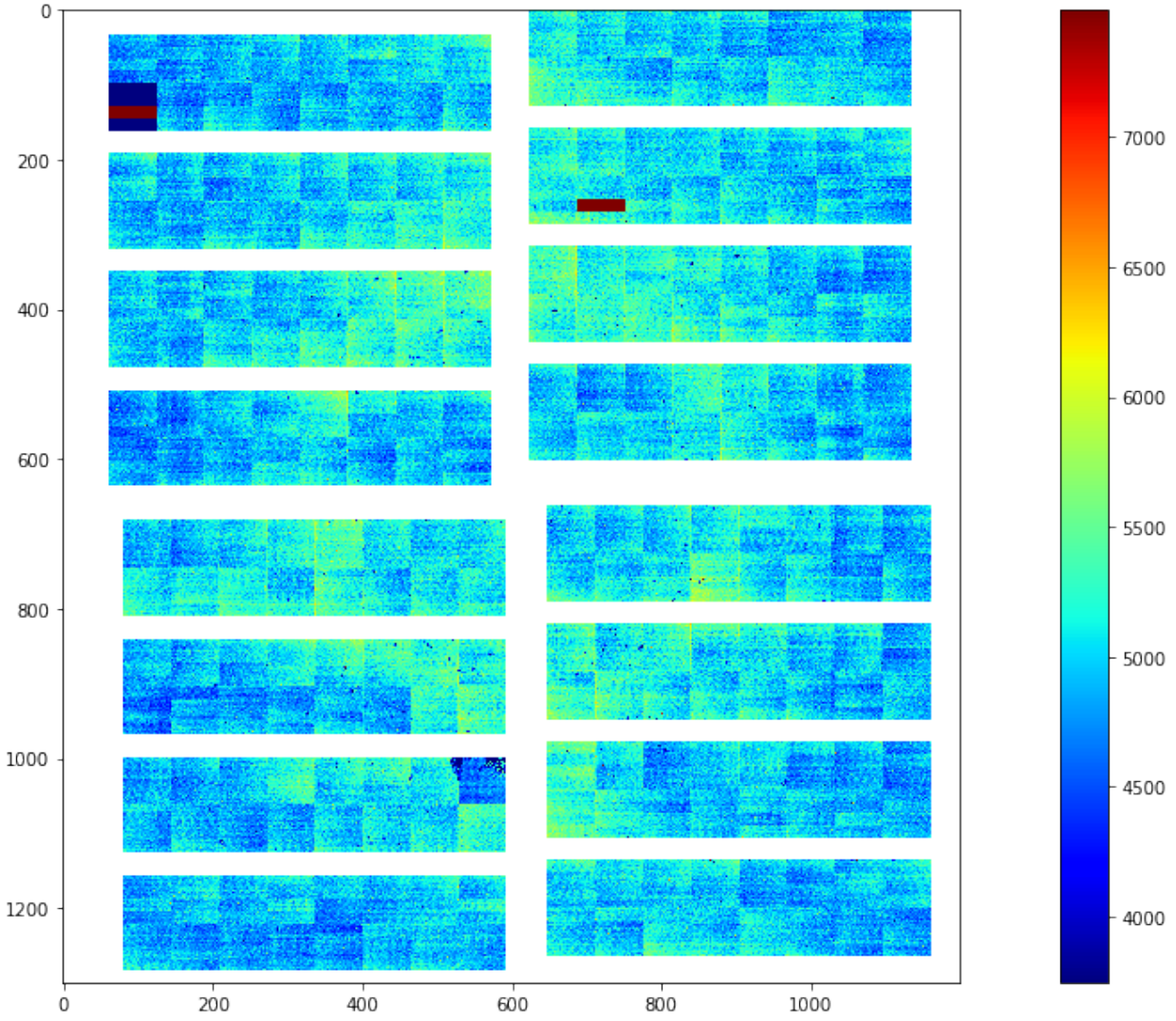

1000
800
600
400
200
0
Signal (ADU)
0
200
400
600
800
1000
1200
1400
Pulse id
10^1
10^0
Counts


Counts
0
10
20
30
40
50
60
Pulse id
0
200
400
600
800
1000
1200
1400
Signal (ADU)
0
25000
50000
75000
100000
125000
150000
175000
200000



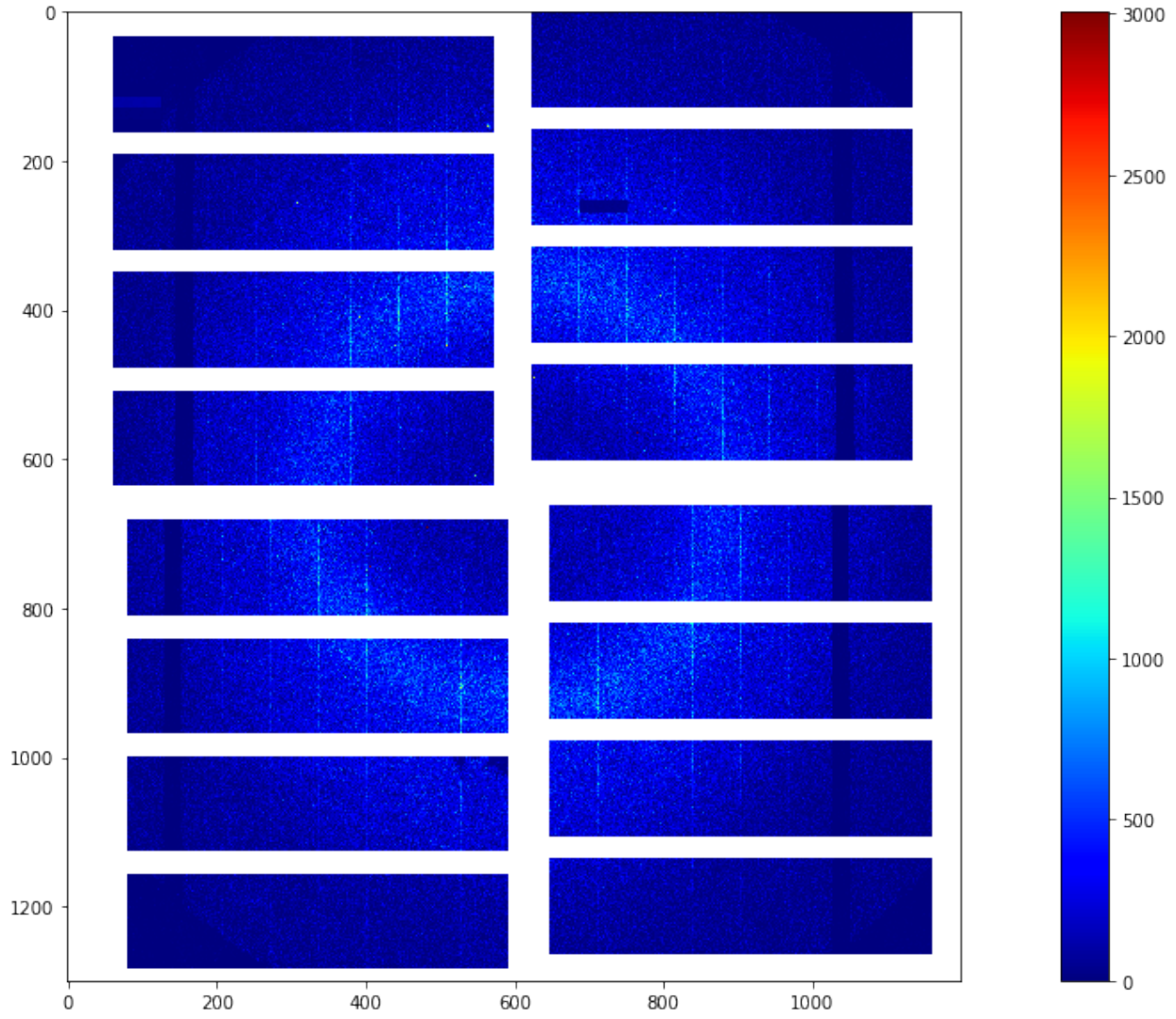
2.4.1 Mean RAW Preview

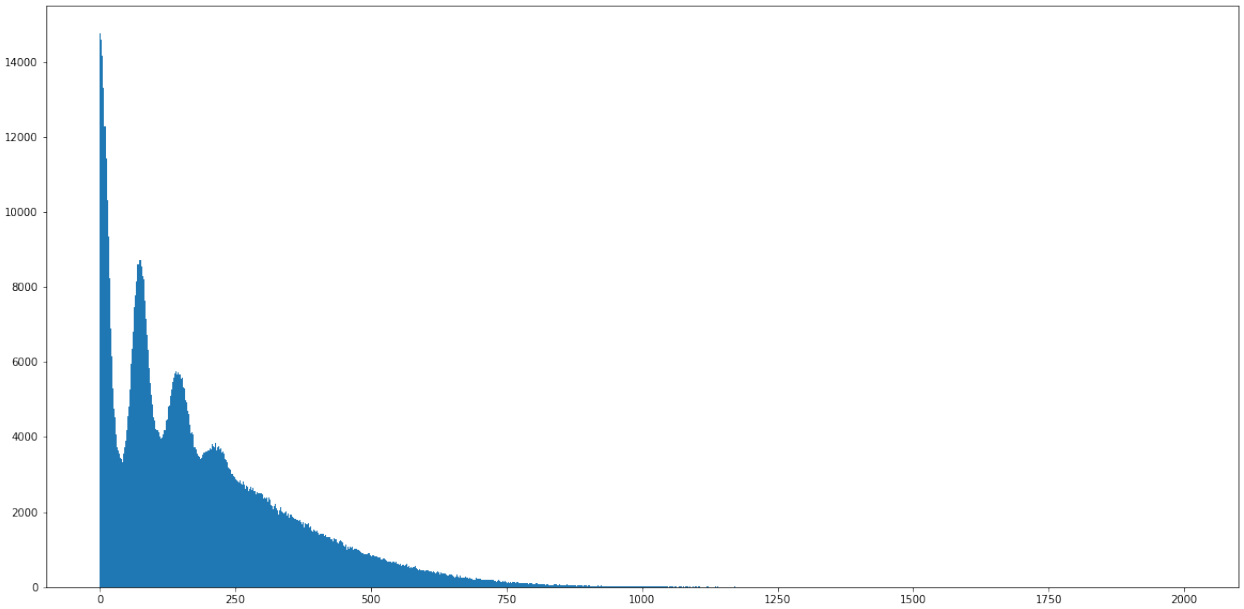
The per pixel mean of the first 128 images of the RAW data



2.4.2 Single Shot Preview

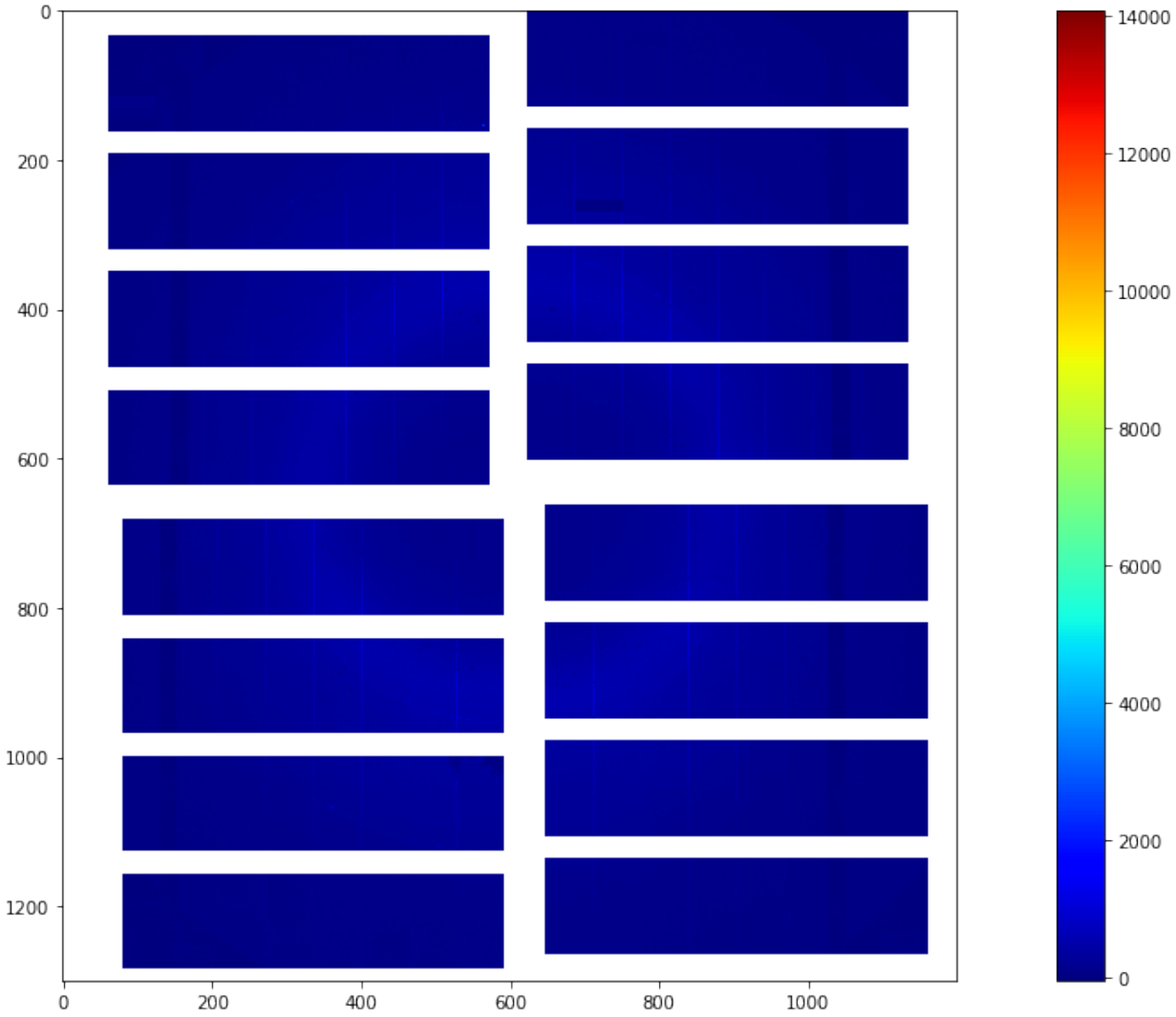
A single shot image from cell 12 of the first train

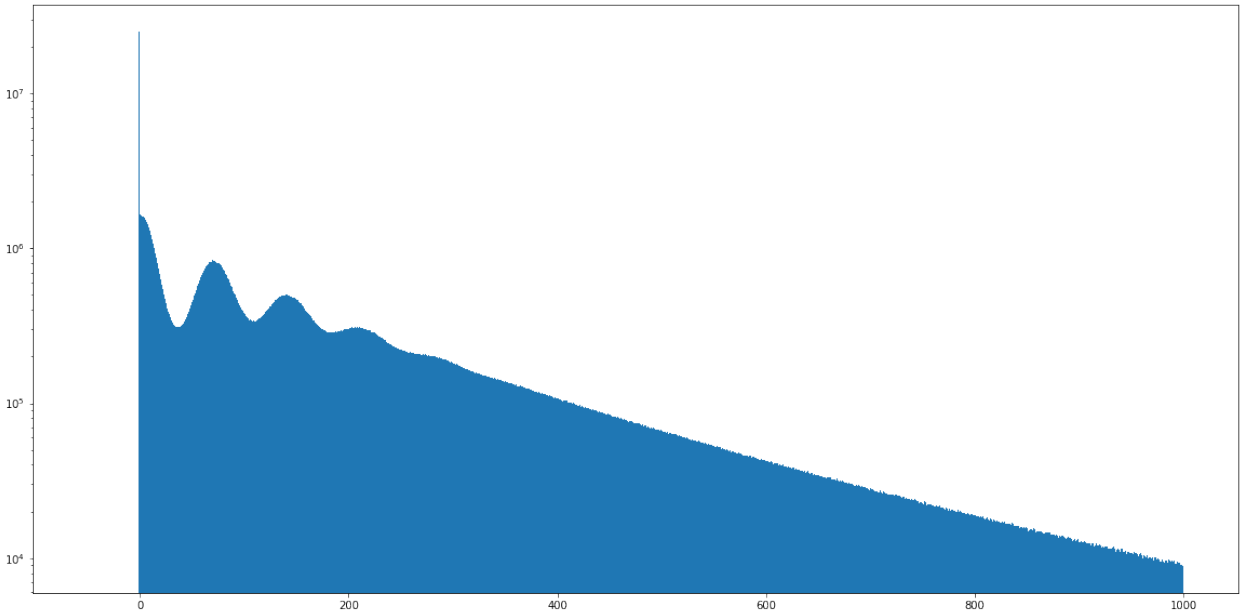

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
3000
2500
2000
1500
1000
500
0


14000
12000
10000
8000
6000
4000
2000
0
0
250
500
750
1000
1250
1500
1750
2000

2.4.3 Mean CORRECTED Preview

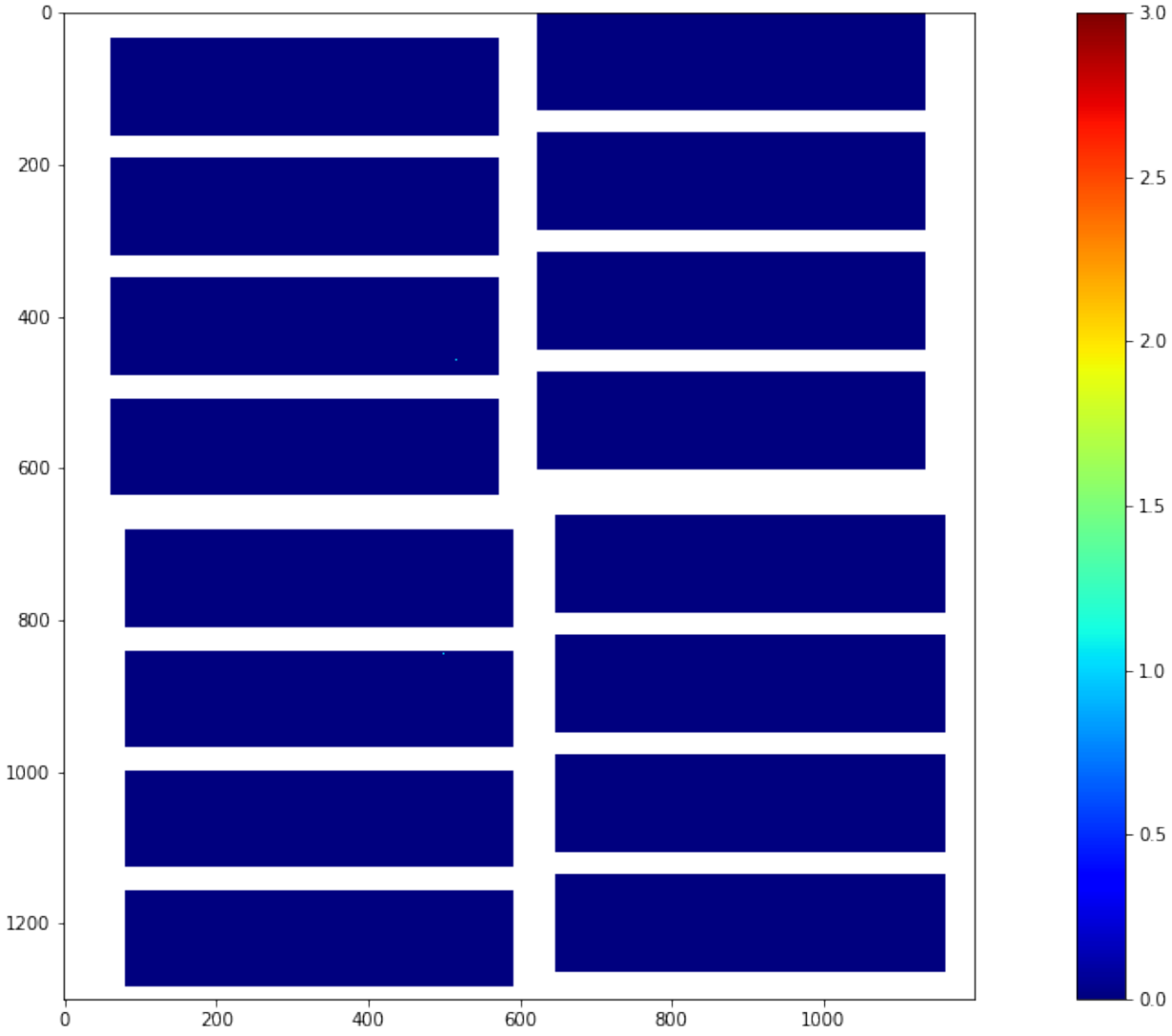
The per pixel mean of the first 128 images of the CORRECTED data





2.4.4 Maximum GAIN Preview

The per pixel maximum of the first 128 images of the digitized GAIN data


0
200
400
600
800
1000
1200
0
200
400
600
800
1000
3.0
2.5
2.0
1.5
1.0
0.5
0.0

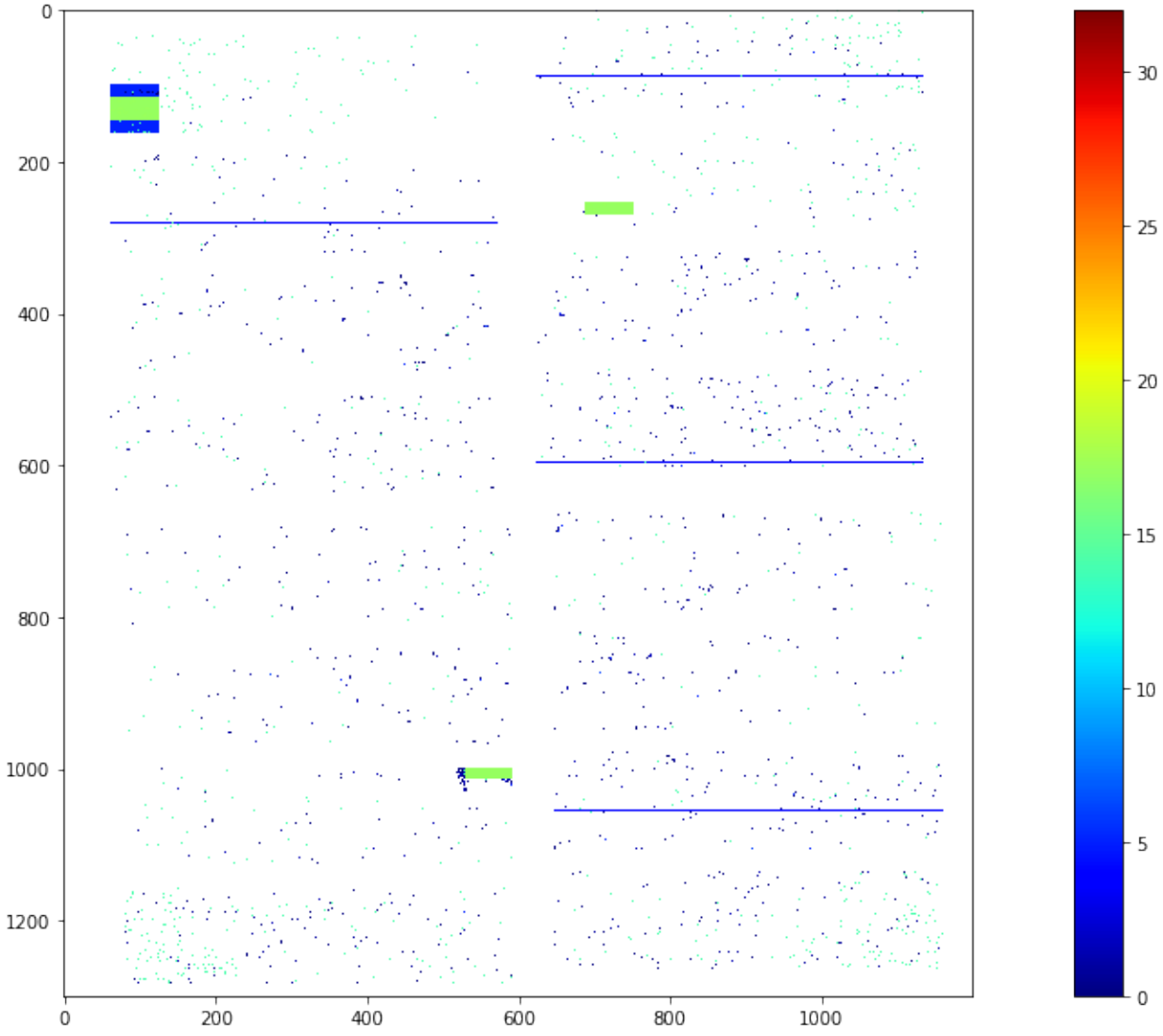
2.5 Bad Pixels

The mask contains dedicated entries for all pixels and memory cells as well as all three gains stages. Each mask entry is encoded in 32 bits as:

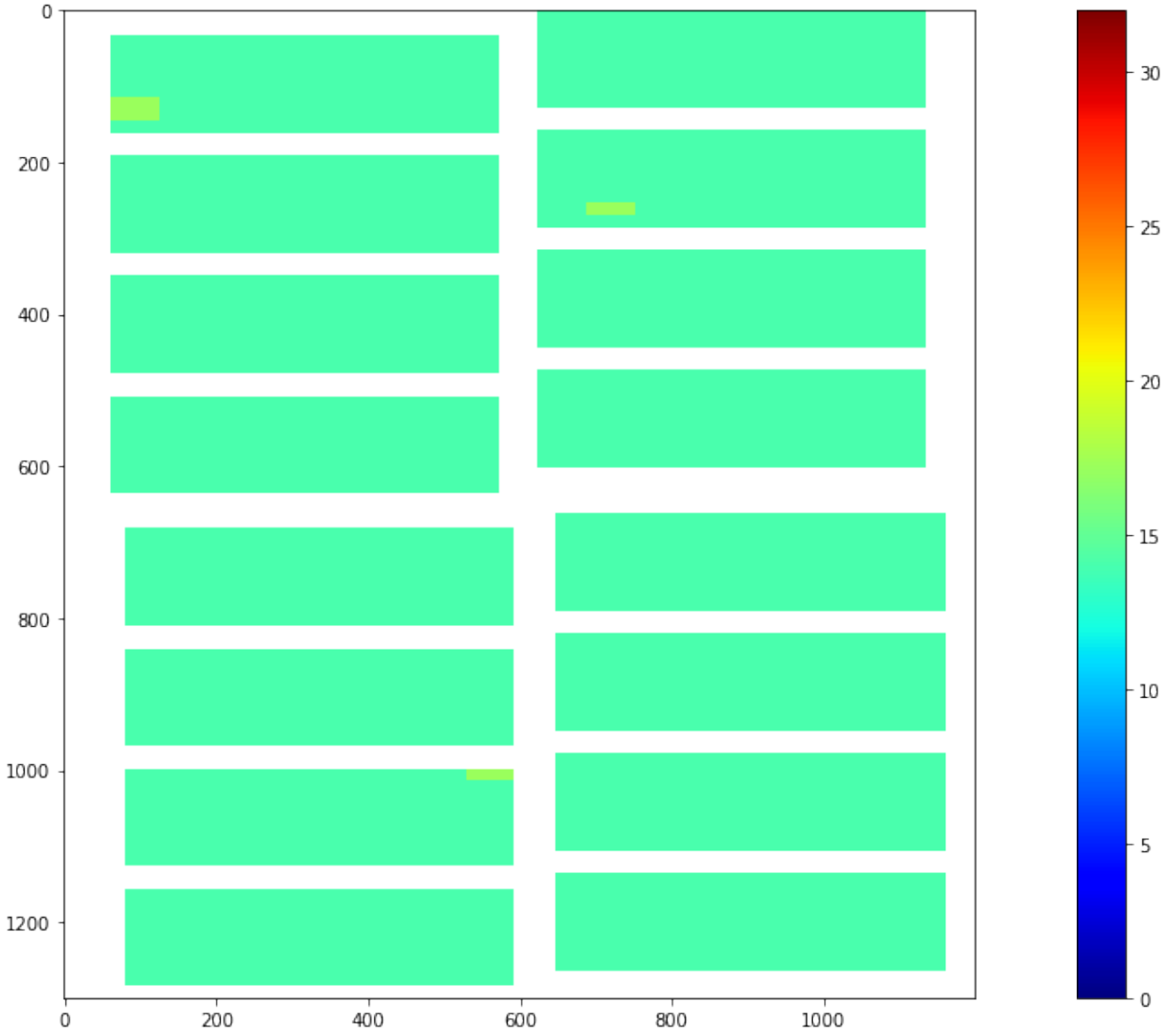
Bad pixel type	Bit mask
OFFSET_OUT_OF_THRESHOLD	0000000000000001
NOISE_OUT_OF_THRESHOLD	0000000000000010
OFFSET_NOISE_EVAL_ERROR	0000000000000100
NO_DARK_DATA	0000000000001000
CI_GAIN_OF_OF_THRESHOLD	0000000000010000
CI_LINEAR_DEVIATION	0000000000100000
CI_EVAL_ERROR	0000000001000000
FF_GAIN_EVAL_ERROR	0000000010000000
FF_GAIN_DEVIATION	0000000100000000
FF_NO_ENTRIES	0000001000000000
CI2_EVAL_ERROR	0000010000000000
VALUE_IS_NAN	0000100000000000
VALUE_OUT_OF_RANGE	0001000000000000
GAIN_THRESHOLDING_ERROR	0010000000000000
DATA_STD_IS_ZERO	0100000000000000
ASIC_STD_BELOW_NOISE	1000000000000000
INTERPOLATED	10000000000000000
NOISY_ADC	100000000000000000
OVERSCAN	1000000000000000000
NON_SENSITIVE	10000000000000000000
NON_LIN_RESPONSE_REGION	100000000000000000000

2.5.1 Single Shot Bad Pixels

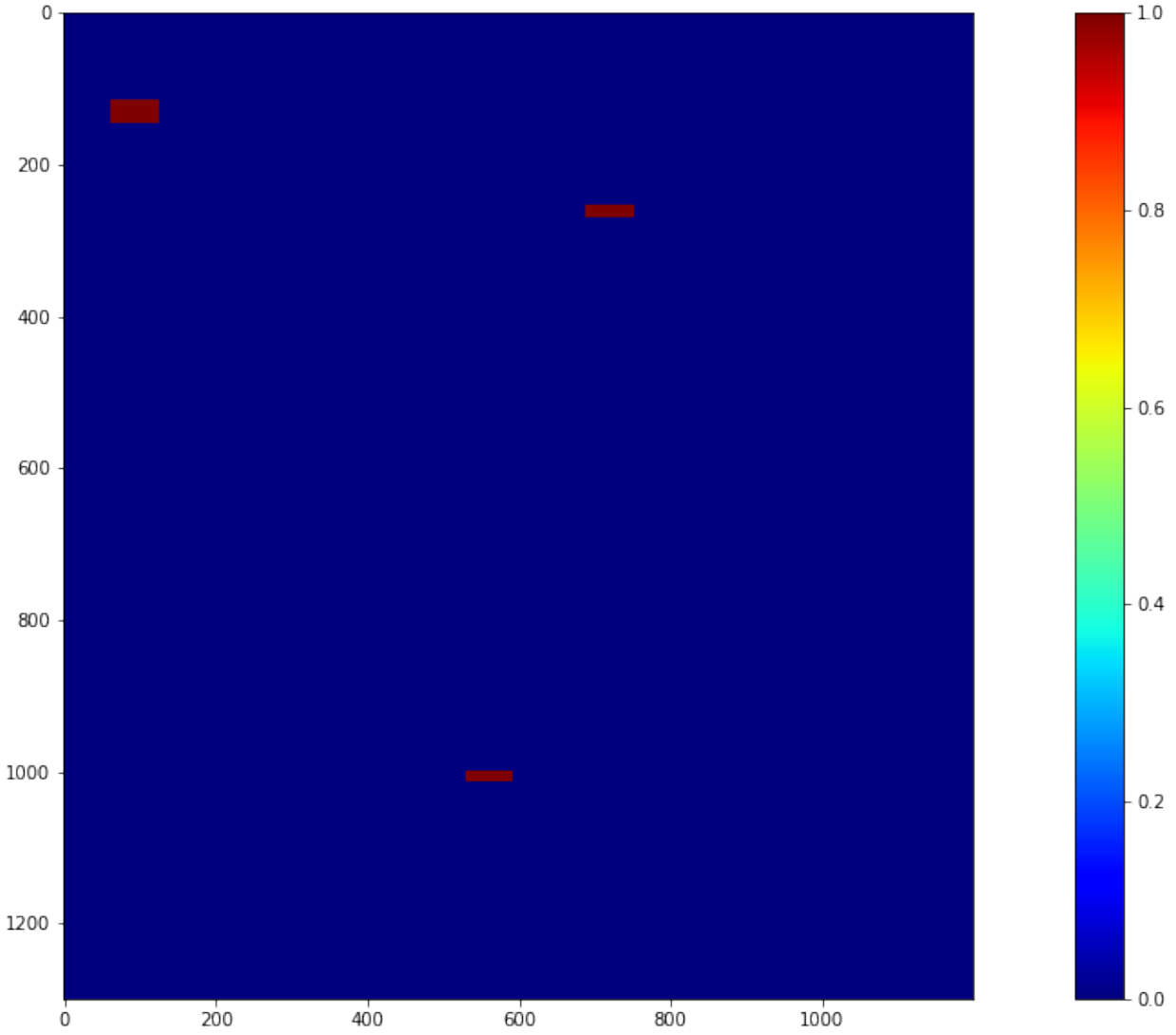
A single shot bad pixel map from cell 4 of the first train

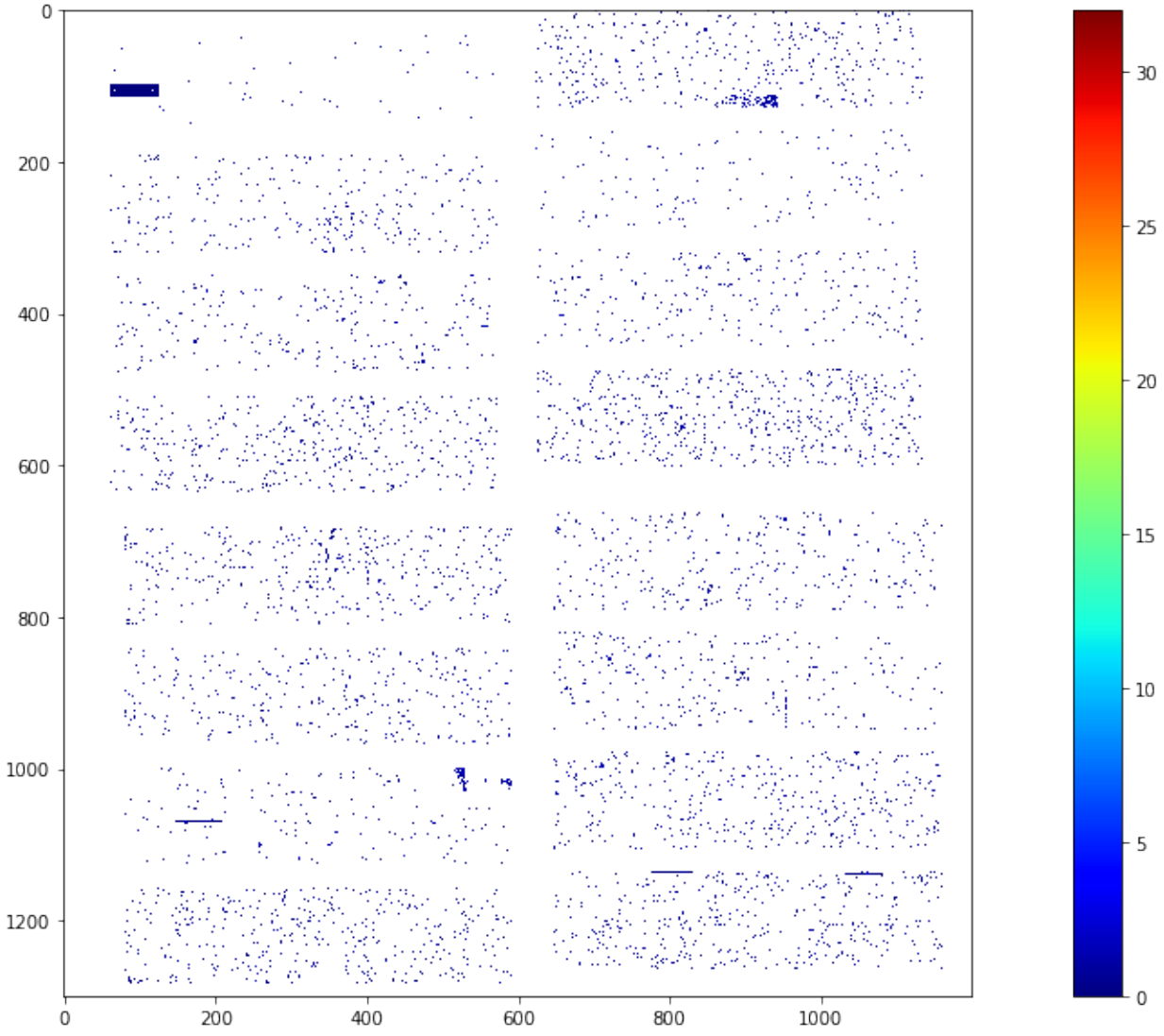

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

2.5.2 Full Train Bad Pixels



2.5.3 Full Train Bad Pixels - Only Dark Char. Related




0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

CHAPTER

THREE

AGIPD OFFLINE CORRECTION, SEQUENCES = 4-7

```
Connecting to profile slurm_prof_9b576fdf-f5a8-492b-be1a-8769350b548a_4-7
Using 2020-03-08 06:47:13+01:00 as creation time
Working in IL Mode: False. Actual cells in use are: 0
Outputting to /gpfs/exfel/d/proc/SPB/202030/p900119/r0084
Detector in use is SPB_DET_AGIPD1M-1
```

```
Gain setting: 0
```

3.1 Processed Files

```
Processing a total of 64 sequence files in chunks of 32
```

#	module	# module	file
0	Q1M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00004.h5
1		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00005.h5
2		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00006.h5
3		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00007.h5
4	Q1M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00004.h5
5		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00005.h5
6		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00006.h5
7		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00007.h5
8	Q1M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00004.h5
9		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00005.h5
10		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00006.h5
11		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00007.h5
12	Q1M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00004.h5
13		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00005.h5
14		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00006.h5
15		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00007.h5
16	Q2M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00004.h5
17		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00005.h5
18		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00006.h5
19		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00007.h5
20	Q2M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00004.h5
21		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00005.h5
22		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00006.h5
23		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00007.h5
24	Q2M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00004.h5
25		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00005.h5
26		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00006.h5
27		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00007.h5
28	Q2M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00004.h5
29		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00005.h5
30		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00006.h5
31		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00007.h5
32	Q3M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00004.h5
33		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00005.h5
34		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00006.h5
35		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00007.h5
36	Q3M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00004.h5
37		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00005.h5
38		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00006.h5
39		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00007.h5
40	Q3M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00004.h5
41		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00005.h5
42		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00006.h5
43		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00007.h5
44	Q3M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00004.h5
45		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00005.h5
46		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00006.h5
47		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00007.h5
48	Q4M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00004.h5
49		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00005.h5
50		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00006.h5
51		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00007.h5
52	Q4M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00004.h5
53		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00005.h5
54		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00006.h5
55		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00007.h5
56	Q4M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00004.h5
57		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00005.h5
58		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00006.h5
59		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00007.h5

```
A range of 500 pulse indices is selected: from 0 to 500 with a step of 1
Running 32 tasks parallel
Running 32 tasks parallel
```

```
Constants were injected on:
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
```

```
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
```

```
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
```

```
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
```

```
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
```

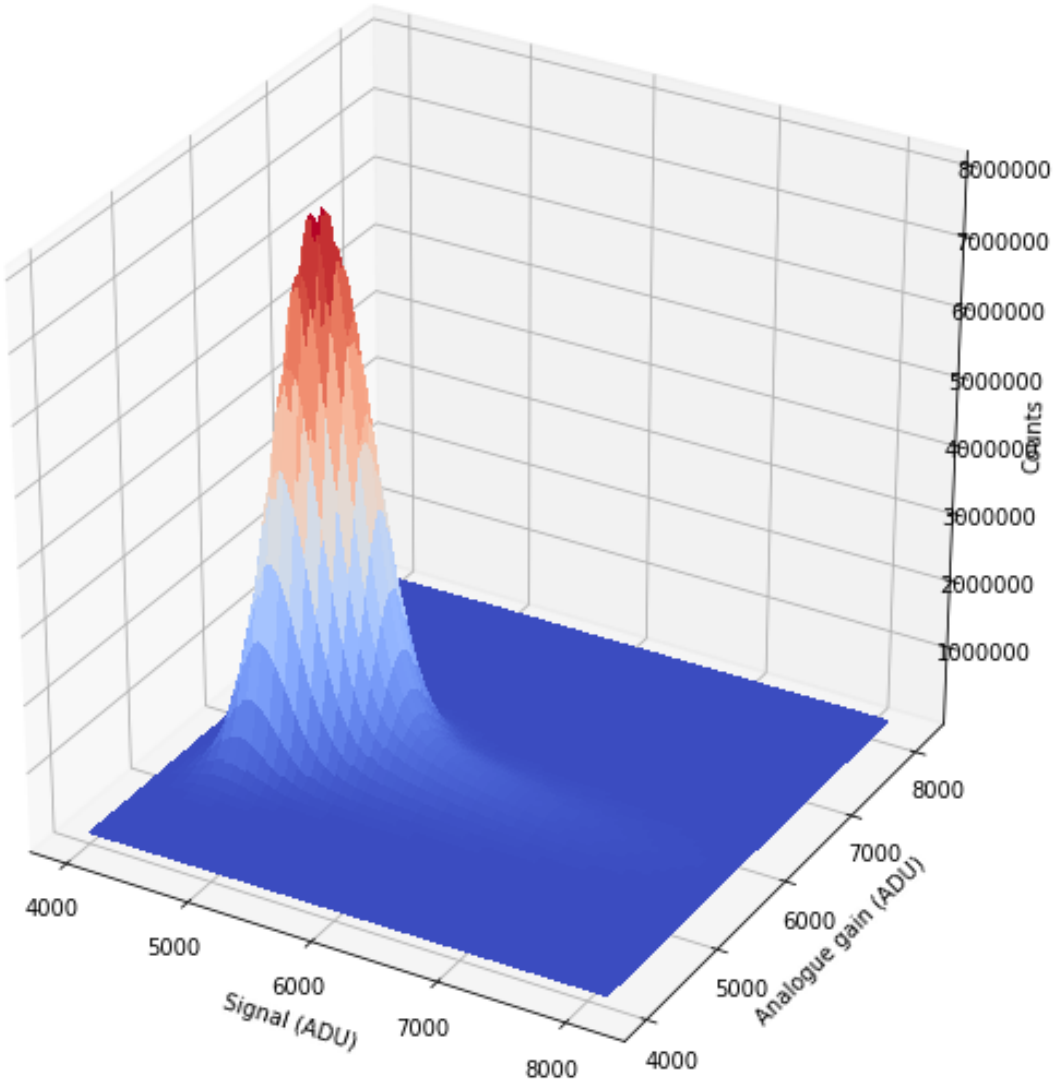
```
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
```

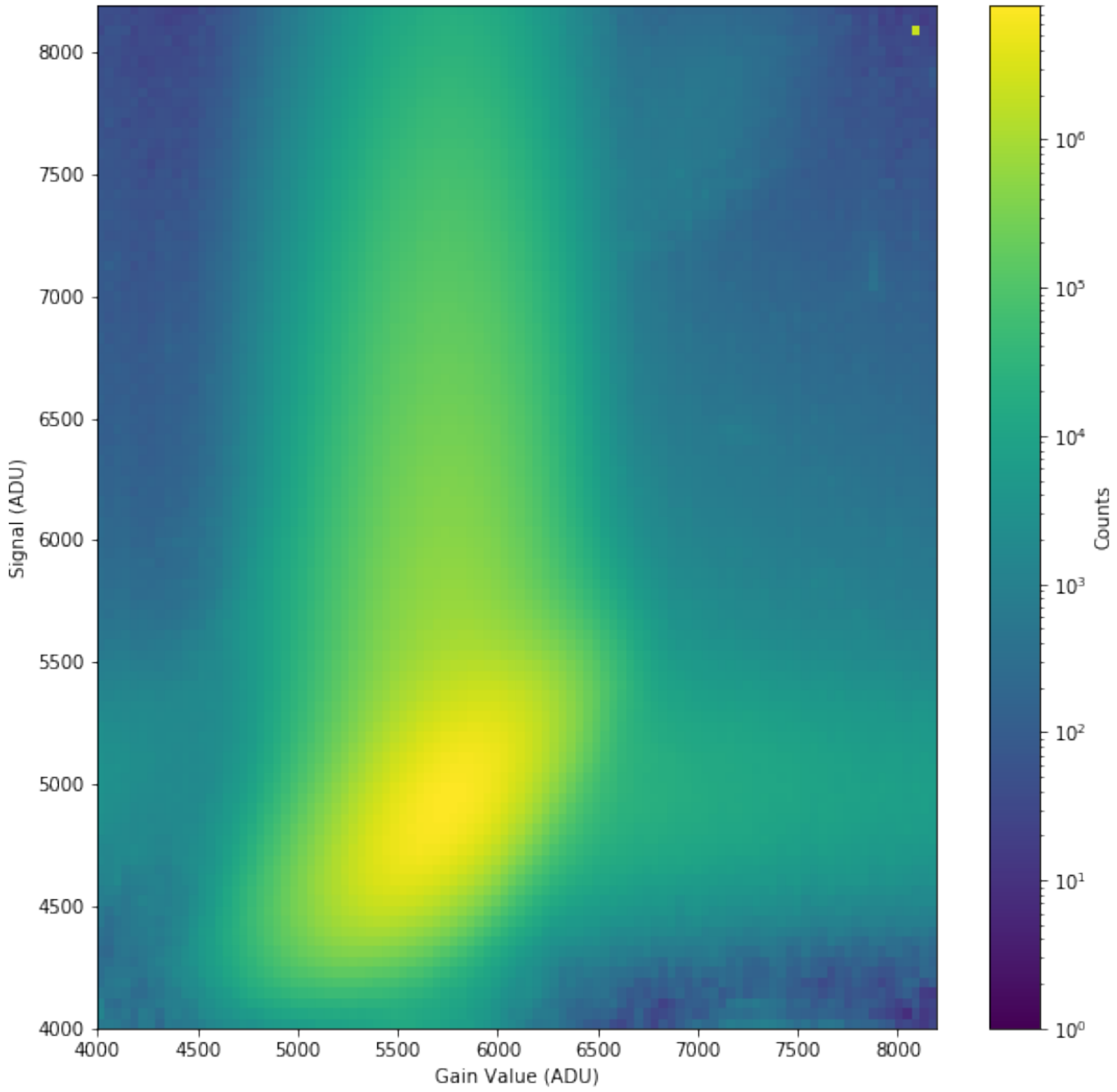
```
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
```

```
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
```

3.2 Signal vs. Analogue Gain

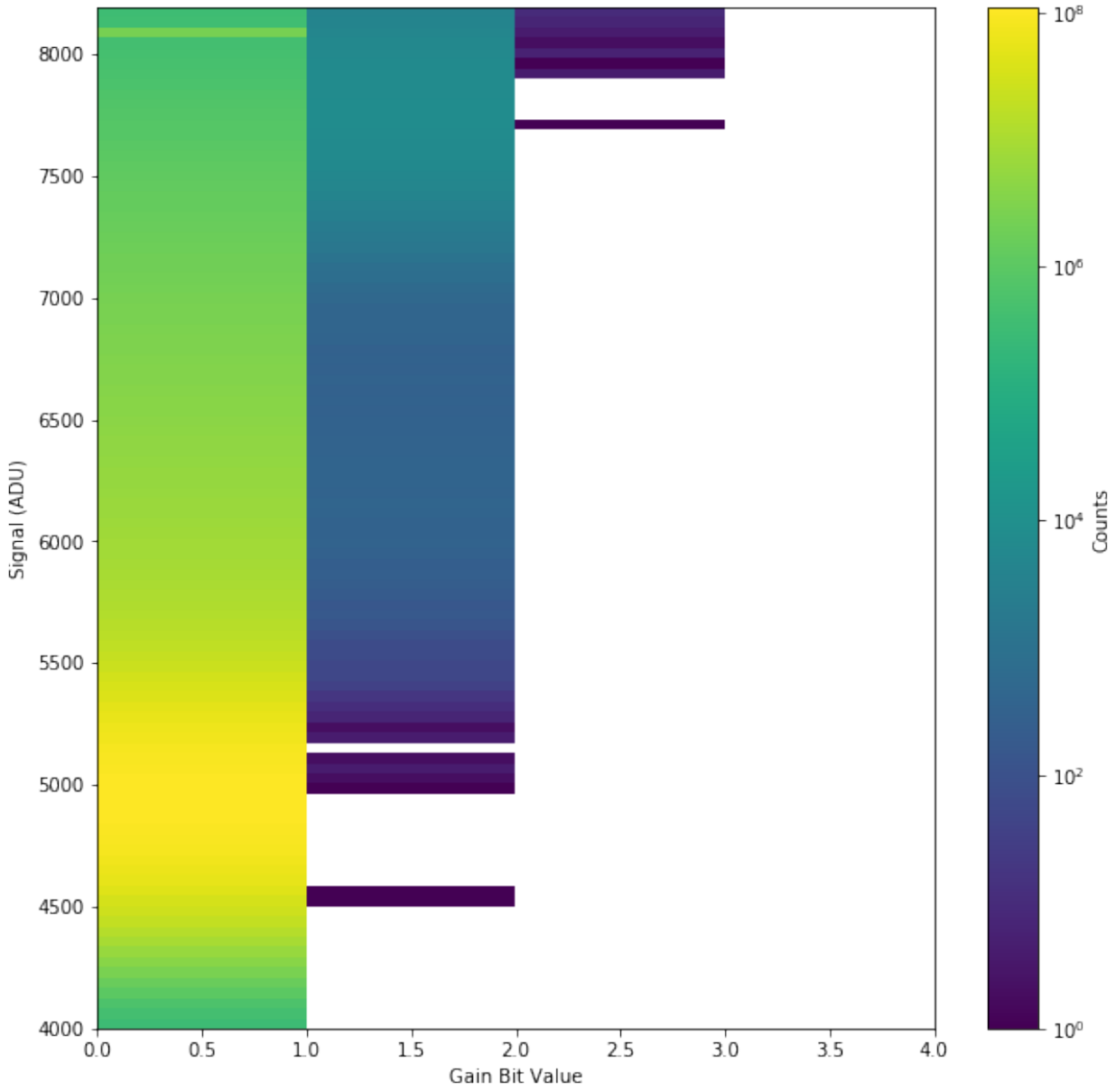
The following plot shows plots signal vs. gain for the first 128 images.

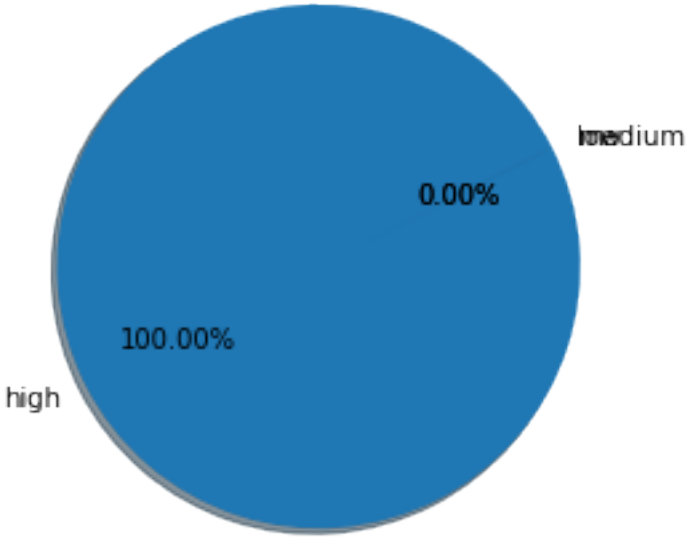

8000000
7000000
6000000
5000000
4000000
3000000
2000000
1000000
Counts
4000
5000
6000
7000
8000
Signal (ADU)
4000
5000
6000
7000
8000
Analogue gain (ADU)



3.3 Signal vs. Digitized Gain

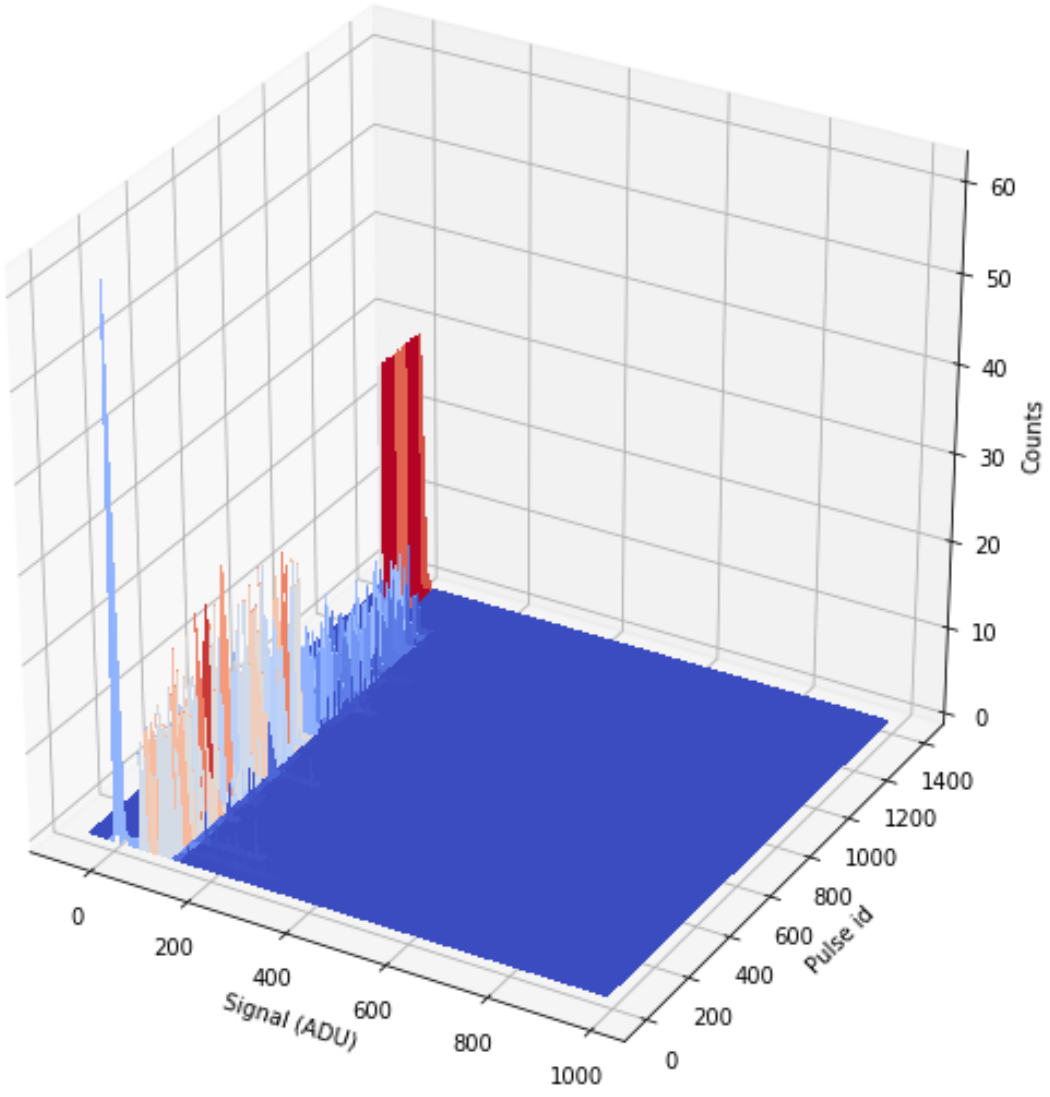
The following plot shows plots signal vs. digitized gain for the first 128 images.

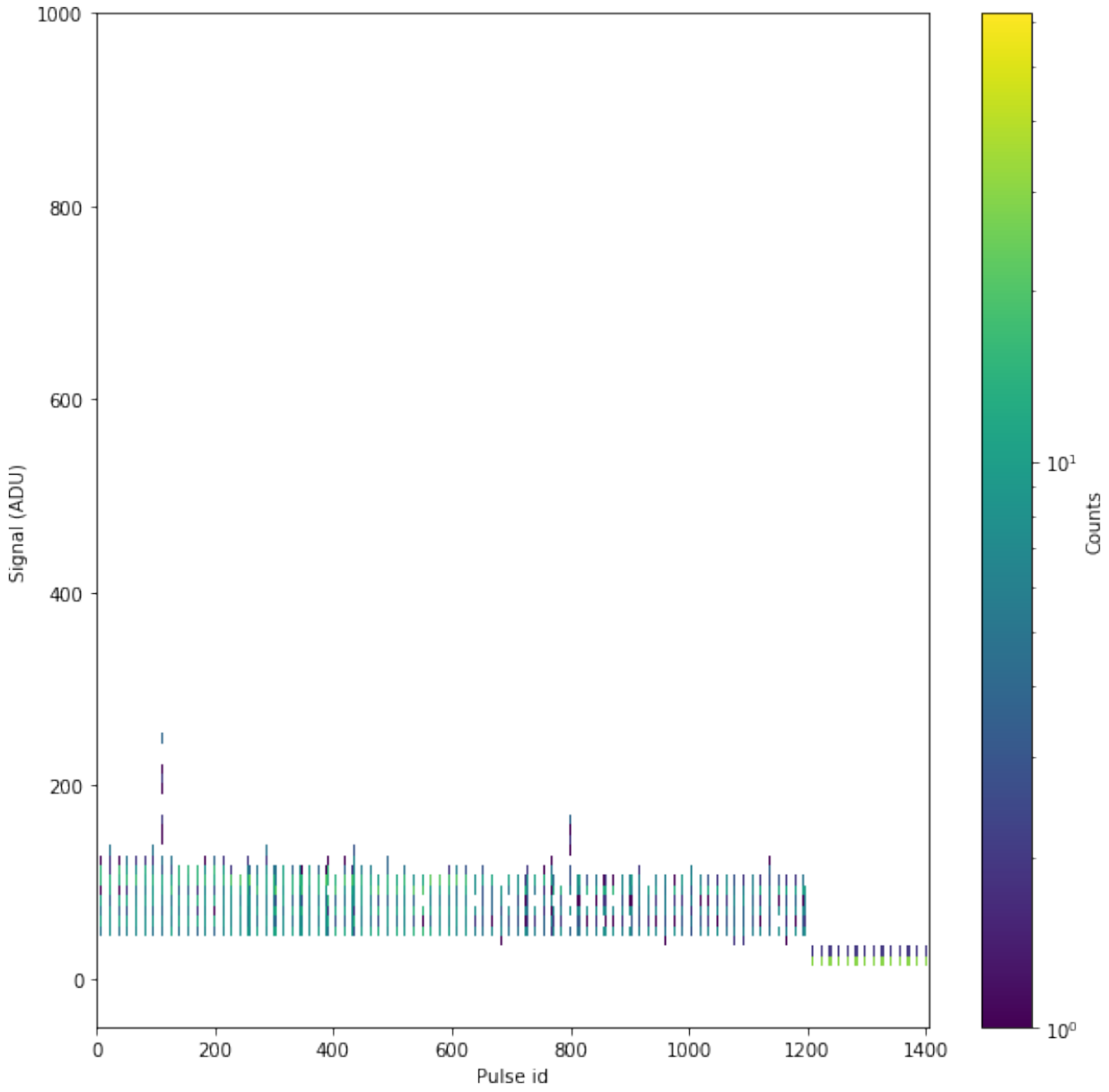

Signal (ADU)
8000
7500
7000
6500
6000
5500
5000
4500
4000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Gain Bit Value
10^8
10^6
10^4
10^2
10^0
Counts

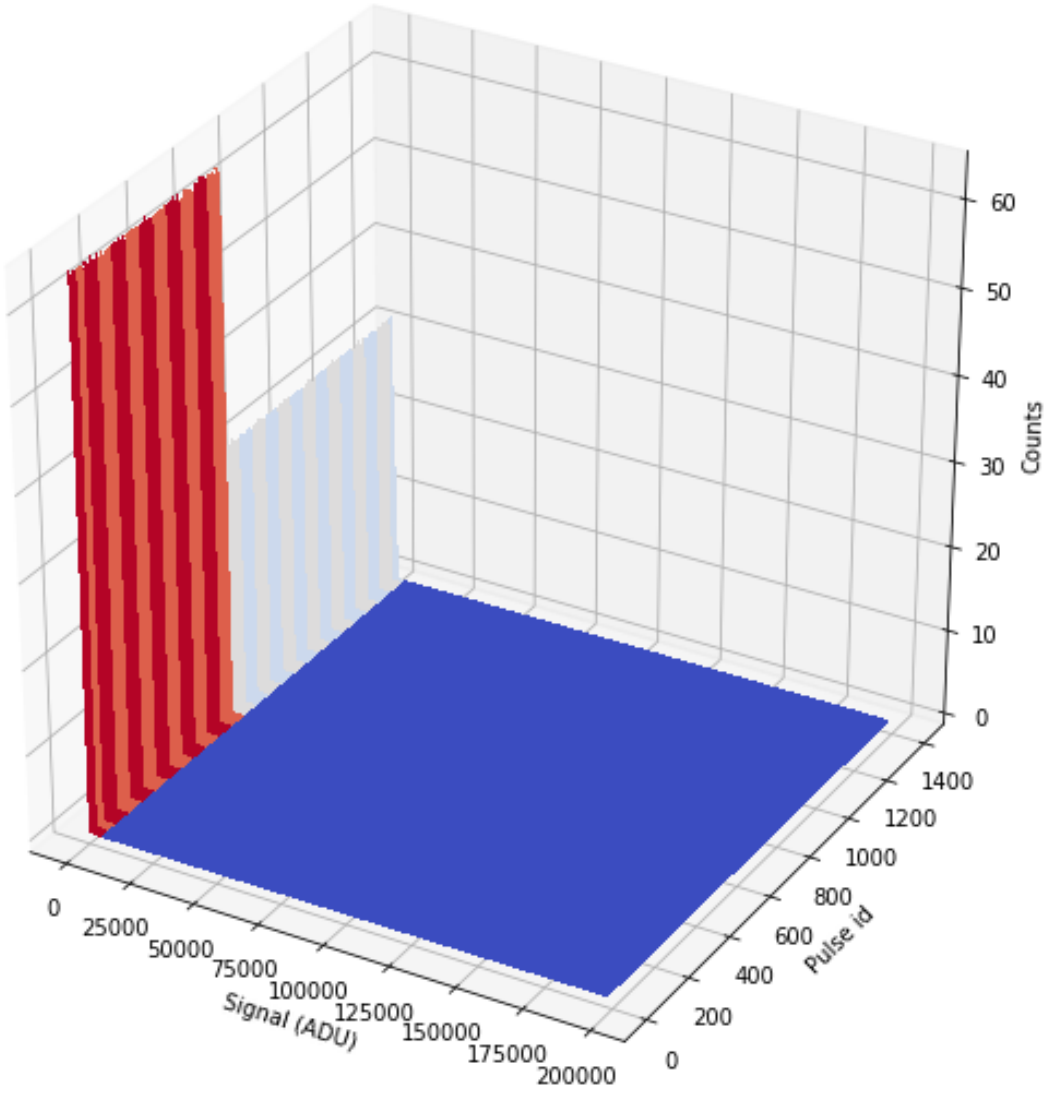


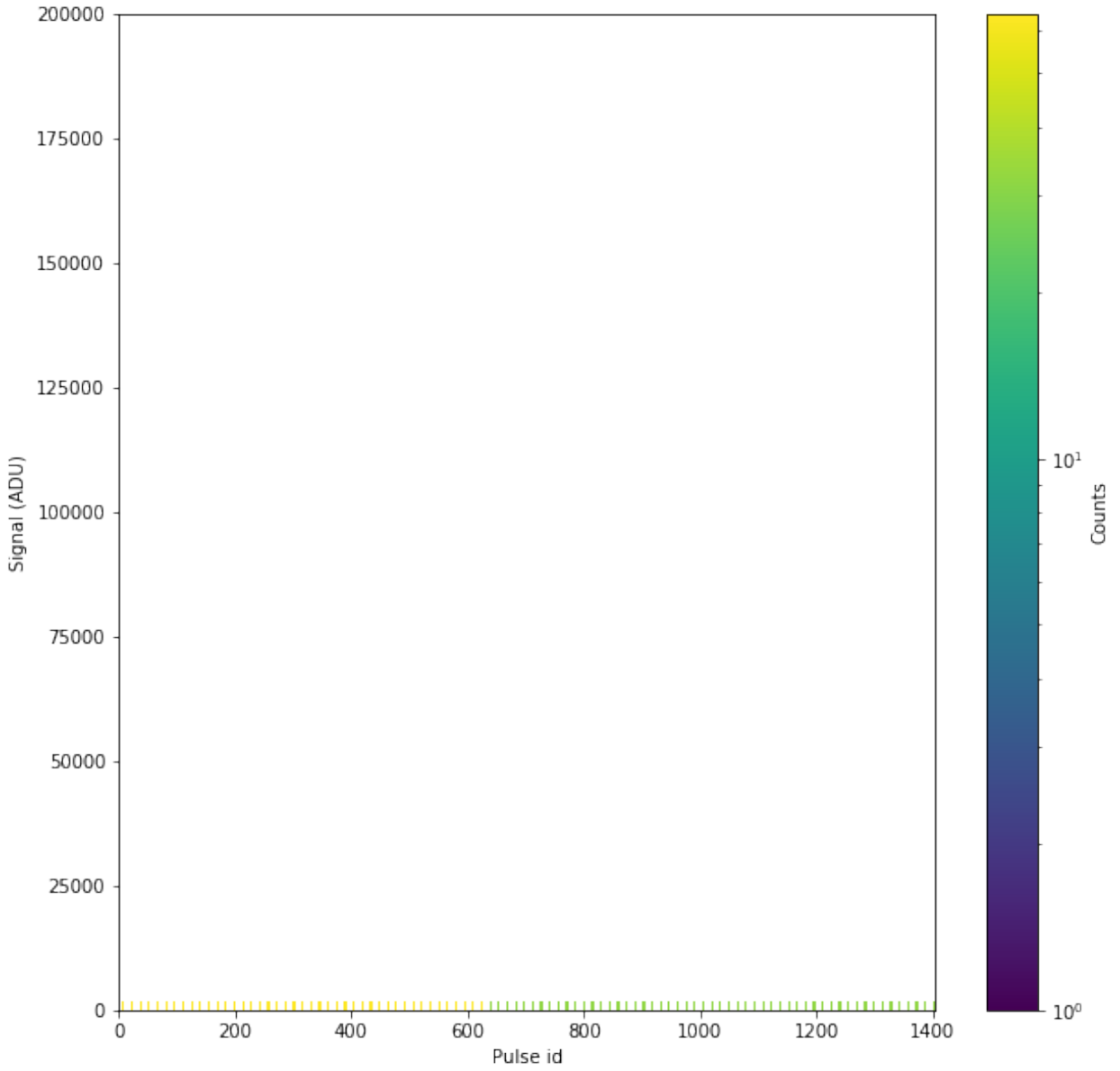
3.4 Mean Intensity per Pulse

The following plots show the mean signal for each pulse in a detailed and expanded intensity region.


Counts
0
10
20
30
40
50
60
Pulse id
0
200
400
600
800
1000
1200
1400
Signal (ADU)
0
200
400
600
800
1000

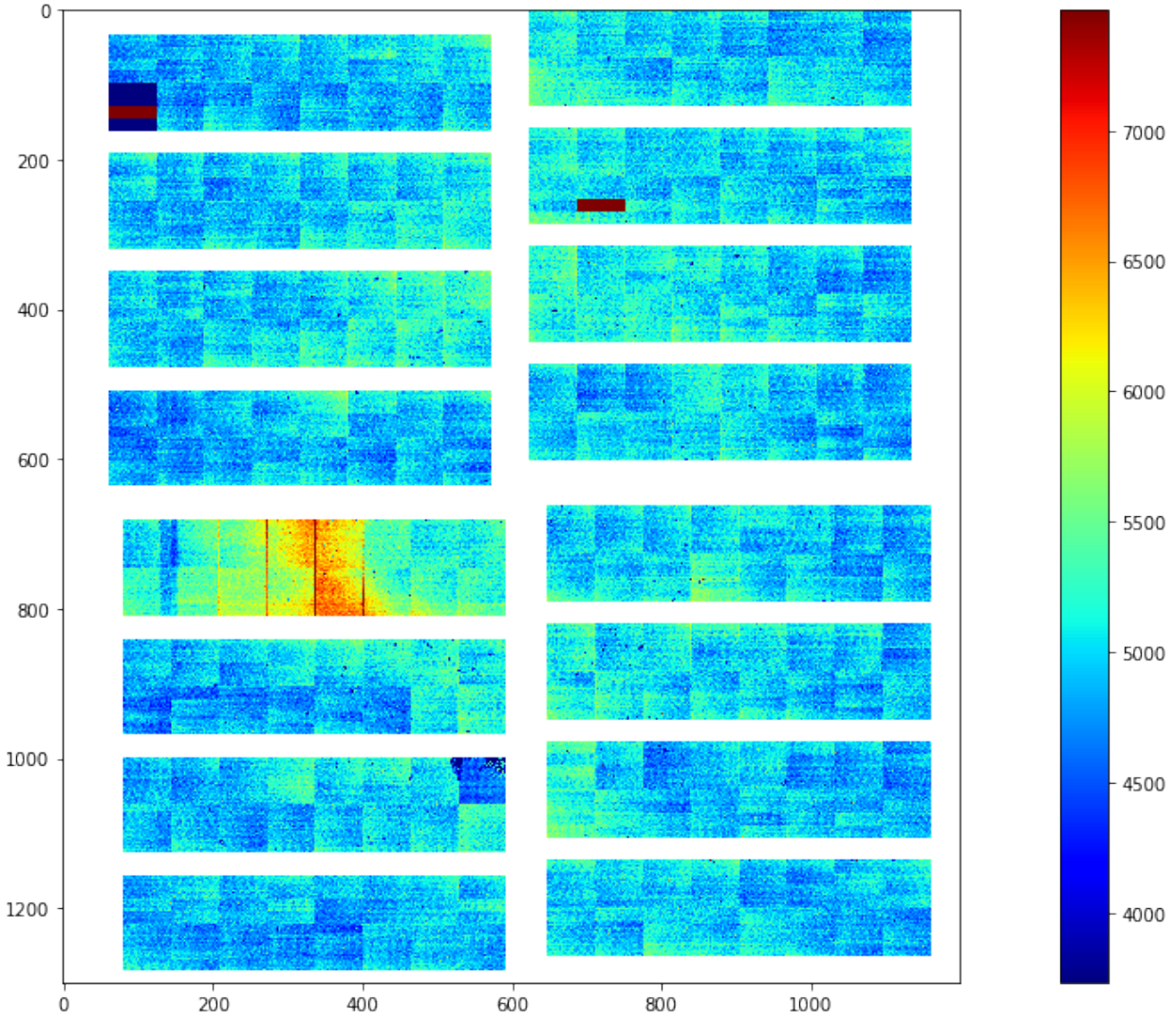

1000
800
600
400
200
0
Signal (ADU)
0
200
400
600
800
1000
1200
1400
Pulse id
10^1
10^0
Counts


Counts
0
10
20
30
40
50
60
Pulse id
0
200
400
600
800
1000
1200
1400
Signal (ADU)
0
25000
50000
75000
100000
125000
150000
175000
200000



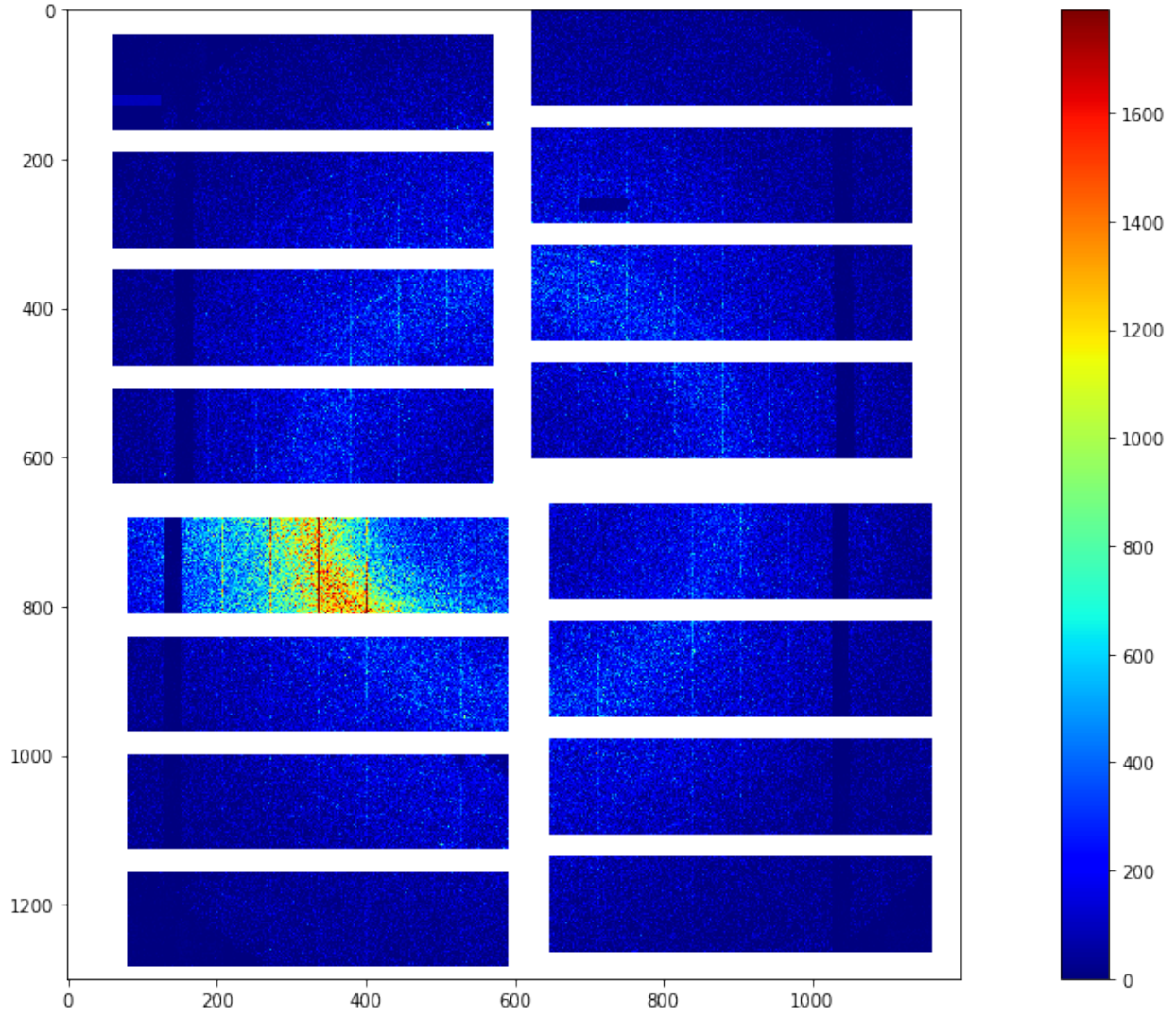
3.4.1 Mean RAW Preview

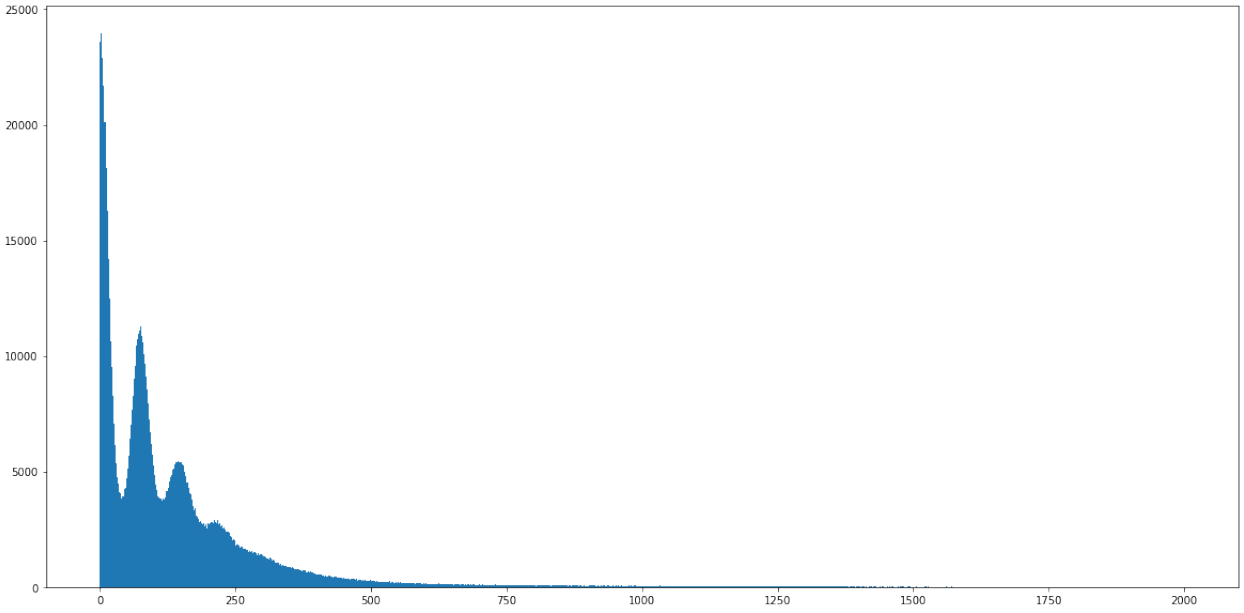
The per pixel mean of the first 128 images of the RAW data



3.4.2 Single Shot Preview

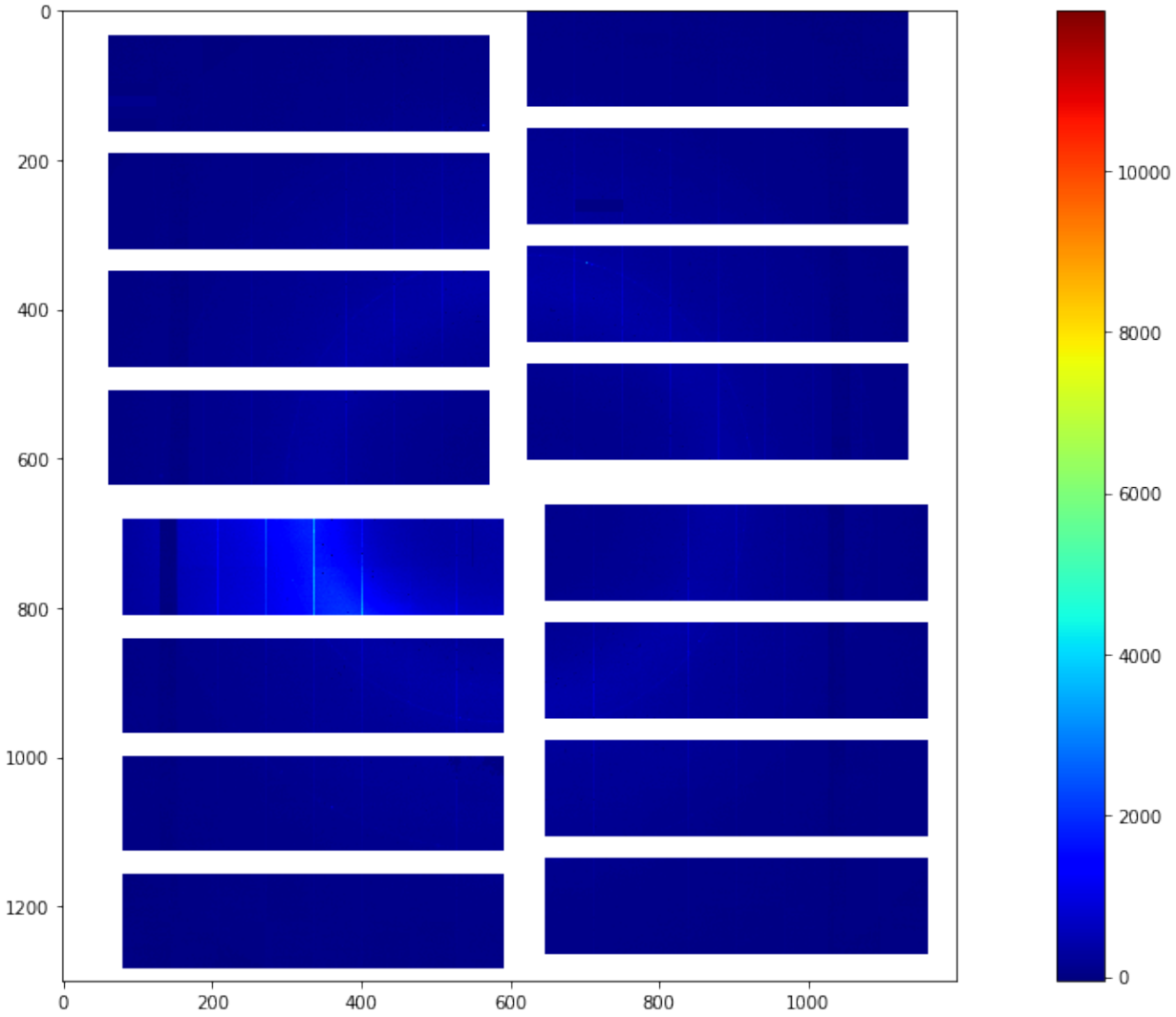
A single shot image from cell 12 of the first train

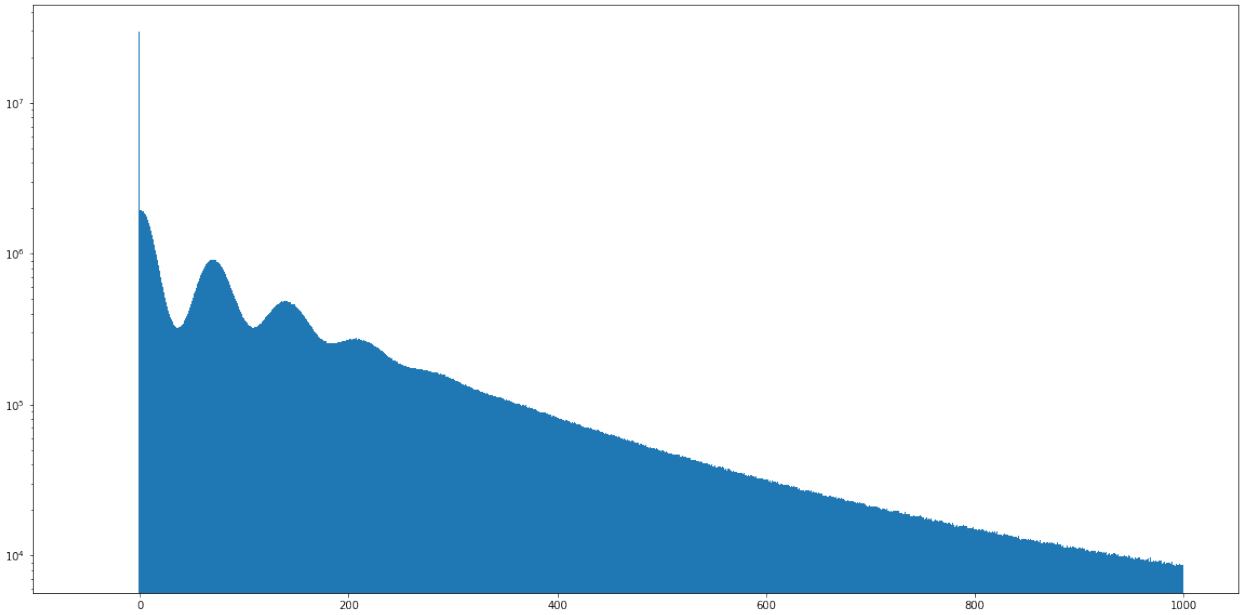

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
1600
1400
1200
1000
800
600
400
200
0


25000
20000
15000
10000
5000
0
0
250
500
750
1000
1250
1500
1750
2000

3.4.3 Mean CORRECTED Preview

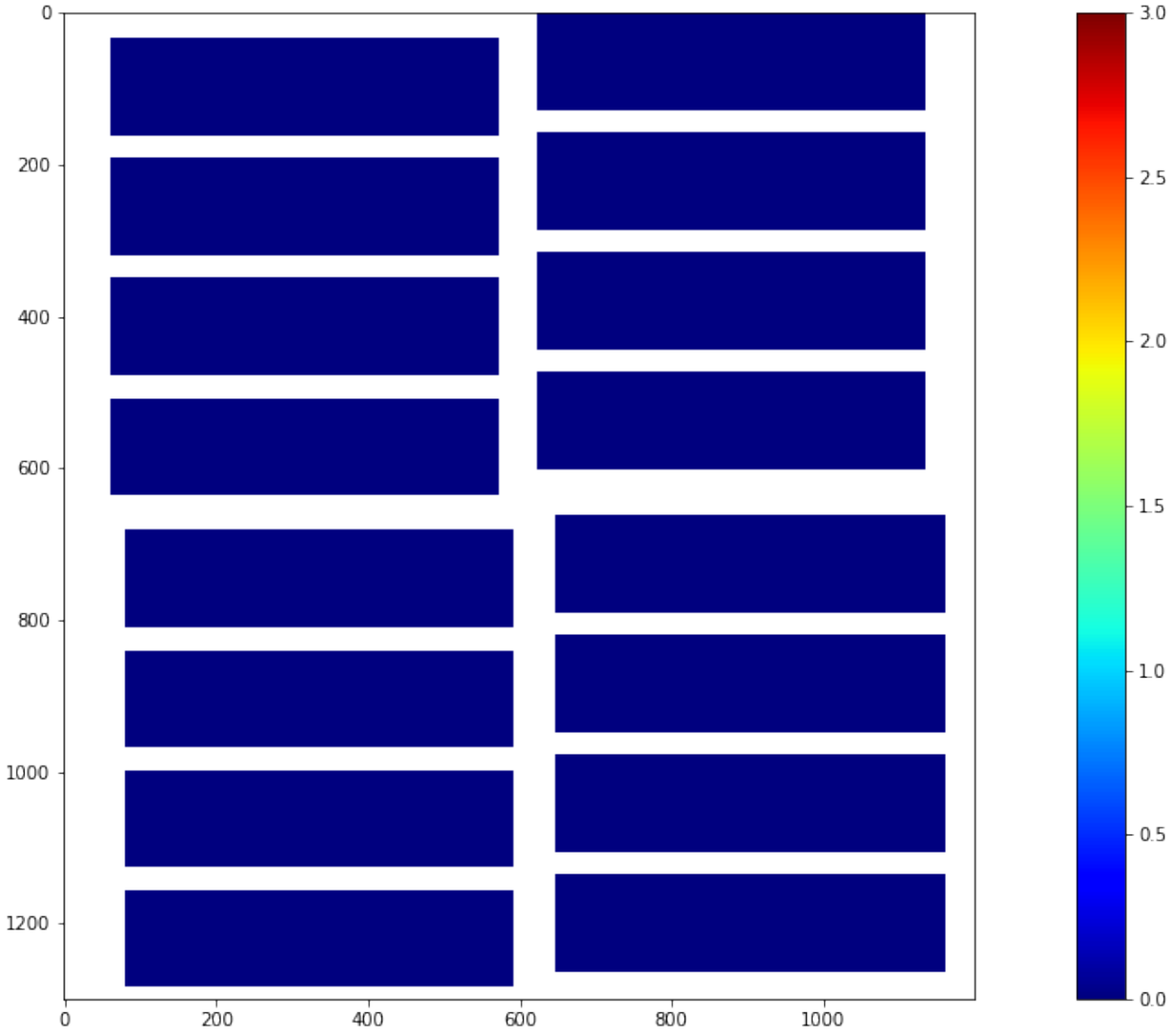
The per pixel mean of the first 128 images of the CORRECTED data





3.4.4 Maximum GAIN Preview

The per pixel maximum of the first 128 images of the digitized GAIN data


0
200
400
600
800
1000
1200
0
200
400
600
800
1000
3.0
2.5
2.0
1.5
1.0
0.5
0.0

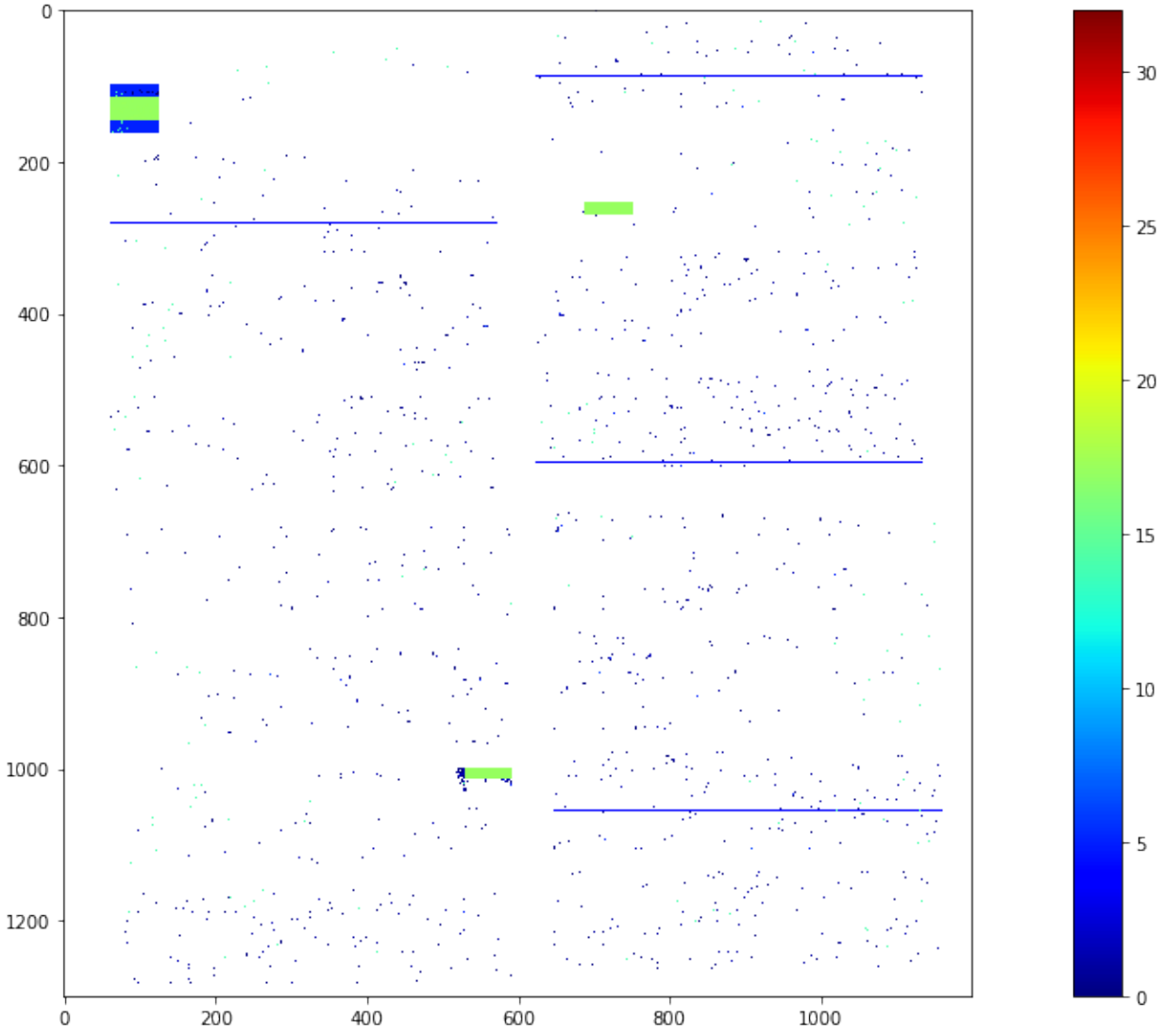
3.5 Bad Pixels

The mask contains dedicated entries for all pixels and memory cells as well as all three gains stages. Each mask entry is encoded in 32 bits as:

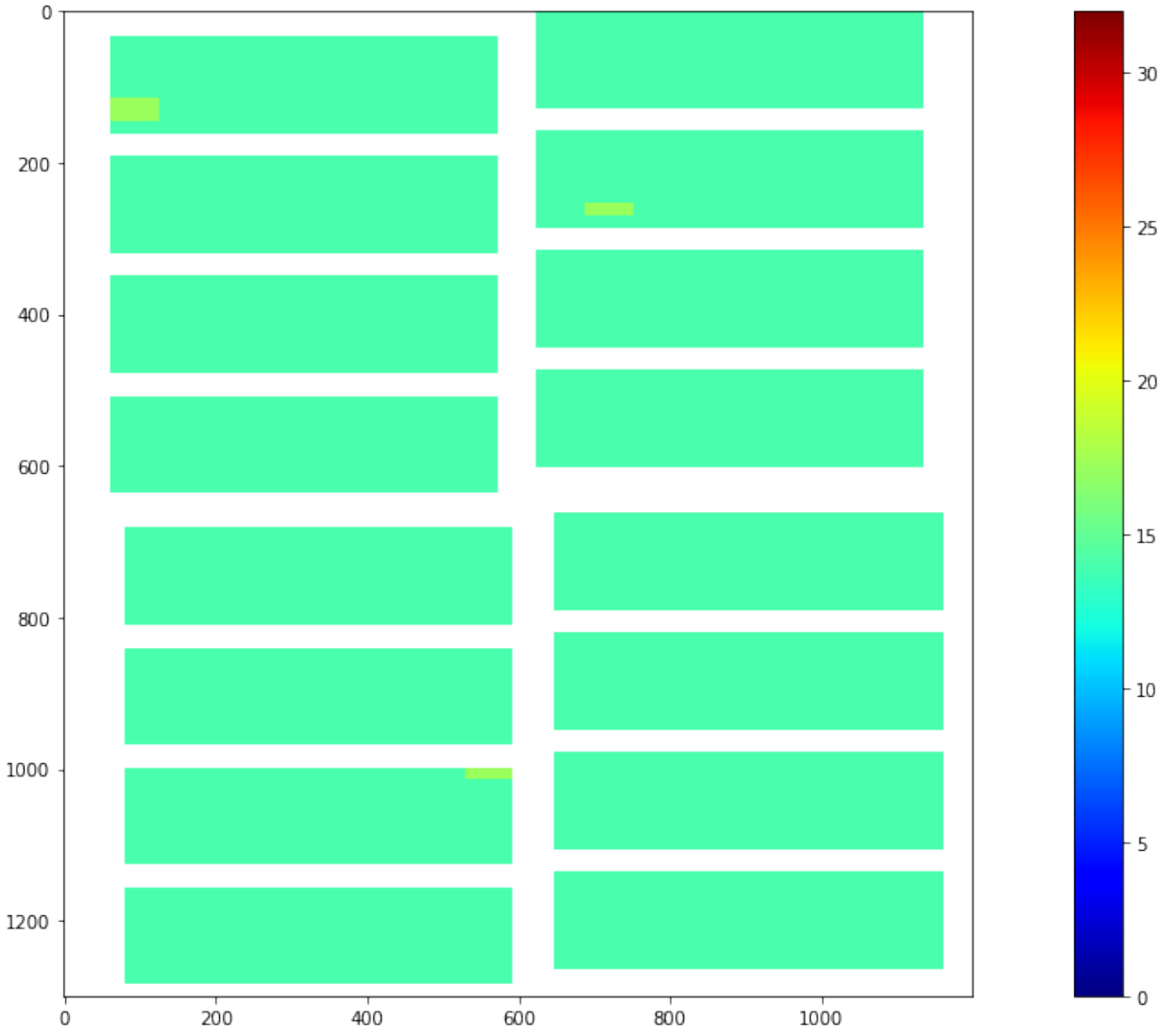
Bad pixel type	Bit mask
OFFSET_OUT_OF_THRESHOLD	0000000000000001
NOISE_OUT_OF_THRESHOLD	0000000000000010
OFFSET_NOISE_EVAL_ERROR	0000000000000100
NO_DARK_DATA	0000000000001000
CI_GAIN_OF_OF_THRESHOLD	0000000000010000
CI_LINEAR_DEVIATION	0000000000100000
CI_EVAL_ERROR	0000000001000000
FF_GAIN_EVAL_ERROR	0000000010000000
FF_GAIN_DEVIATION	0000000100000000
FF_NO_ENTRIES	0000001000000000
CI2_EVAL_ERROR	0000010000000000
VALUE_IS_NAN	0000100000000000
VALUE_OUT_OF_RANGE	0001000000000000
GAIN_THRESHOLDING_ERROR	0010000000000000
DATA_STD_IS_ZERO	0100000000000000
ASIC_STD_BELOW_NOISE	1000000000000000
INTERPOLATED	10000000000000000
NOISY_ADC	100000000000000000
OVERSCAN	1000000000000000000
NON_SENSITIVE	10000000000000000000
NON_LIN_RESPONSE_REGION	100000000000000000000

3.5.1 Single Shot Bad Pixels

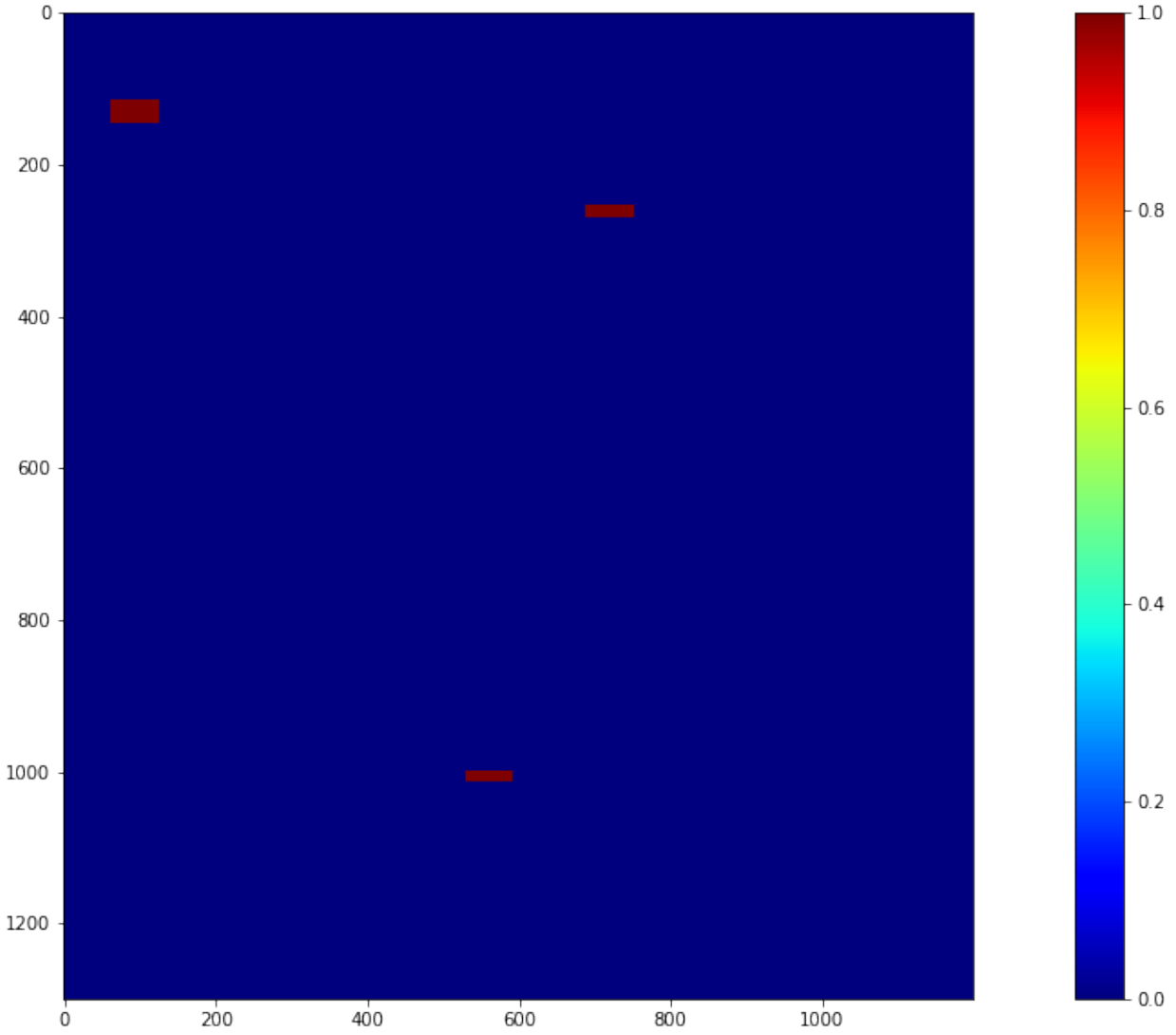
A single shot bad pixel map from cell 4 of the first train

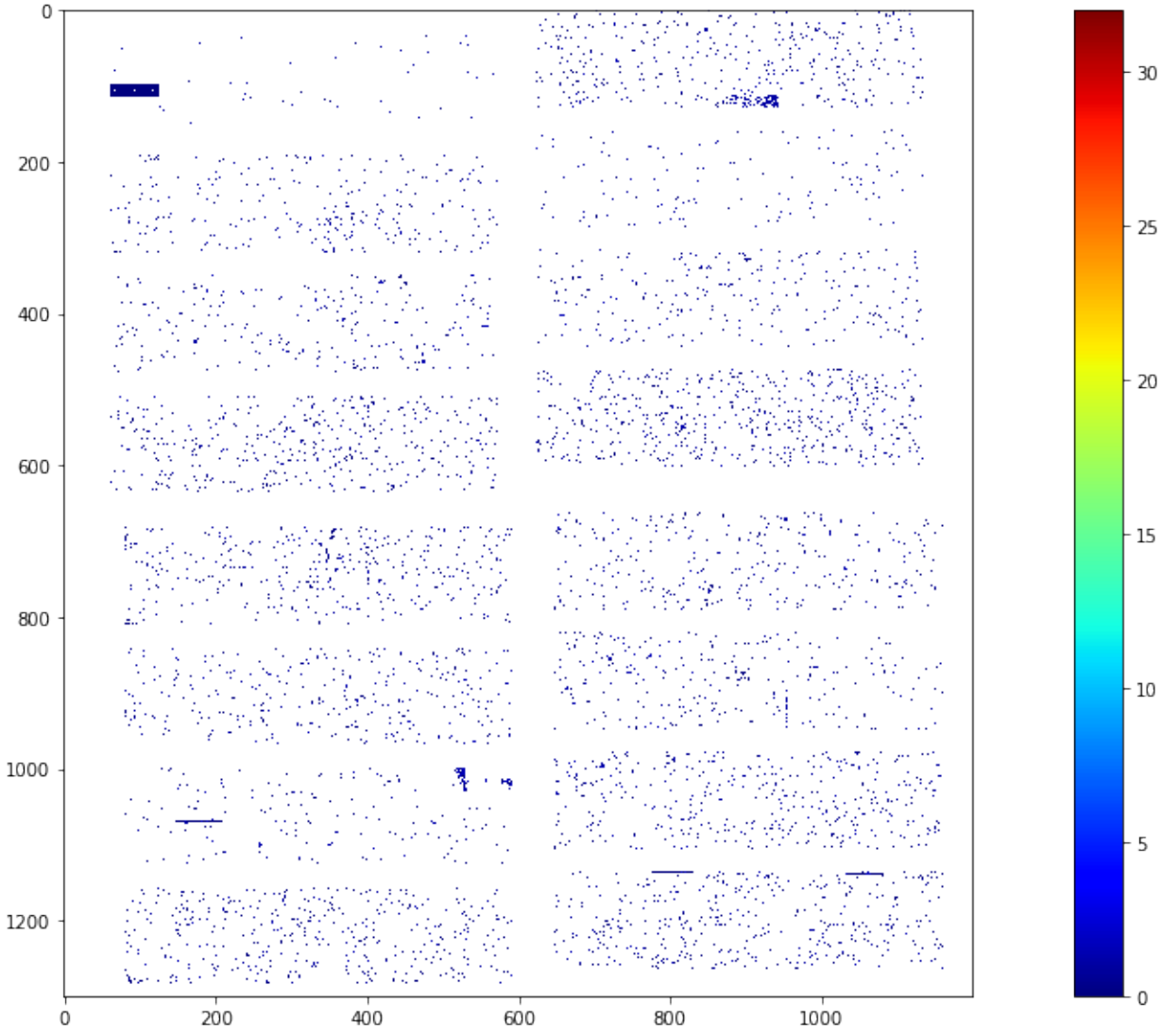

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

3.5.2 Full Train Bad Pixels



3.5.3 Full Train Bad Pixels - Only Dark Char. Related




0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

CHAPTER

FOUR

AGIPD OFFLINE CORRECTION, SEQUENCES = 8-11

```
Connecting to profile slurm_prof_9b576fdf-f5a8-492b-be1a-8769350b548a_8-11
Using 2020-03-08 06:47:13+01:00 as creation time
Working in IL Mode: False. Actual cells in use are: 0
Outputting to /gpfs/exfel/d/proc/SPB/202030/p900119/r0084
Detector in use is SPB_DET_AGIPD1M-1
```

```
Gain setting: 0
```

4.1 Processed Files

```
Processing a total of 64 sequence files in chunks of 32
```

#	module	# module	file
0	Q1M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00008.h5
1		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00009.h5
2		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00010.h5
3		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00011.h5
4	Q1M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00008.h5
5		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00009.h5
6		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00010.h5
7		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00011.h5
8	Q1M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00008.h5
9		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00009.h5
10		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00010.h5
11		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00011.h5
12	Q1M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00008.h5
13		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00009.h5
14		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00010.h5
15		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00011.h5
16	Q2M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00008.h5
17		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00009.h5
18		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00010.h5
19		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00011.h5
20	Q2M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00008.h5
21		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00009.h5
22		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00010.h5
23		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00011.h5
24	Q2M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00008.h5
25		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00009.h5
26		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00010.h5
27		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00011.h5
28	Q2M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00008.h5
29		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00009.h5
30		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00010.h5
31		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00011.h5
32	Q3M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00008.h5
33		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00009.h5
34		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00010.h5
35		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00011.h5
36	Q3M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00008.h5
37		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00009.h5
38		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00010.h5
39		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00011.h5
40	Q3M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00008.h5
41		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00009.h5
42		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00010.h5
43		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00011.h5
44	Q3M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00008.h5
45		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00009.h5
46		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00010.h5
47		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00011.h5
48	Q4M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00008.h5
49		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00009.h5
50		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00010.h5
51		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00011.h5
52	Q4M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00008.h5
53		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00009.h5
54		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00010.h5
55		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00011.h5
56	Q4M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00008.h5
57		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00009.h5
58		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00010.h5
59		3	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00011.h5

```
A range of 500 pulse indices is selected: from 0 to 500 with a step of 1
Running 32 tasks parallel
Running 32 tasks parallel
```

```
Constants were injected on:
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
```

```
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
```

```
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
```

```
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
```

```
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
```

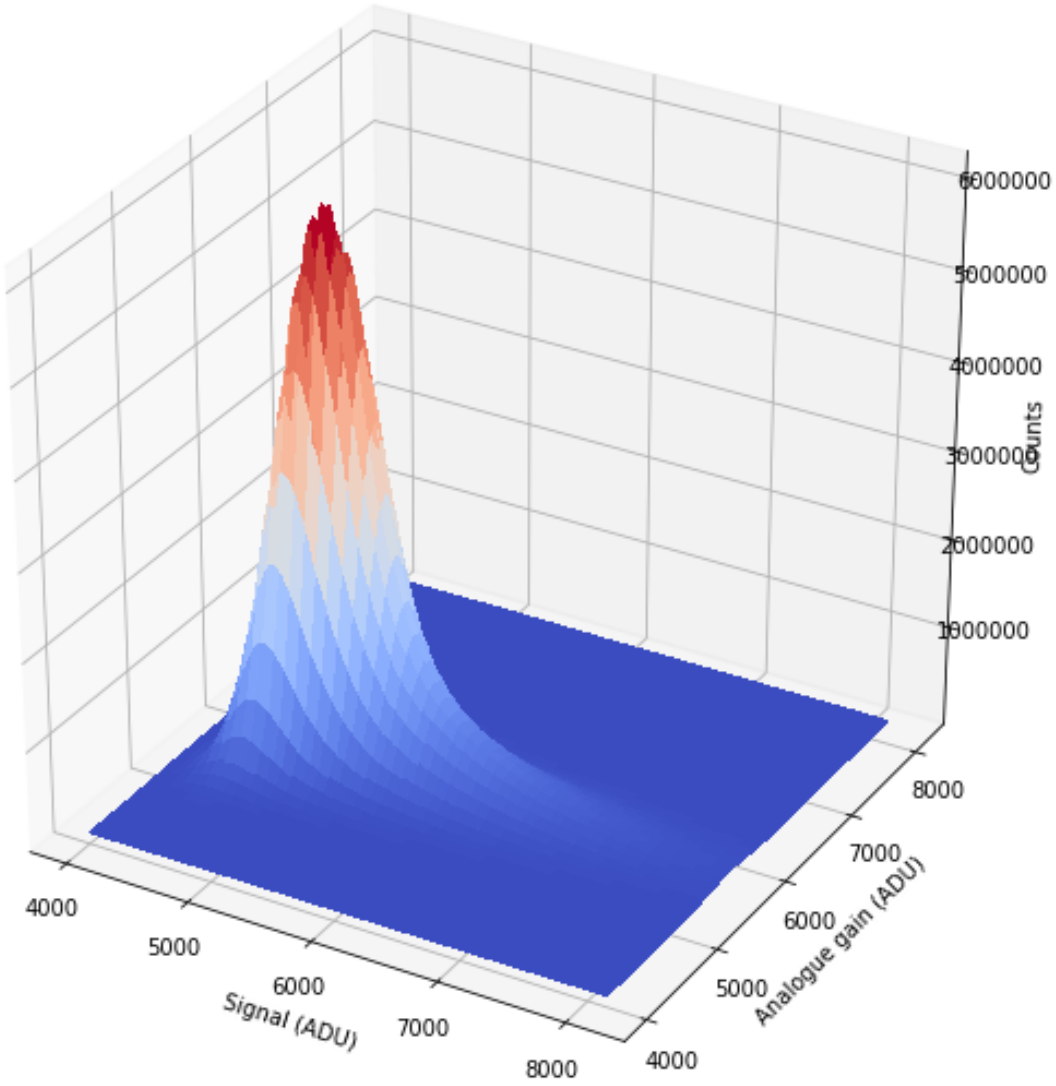
```
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
```

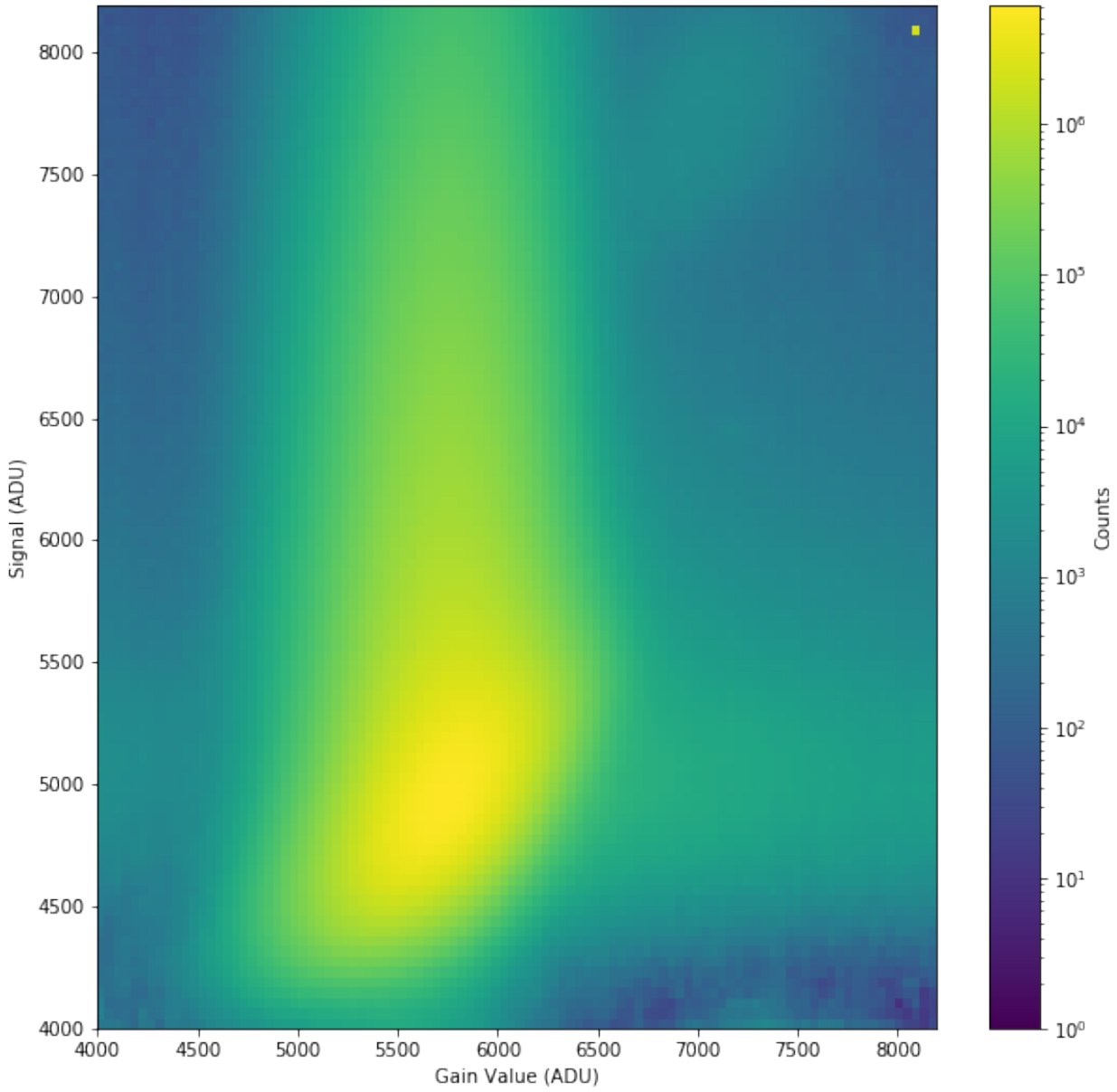
```
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
```

```
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
```

4.2 Signal vs. Analogue Gain

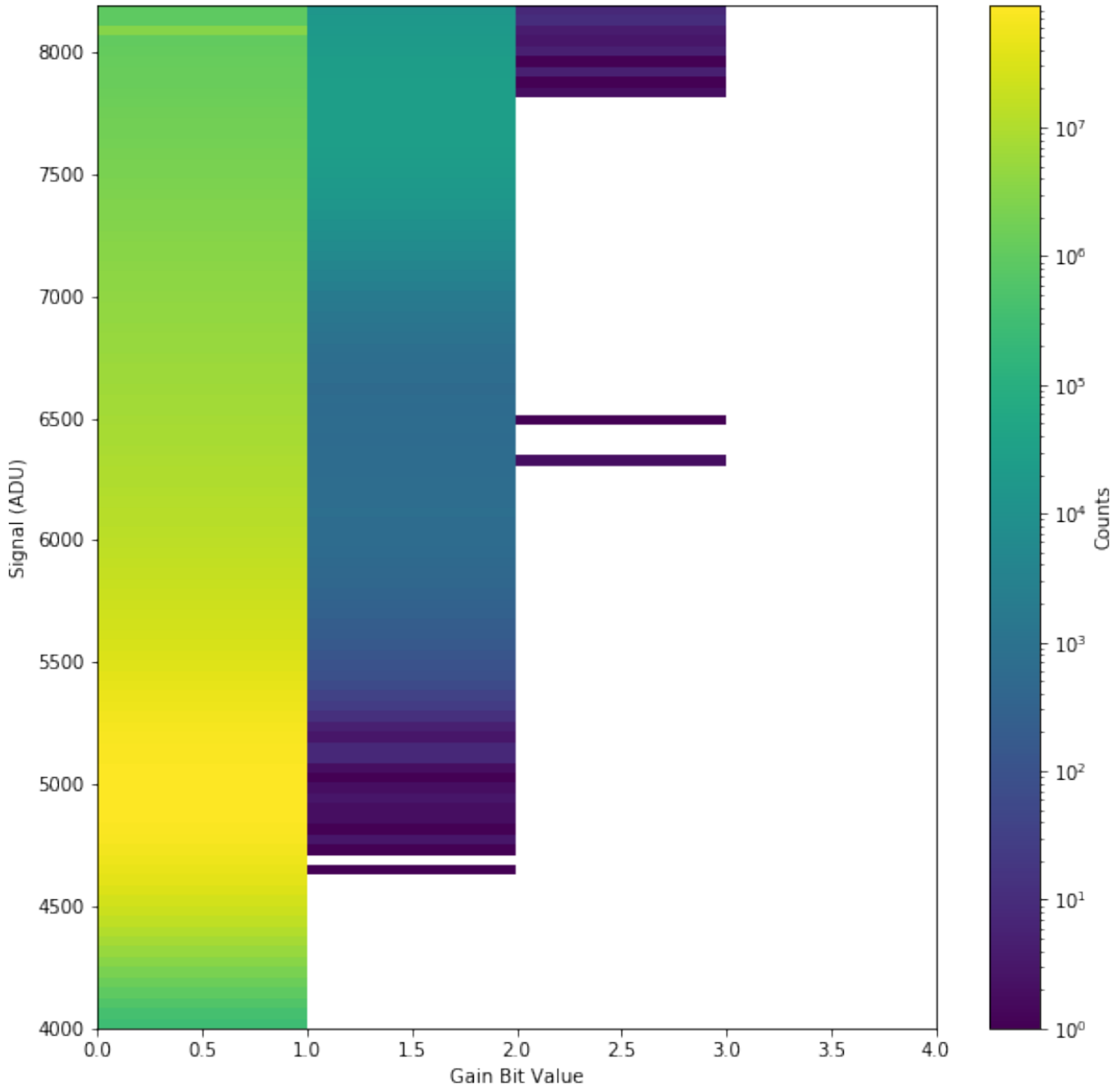
The following plot shows plots signal vs. gain for the first 128 images.

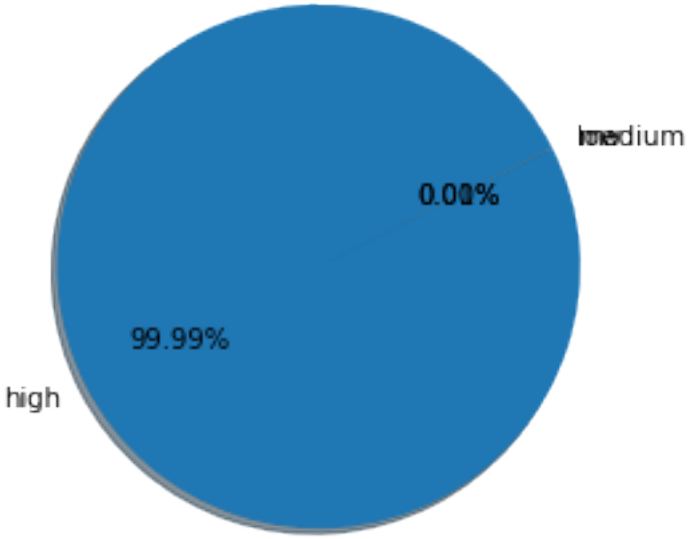

6000000
5000000
4000000
3000000
2000000
1000000
Counts
4000
5000
6000
7000
8000
Signal (ADU)
4000
5000
6000
7000
8000
Analogue gain (ADU)



4.3 Signal vs. Digitized Gain

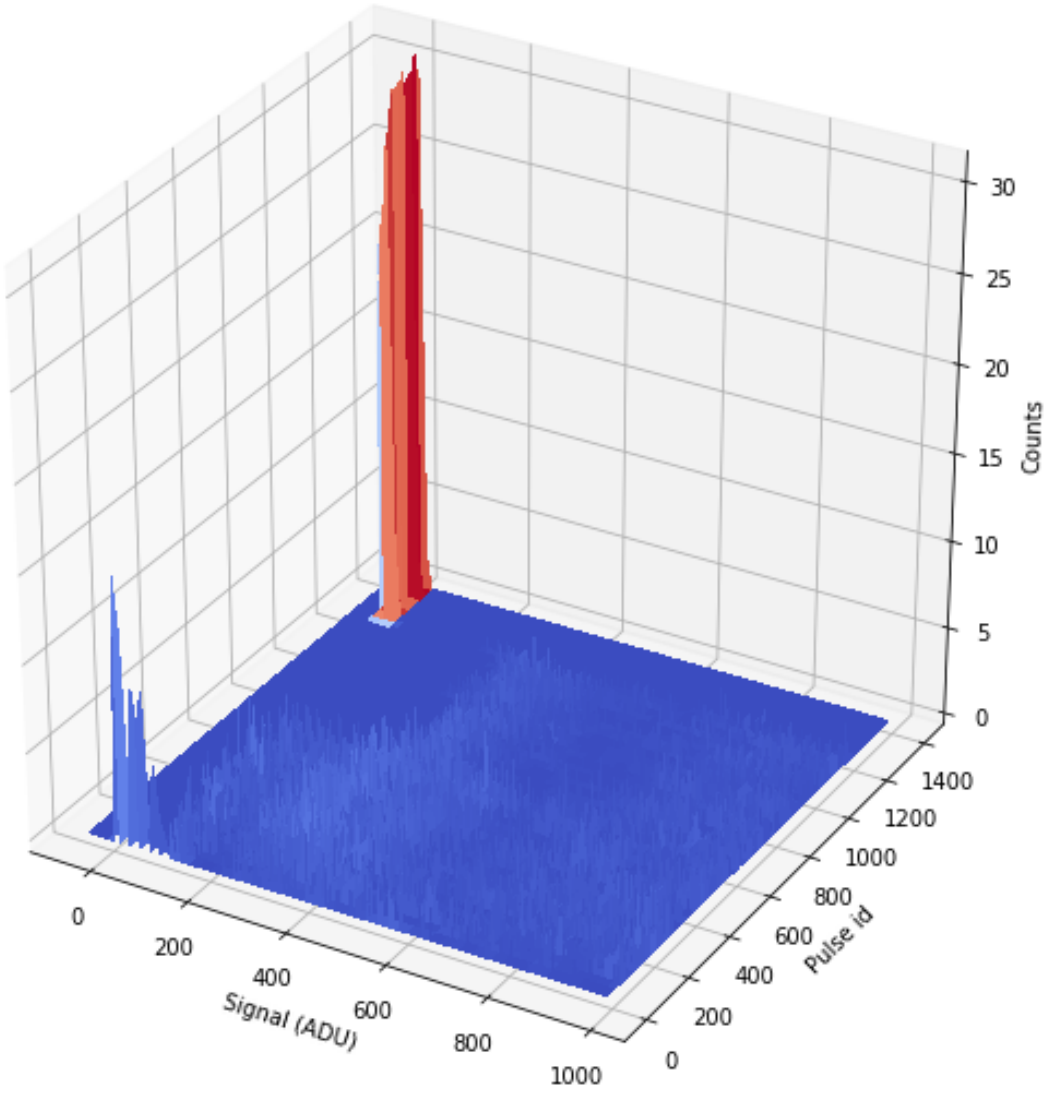
The following plot shows plots signal vs. digitized gain for the first 128 images.

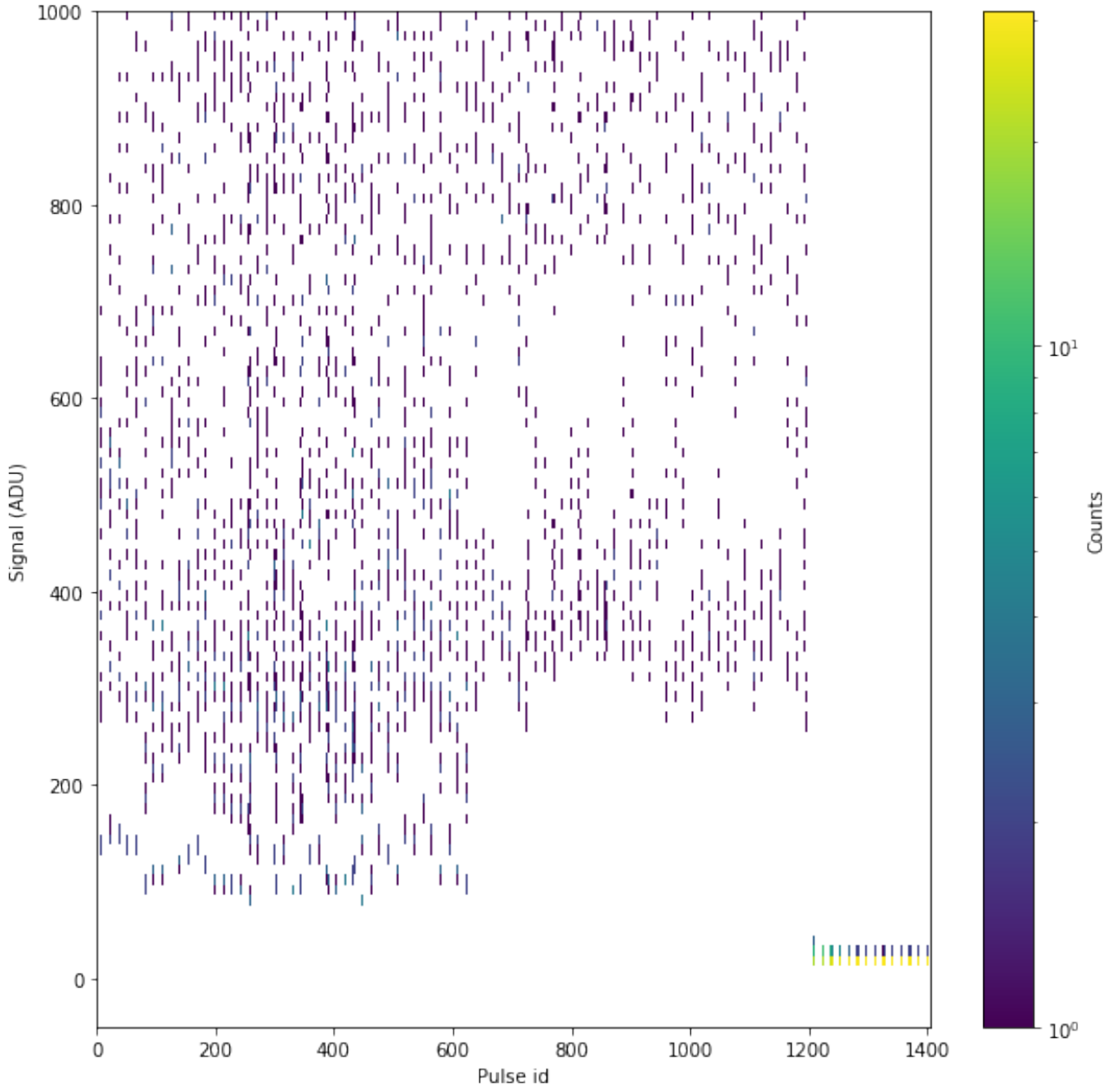

Signal (ADU)
8000
7500
7000
6500
6000
5500
5000
4500
4000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Gain Bit Value
Counts
10^7
10^6
10^5
10^4
10^3
10^2
10^1
10^0

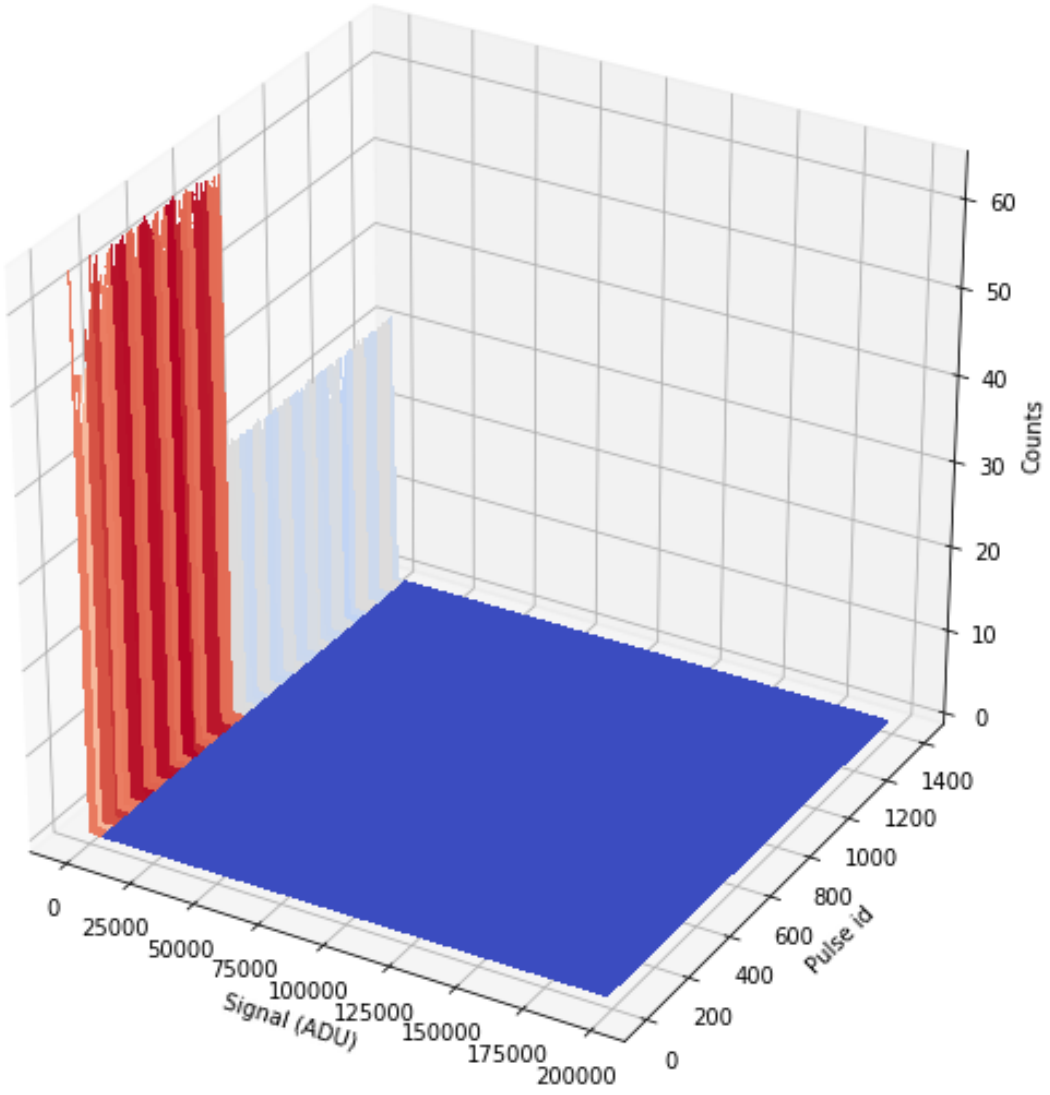


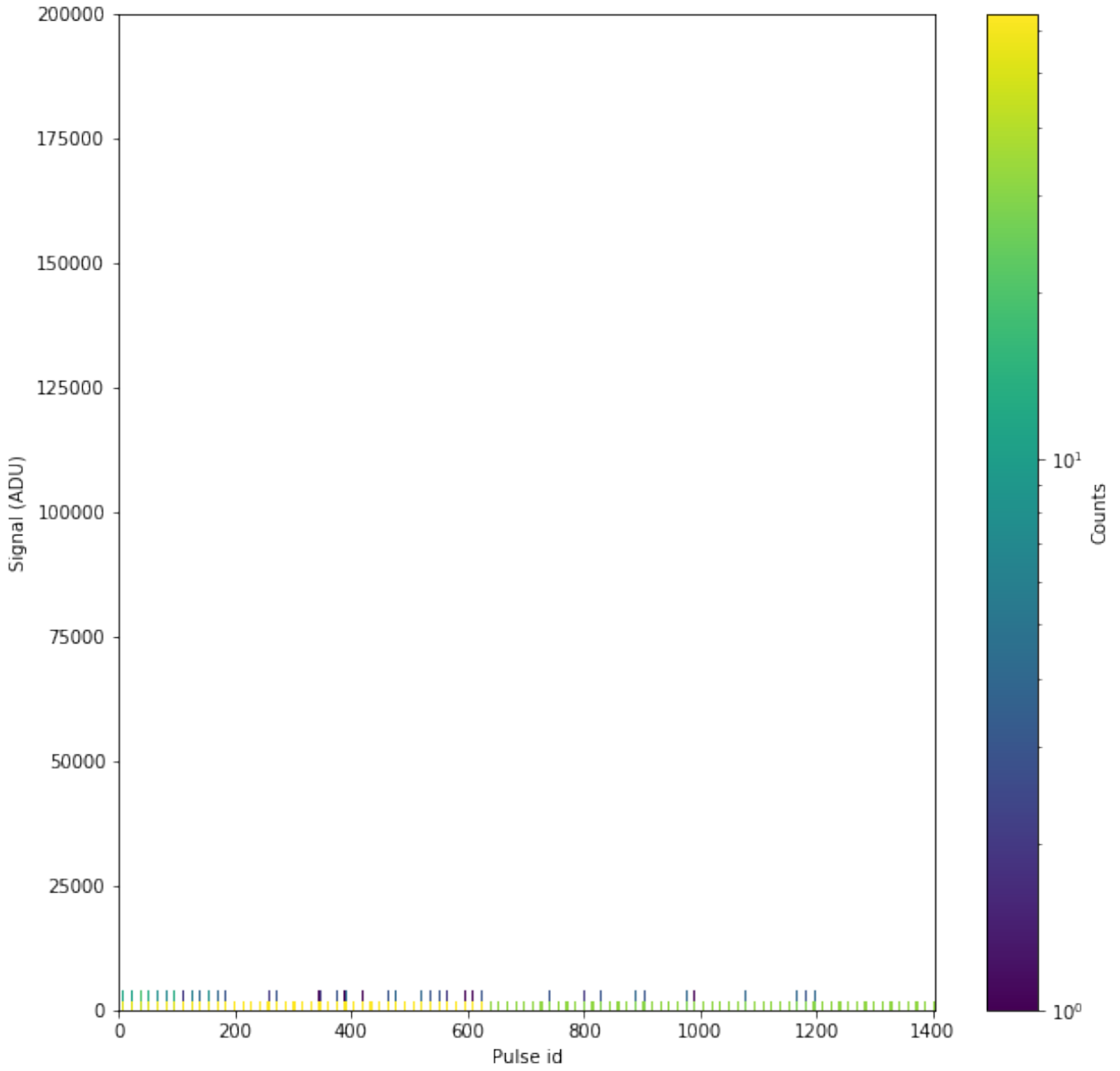
4.4 Mean Intensity per Pulse

The following plots show the mean signal for each pulse in a detailed and expanded intensity region.


30
25
20
15
10
5
0
Counts
0
200
400
600
800
1000
Signal (ADU)
0
200
400
600
800
1000
1200
1400
Pulse id

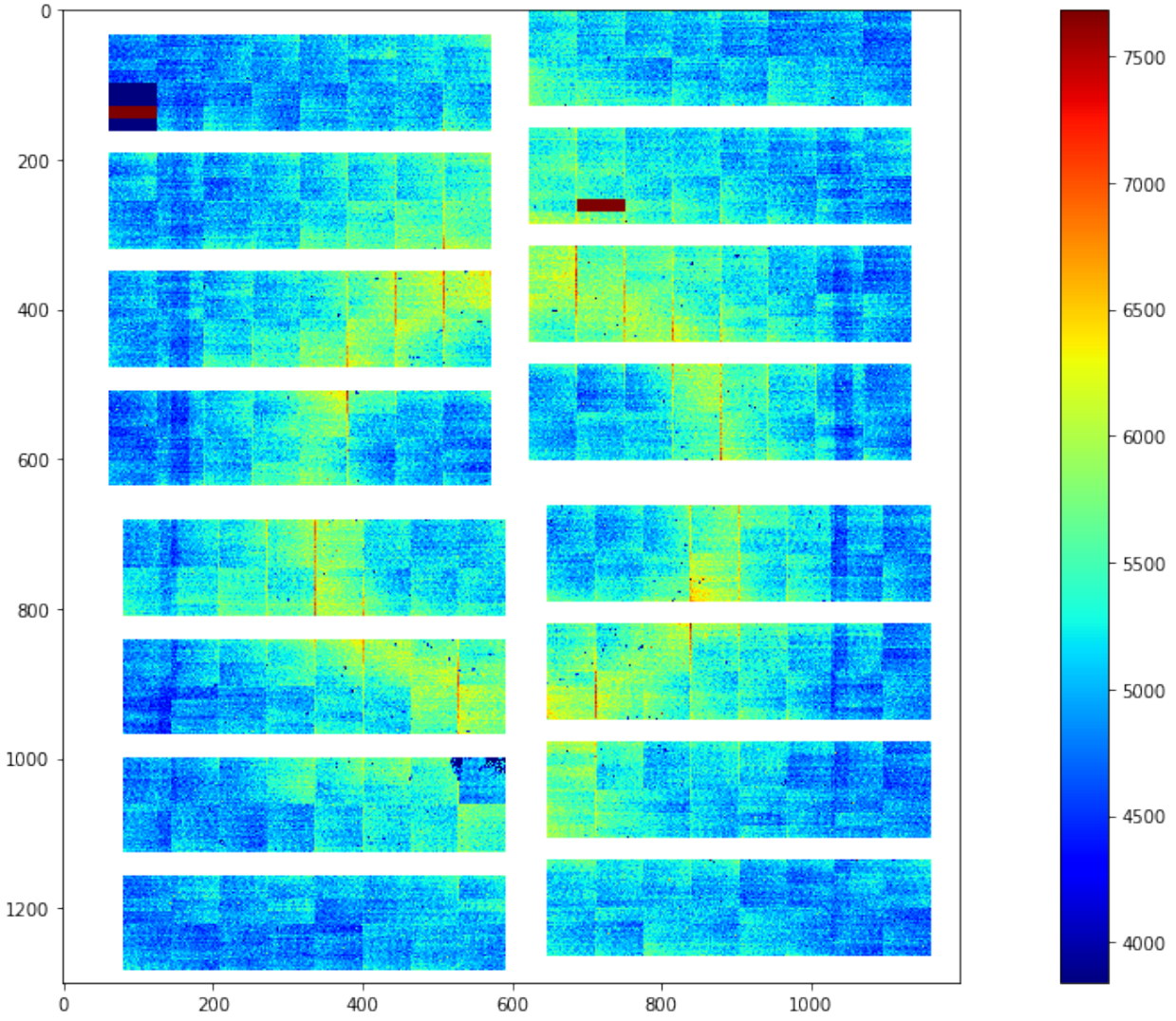

1000
800
600
400
200
0
Signal (ADU)
0
200
400
600
800
1000
1200
1400
Pulse id
10^1
10^0
Counts


Counts
0
10
20
30
40
50
60
Pulse id
0
200
400
600
800
1000
1200
1400
Signal (ADU)
0
25000
50000
75000
100000
125000
150000
175000
200000



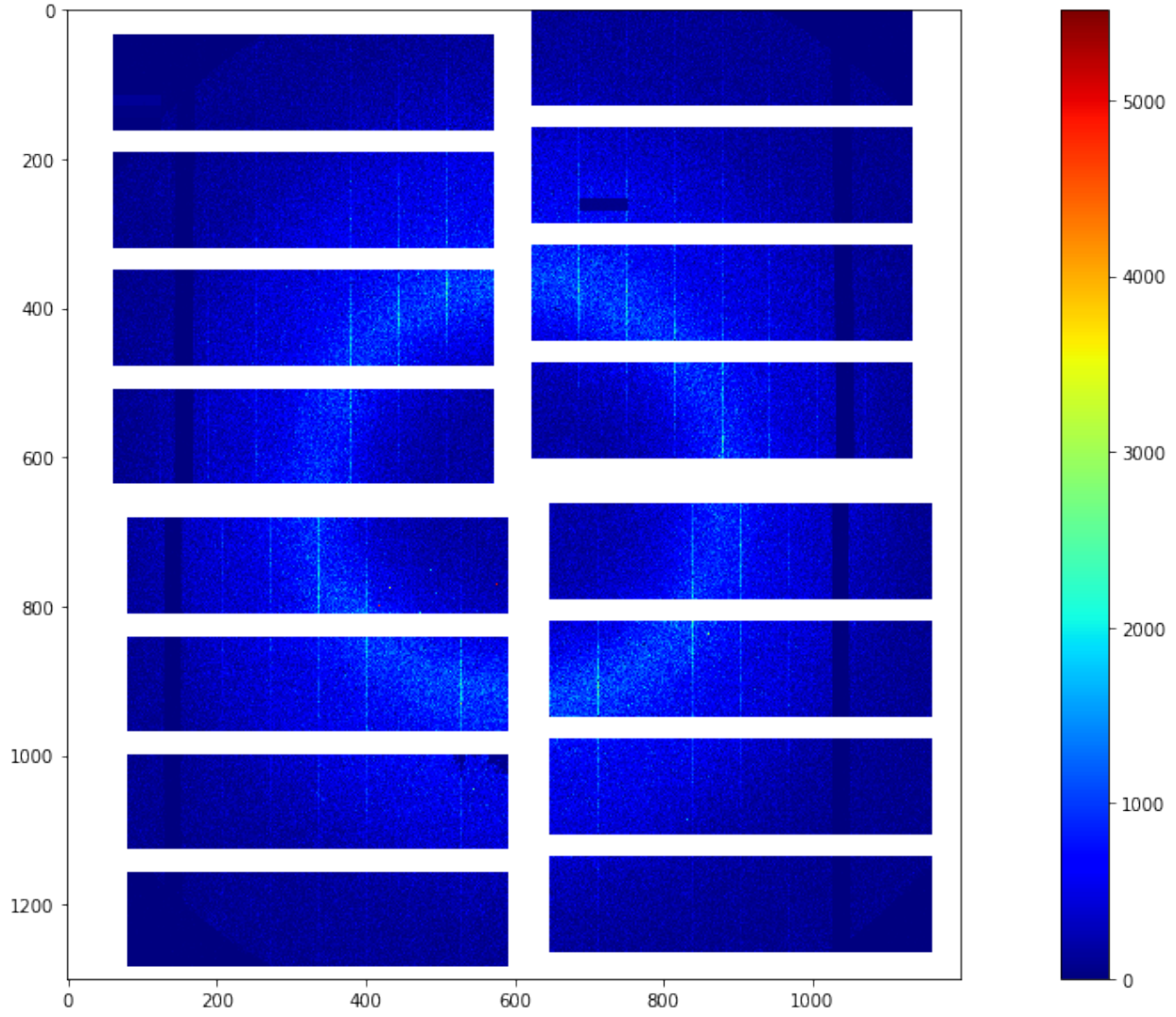
4.4.1 Mean RAW Preview

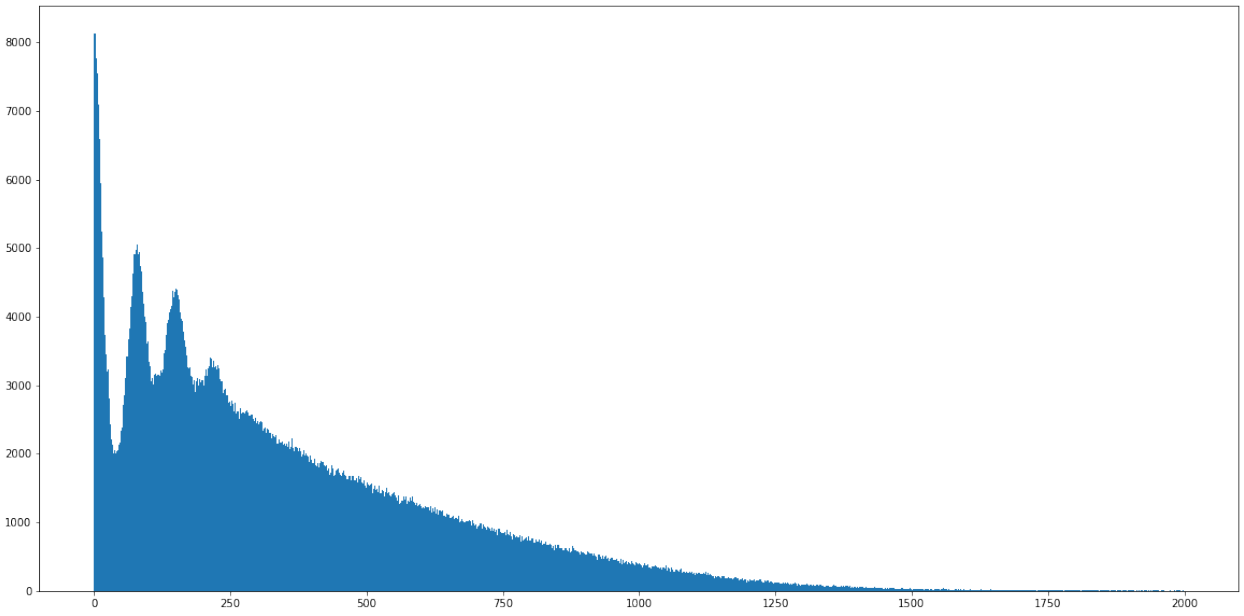
The per pixel mean of the first 128 images of the RAW data



4.4.2 Single Shot Preview

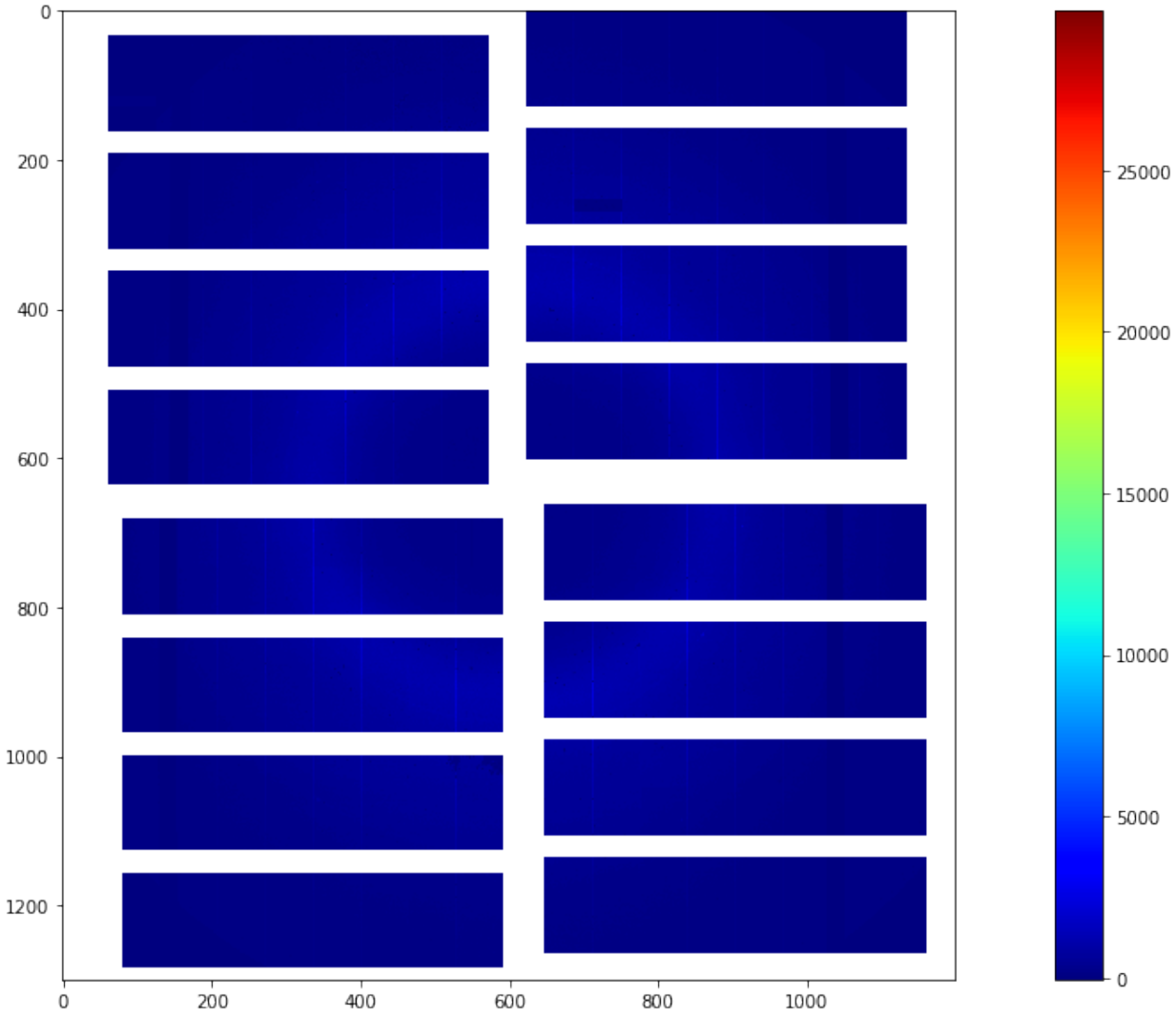
A single shot image from cell 12 of the first train

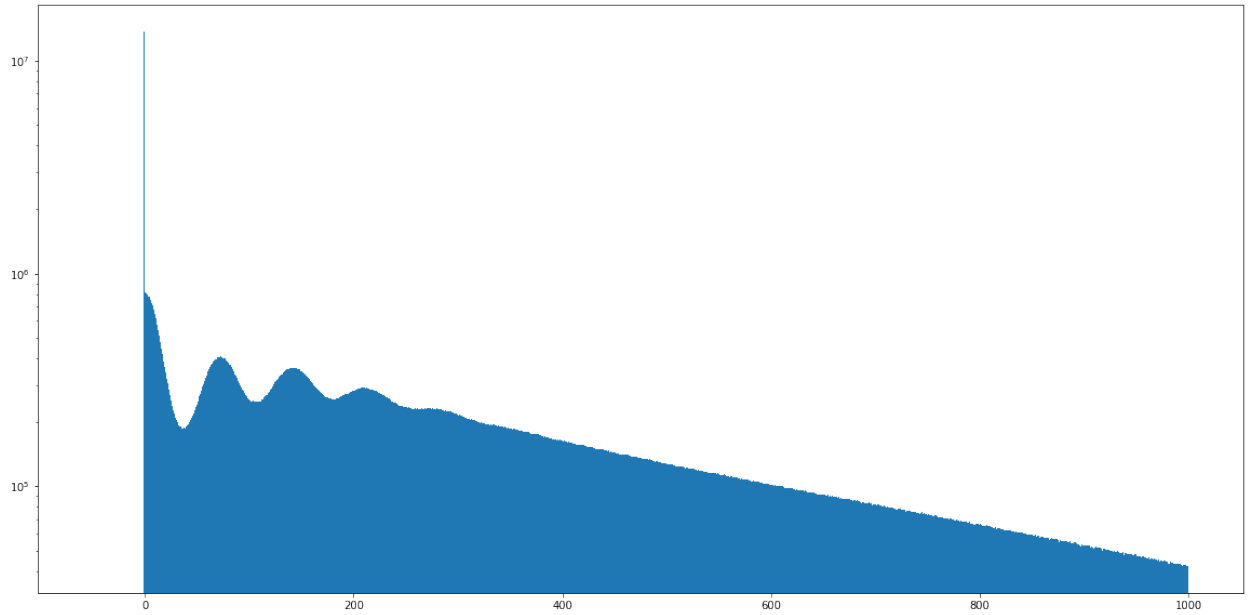

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
5000
4000
3000
2000
1000
0


8000
7000
6000
5000
4000
3000
2000
1000
0
0
250
500
750
1000
1250
1500
1750
2000

4.4.3 Mean CORRECTED Preview

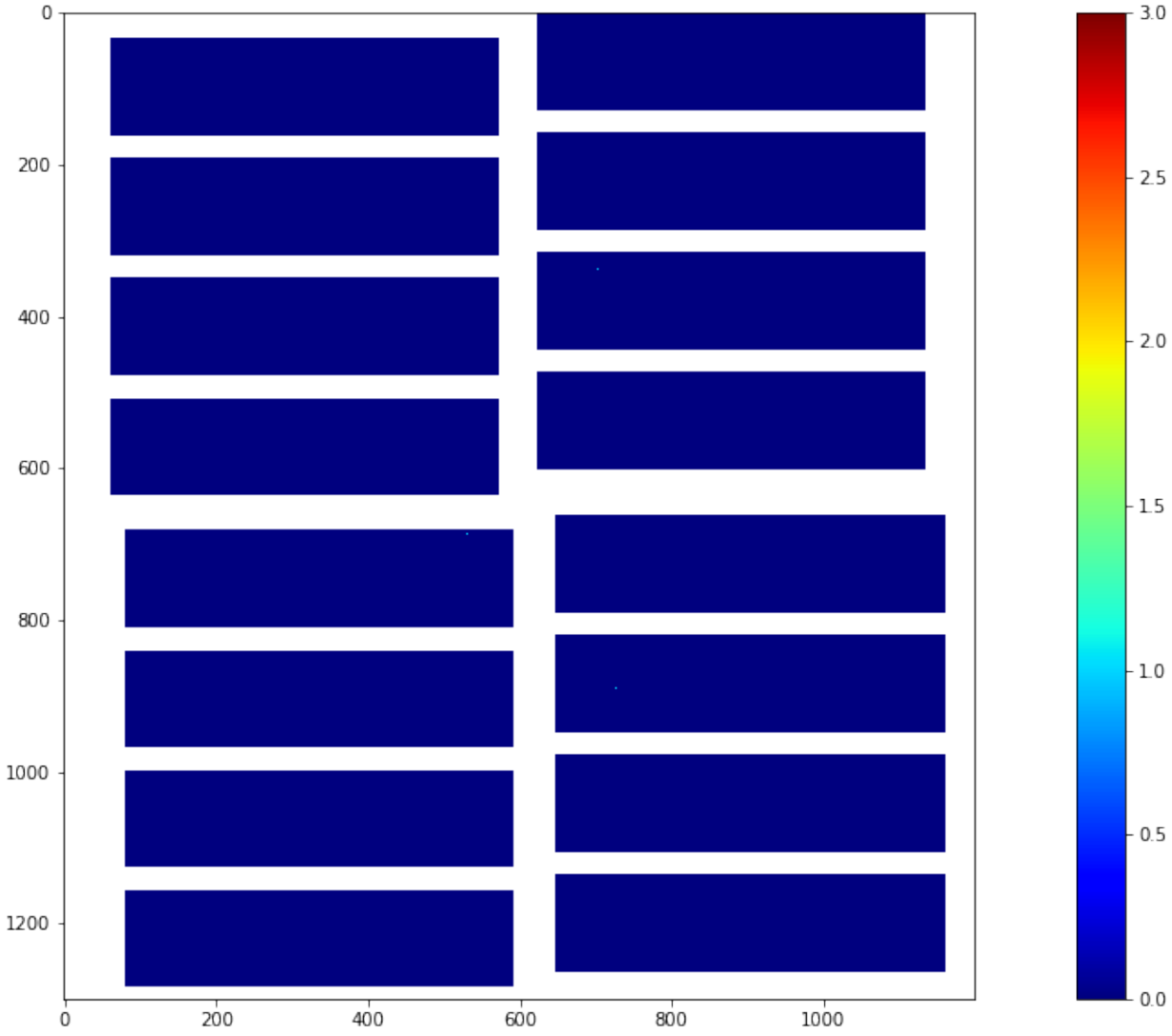
The per pixel mean of the first 128 images of the CORRECTED data





4.4.4 Maximum GAIN Preview

The per pixel maximum of the first 128 images of the digitized GAIN data


0
200
400
600
800
1000
1200
0
200
400
600
800
1000
3.0
2.5
2.0
1.5
1.0
0.5
0.0

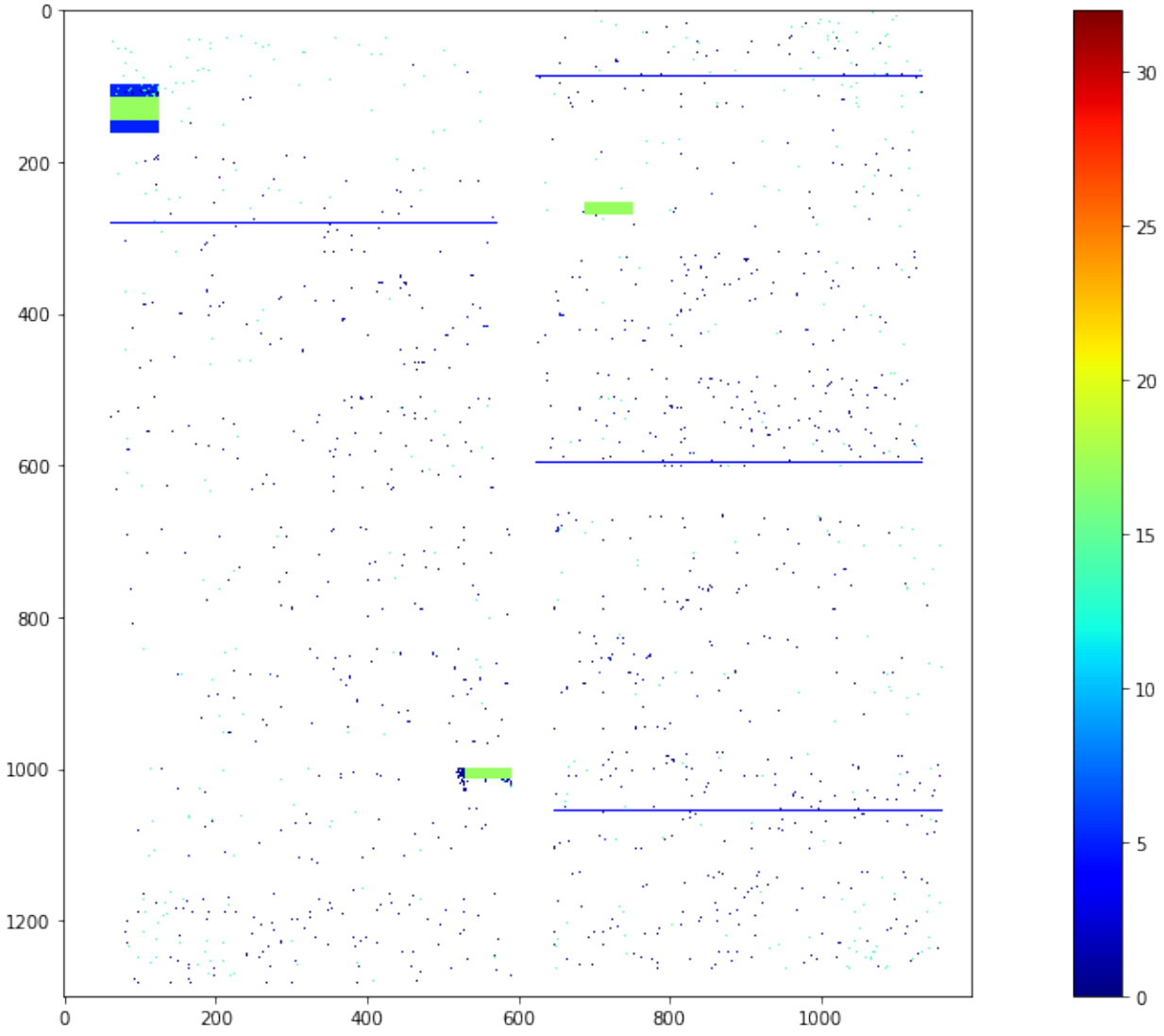
4.5 Bad Pixels

The mask contains dedicated entries for all pixels and memory cells as well as all three gains stages. Each mask entry is encoded in 32 bits as:

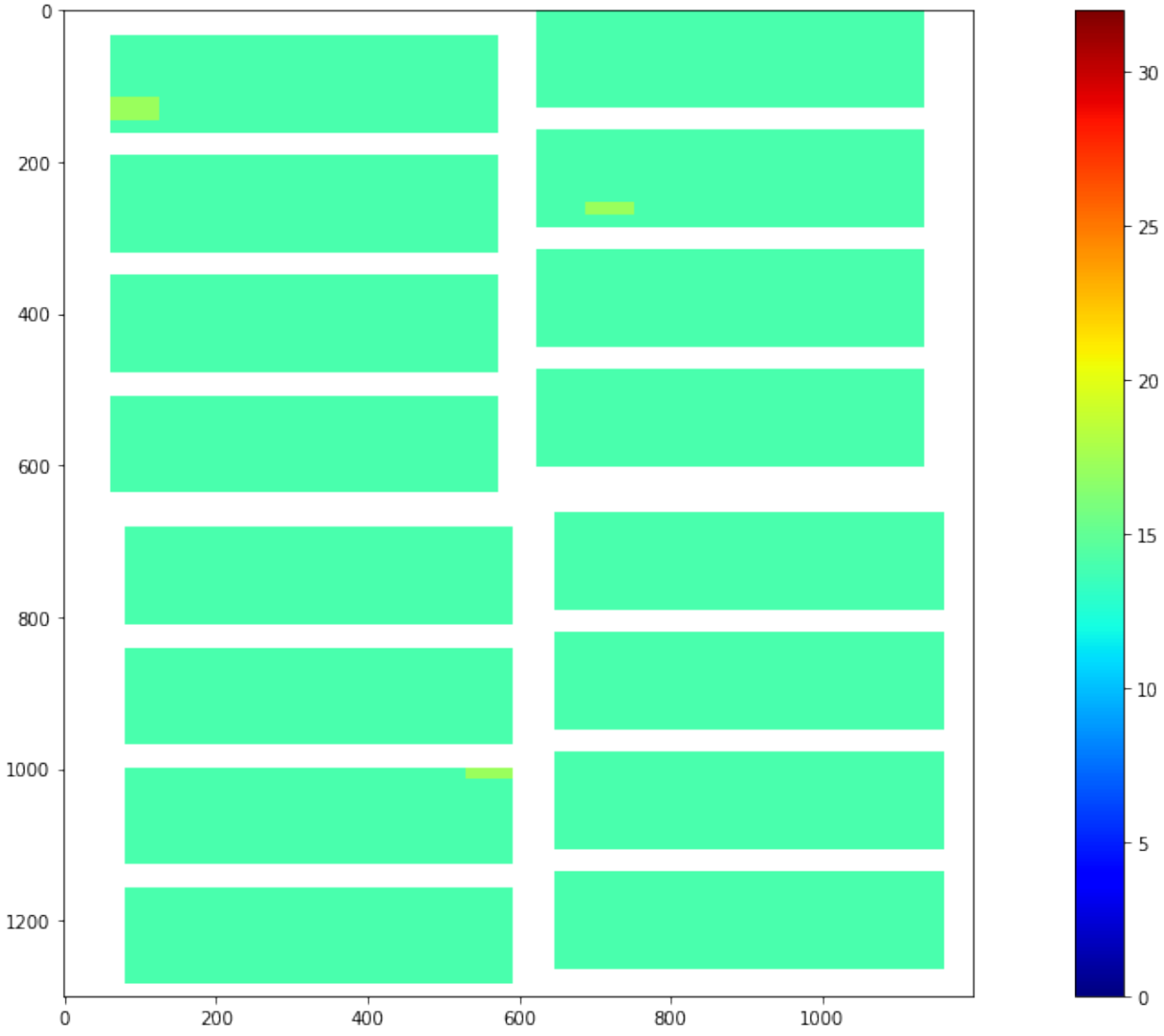
Bad pixel type	Bit mask
OFFSET_OUT_OF_THRESHOLD	0000000000000001
NOISE_OUT_OF_THRESHOLD	0000000000000010
OFFSET_NOISE_EVAL_ERROR	0000000000000100
NO_DARK_DATA	0000000000001000
CI_GAIN_OF_OF_THRESHOLD	0000000000010000
CI_LINEAR_DEVIATION	0000000000100000
CI_EVAL_ERROR	0000000001000000
FF_GAIN_EVAL_ERROR	0000000010000000
FF_GAIN_DEVIATION	0000000100000000
FF_NO_ENTRIES	0000001000000000
CI2_EVAL_ERROR	0000010000000000
VALUE_IS_NAN	0000100000000000
VALUE_OUT_OF_RANGE	0001000000000000
GAIN_THRESHOLDING_ERROR	0010000000000000
DATA_STD_IS_ZERO	0100000000000000
ASIC_STD_BELOW_NOISE	1000000000000000
INTERPOLATED	10000000000000000
NOISY_ADC	100000000000000000
OVERSCAN	1000000000000000000
NON_SENSITIVE	10000000000000000000
NON_LIN_RESPONSE_REGION	100000000000000000000

4.5.1 Single Shot Bad Pixels

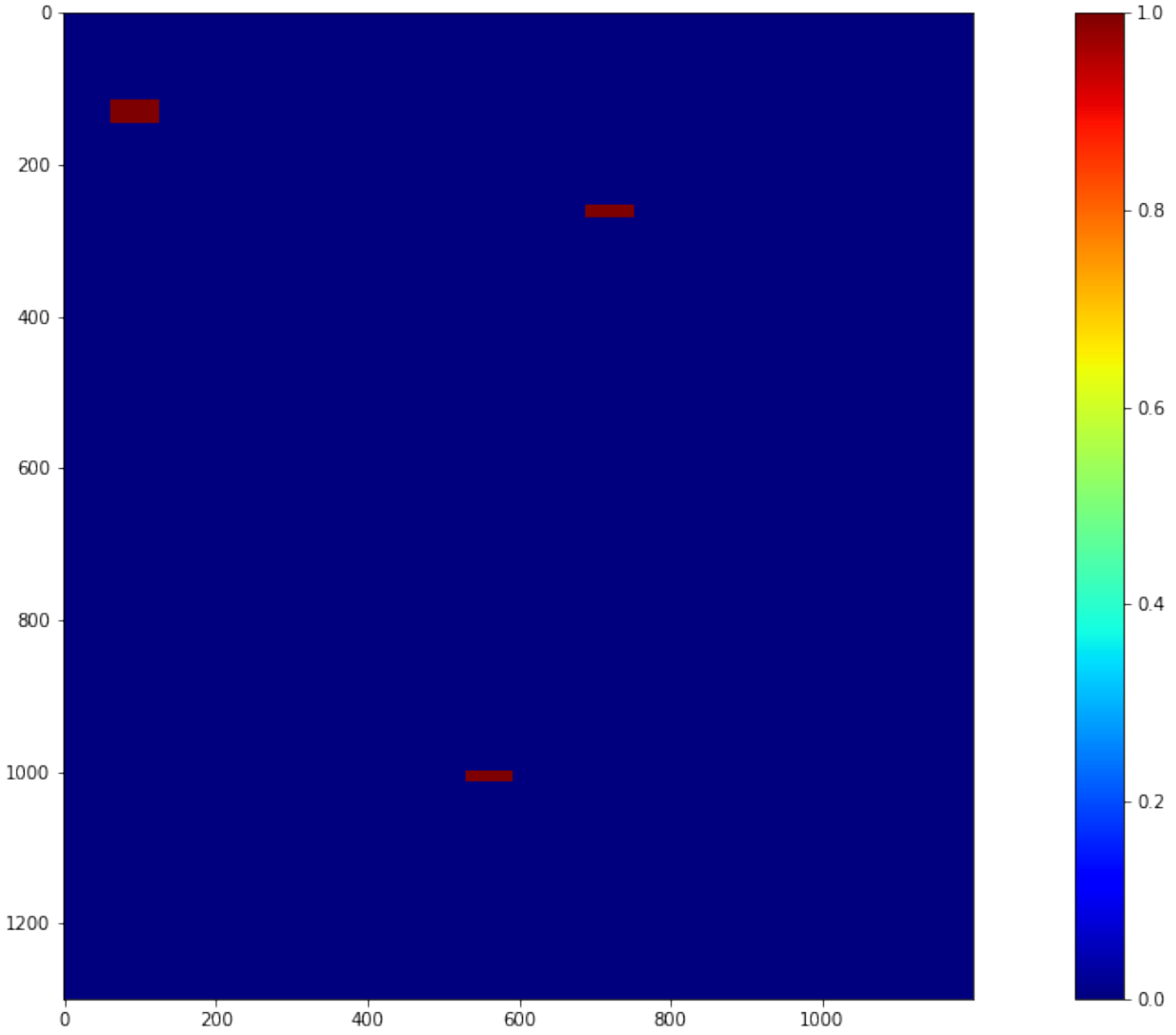
A single shot bad pixel map from cell 4 of the first train

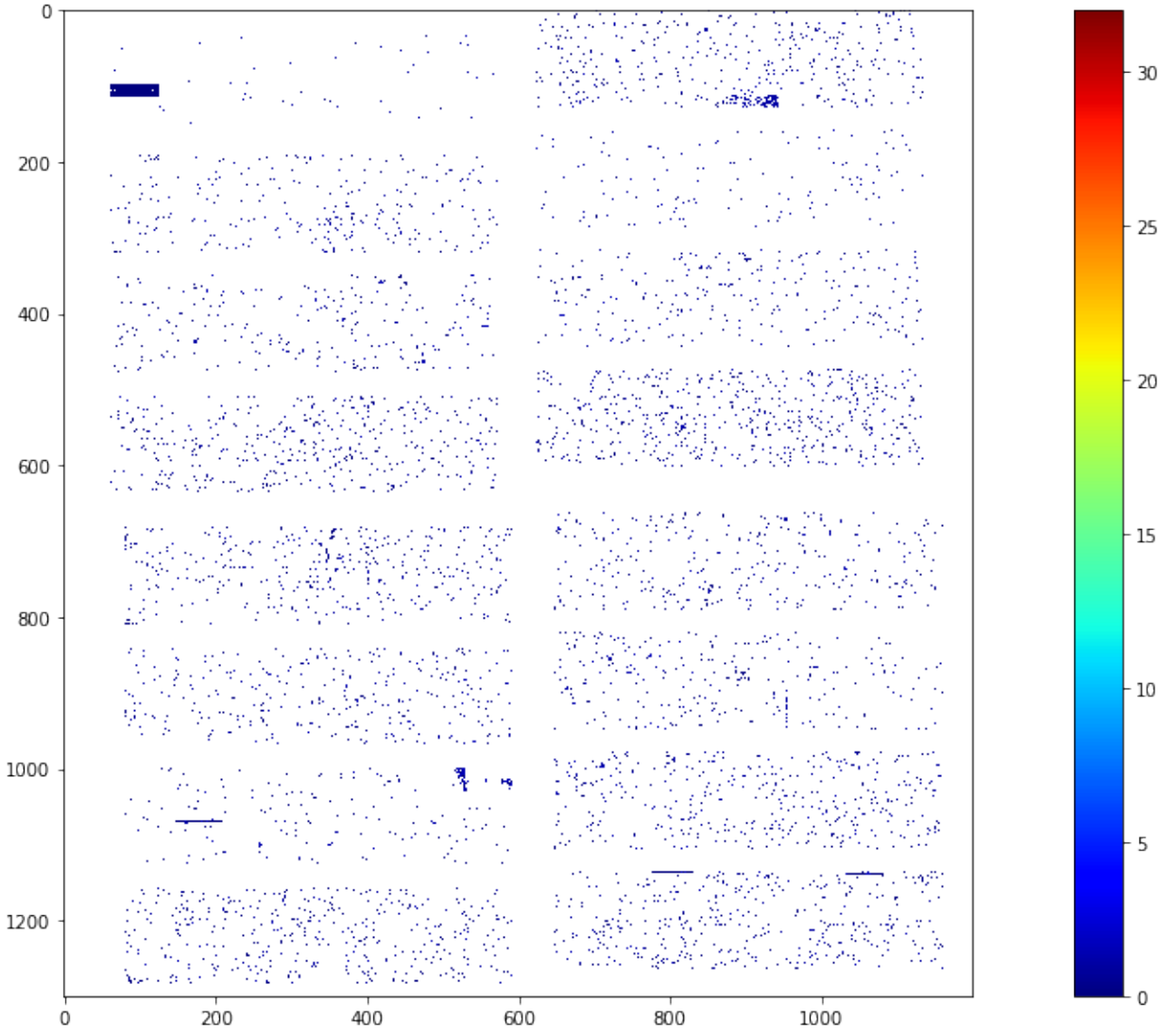

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

4.5.2 Full Train Bad Pixels



4.5.3 Full Train Bad Pixels - Only Dark Char. Related




0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

CHAPTER

FIVE

AGIPD OFFLINE CORRECTION, SEQUENCES = 12-14

```
Connecting to profile slurm_prof_9b576fdf-f5a8-492b-be1a-8769350b548a_12-14
Using 2020-03-08 06:47:13+01:00 as creation time
Working in IL Mode: False. Actual cells in use are: 0
Outputting to /gpfs/exfel/d/proc/SPB/202030/p900119/r0084
Detector in use is SPB_DET_AGIPD1M-1
```

```
Gain setting: 0
```

5.1 Processed Files

```
Processing a total of 48 sequence files in chunks of 32
```

#	module	# module	file
0	Q1M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00012.h5
1		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00013.h5
2		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00014.h5
3	Q1M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00012.h5
4		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00013.h5
5		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00014.h5
6	Q1M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00012.h5
7		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00013.h5
8		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00014.h5
9	Q1M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00012.h5
10		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00013.h5
11		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00014.h5
12	Q2M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00012.h5
13		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00013.h5
14		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00014.h5
15	Q2M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00012.h5
16		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00013.h5
17		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00014.h5
18	Q2M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00012.h5
19		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00013.h5
20		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00014.h5
21	Q2M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00012.h5
22		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00013.h5
23		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00014.h5
24	Q3M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00012.h5
25		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00013.h5
26		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00014.h5
27	Q3M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00012.h5
28		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00013.h5
29		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00014.h5
30	Q3M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00012.h5
31		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00013.h5
32		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00014.h5
33	Q3M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00012.h5
34		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00013.h5
35		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00014.h5
36	Q4M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00012.h5
37		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00013.h5
38		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00014.h5
39	Q4M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00012.h5
40		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00013.h5
41		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00014.h5
42	Q4M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00012.h5
43		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00013.h5
44		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00014.h5
45	Q4M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD15-S00012.h5
46		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD15-S00013.h5
47		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD15-S00014.h5

```
A range of 500 pulse indices is selected: from 0 to 500 with a step of 1
Running 32 tasks parallel
Running 16 tasks parallel
```

```
Constants were injected on:
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
```

```
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
```

```
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
```

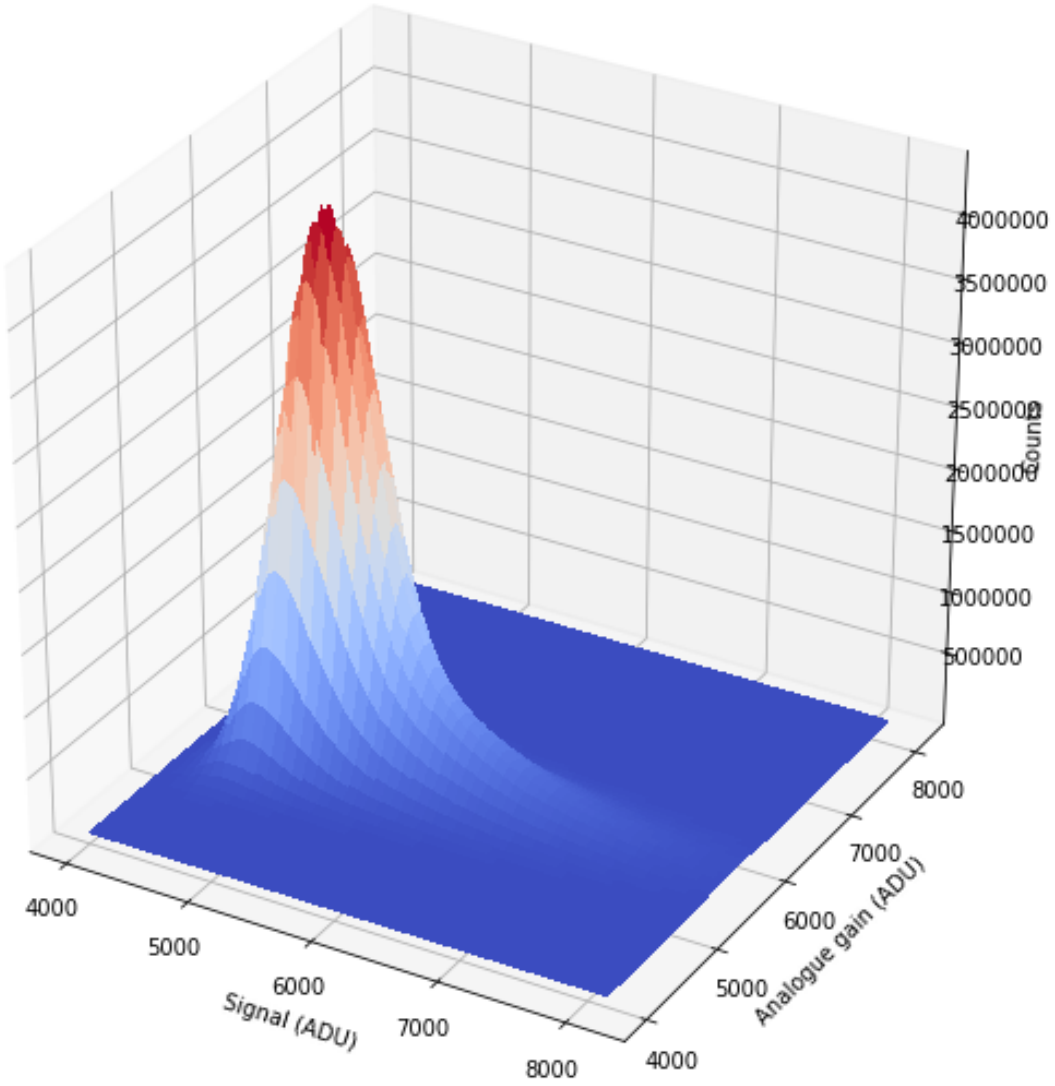
```
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
```

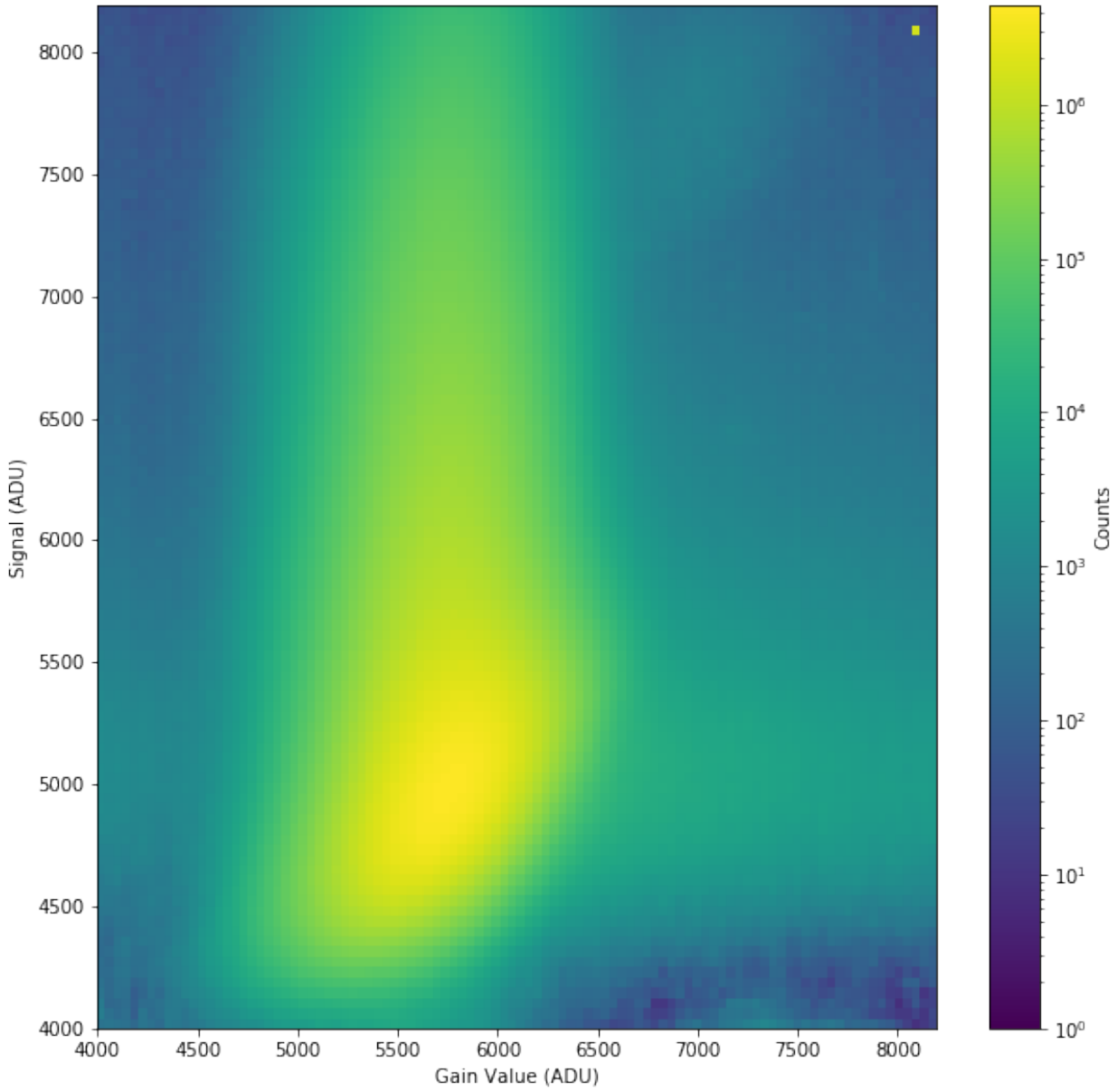
```
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
```

```
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
```

5.2 Signal vs. Analogue Gain

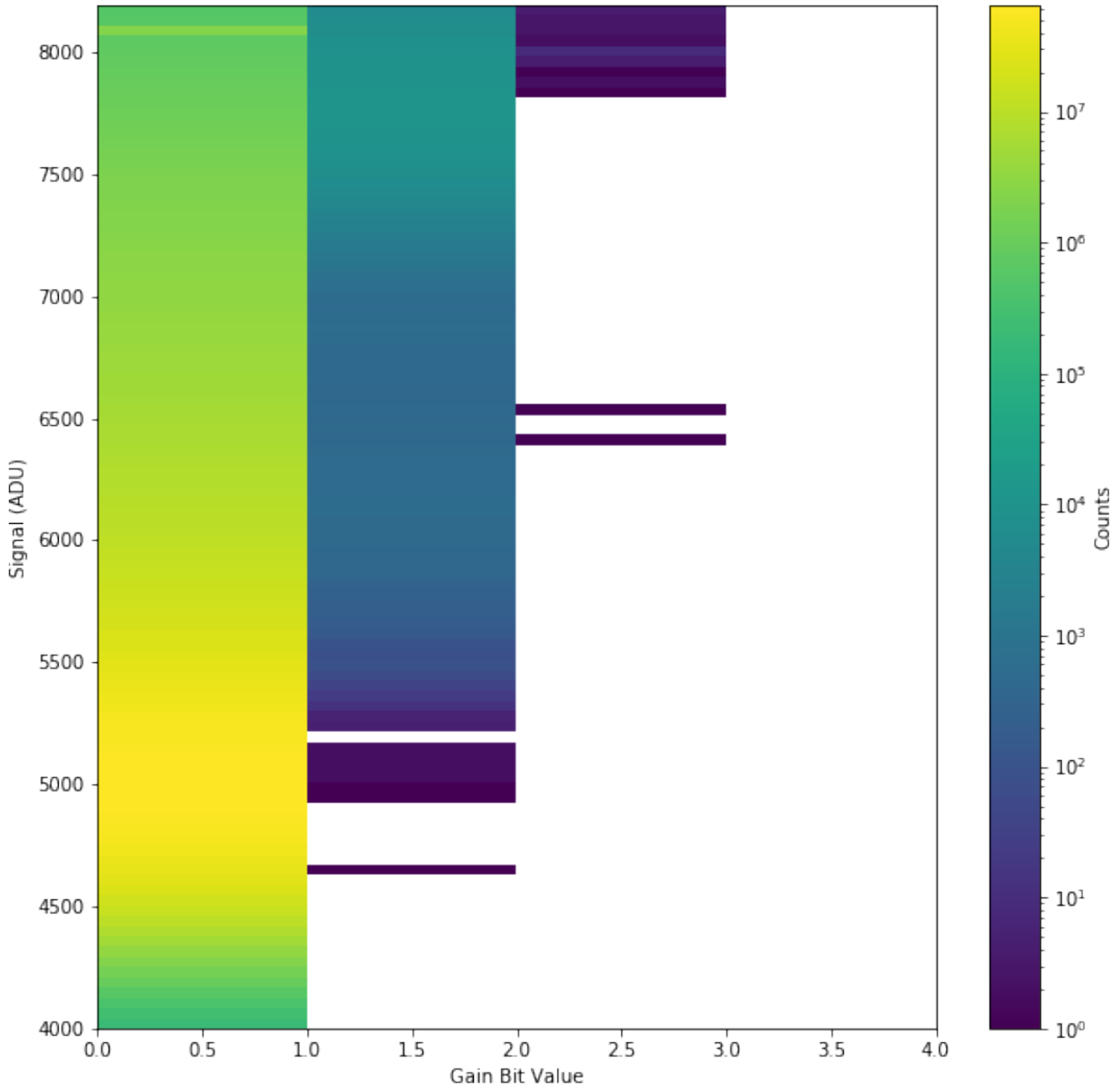
The following plot shows plots signal vs. gain for the first 128 images.

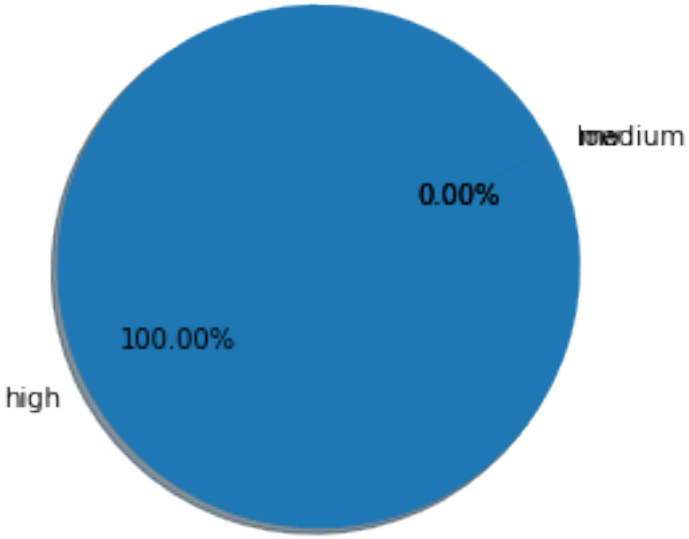

4000000
3500000
3000000
2500000
2000000
1500000
1000000
500000
Count
4000
5000
6000
7000
8000
Signal (ADU)
4000
5000
6000
7000
8000
Analogue gain (ADU)



5.3 Signal vs. Digitized Gain

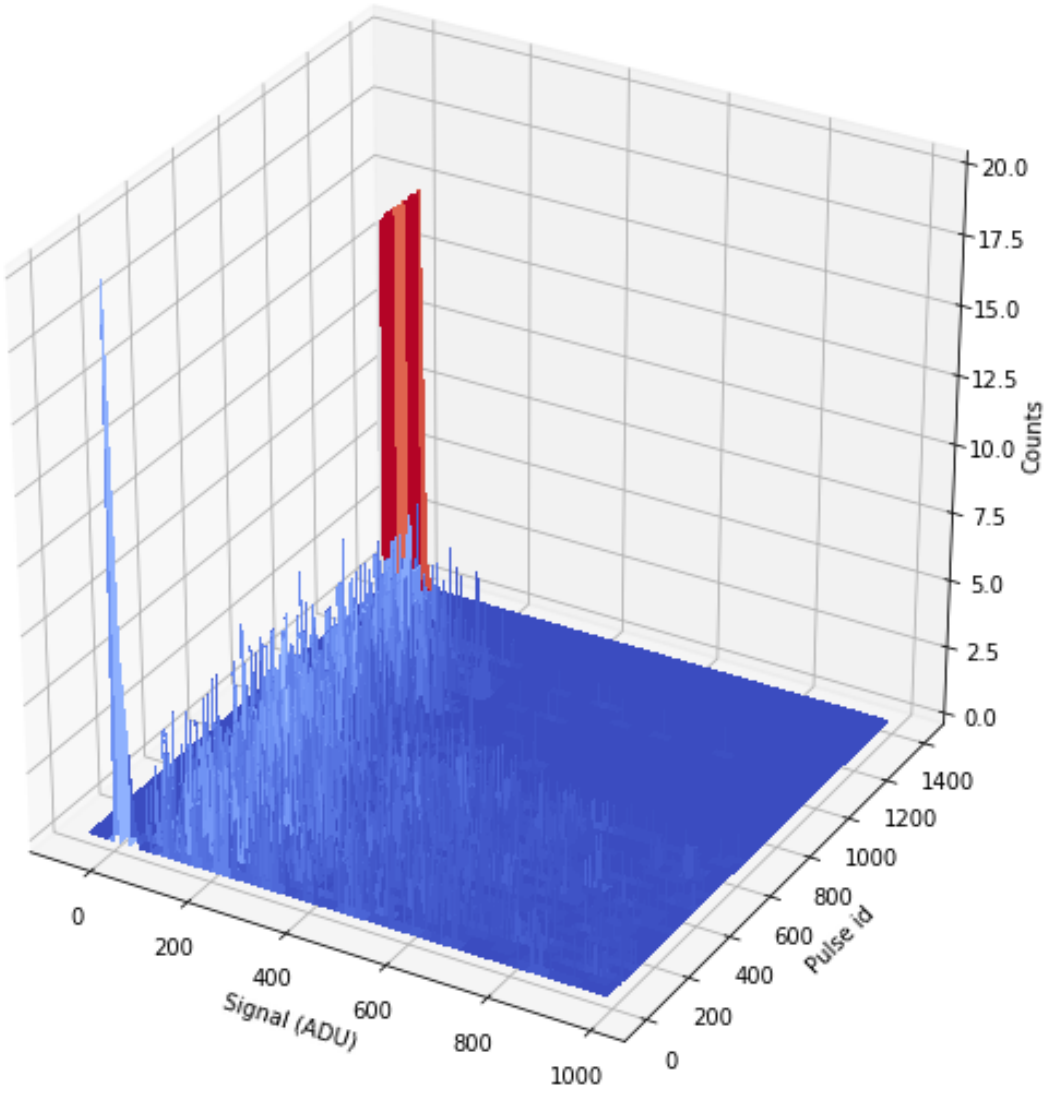
The following plot shows plots signal vs. digitized gain for the first 128 images.

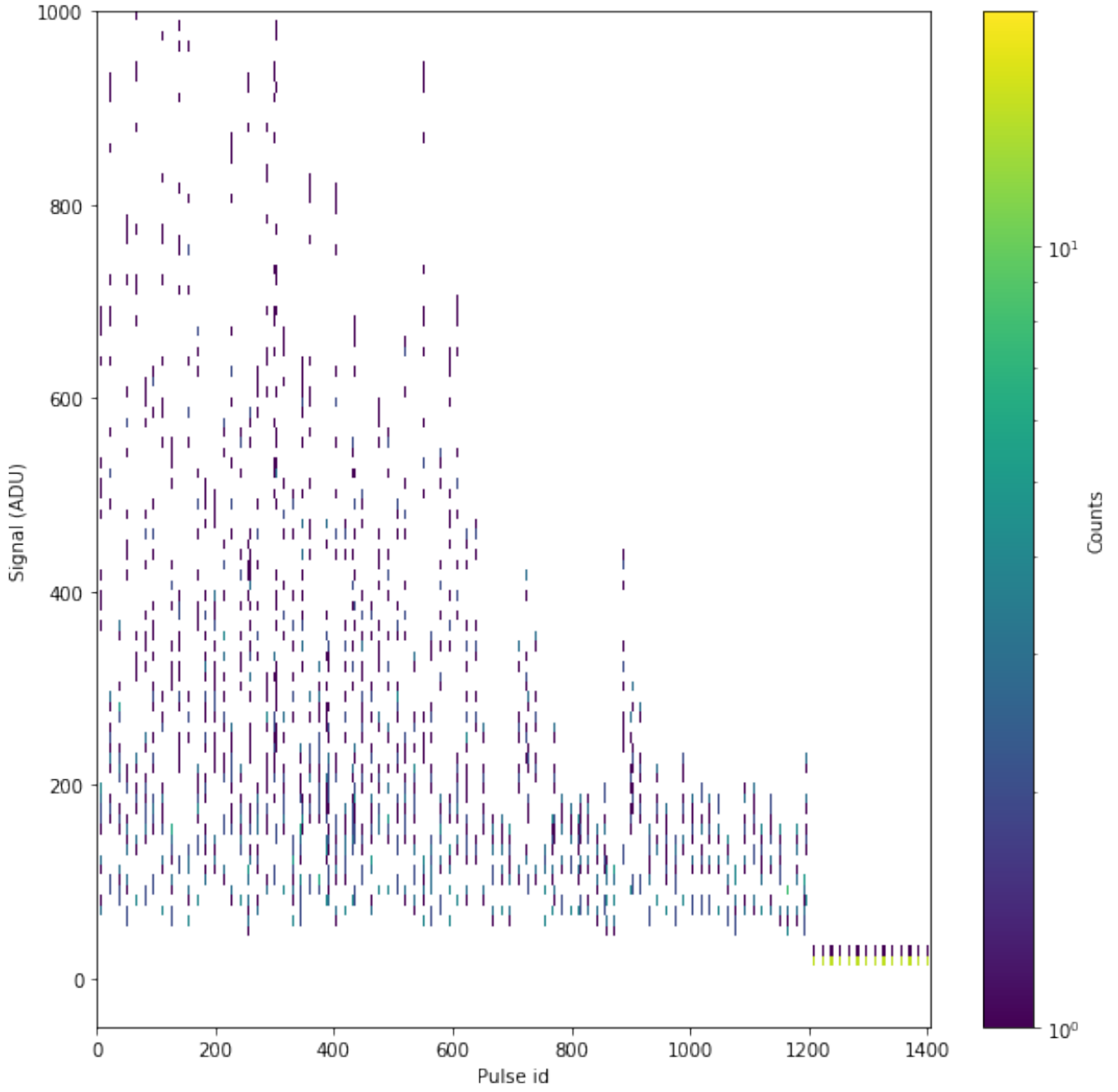

Signal (ADU)
8000
7500
7000
6500
6000
5500
5000
4500
4000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Gain Bit Value
Counts
10^7
10^6
10^5
10^4
10^3
10^2
10^1
10^0

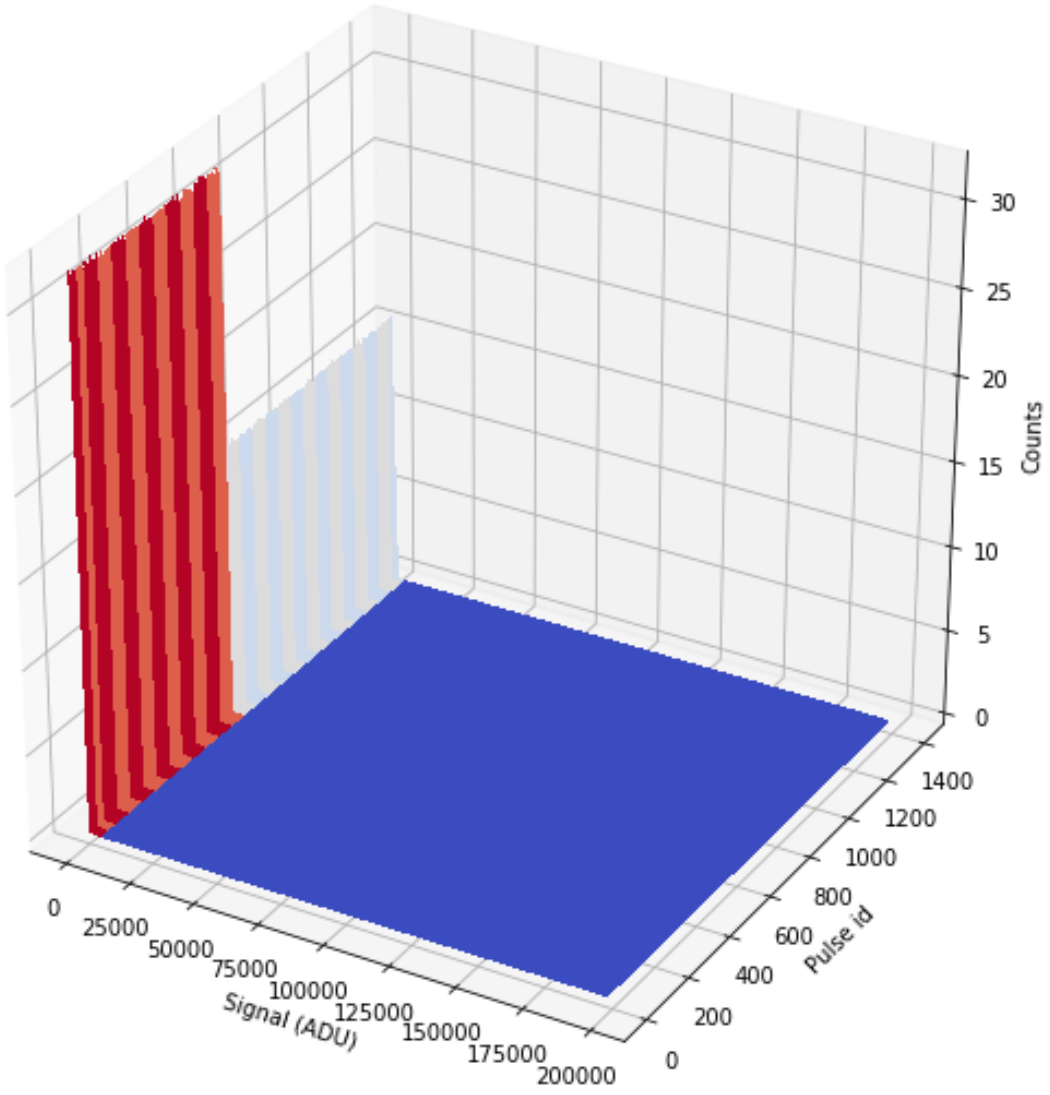


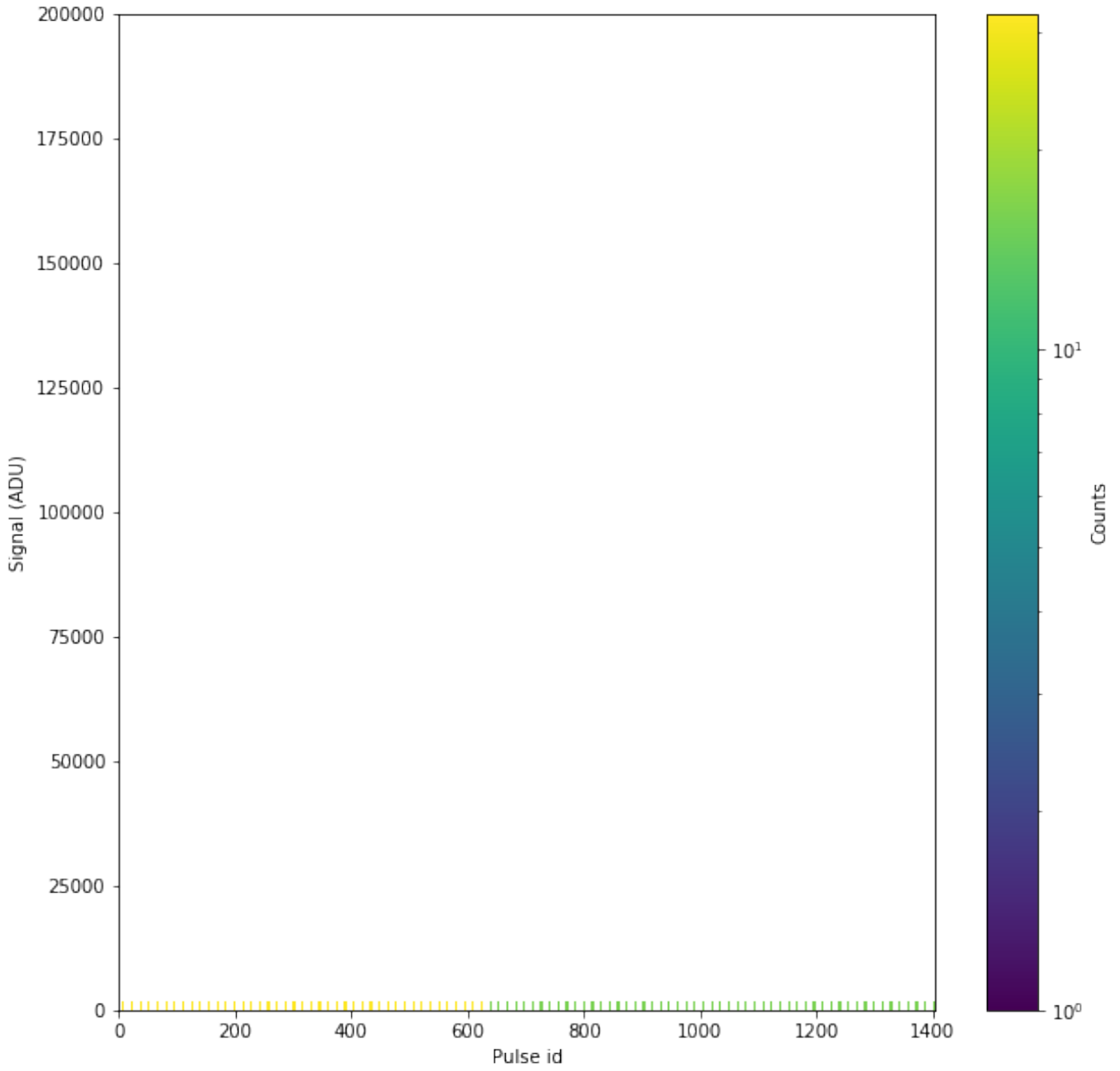
5.4 Mean Intensity per Pulse

The following plots show the mean signal for each pulse in a detailed and expanded intensity region.


20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
Counts
0
200
400
600
800
1000
Signal (ADU)
0
200
400
600
800
1000
1200
1400
Pulse id

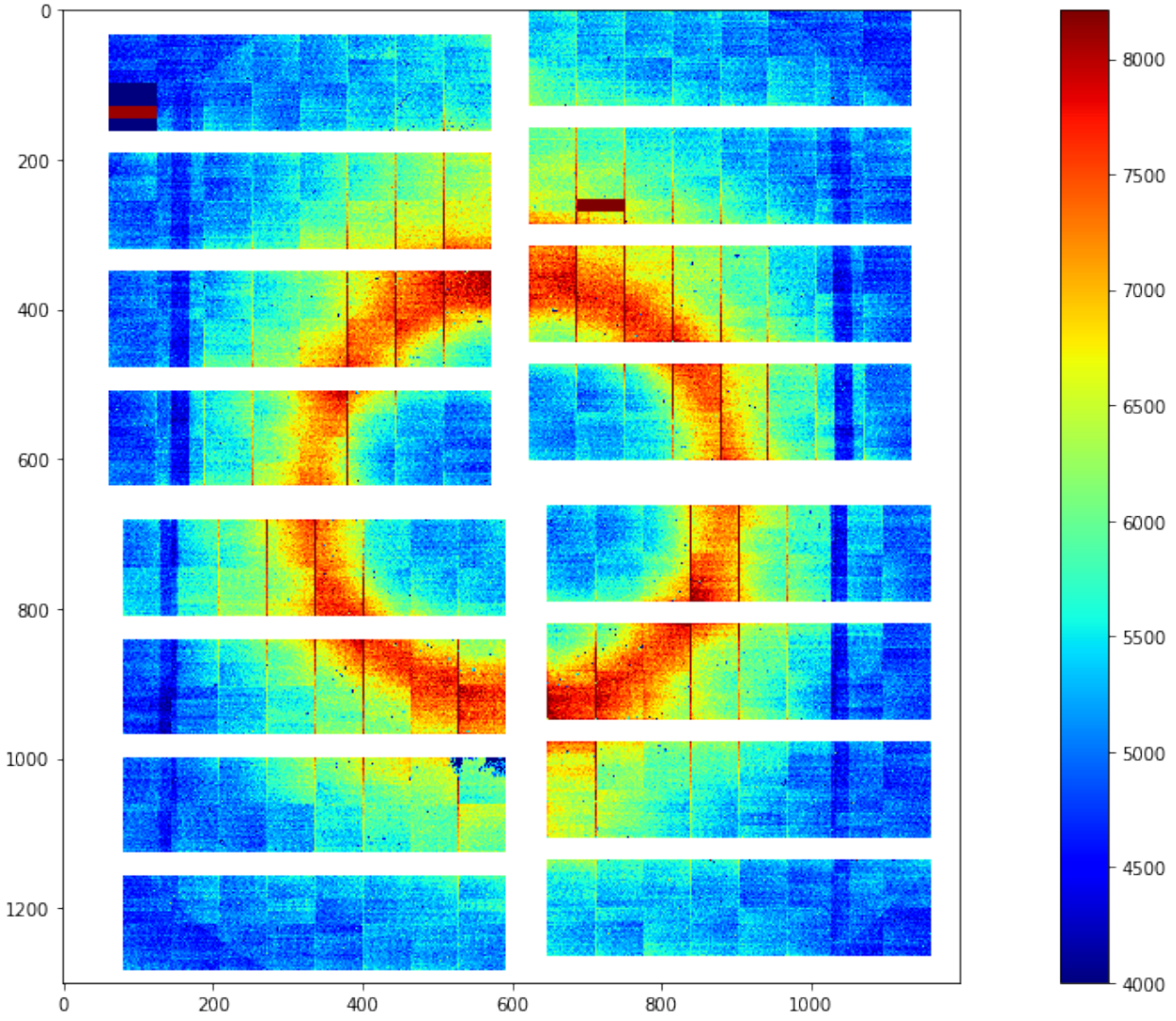

1000
800
600
400
200
0
Signal (ADU)
0
200
400
600
800
1000
1200
1400
Pulse id
10^1
10^0
Counts


Counts
30
25
20
15
10
5
0
Pulse id
1400
1200
1000
800
600
400
200
0
Signal (ADU)
0
25000
50000
75000
100000
125000
150000
175000
200000



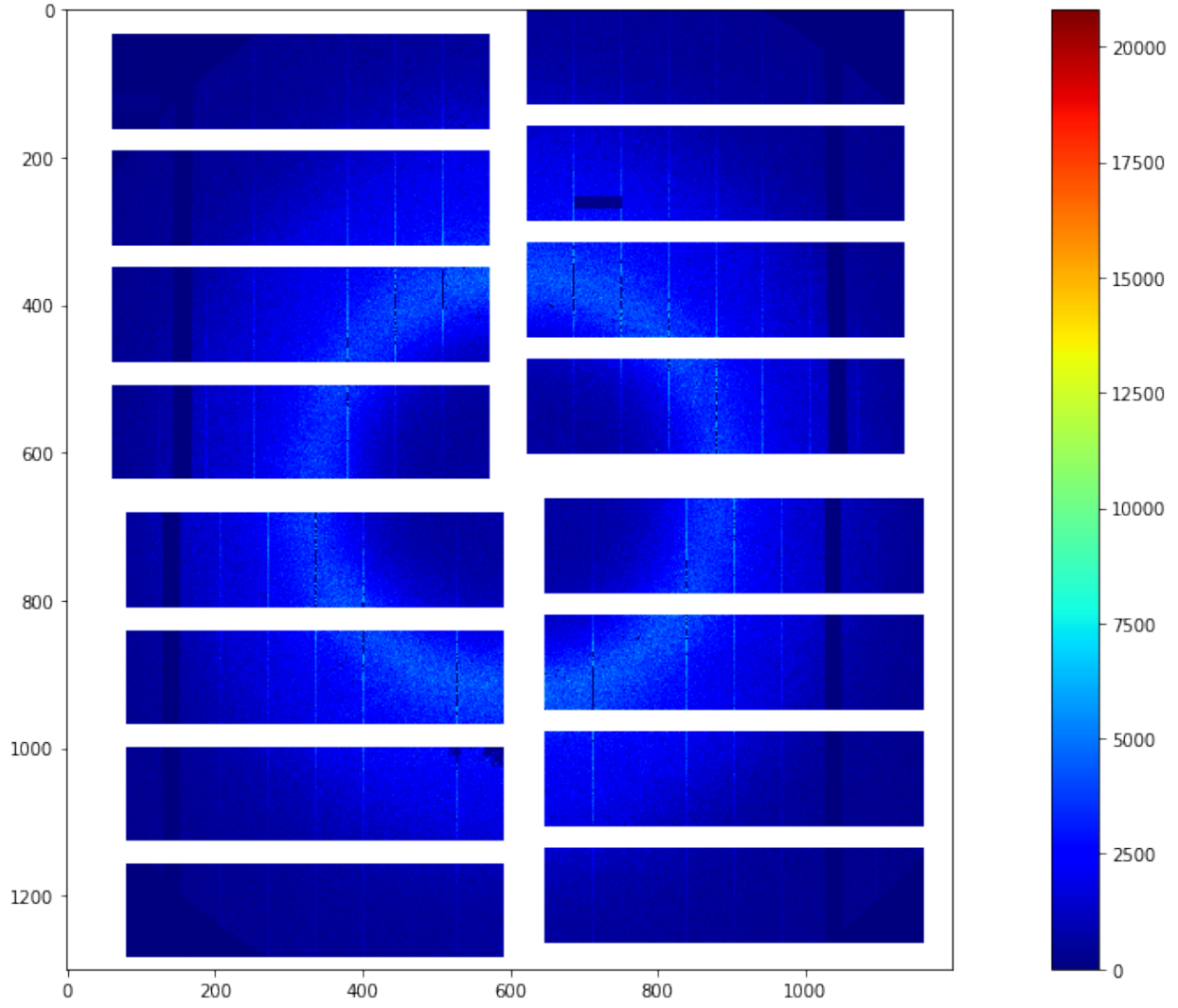
5.4.1 Mean RAW Preview

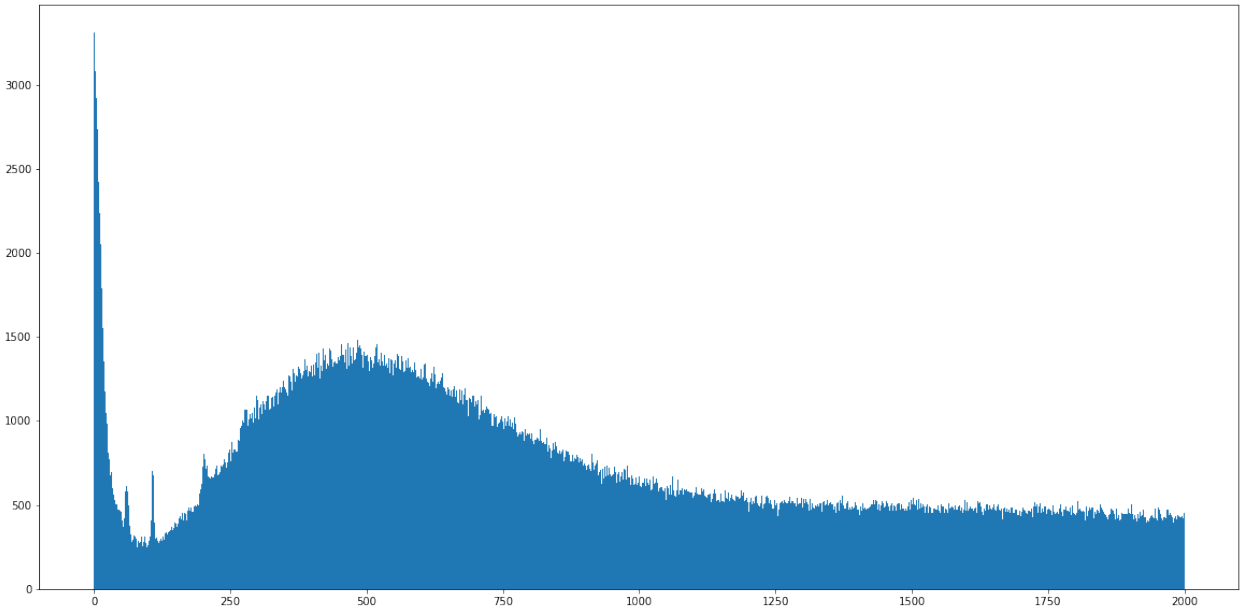
The per pixel mean of the first 128 images of the RAW data



5.4.2 Single Shot Preview

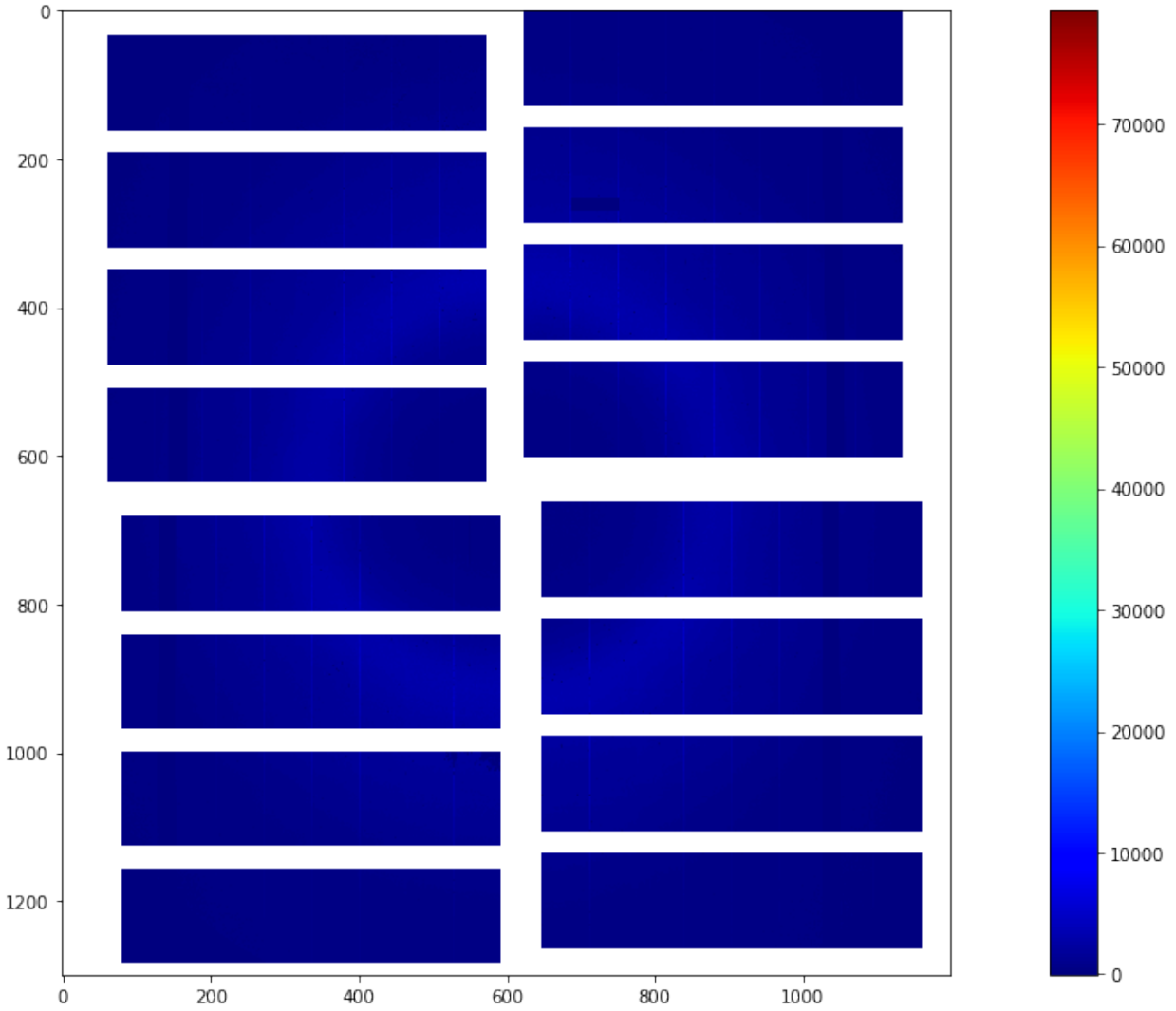
A single shot image from cell 12 of the first train

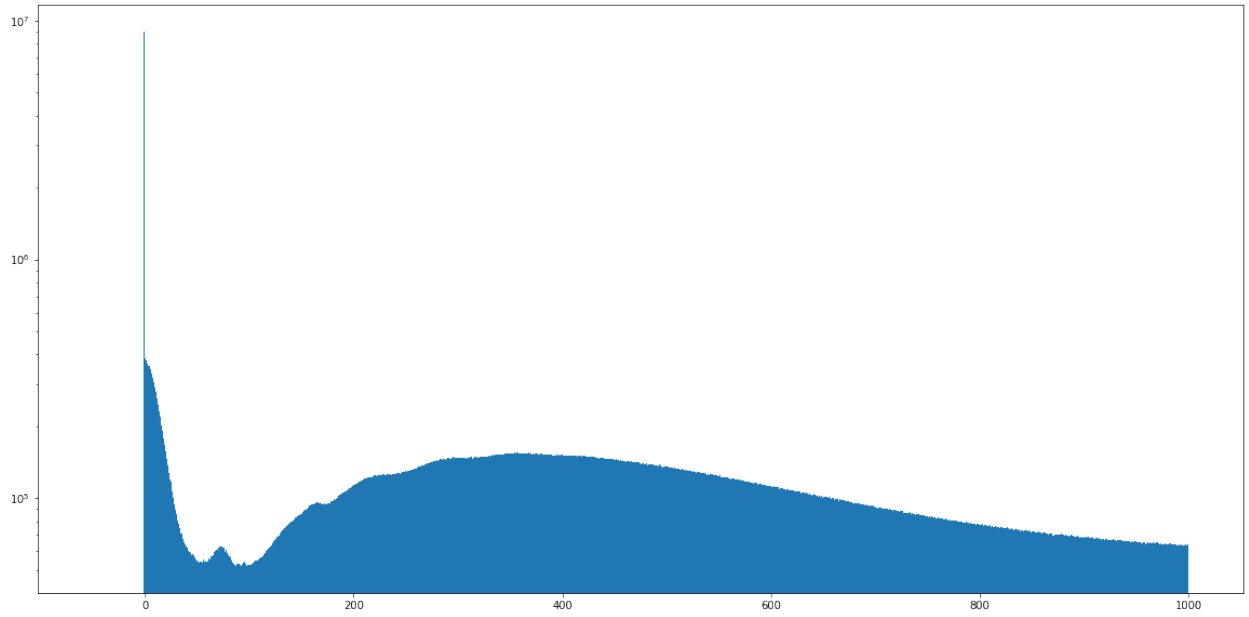

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
20000
17500
15000
12500
10000
7500
5000
2500
0


3000
2500
2000
1500
1000
500
0
0
250
500
750
1000
1250
1500
1750
2000

5.4.3 Mean CORRECTED Preview

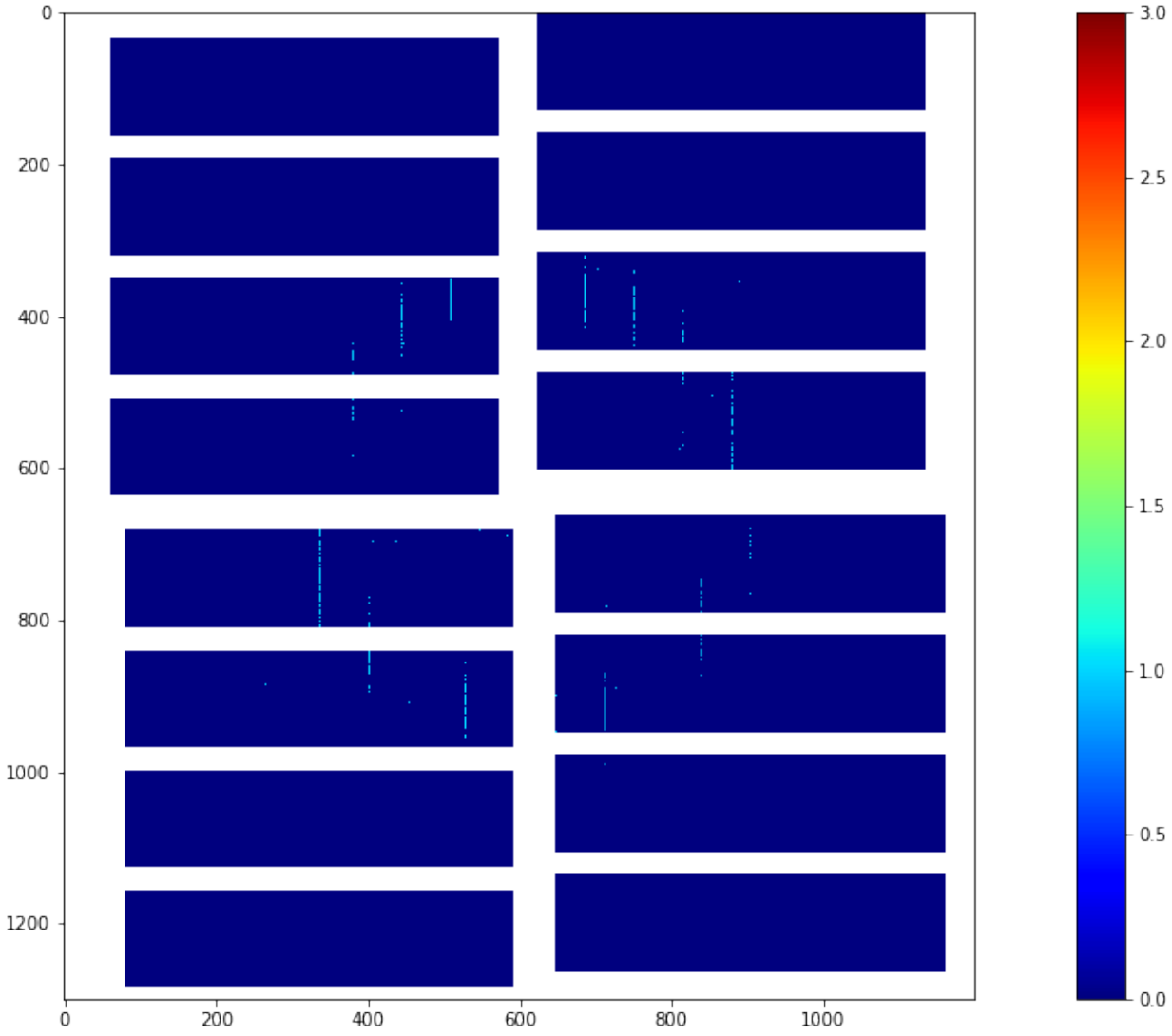
The per pixel mean of the first 128 images of the CORRECTED data





5.4.4 Maximum GAIN Preview

The per pixel maximum of the first 128 images of the digitized GAIN data


0
200
400
600
800
1000
1200
0
200
400
600
800
1000
3.0
2.5
2.0
1.5
1.0
0.5
0.0

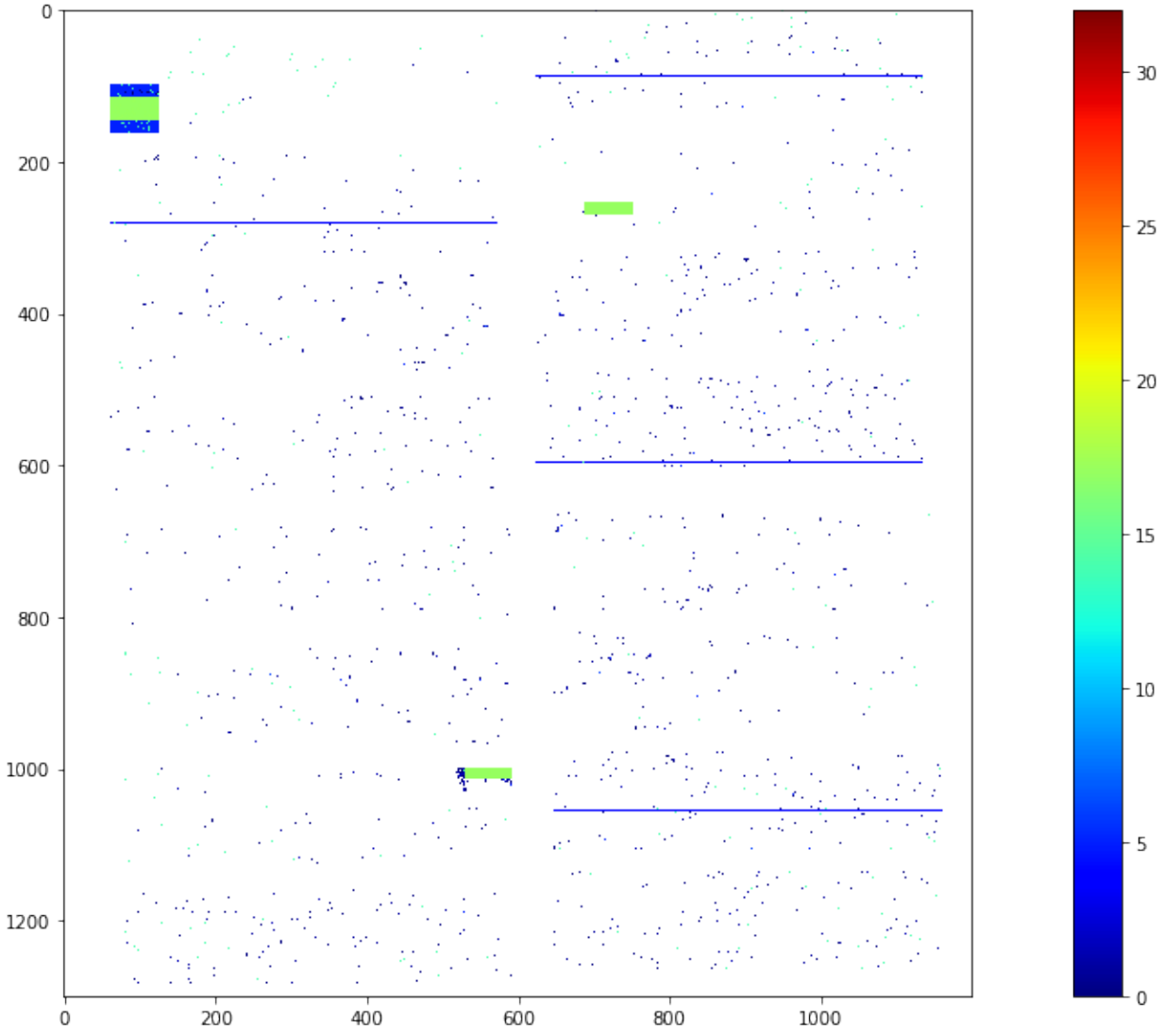
5.5 Bad Pixels

The mask contains dedicated entries for all pixels and memory cells as well as all three gains stages. Each mask entry is encoded in 32 bits as:

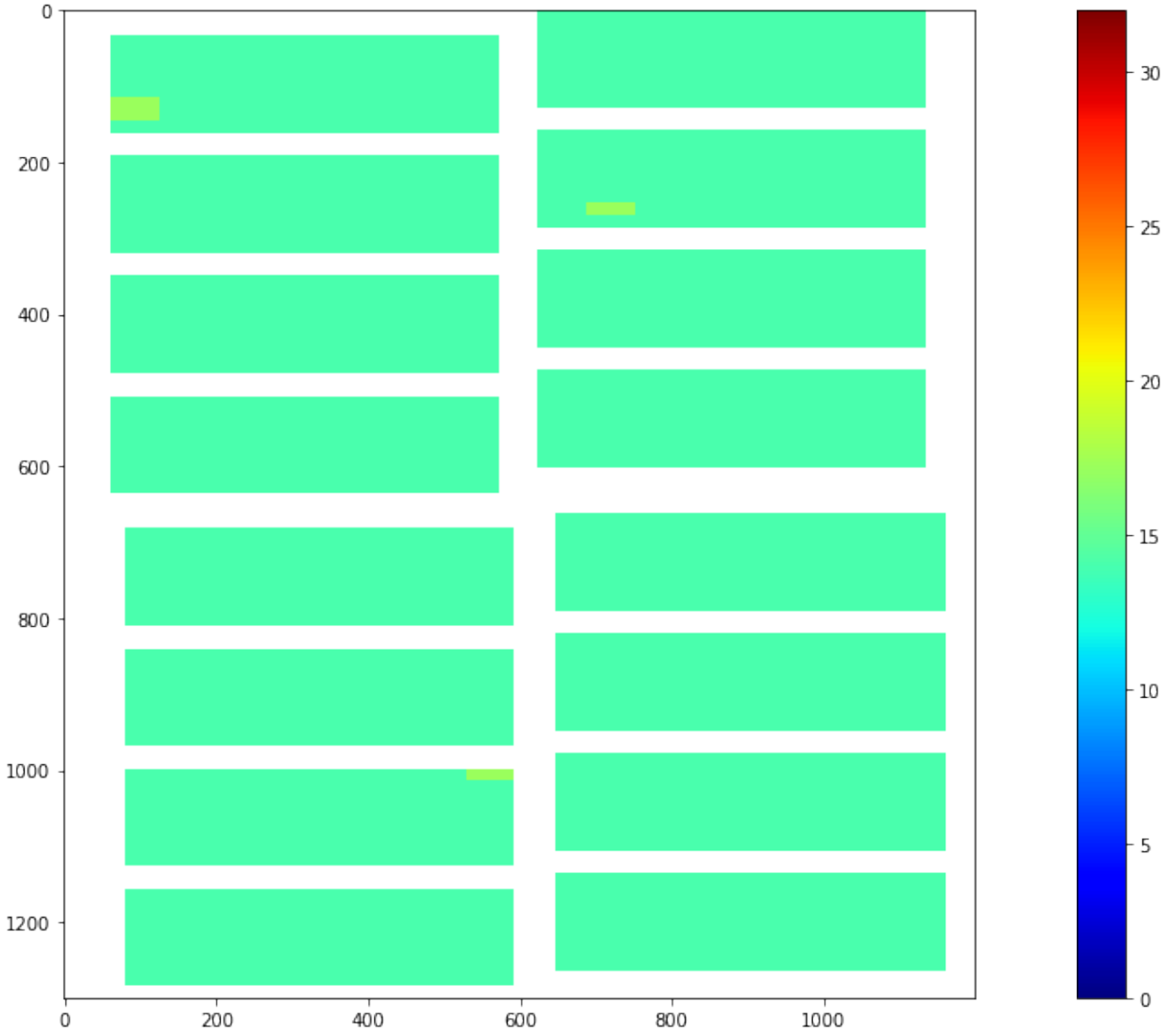
Bad pixel type	Bit mask
OFFSET_OUT_OF_THRESHOLD	0000000000000001
NOISE_OUT_OF_THRESHOLD	0000000000000010
OFFSET_NOISE_EVAL_ERROR	0000000000000100
NO_DARK_DATA	0000000000001000
CI_GAIN_OF_OF_THRESHOLD	0000000000010000
CI_LINEAR_DEVIATION	0000000000100000
CI_EVAL_ERROR	0000000001000000
FF_GAIN_EVAL_ERROR	0000000010000000
FF_GAIN_DEVIATION	0000000100000000
FF_NO_ENTRIES	0000001000000000
CI2_EVAL_ERROR	0000010000000000
VALUE_IS_NAN	0000100000000000
VALUE_OUT_OF_RANGE	0001000000000000
GAIN_THRESHOLDING_ERROR	0010000000000000
DATA_STD_IS_ZERO	0100000000000000
ASIC_STD_BELOW_NOISE	1000000000000000
INTERPOLATED	10000000000000000
NOISY_ADC	100000000000000000
OVERSCAN	1000000000000000000
NON_SENSITIVE	10000000000000000000
NON_LIN_RESPONSE_REGION	100000000000000000000

5.5.1 Single Shot Bad Pixels

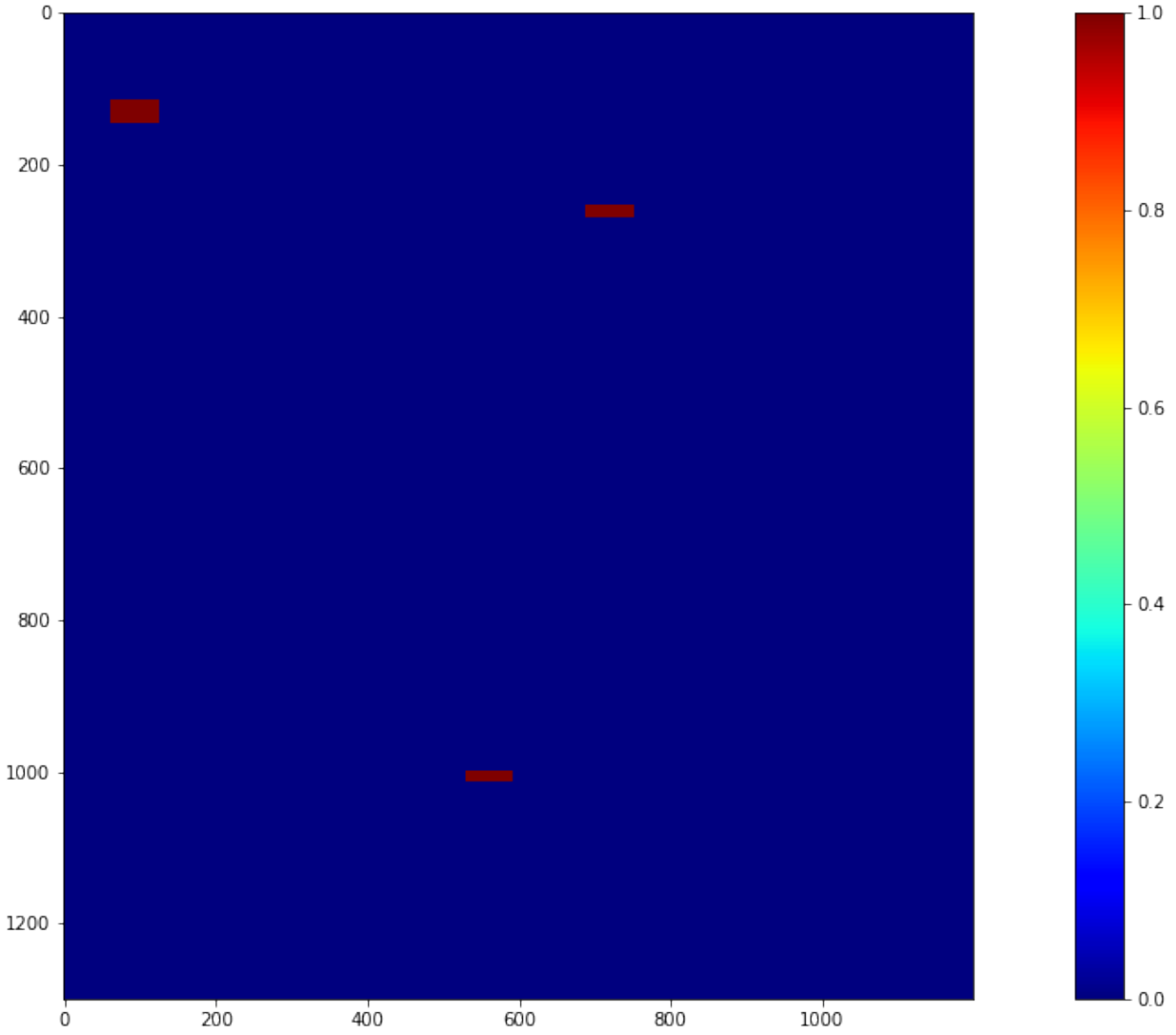
A single shot bad pixel map from cell 4 of the first train

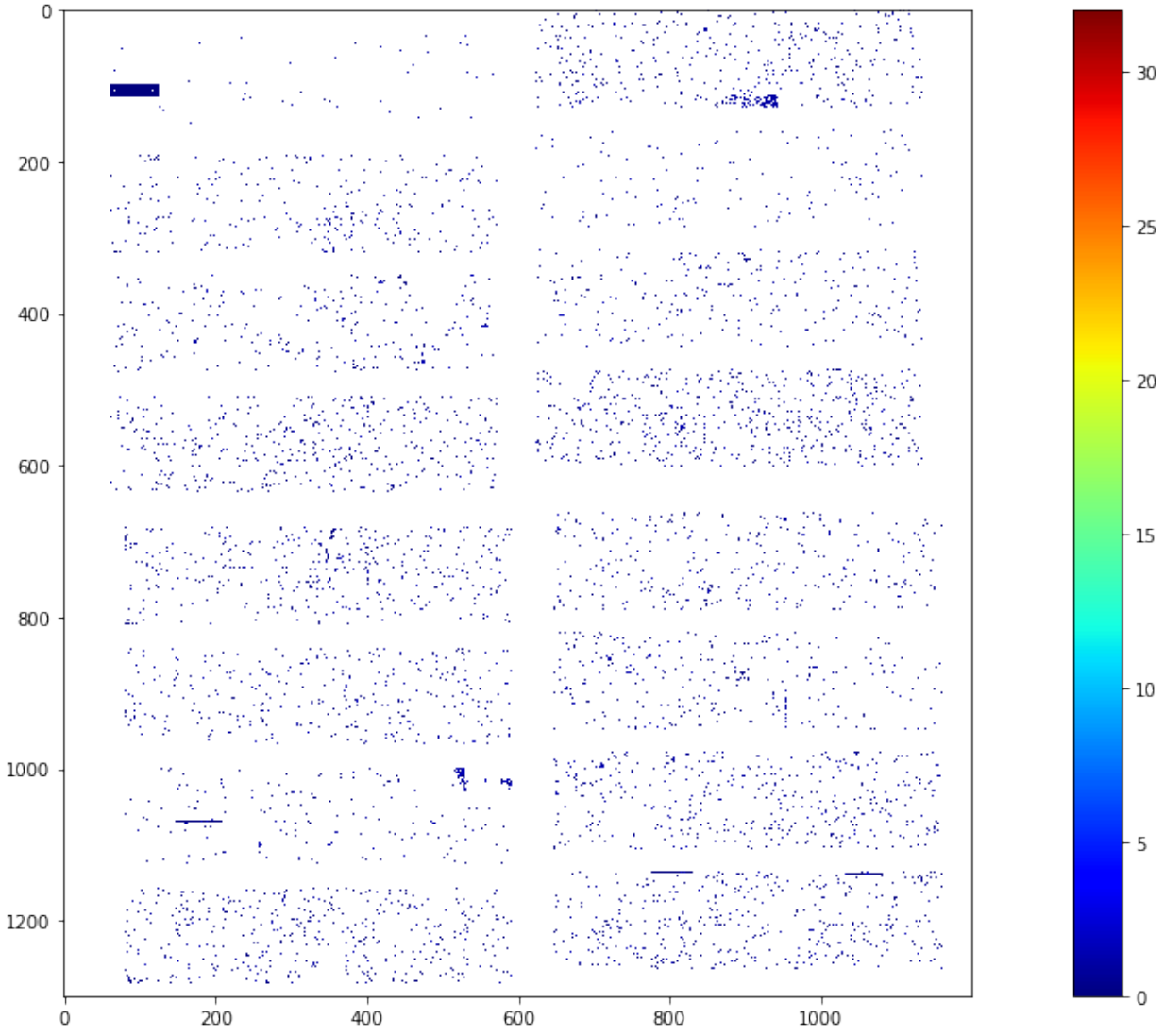

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

5.5.2 Full Train Bad Pixels



5.5.3 Full Train Bad Pixels - Only Dark Char. Related




0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

CHAPTER

SIX

AGIPD OFFLINE CORRECTION, SEQUENCES = 15-17

```
Connecting to profile slurm_prof_9b576fdf-f5a8-492b-be1a-8769350b548a_15-17
Using 2020-03-08 06:47:13+01:00 as creation time
Working in IL Mode: False. Actual cells in use are: 0
Outputting to /gpfs/exfel/d/proc/SPB/202030/p900119/r0084
Detector in use is SPB_DET_AGIPD1M-1
```

```
Gain setting: 0
```

6.1 Processed Files

```
Processing a total of 48 sequence files in chunks of 32
```

#	module	# module	file
0	Q1M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00015.h5
1		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00016.h5
2		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00017.h5
3	Q1M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00015.h5
4		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00016.h5
5		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00017.h5
6	Q1M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00015.h5
7		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00016.h5
8		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00017.h5
9	Q1M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00015.h5
10		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00016.h5
11		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00017.h5
12	Q2M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00015.h5
13		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00016.h5
14		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00017.h5
15	Q2M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00015.h5
16		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00016.h5
17		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00017.h5
18	Q2M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00015.h5
19		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00016.h5
20		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00017.h5
21	Q2M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00015.h5
22		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00016.h5
23		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00017.h5
24	Q3M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00015.h5
25		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00016.h5
26		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00017.h5
27	Q3M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00015.h5
28		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00016.h5
29		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00017.h5
30	Q3M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00015.h5
31		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00016.h5
32		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00017.h5
33	Q3M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00015.h5
34		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00016.h5
35		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00017.h5
36	Q4M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00015.h5
37		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00016.h5
38		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00017.h5
39	Q4M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00015.h5
40		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00016.h5
41		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00017.h5
42	Q4M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00015.h5
43		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00016.h5
44		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00017.h5
45	Q4M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD15-S00015.h5
46		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD15-S00016.h5
47		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD15-S00017.h5

```
A range of 500 pulse indices is selected: from 0 to 500 with a step of 1
Running 32 tasks parallel
Running 16 tasks parallel
```

```
Constants were injected on:
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
```

```
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
```

```
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
```

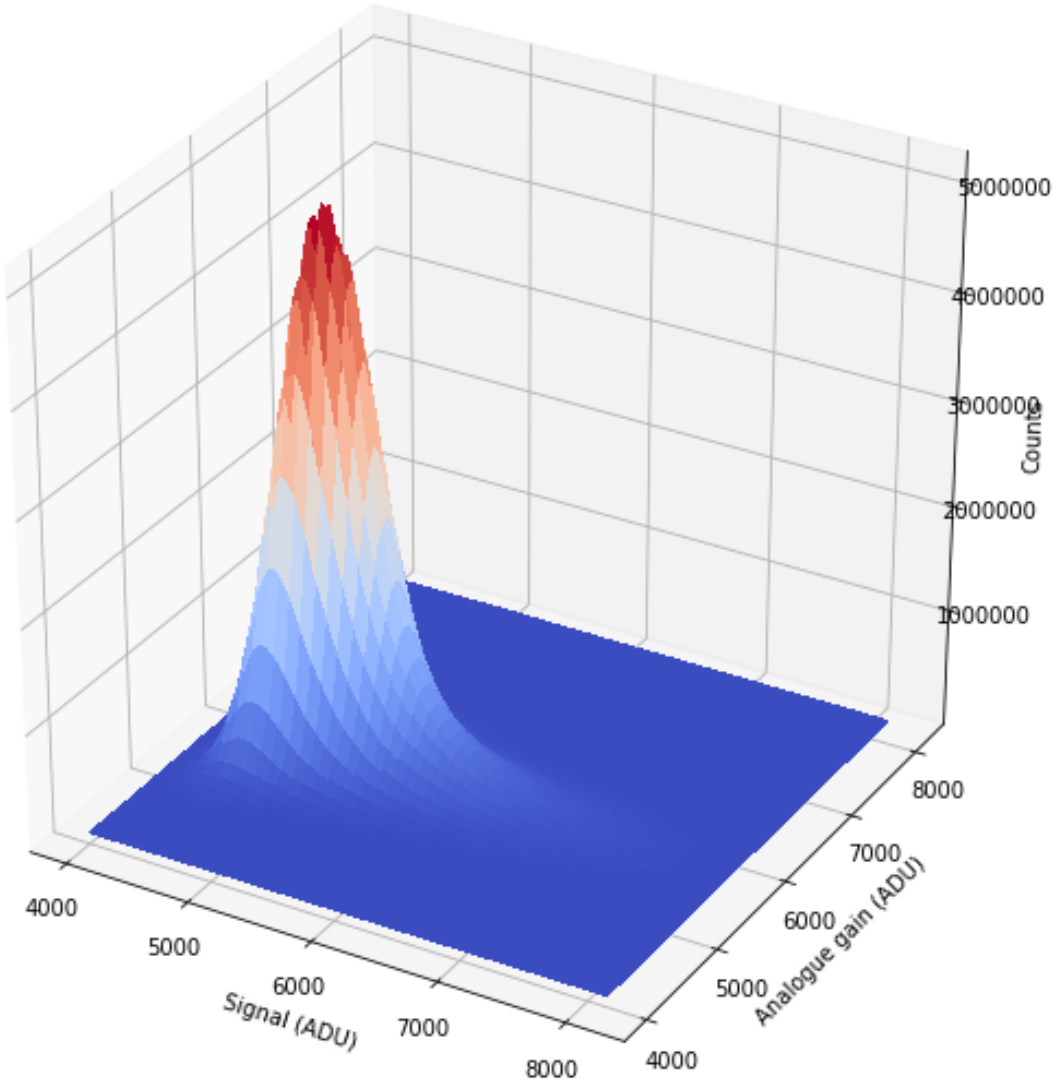
```
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
```

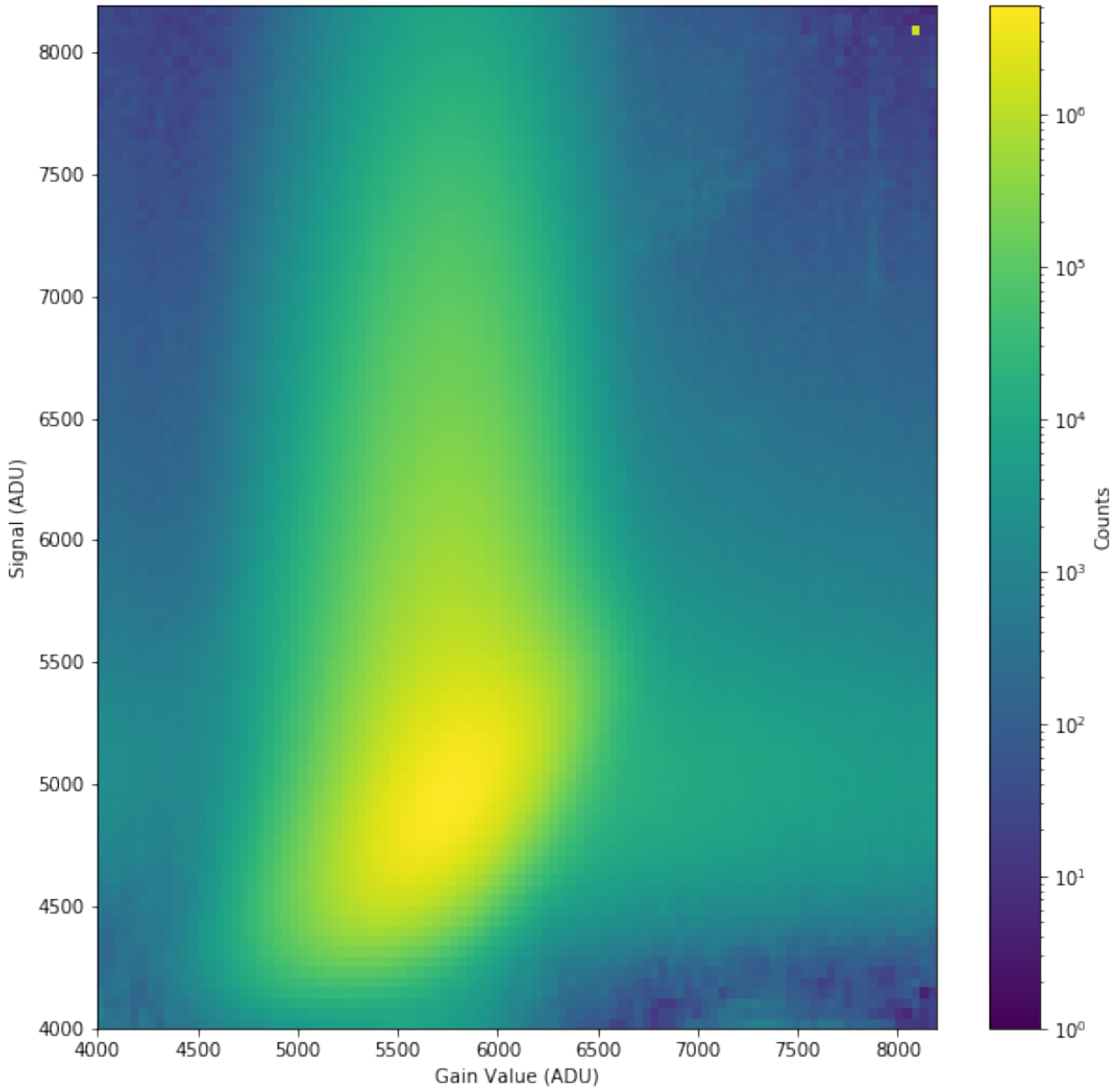
```
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
```

```
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
```

6.2 Signal vs. Analogue Gain

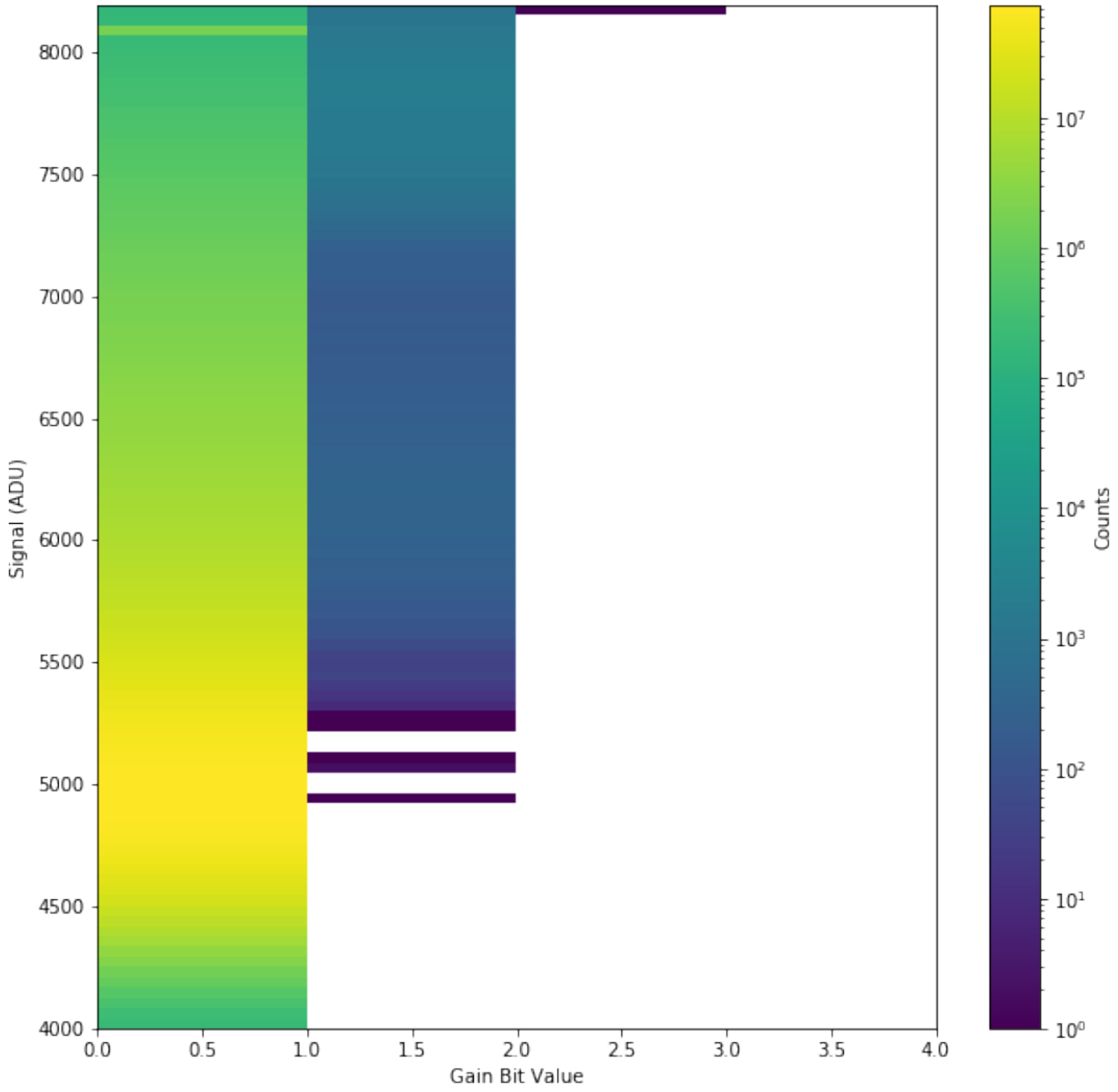
The following plot shows plots signal vs. gain for the first 128 images.

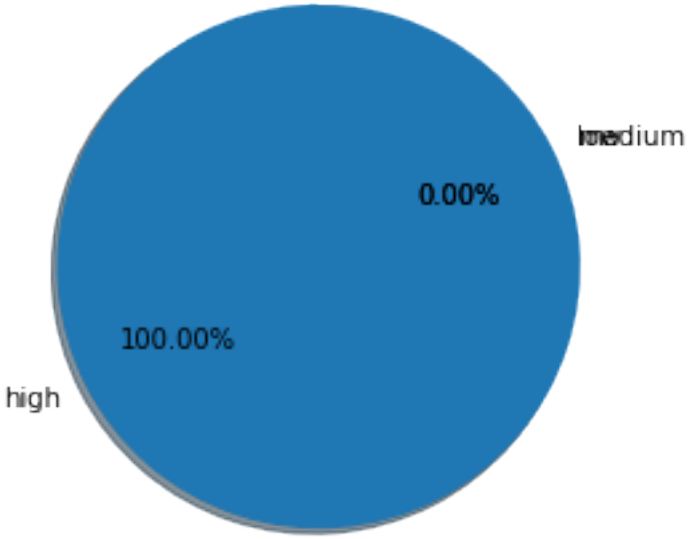

5000000
4000000
3000000
2000000
1000000
Counts
4000
5000
6000
7000
8000
Signal (ADU)
4000
5000
6000
7000
8000
Analogue gain (ADU)



6.3 Signal vs. Digitized Gain

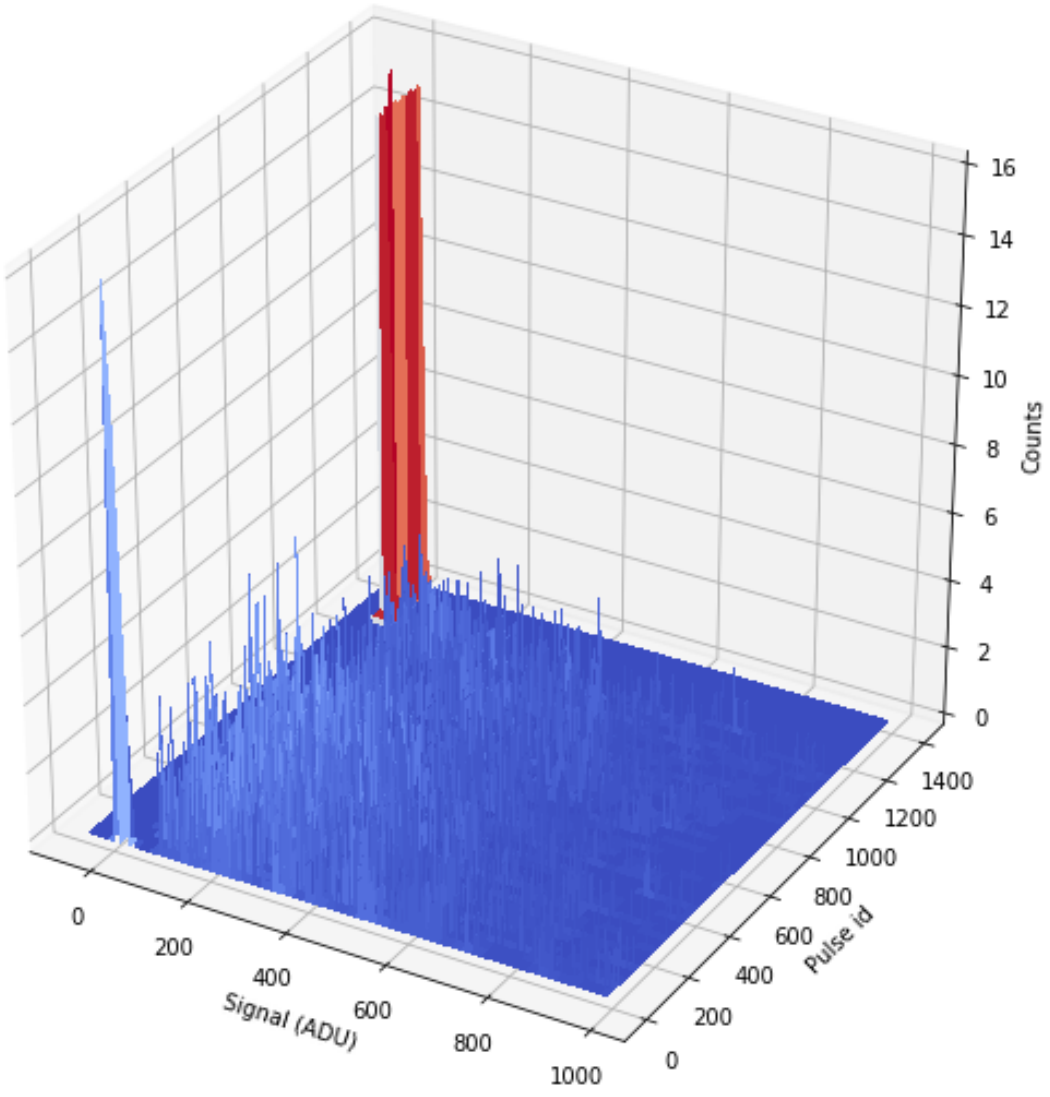
The following plot shows plots signal vs. digitized gain for the first 128 images.

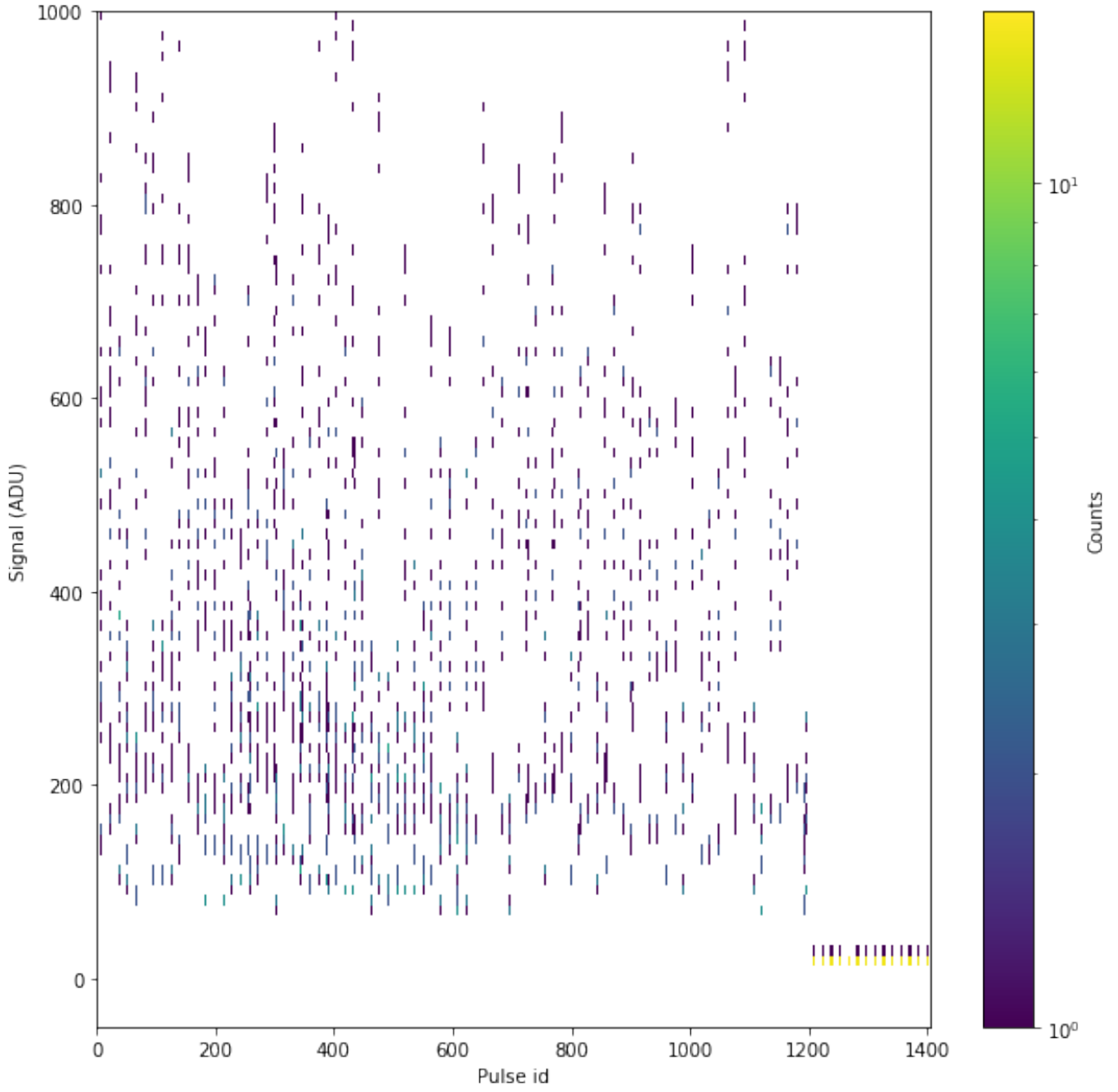

Signal (ADU)
8000
7500
7000
6500
6000
5500
5000
4500
4000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Gain Bit Value
Counts
10^7
10^6
10^5
10^4
10^3
10^2
10^1
10^0

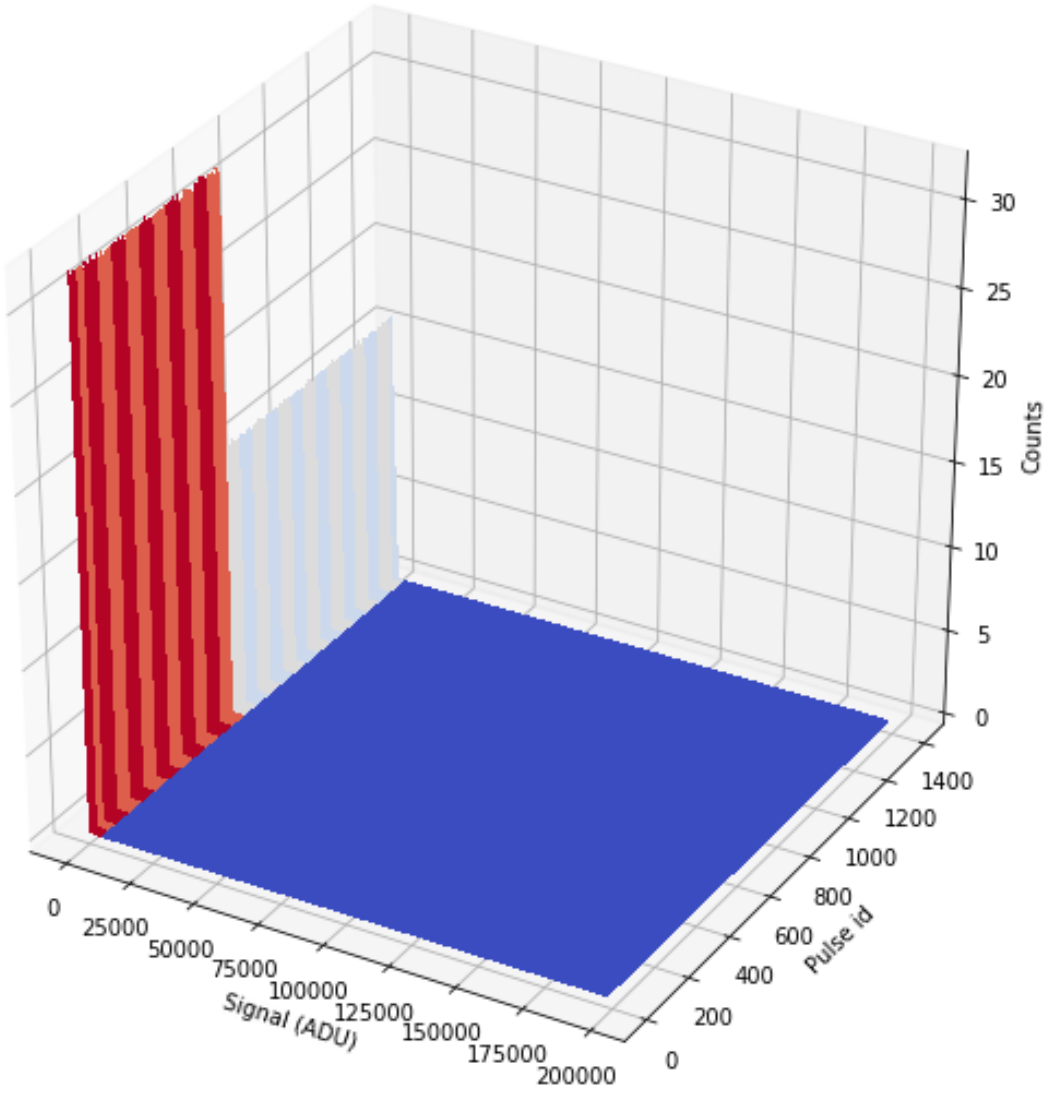


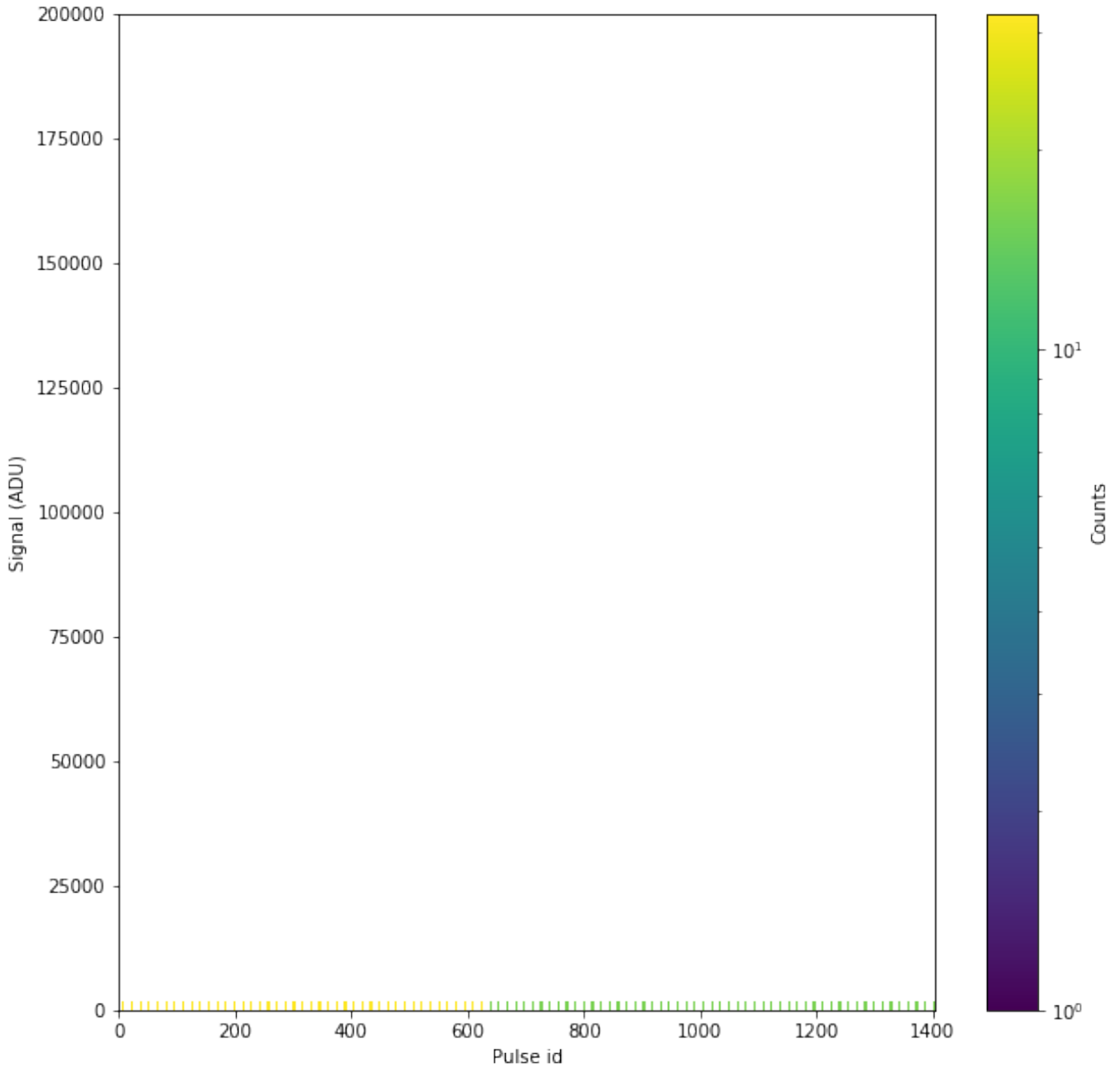
6.4 Mean Intensity per Pulse

The following plots show the mean signal for each pulse in a detailed and expanded intensity region.


Counts
0
2
4
6
8
10
12
14
16
Pulse id
0
200
400
600
800
1000
1200
1400
Signal (ADU)
0
200
400
600
800
1000

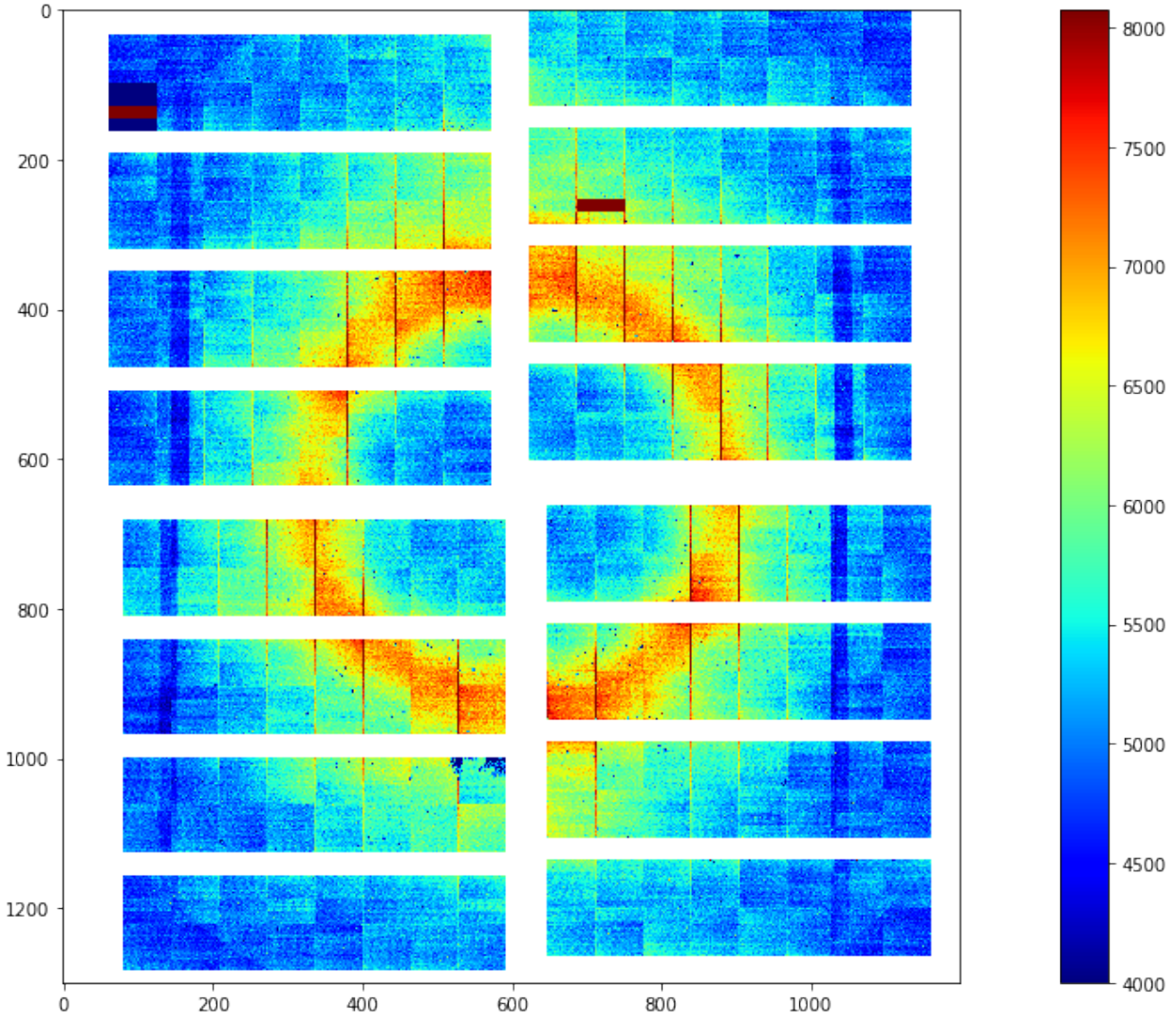

1000
800
600
400
200
0
Signal (ADU)
0
200
400
600
800
1000
1200
1400
Pulse id
10^1
10^0
Counts


30
25
20
15
10
5
0
Counts
1400
1200
1000
800
600
400
200
0
Pulse id
0
25000
50000
75000
100000
125000
150000
175000
200000
Signal (ADU)



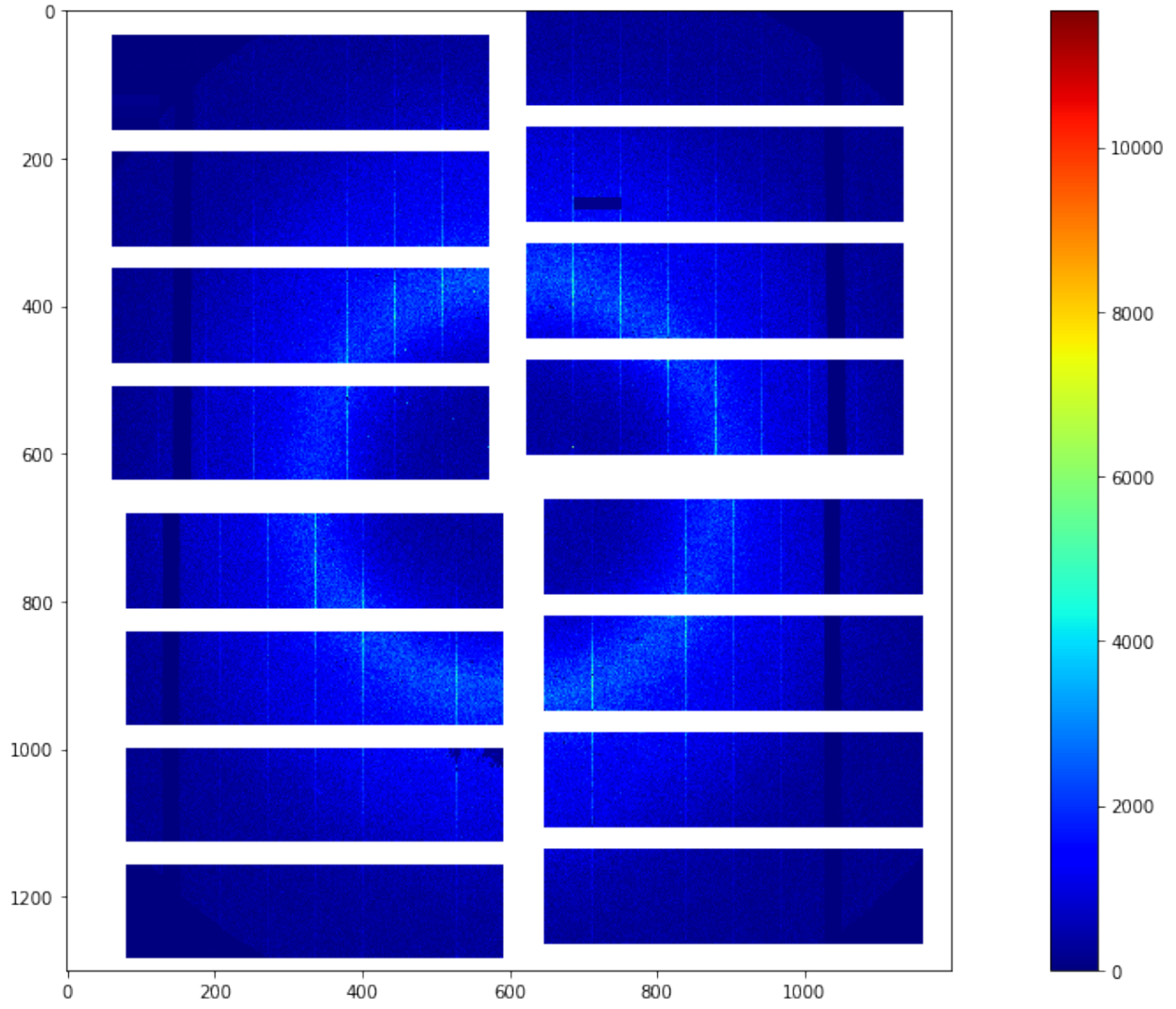
6.4.1 Mean RAW Preview

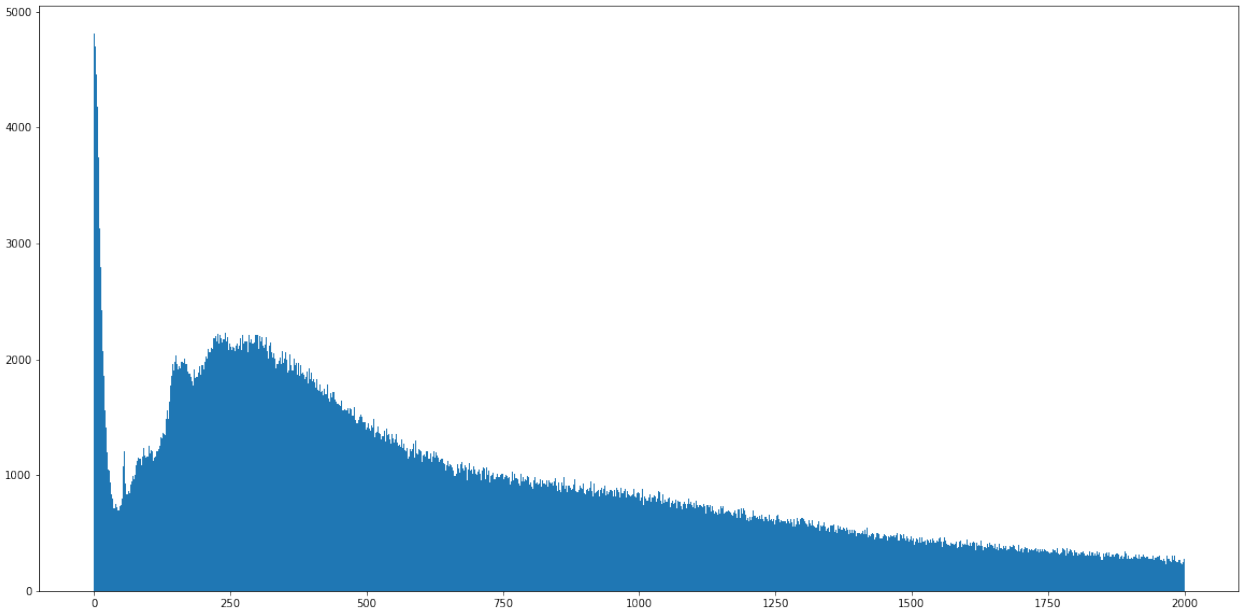
The per pixel mean of the first 128 images of the RAW data



6.4.2 Single Shot Preview

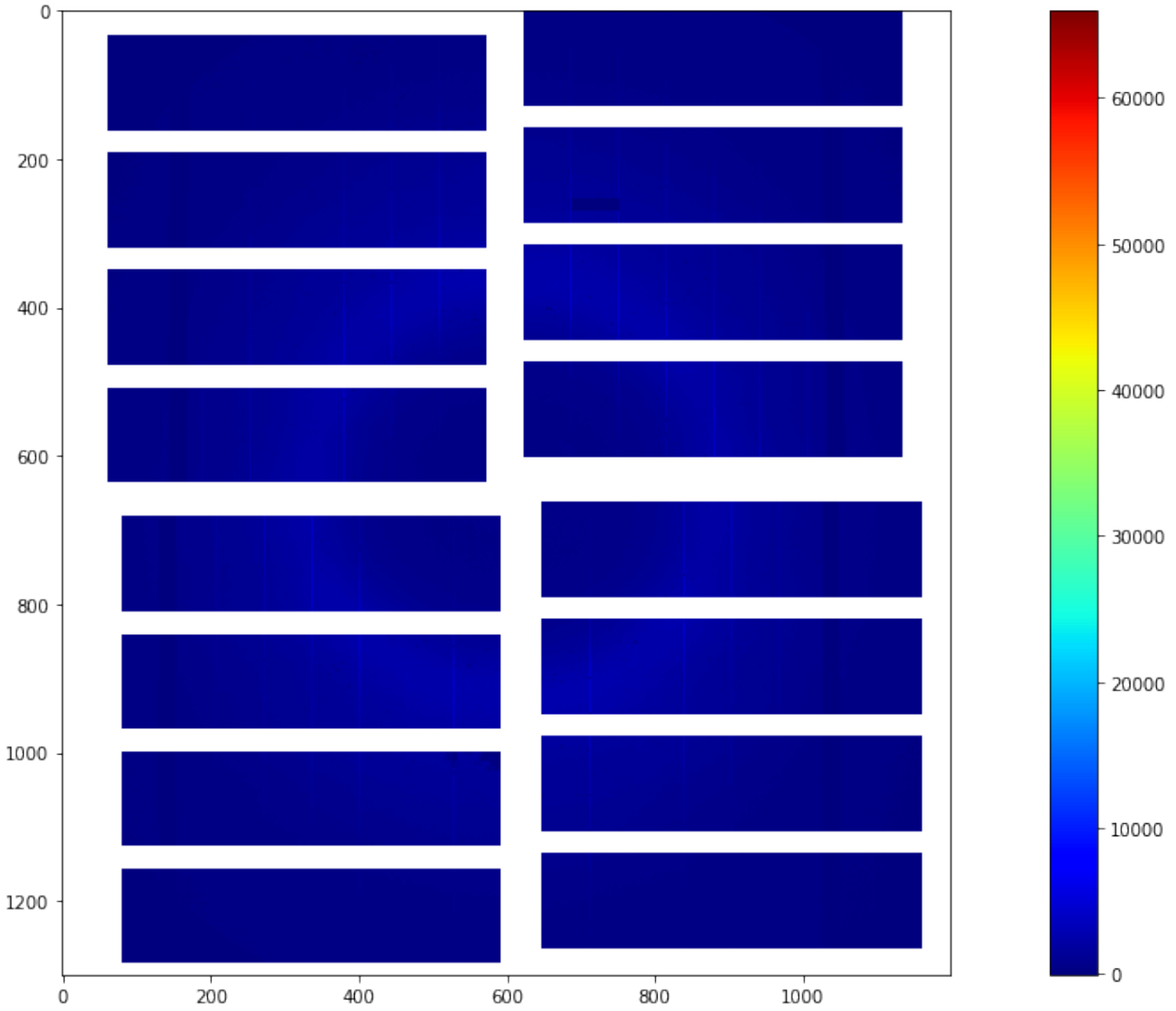
A single shot image from cell 12 of the first train

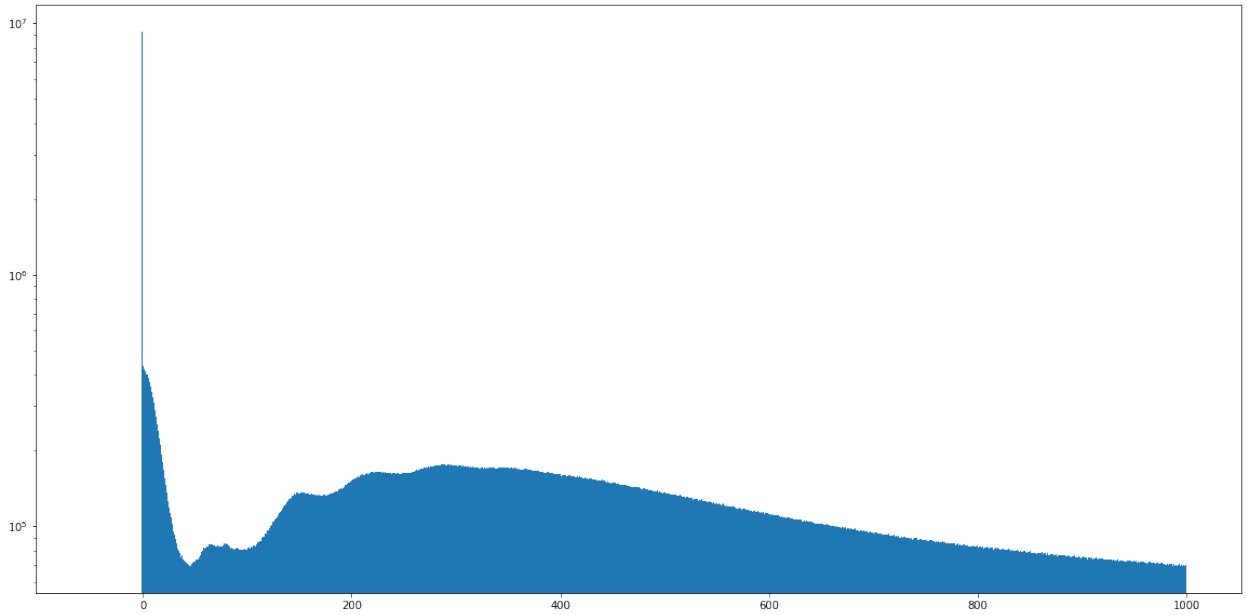

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
10000
8000
6000
4000
2000
0


5000
4000
3000
2000
1000
0
0
250
500
750
1000
1250
1500
1750
2000

6.4.3 Mean CORRECTED Preview

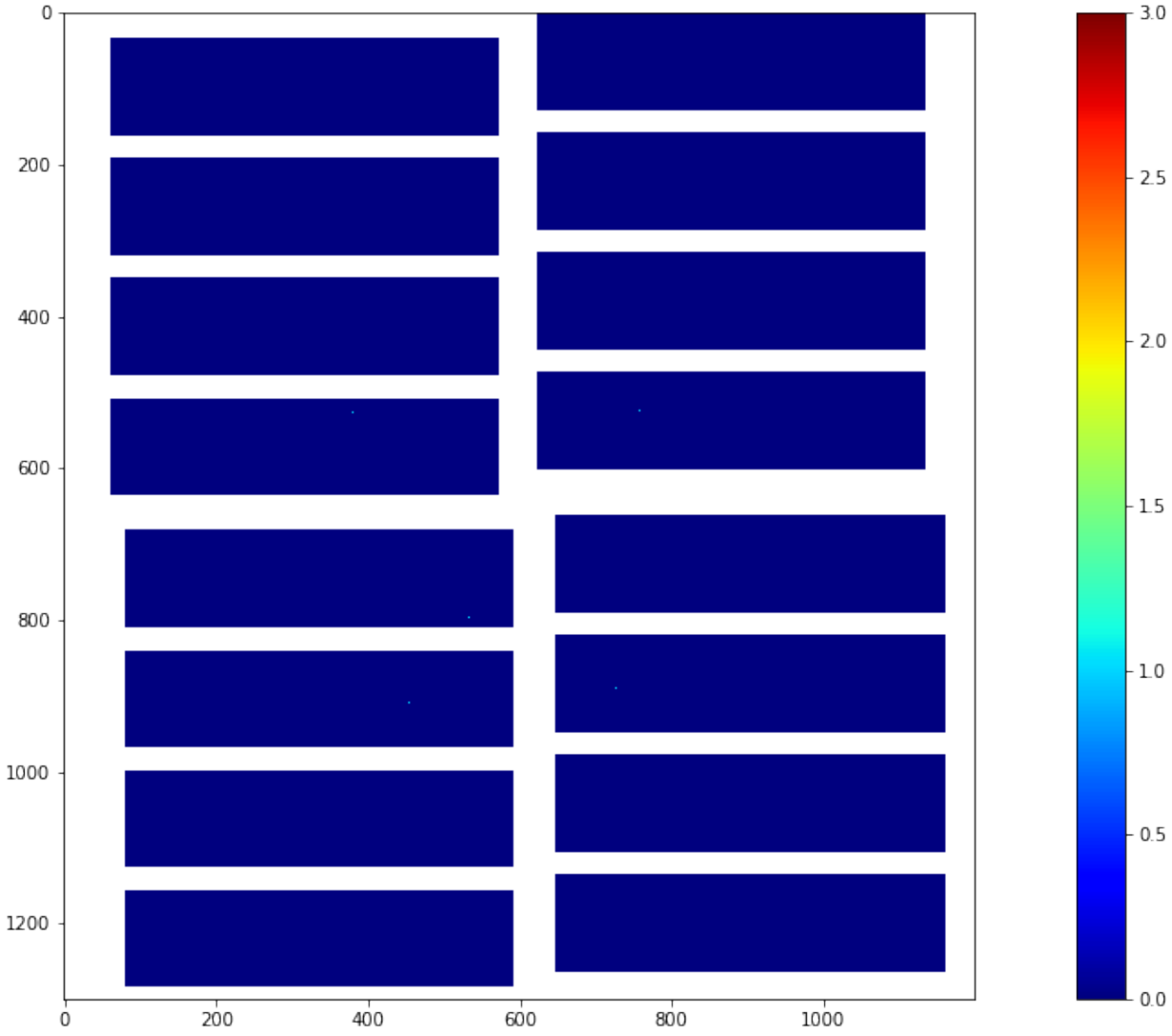
The per pixel mean of the first 128 images of the CORRECTED data





6.4.4 Maximum GAIN Preview

The per pixel maximum of the first 128 images of the digitized GAIN data


0
200
400
600
800
1000
1200
0
200
400
600
800
1000
3.0
2.5
2.0
1.5
1.0
0.5
0.0

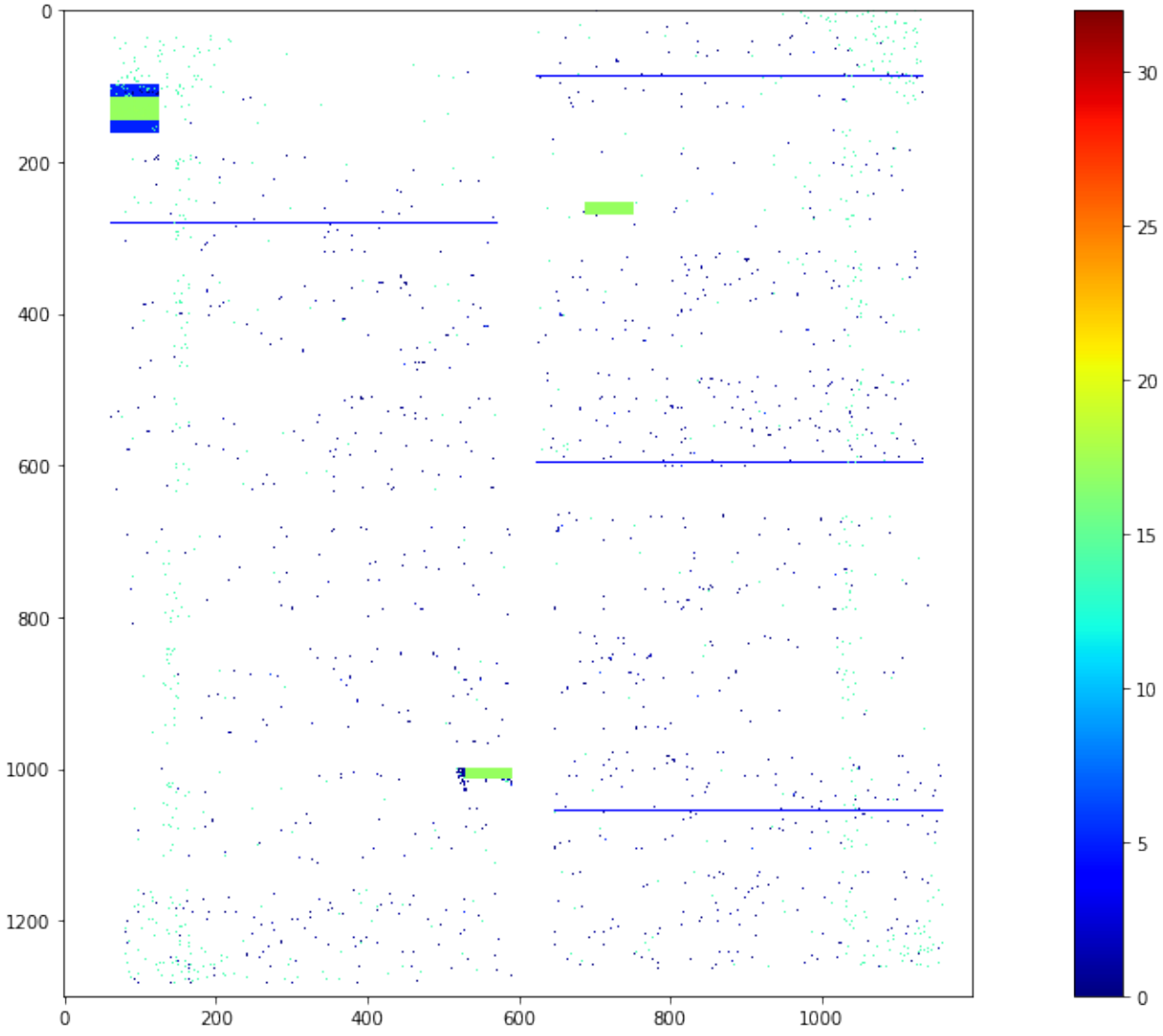
6.5 Bad Pixels

The mask contains dedicated entries for all pixels and memory cells as well as all three gains stages. Each mask entry is encoded in 32 bits as:

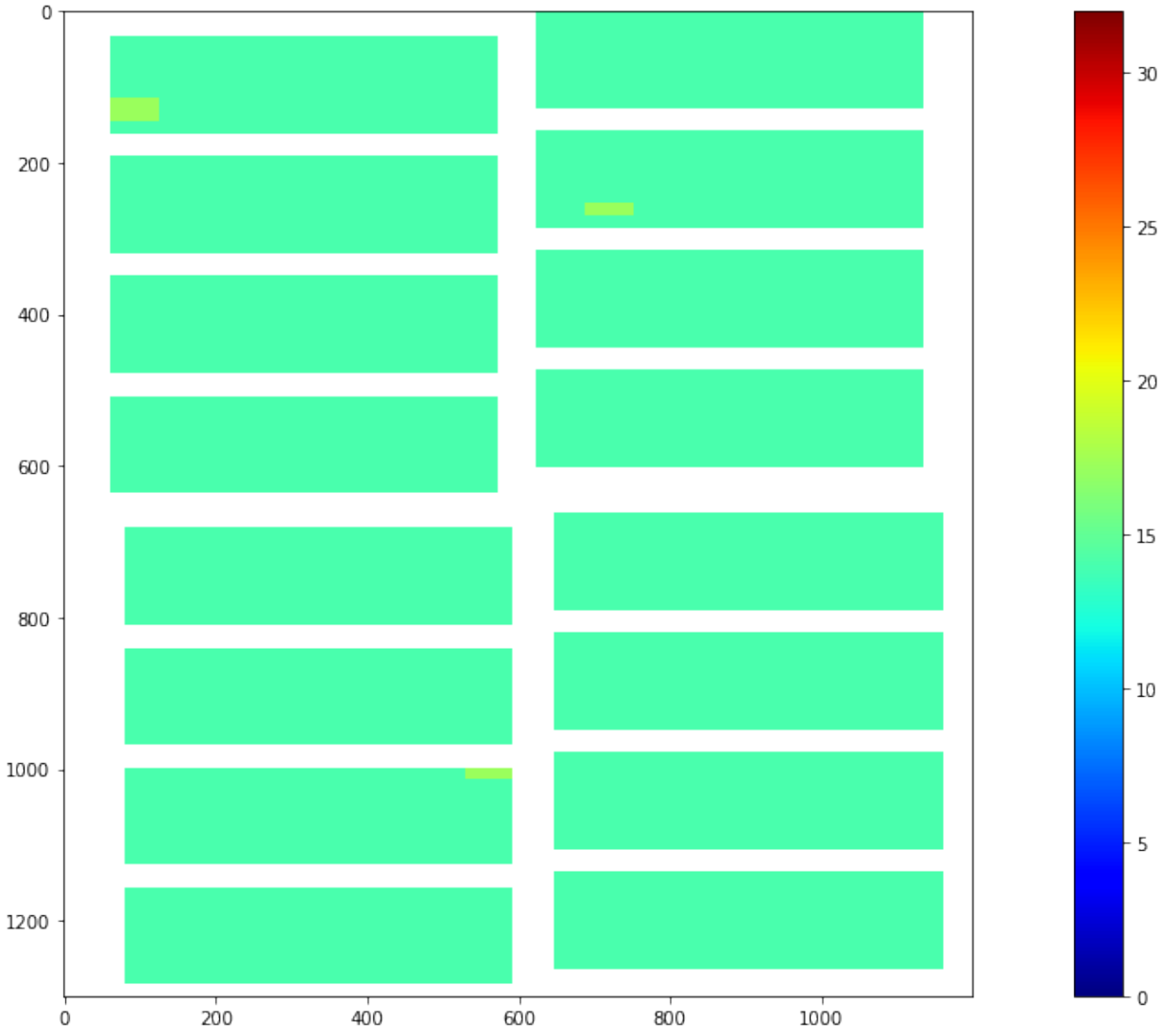
Bad pixel type	Bit mask
OFFSET_OUT_OF_THRESHOLD	0000000000000001
NOISE_OUT_OF_THRESHOLD	0000000000000010
OFFSET_NOISE_EVAL_ERROR	0000000000000100
NO_DARK_DATA	0000000000001000
CI_GAIN_OF_OF_THRESHOLD	0000000000010000
CI_LINEAR_DEVIATION	0000000000100000
CI_EVAL_ERROR	0000000001000000
FF_GAIN_EVAL_ERROR	0000000010000000
FF_GAIN_DEVIATION	0000000100000000
FF_NO_ENTRIES	0000001000000000
CI2_EVAL_ERROR	0000010000000000
VALUE_IS_NAN	0000100000000000
VALUE_OUT_OF_RANGE	0001000000000000
GAIN_THRESHOLDING_ERROR	0010000000000000
DATA_STD_IS_ZERO	0100000000000000
ASIC_STD_BELOW_NOISE	1000000000000000
INTERPOLATED	10000000000000000
NOISY_ADC	100000000000000000
OVERSCAN	1000000000000000000
NON_SENSITIVE	10000000000000000000
NON_LIN_RESPONSE_REGION	100000000000000000000

6.5.1 Single Shot Bad Pixels

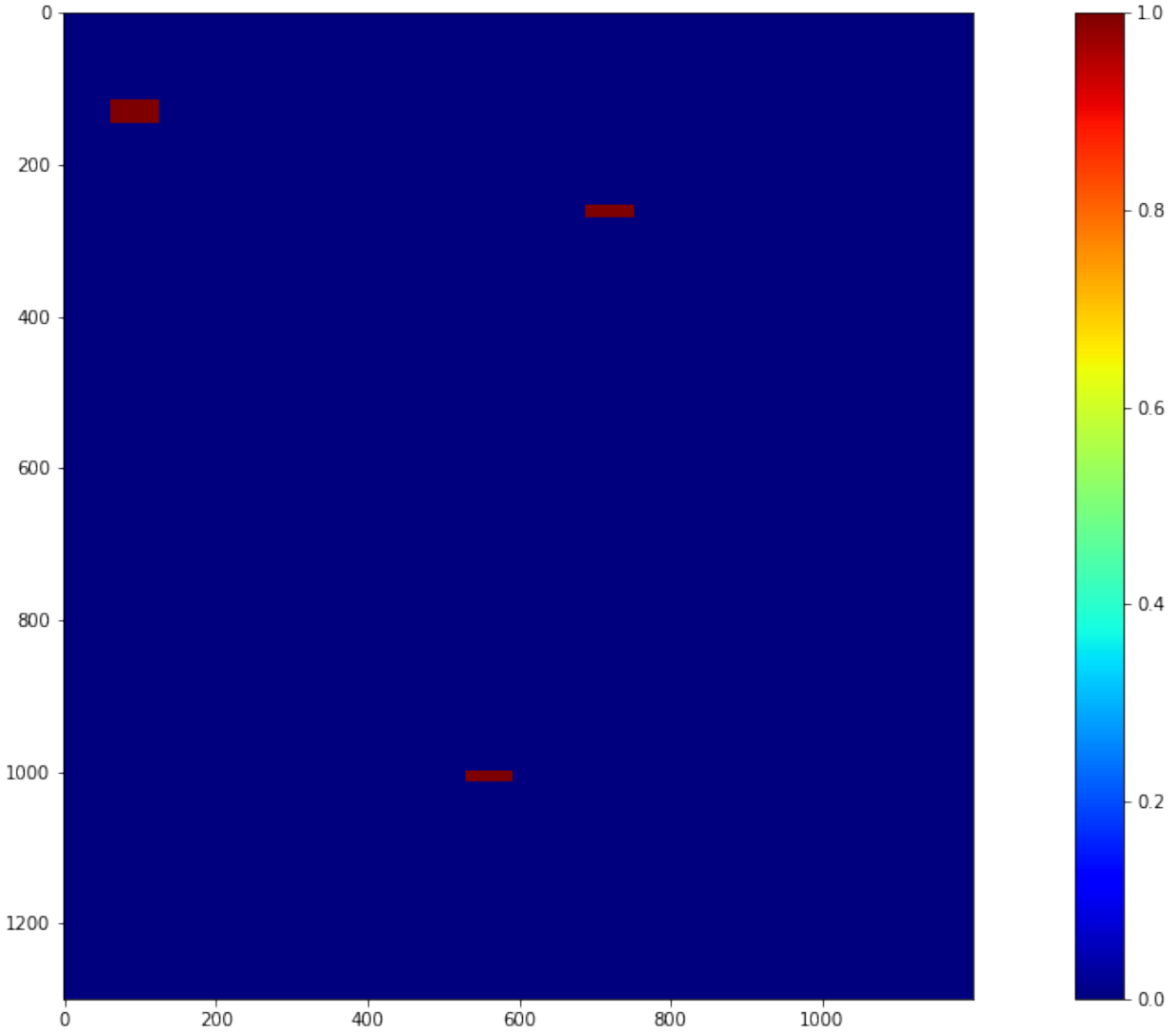
A single shot bad pixel map from cell 4 of the first train

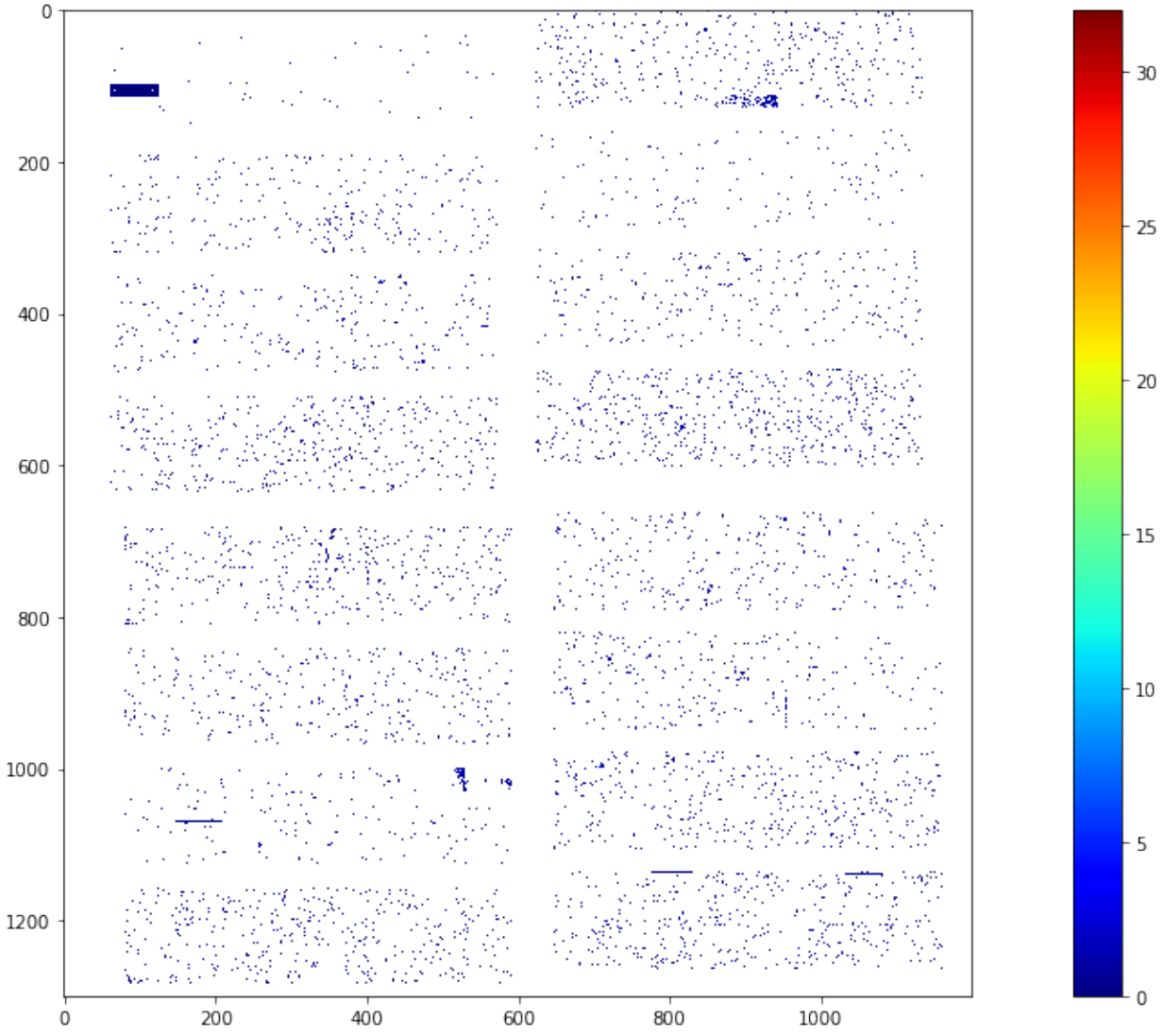

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

6.5.2 Full Train Bad Pixels



6.5.3 Full Train Bad Pixels - Only Dark Char. Related




0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

CHAPTER

SEVEN

AGIPD OFFLINE CORRECTION, SEQUENCES = 18-20

```
Connecting to profile slurm_prof_9b576fdf-f5a8-492b-be1a-8769350b548a_18-20
Using 2020-03-08 06:47:13+01:00 as creation time
Working in IL Mode: False. Actual cells in use are: 0
Outputting to /gpfs/exfel/d/proc/SPB/202030/p900119/r0084
Detector in use is SPB_DET_AGIPD1M-1
```

```
Gain setting: 0
```

7.1 Processed Files

```
Processing a total of 48 sequence files in chunks of 32
```

#	module	# module	file
0	Q1M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00018.h5
1		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00019.h5
2		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00020.h5
3	Q1M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00018.h5
4		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00019.h5
5		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00020.h5
6	Q1M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00018.h5
7		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00019.h5
8		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00020.h5
9	Q1M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00018.h5
10		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00019.h5
11		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00020.h5
12	Q2M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00018.h5
13		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00019.h5
14		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00020.h5
15	Q2M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00018.h5
16		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00019.h5
17		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00020.h5
18	Q2M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00018.h5
19		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00019.h5
20		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00020.h5
21	Q2M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00018.h5
22		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00019.h5
23		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00020.h5
24	Q3M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00018.h5
25		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00019.h5
26		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00020.h5
27	Q3M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00018.h5
28		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00019.h5
29		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00020.h5
30	Q3M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00018.h5
31		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00019.h5
32		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00020.h5
33	Q3M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00018.h5
34		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00019.h5
35		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00020.h5
36	Q4M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00018.h5
37		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00019.h5
38		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00020.h5
39	Q4M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00018.h5
40		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00019.h5
41		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00020.h5
42	Q4M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00018.h5
43		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00019.h5
44		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00020.h5
45	Q4M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD15-S00018.h5
46		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD15-S00019.h5
47		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD15-S00020.h5

```
A range of 500 pulse indices is selected: from 0 to 500 with a step of 1
Running 32 tasks parallel
Running 16 tasks parallel
```

```
Constants were injected on:
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
```

```
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
```

```
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
```

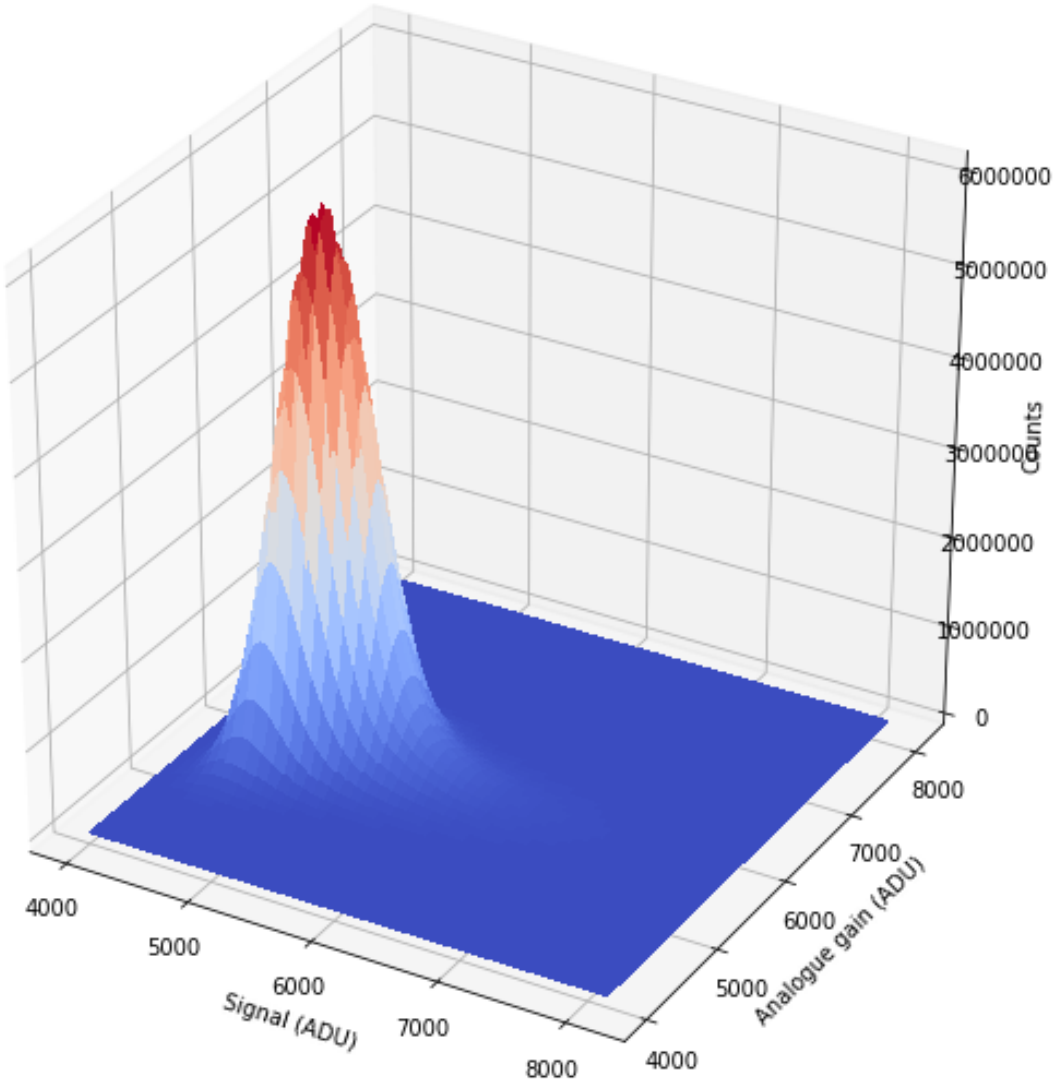
```
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
```

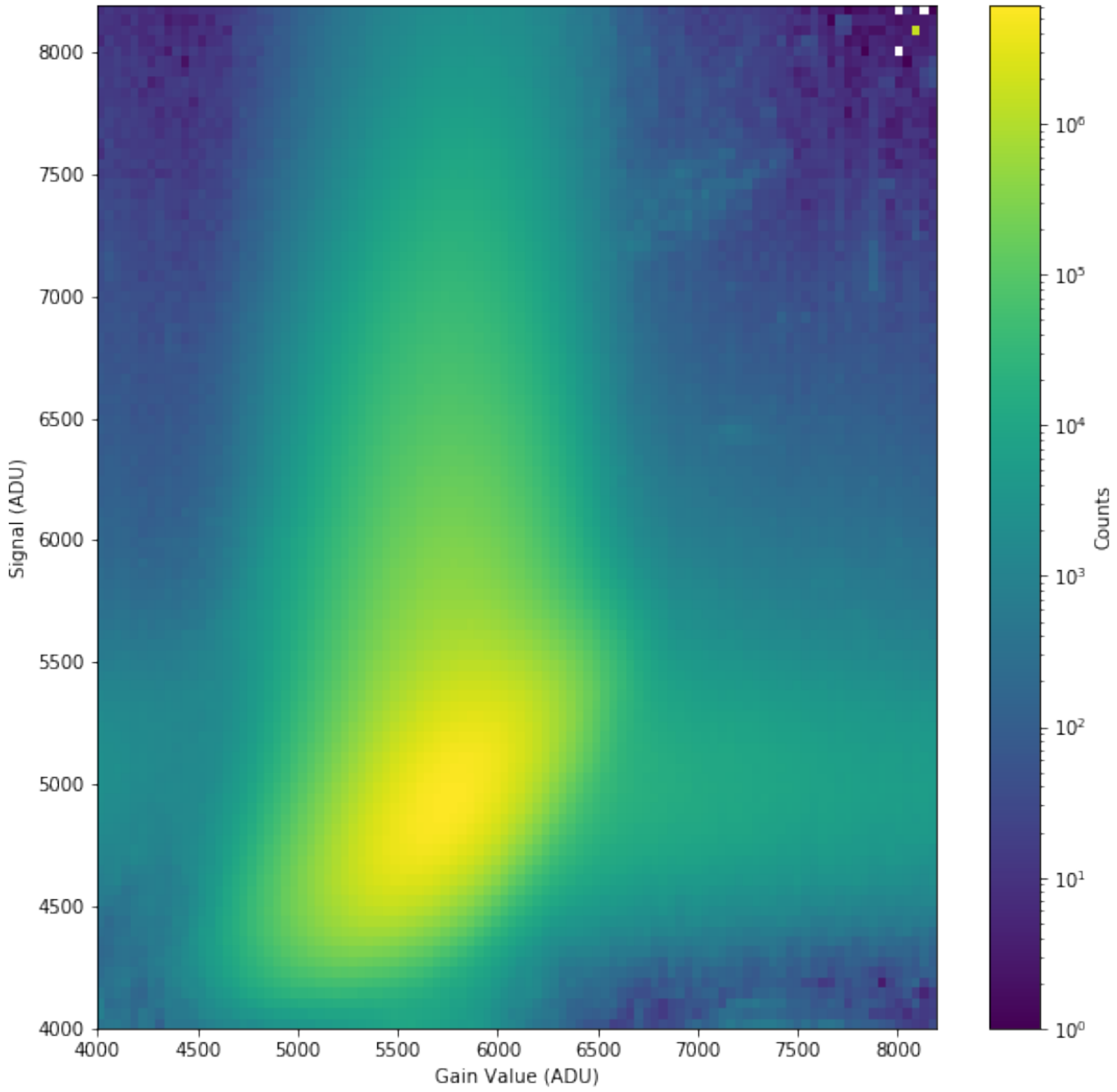
```
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
```

```
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
```

7.2 Signal vs. Analogue Gain

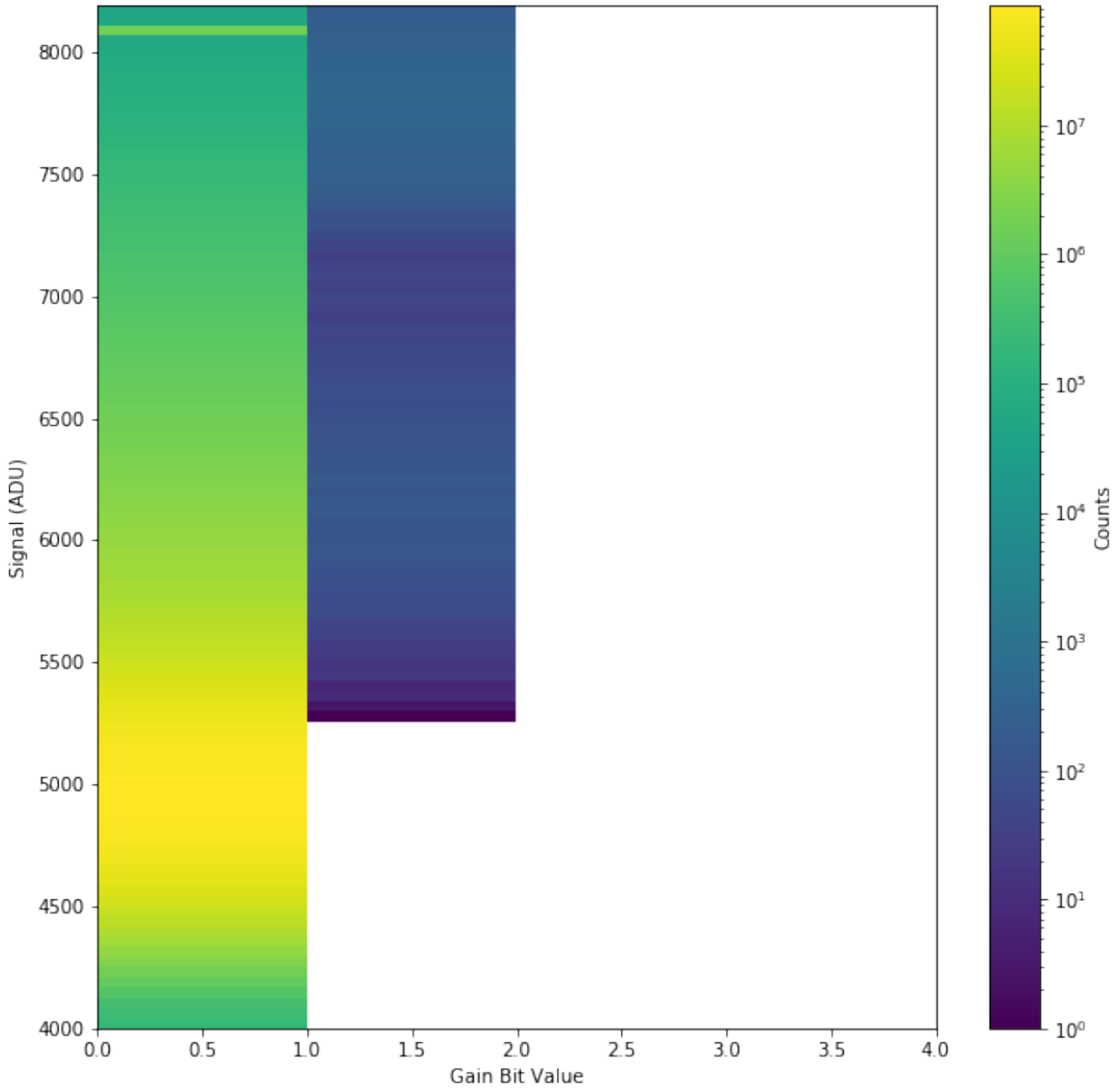
The following plot shows plots signal vs. gain for the first 128 images.

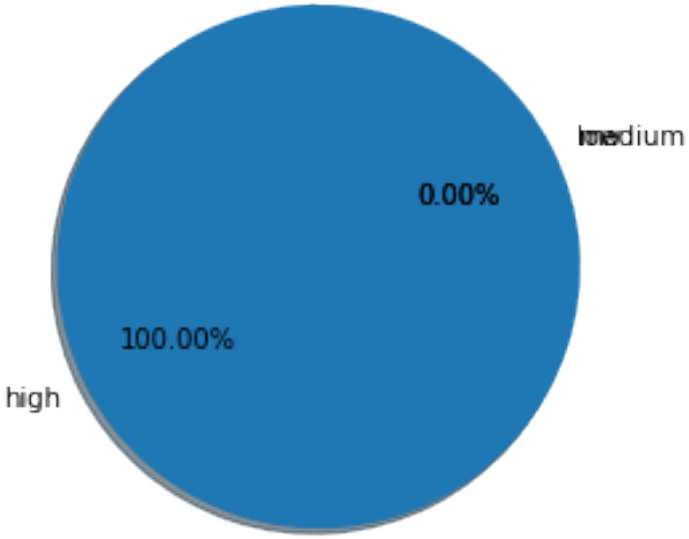

6000000
5000000
4000000
3000000
2000000
1000000
0
Counts
4000
5000
6000
7000
8000
Signal (ADU)
4000
5000
6000
7000
8000
Analogue gain (ADU)



7.3 Signal vs. Digitized Gain

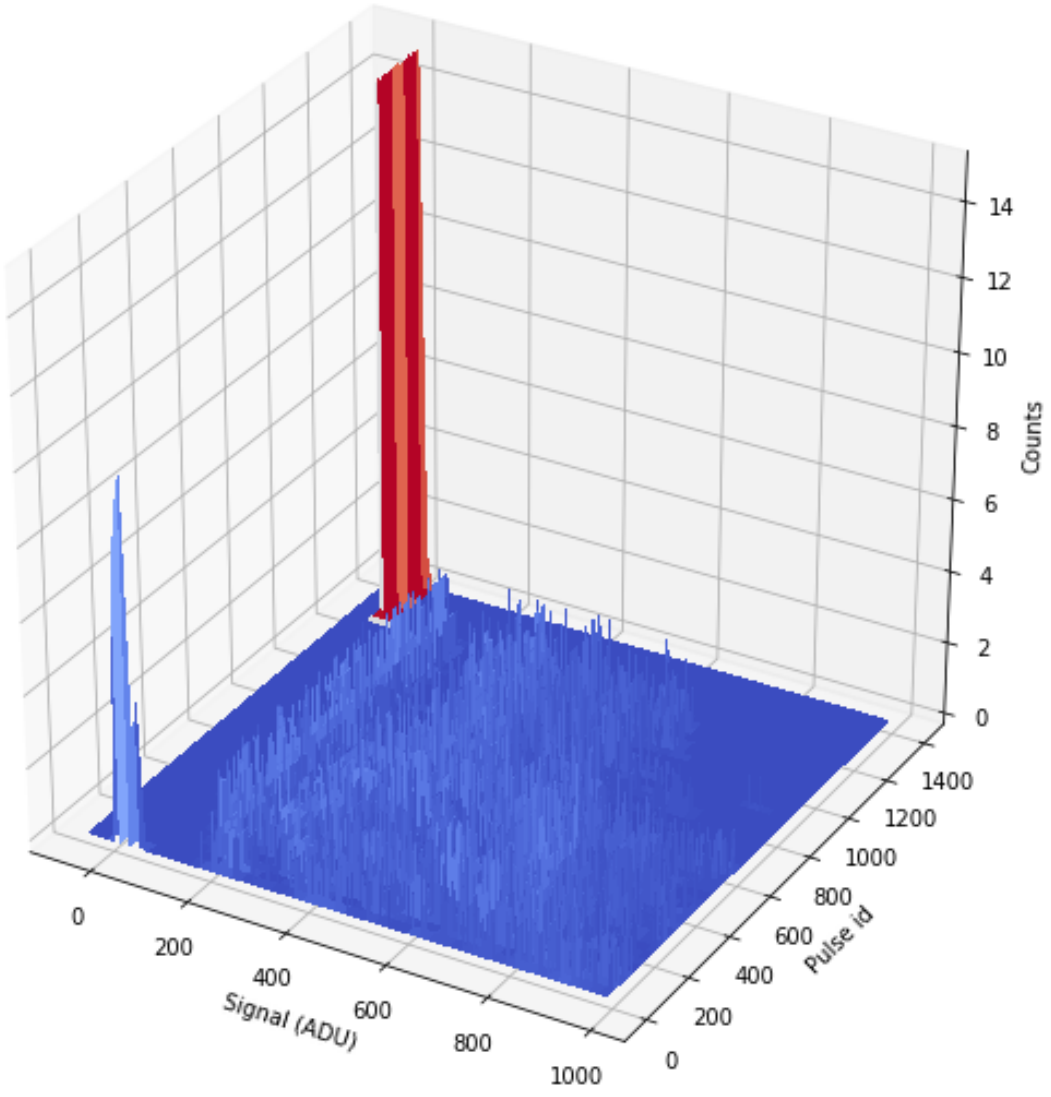
The following plot shows plots signal vs. digitized gain for the first 128 images.

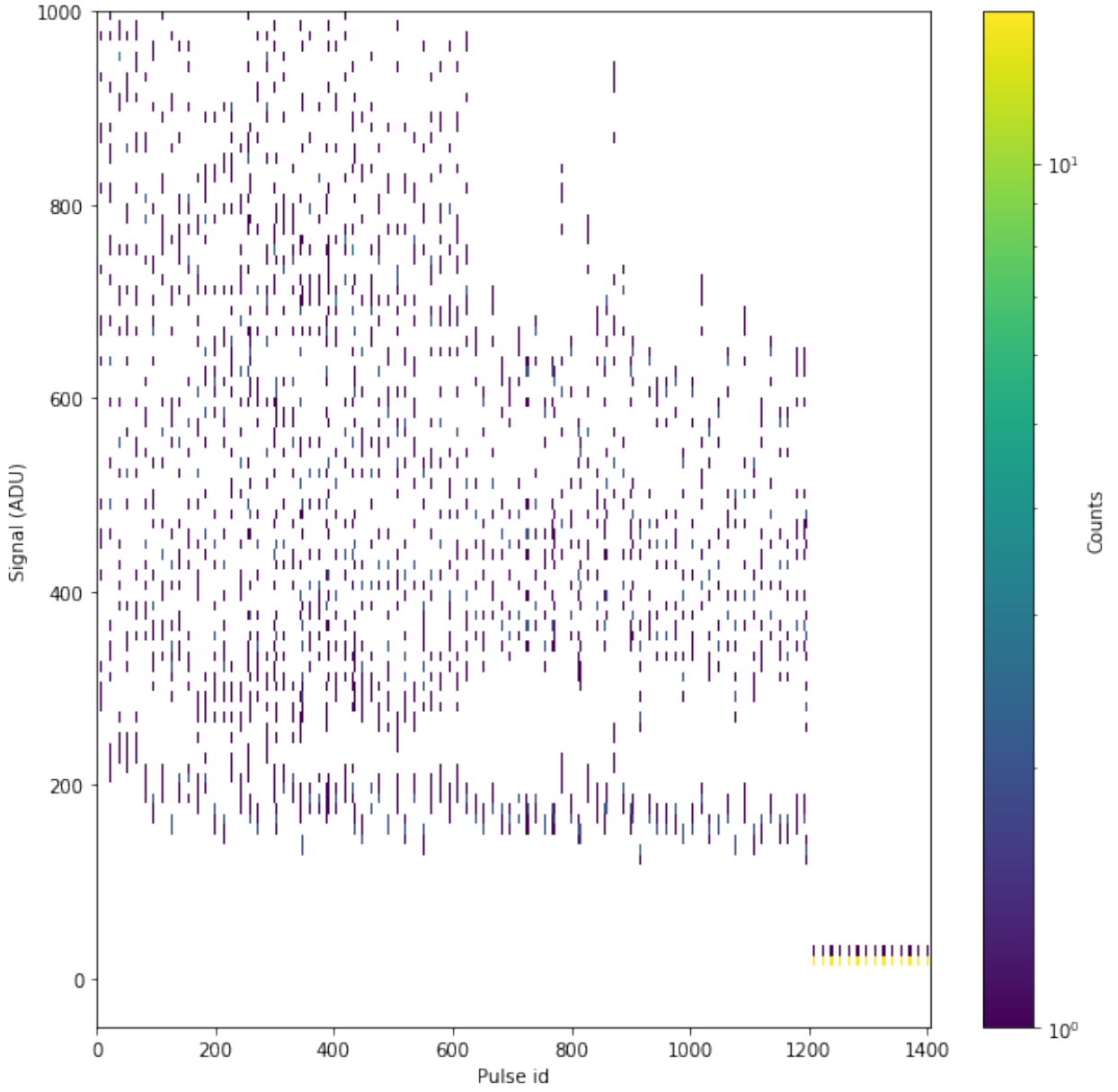

8000
7500
7000
6500
6000
5500
5000
4500
4000
Signal (ADU)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Gain Bit Value
10^7
10^6
10^5
10^4
10^3
10^2
10^1
10^0
Counts

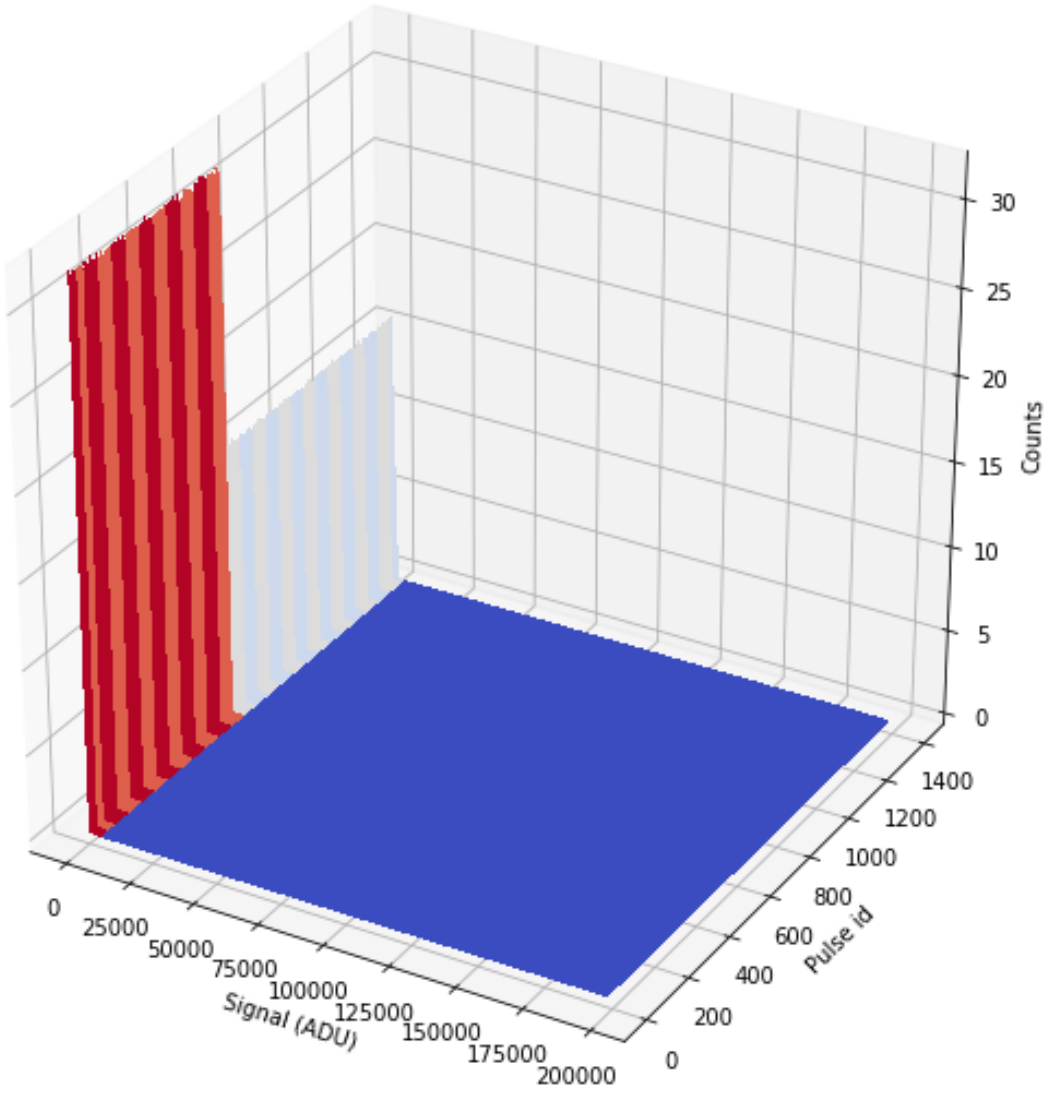


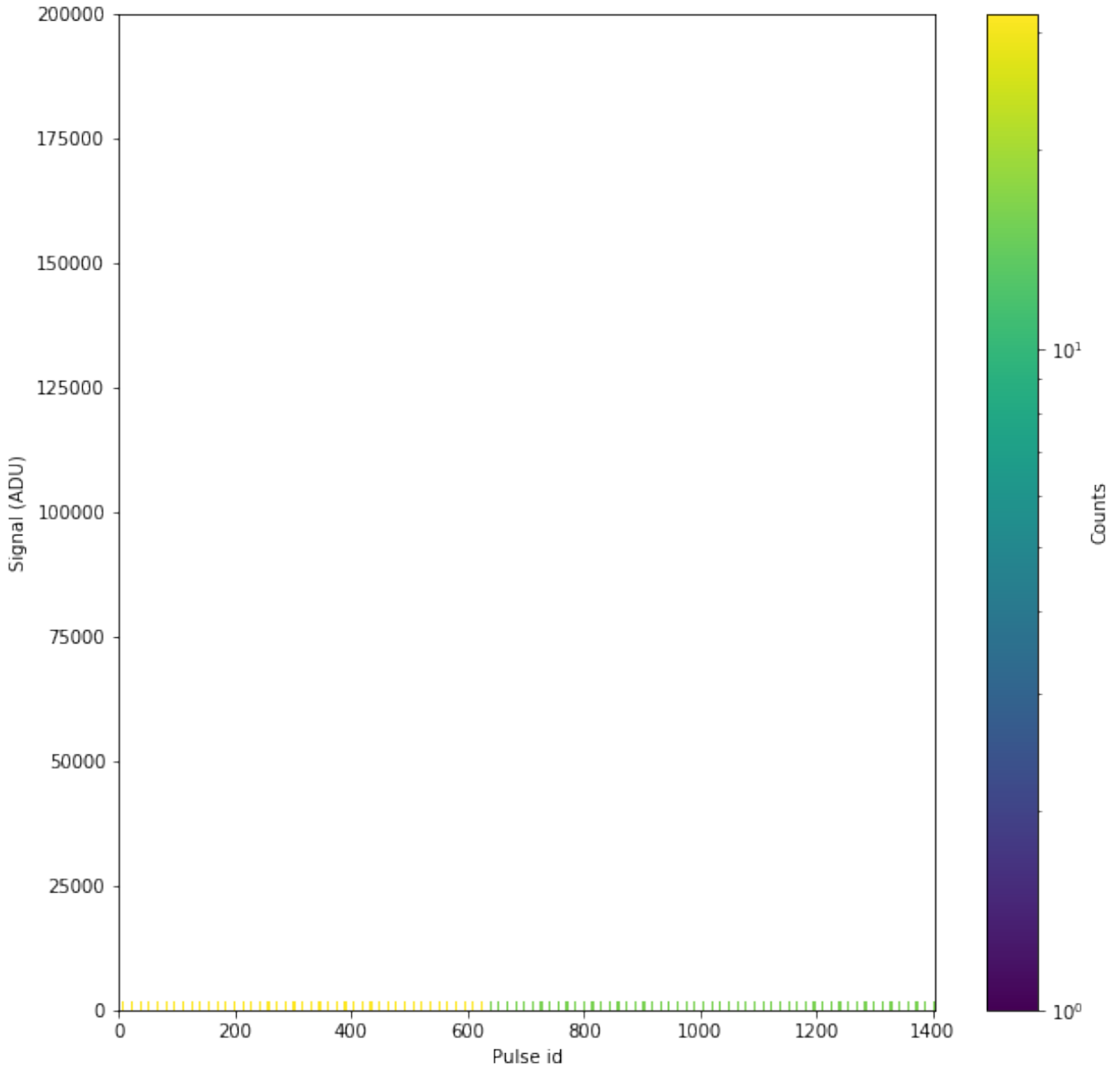
7.4 Mean Intensity per Pulse

The following plots show the mean signal for each pulse in a detailed and expanded intensity region.


Counts
0
2
4
6
8
10
12
14
Pulse id
0
200
400
600
800
1000
1200
1400
Signal (ADU)
0
200
400
600
800
1000

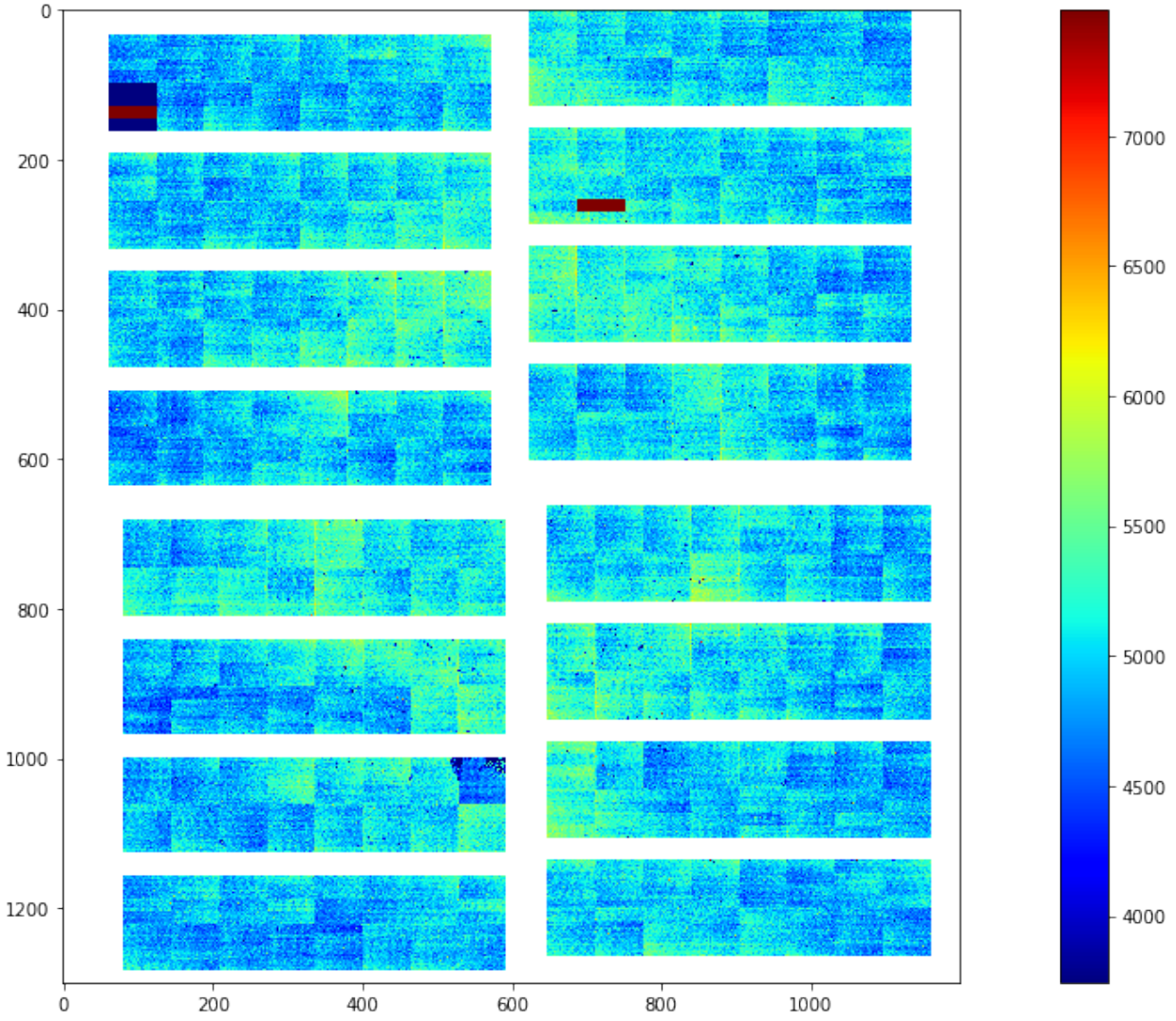

1000
800
600
400
200
0
Signal (ADU)
0
200
400
600
800
1000
1200
1400
Pulse id
10^1
10^0
Counts


Counts
30
25
20
15
10
5
0
Pulse id
1400
1200
1000
800
600
400
200
0
Signal (ADU)
0
25000
50000
75000
100000
125000
150000
175000
200000



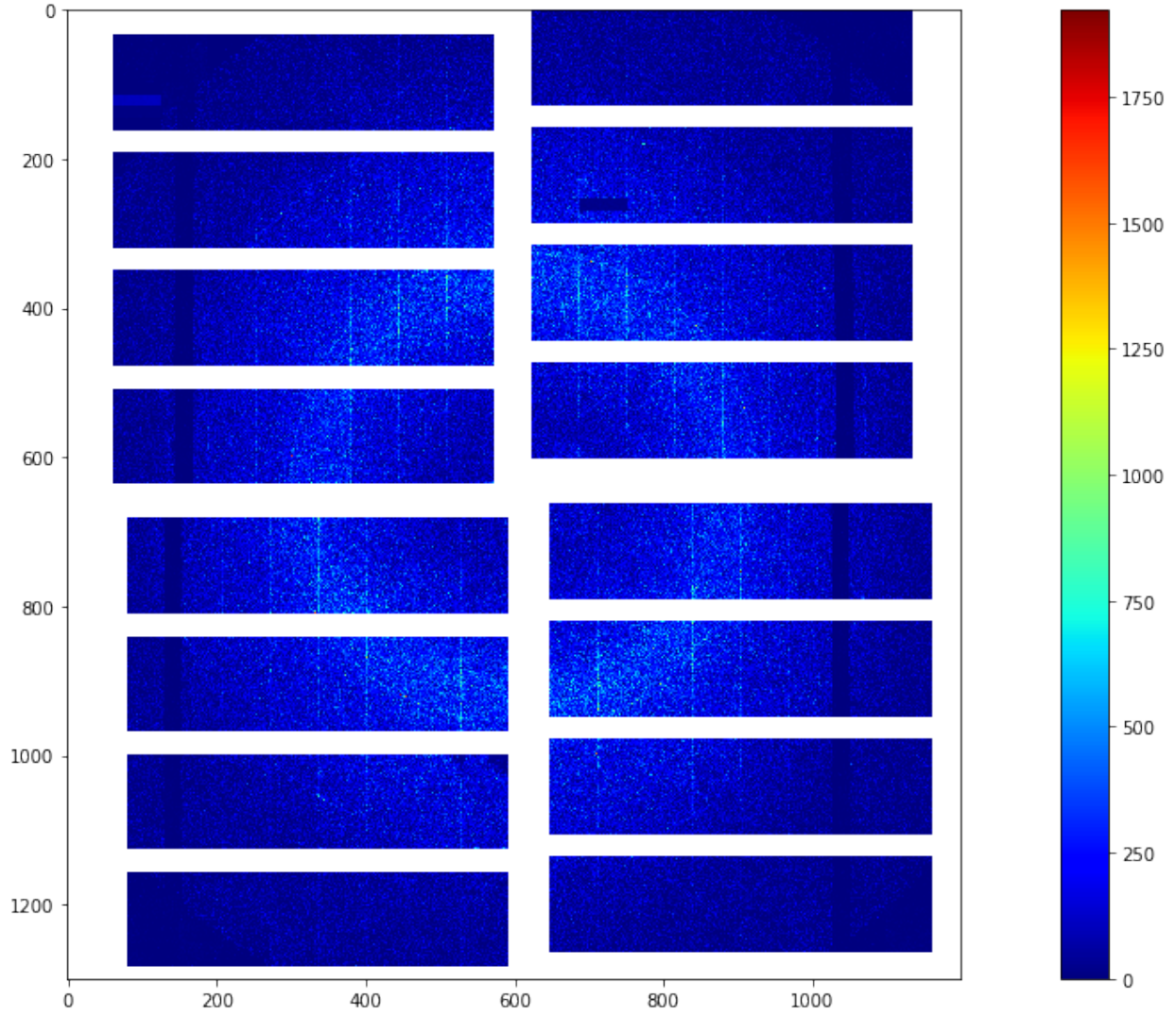
7.4.1 Mean RAW Preview

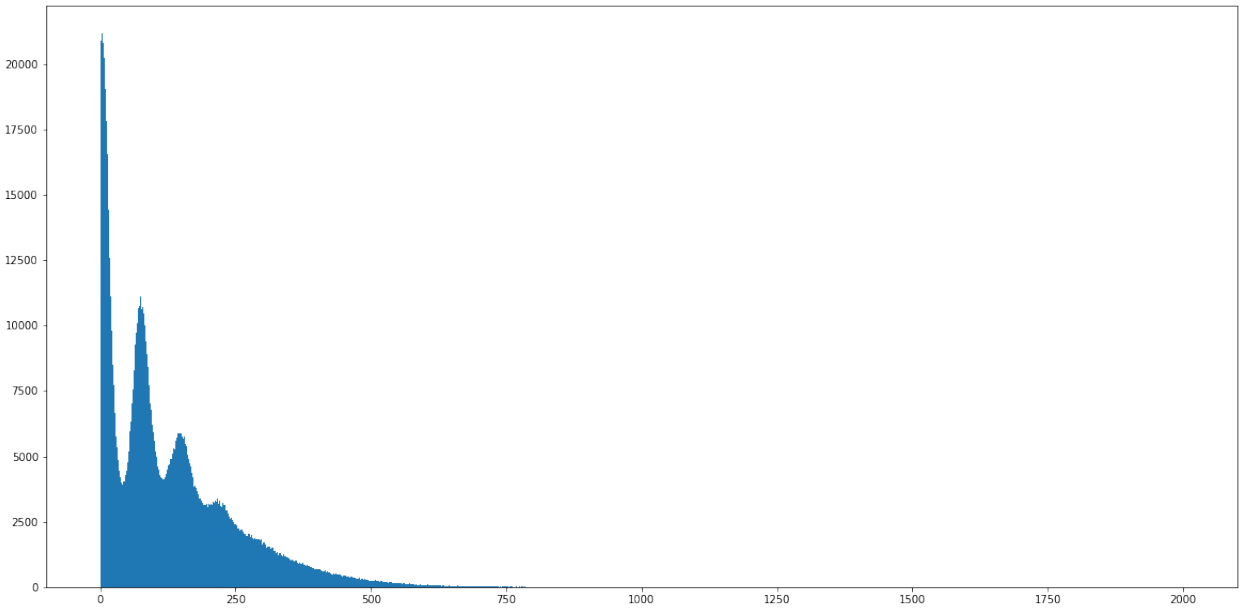
The per pixel mean of the first 128 images of the RAW data



7.4.2 Single Shot Preview

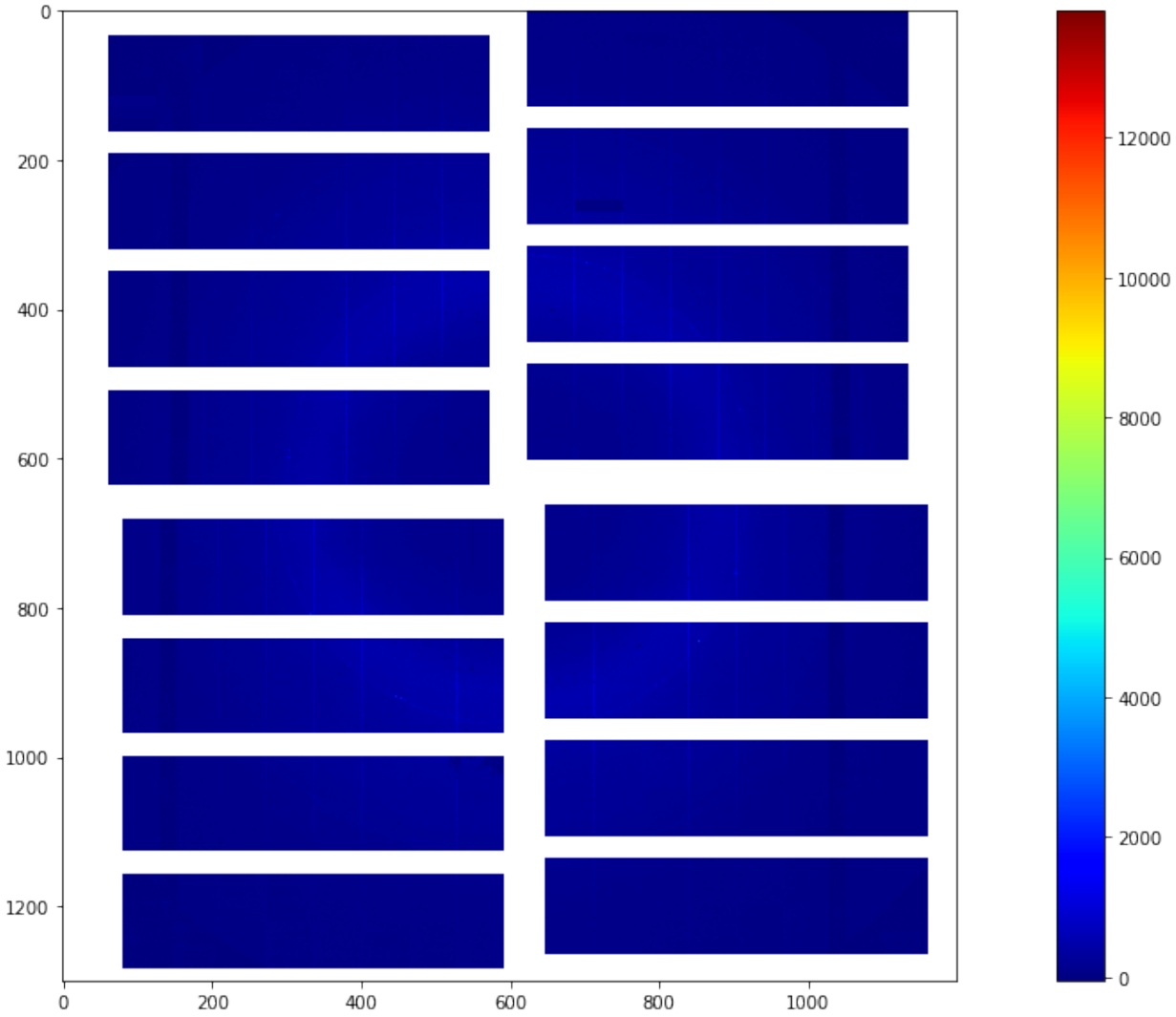
A single shot image from cell 12 of the first train

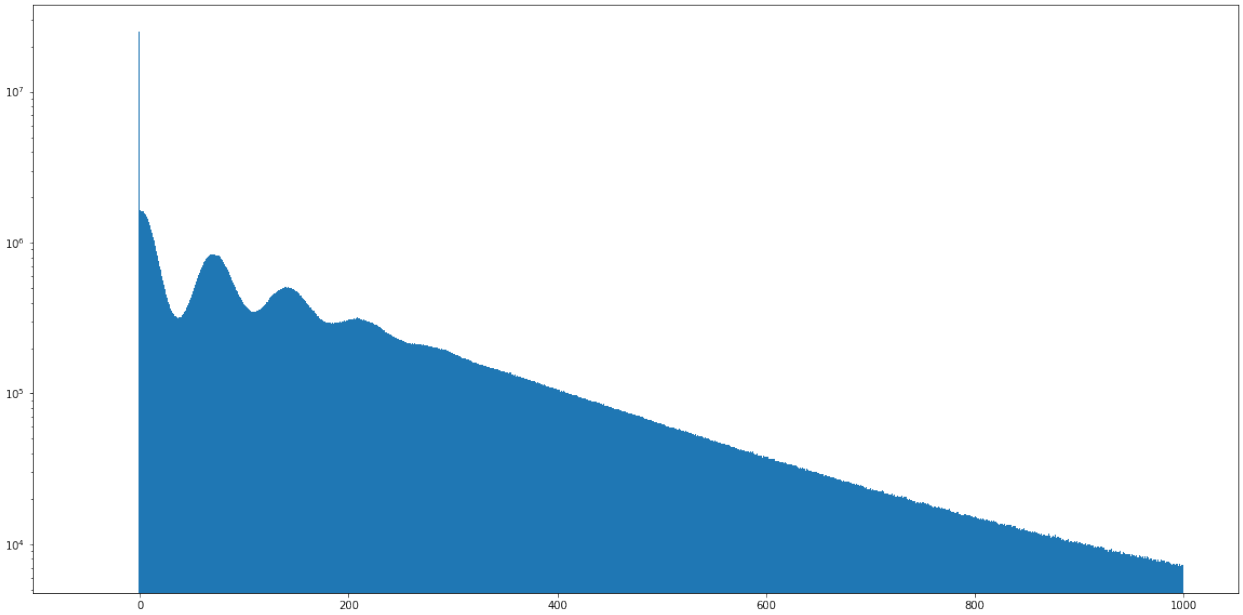

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
1750
1500
1250
1000
750
500
250
0


20000
17500
15000
12500
10000
7500
5000
2500
0
0
250
500
750
1000
1250
1500
1750
2000

7.4.3 Mean CORRECTED Preview

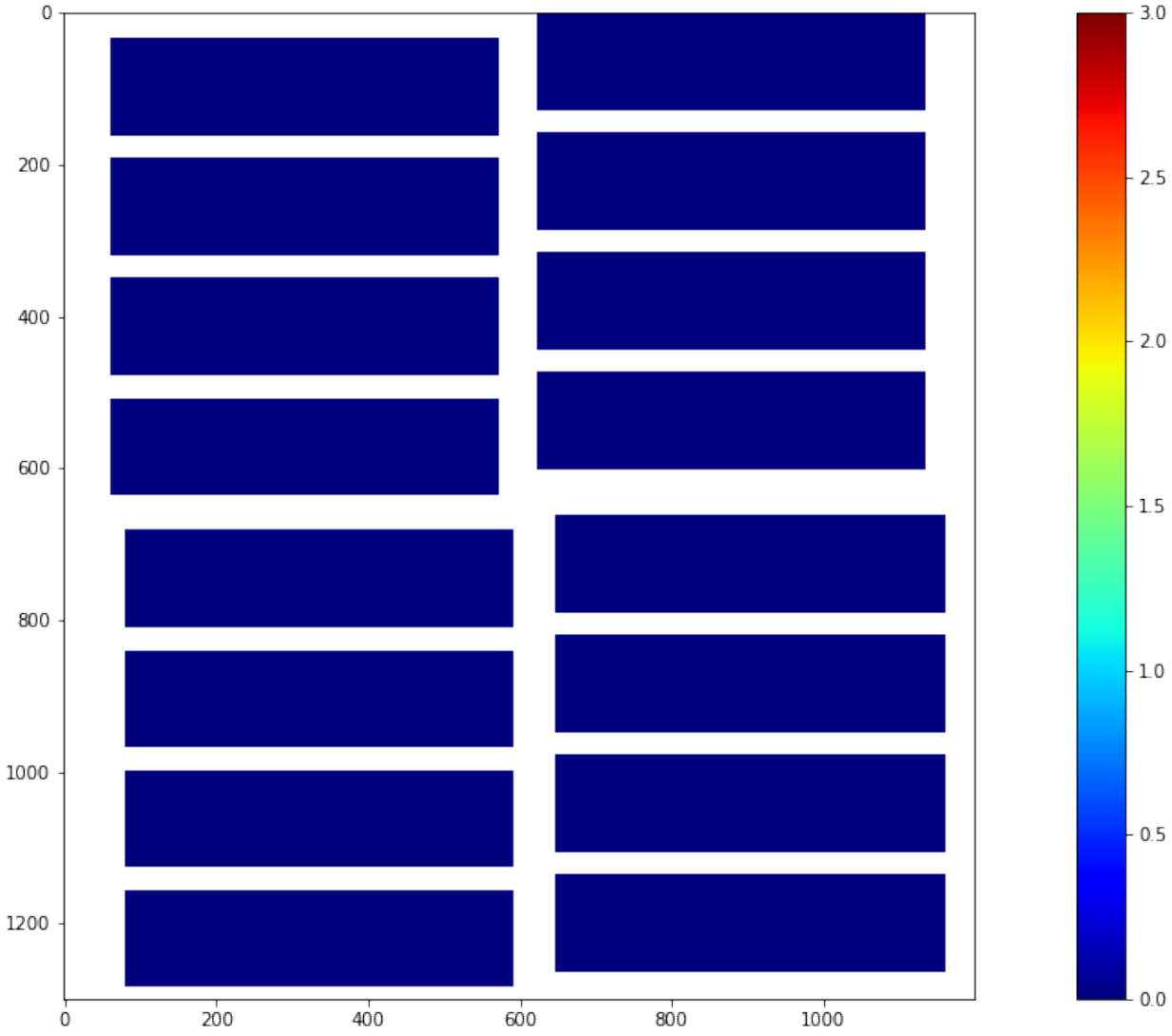
The per pixel mean of the first 128 images of the CORRECTED data





7.4.4 Maximum GAIN Preview

The per pixel maximum of the first 128 images of the digitized GAIN data


0
200
400
600
800
1000
1200
0
200
400
600
800
1000
3.0
2.5
2.0
1.5
1.0
0.5
0.0

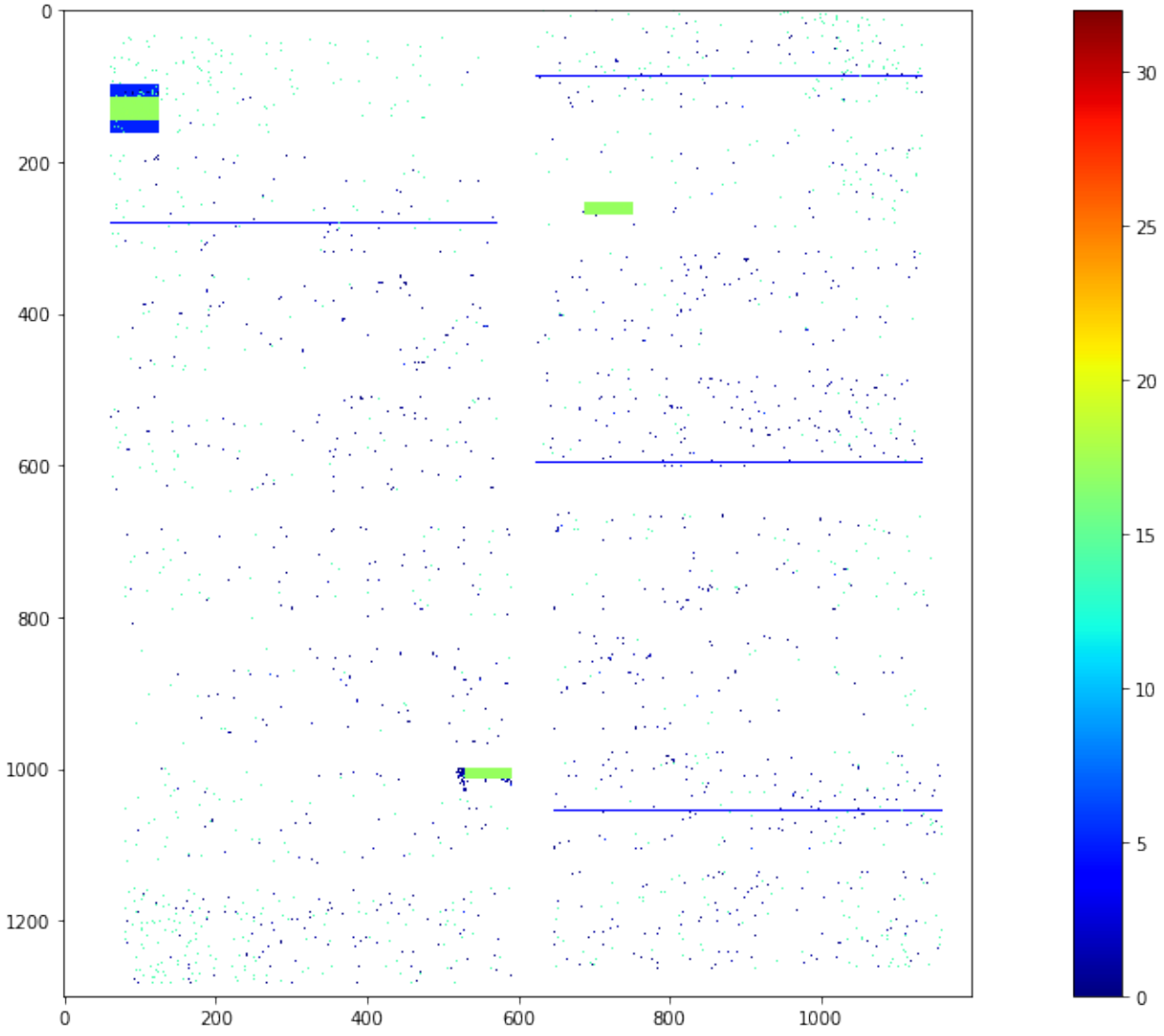
7.5 Bad Pixels

The mask contains dedicated entries for all pixels and memory cells as well as all three gains stages. Each mask entry is encoded in 32 bits as:

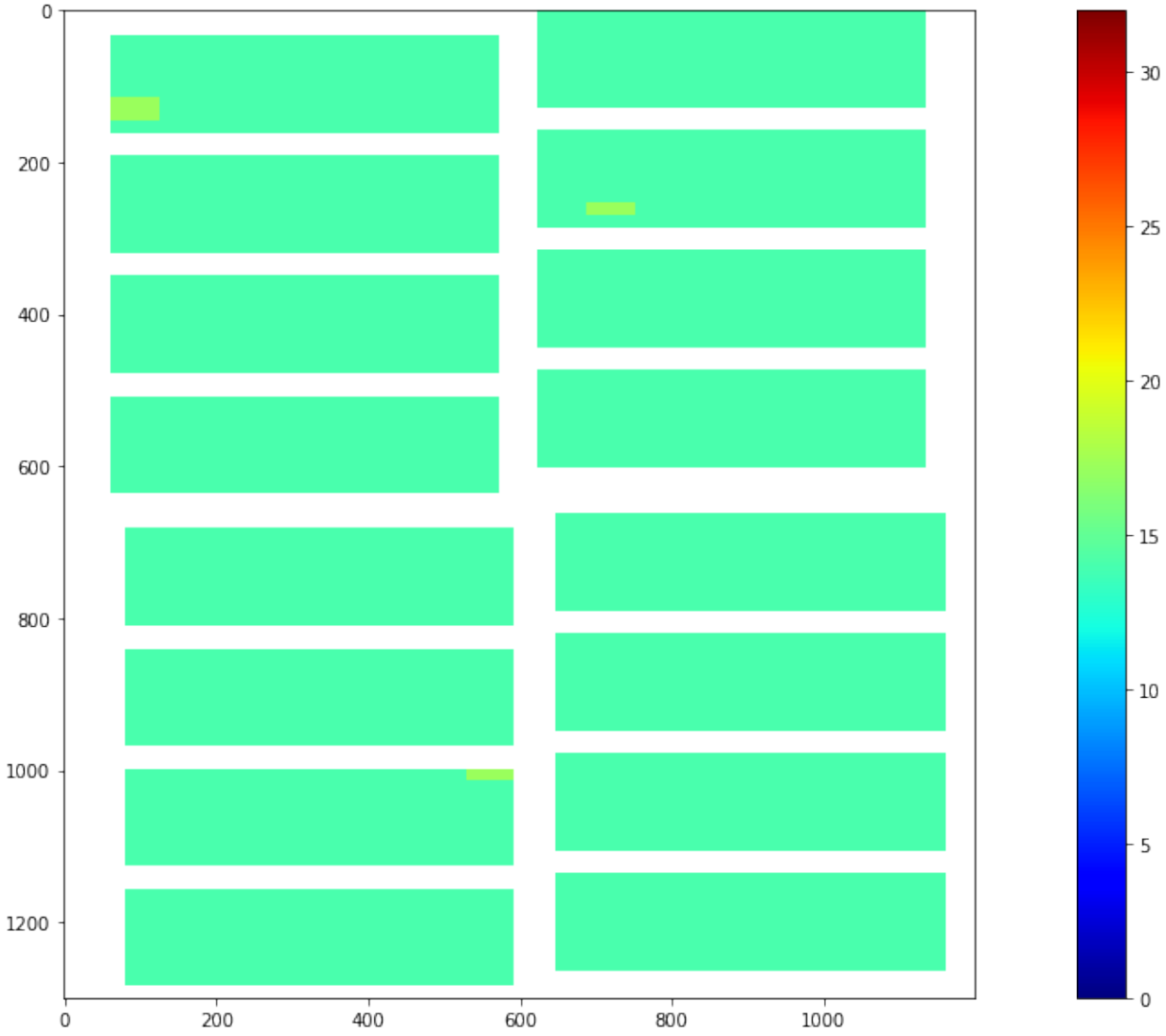
Bad pixel type	Bit mask
OFFSET_OUT_OF_THRESHOLD	0000000000000001
NOISE_OUT_OF_THRESHOLD	0000000000000010
OFFSET_NOISE_EVAL_ERROR	0000000000000100
NO_DARK_DATA	0000000000001000
CI_GAIN_OF_OF_THRESHOLD	0000000000010000
CI_LINEAR_DEVIATION	0000000000100000
CI_EVAL_ERROR	0000000001000000
FF_GAIN_EVAL_ERROR	0000000010000000
FF_GAIN_DEVIATION	0000000100000000
FF_NO_ENTRIES	0000001000000000
CI2_EVAL_ERROR	0000010000000000
VALUE_IS_NAN	0000100000000000
VALUE_OUT_OF_RANGE	0001000000000000
GAIN_THRESHOLDING_ERROR	0010000000000000
DATA_STD_IS_ZERO	0100000000000000
ASIC_STD_BELOW_NOISE	1000000000000000
INTERPOLATED	10000000000000000
NOISY_ADC	100000000000000000
OVERSCAN	1000000000000000000
NON_SENSITIVE	10000000000000000000
NON_LIN_RESPONSE_REGION	100000000000000000000

7.5.1 Single Shot Bad Pixels

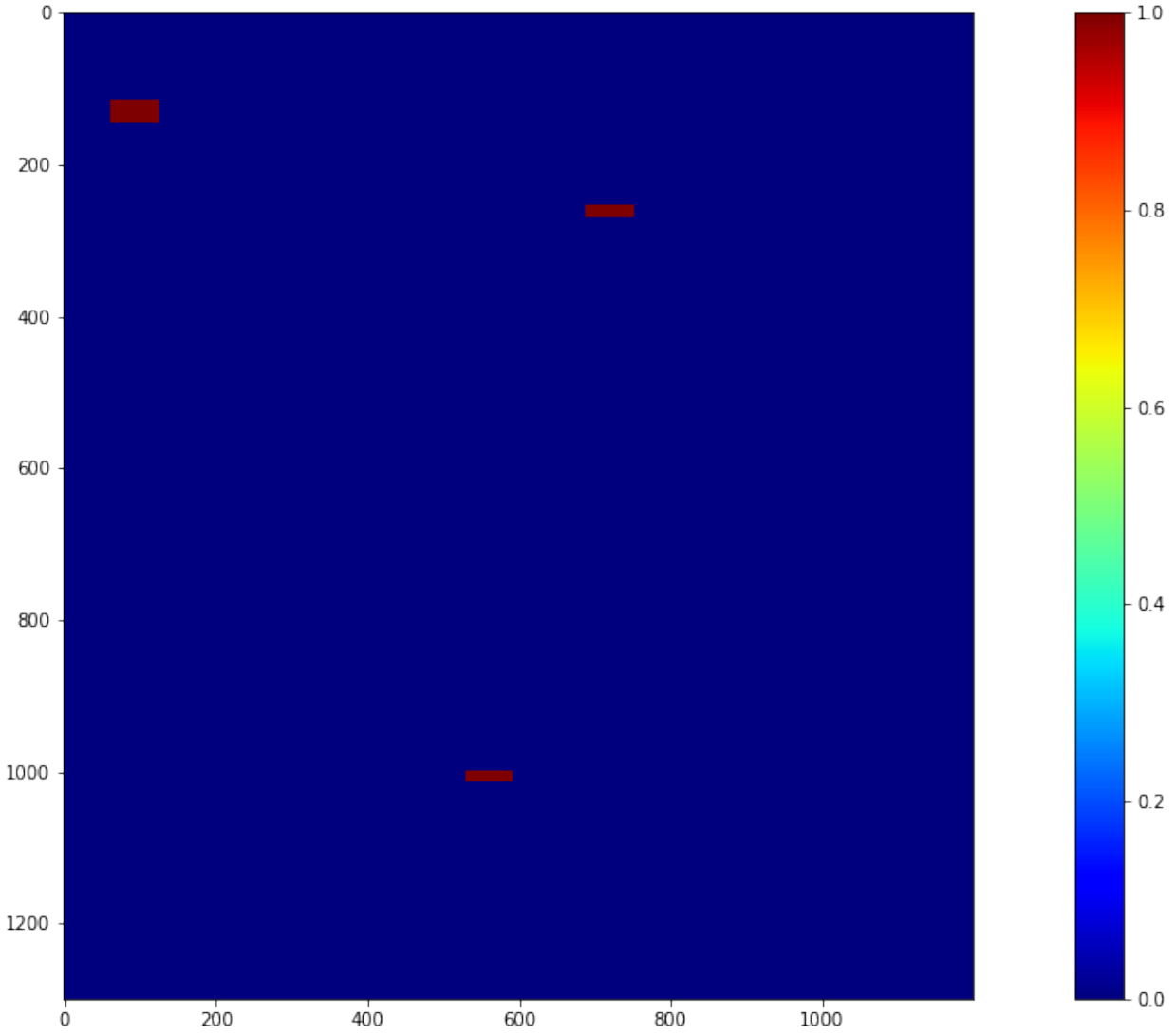
A single shot bad pixel map from cell 4 of the first train

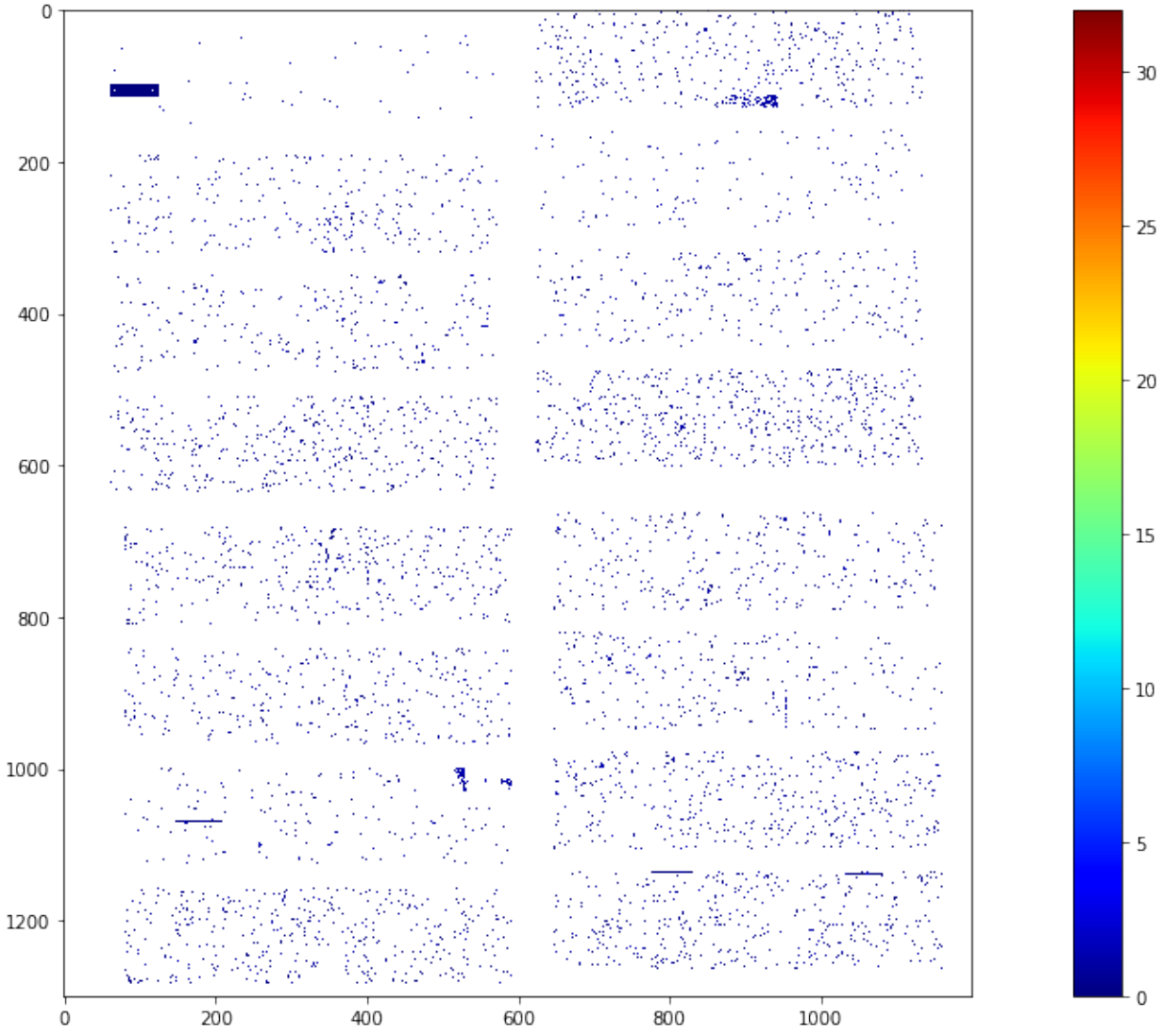

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

7.5.2 Full Train Bad Pixels



7.5.3 Full Train Bad Pixels - Only Dark Char. Related




0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

CHAPTER

EIGHT

AGIPD OFFLINE CORRECTION, SEQUENCES = 21-23

```
Connecting to profile slurm_prof_9b576fdf-f5a8-492b-be1a-8769350b548a_21-23
Using 2020-03-08 06:47:13+01:00 as creation time
Working in IL Mode: False. Actual cells in use are: 0
Outputting to /gpfs/exfel/d/proc/SPB/202030/p900119/r0084
Detector in use is SPB_DET_AGIPD1M-1
```

```
Gain setting: 0
```

8.1 Processed Files

```
Processing a total of 48 sequence files in chunks of 32
```

#	module	# module	file
0	Q1M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00021.h5
1		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00022.h5
2		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD00-S00023.h5
3	Q1M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00021.h5
4		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00022.h5
5		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD01-S00023.h5
6	Q1M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00021.h5
7		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00022.h5
8		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD02-S00023.h5
9	Q1M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00021.h5
10		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00022.h5
11		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD03-S00023.h5
12	Q2M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00021.h5
13		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00022.h5
14		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD04-S00023.h5
15	Q2M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00021.h5
16		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00022.h5
17		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD05-S00023.h5
18	Q2M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00021.h5
19		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00022.h5
20		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD06-S00023.h5
21	Q2M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00021.h5
22		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00022.h5
23		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD07-S00023.h5
24	Q3M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00021.h5
25		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00022.h5
26		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD08-S00023.h5
27	Q3M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00021.h5
28		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00022.h5
29		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD09-S00023.h5
30	Q3M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00021.h5
31		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00022.h5
32		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD10-S00023.h5
33	Q3M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00021.h5
34		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00022.h5
35		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD11-S00023.h5
36	Q4M1	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00021.h5
37		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00022.h5
38		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD12-S00023.h5
39	Q4M2	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00021.h5
40		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00022.h5
41		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD13-S00023.h5
42	Q4M3	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00021.h5
43		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00022.h5
44		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD14-S00023.h5
45	Q4M4	0	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD15-S00021.h5
46		1	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD15-S00022.h5
47		2	/gpfs/exfel/exp/SPB/202030/p900119/raw/r0084/RAW-R0084-AGIPD15-S00023.h5

```
A range of 500 pulse indices is selected: from 0 to 500 with a step of 1
Running 32 tasks parallel
Running 16 tasks parallel
```

```
Constants were injected on:
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
```

```
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
```

```
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
```

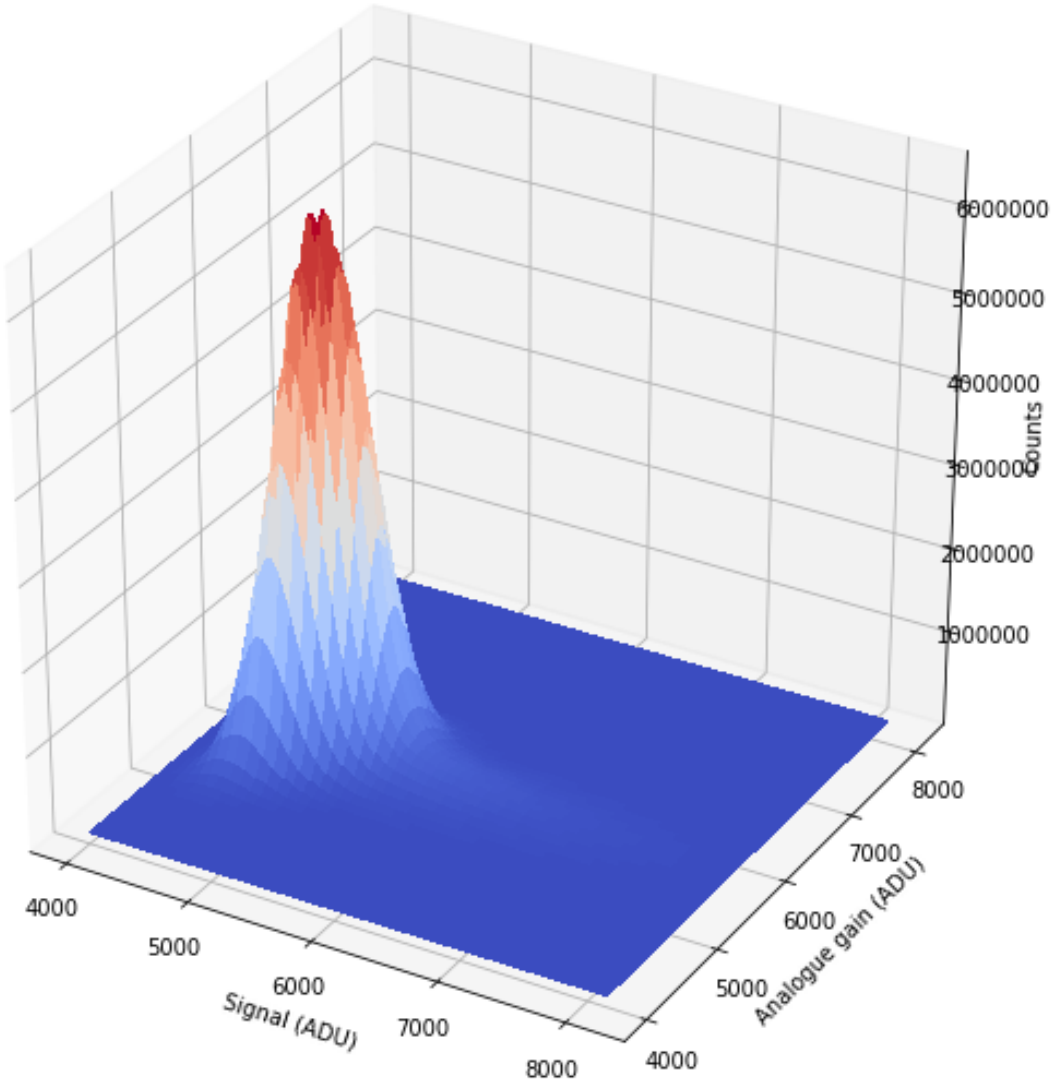
```
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
Q1M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:50
slopesPC.... 19-11-25 21:40
```

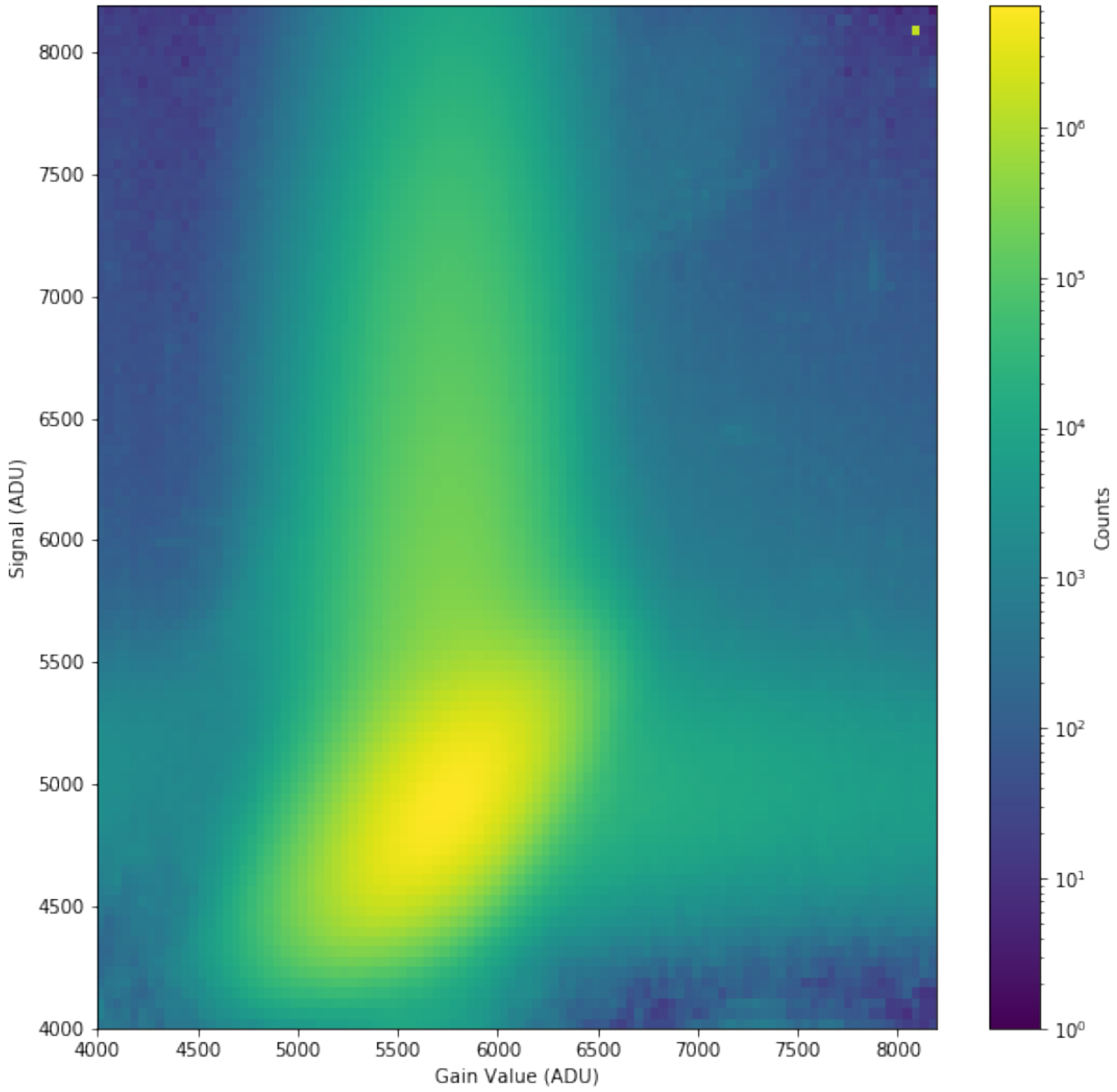
```
Q1M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:22
slopesPC.... 19-11-25 21:24
Q1M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:10
slopesPC.... 19-11-25 21:40
Q1M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 19:13
slopesPC.... 19-11-25 22:01
Q2M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:20
slopesPC.... 19-11-25 21:30
Q2M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:00
Q2M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:24
slopesPC.... 19-11-25 21:09
Q2M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:52
slopesPC.... 19-11-25 21:05
Q3M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ None
slopesPC.... 19-11-25 21:04
Q3M2
offset...... 20-03-04 15:33
```

```
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:34
Q3M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:38
slopesPC.... 19-11-25 22:00
Q3M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:25
slopesPC.... 19-11-25 21:58
Q4M1
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:41
slopesPC.... 19-11-25 22:07
Q4M2
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:19
slopesPC.... 19-11-25 21:33
Q4M3
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:18
slopesPC.... 19-11-25 21:42
Q4M4
offset...... 20-03-04 15:33
noise....... 20-03-04 15:33
bpixels..... 20-03-04 15:33
thresholds.. 20-03-04 15:33
bppc........ 20-03-05 18:21
slopesPC.... 19-11-25 21:59
```

8.2 Signal vs. Analogue Gain

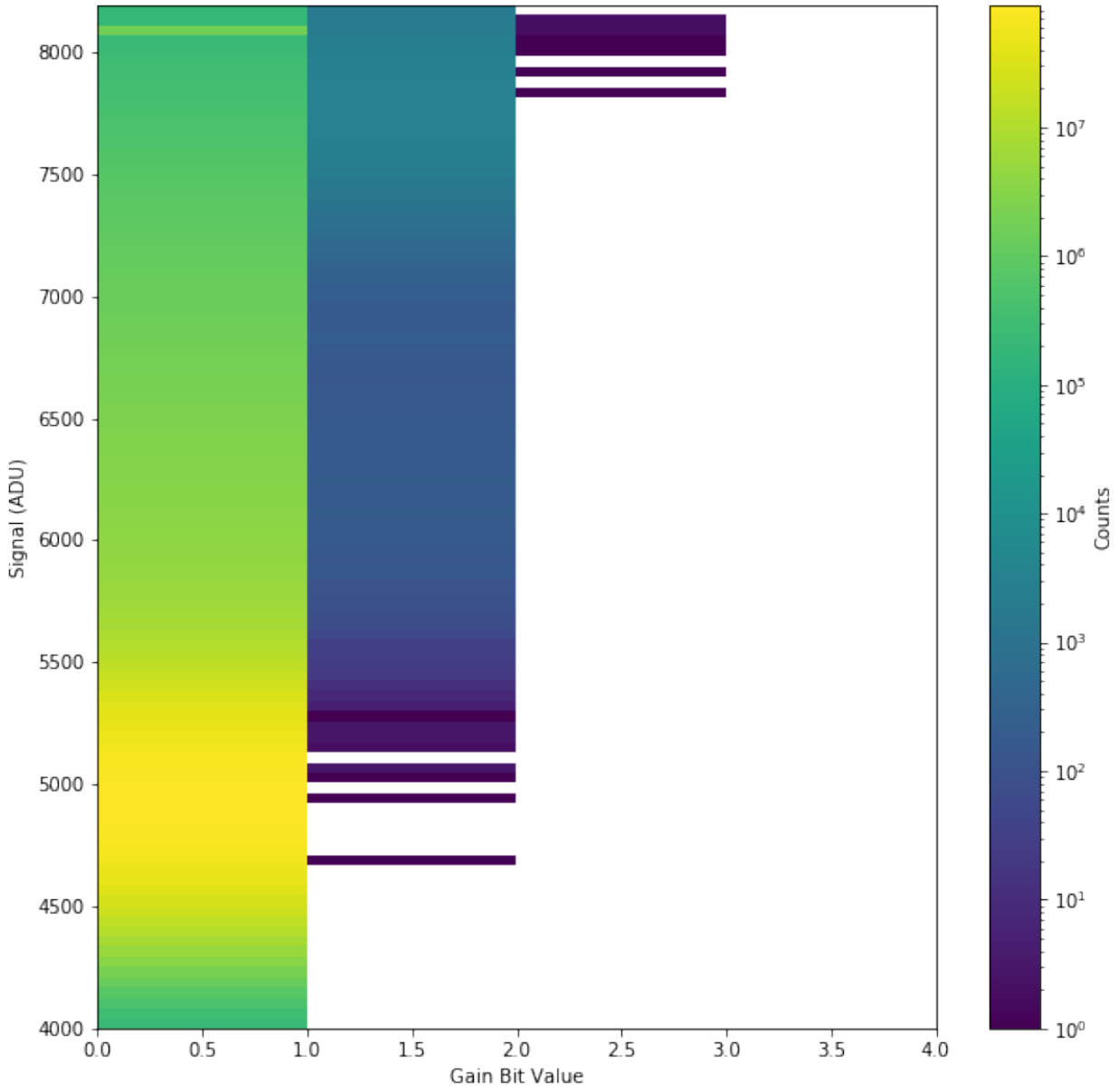
The following plot shows plots signal vs. gain for the first 128 images.

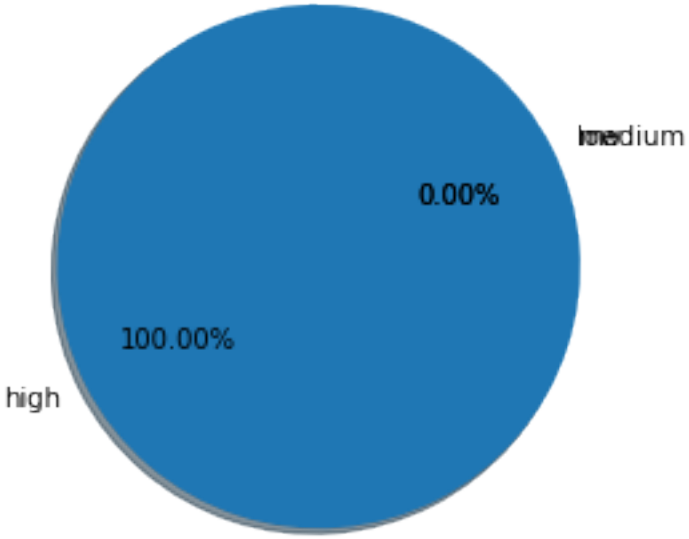

6000000
5000000
4000000
3000000
2000000
1000000
Counts
4000
5000
6000
7000
8000
Signal (ADU)
4000
5000
6000
7000
8000
Analogue gain (ADU)



8.3 Signal vs. Digitized Gain

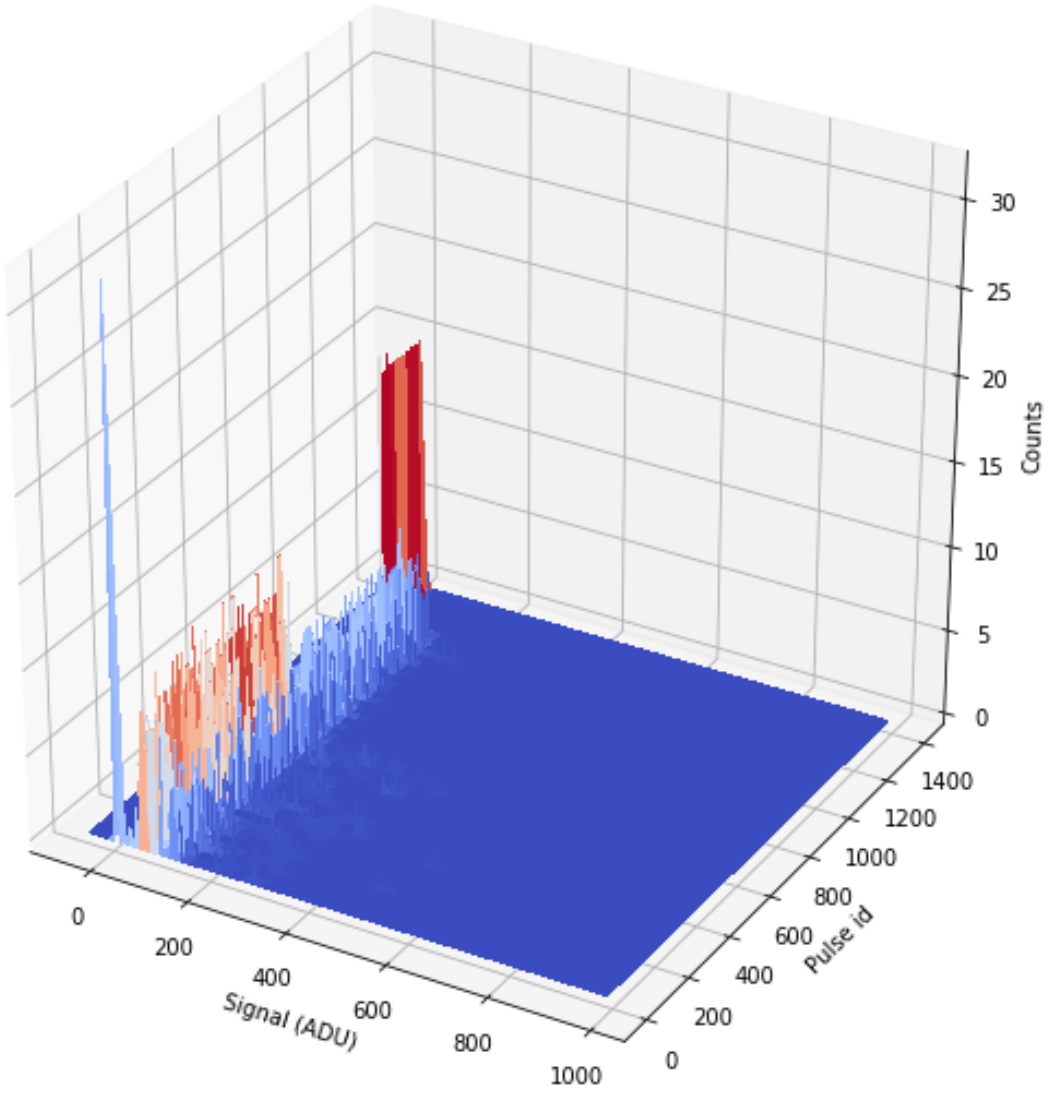
The following plot shows plots signal vs. digitized gain for the first 128 images.

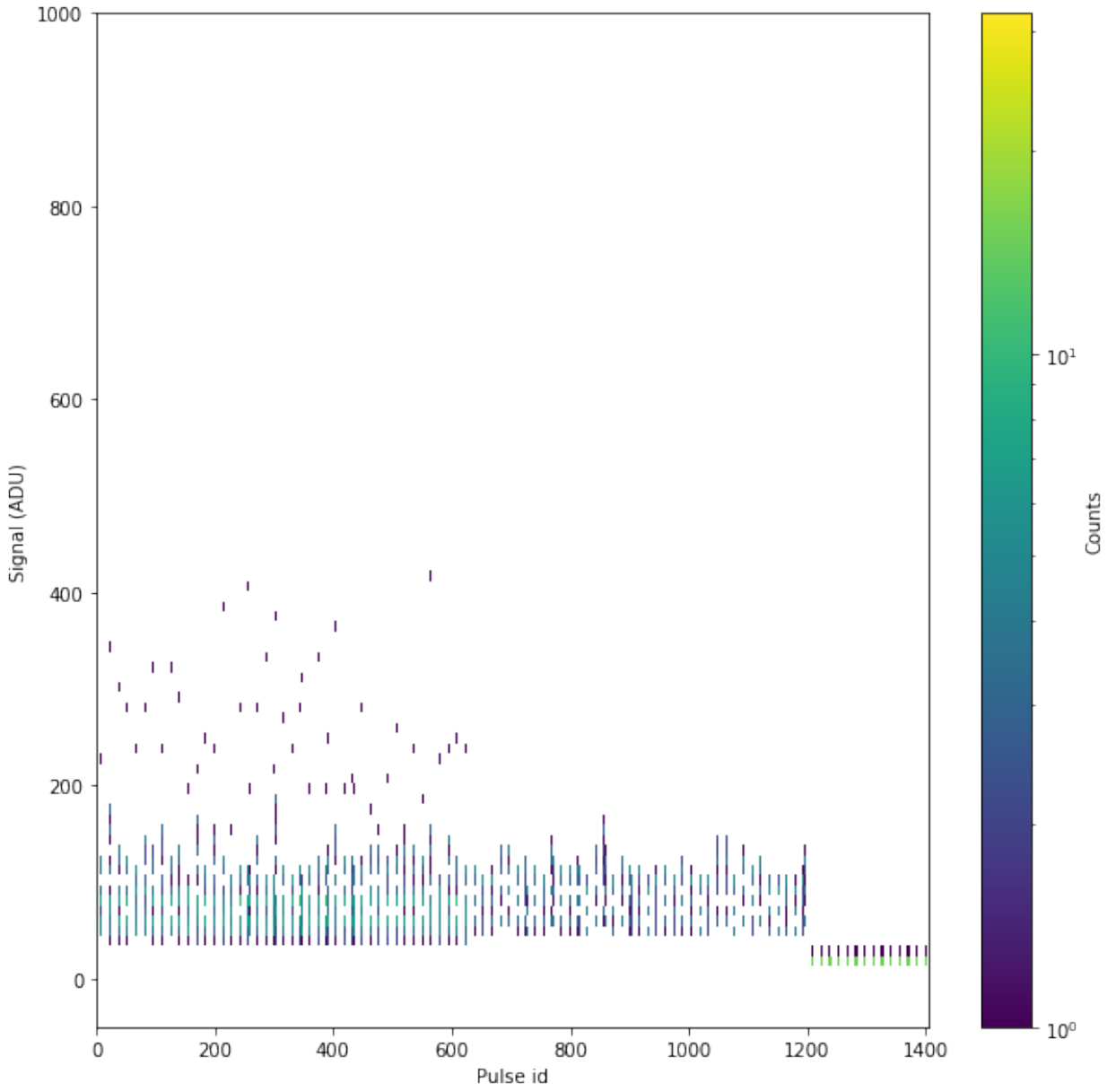

Signal (ADU)
8000
7500
7000
6500
6000
5500
5000
4500
4000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Gain Bit Value
Counts
10^7
10^6
10^5
10^4
10^3
10^2
10^1
10^0

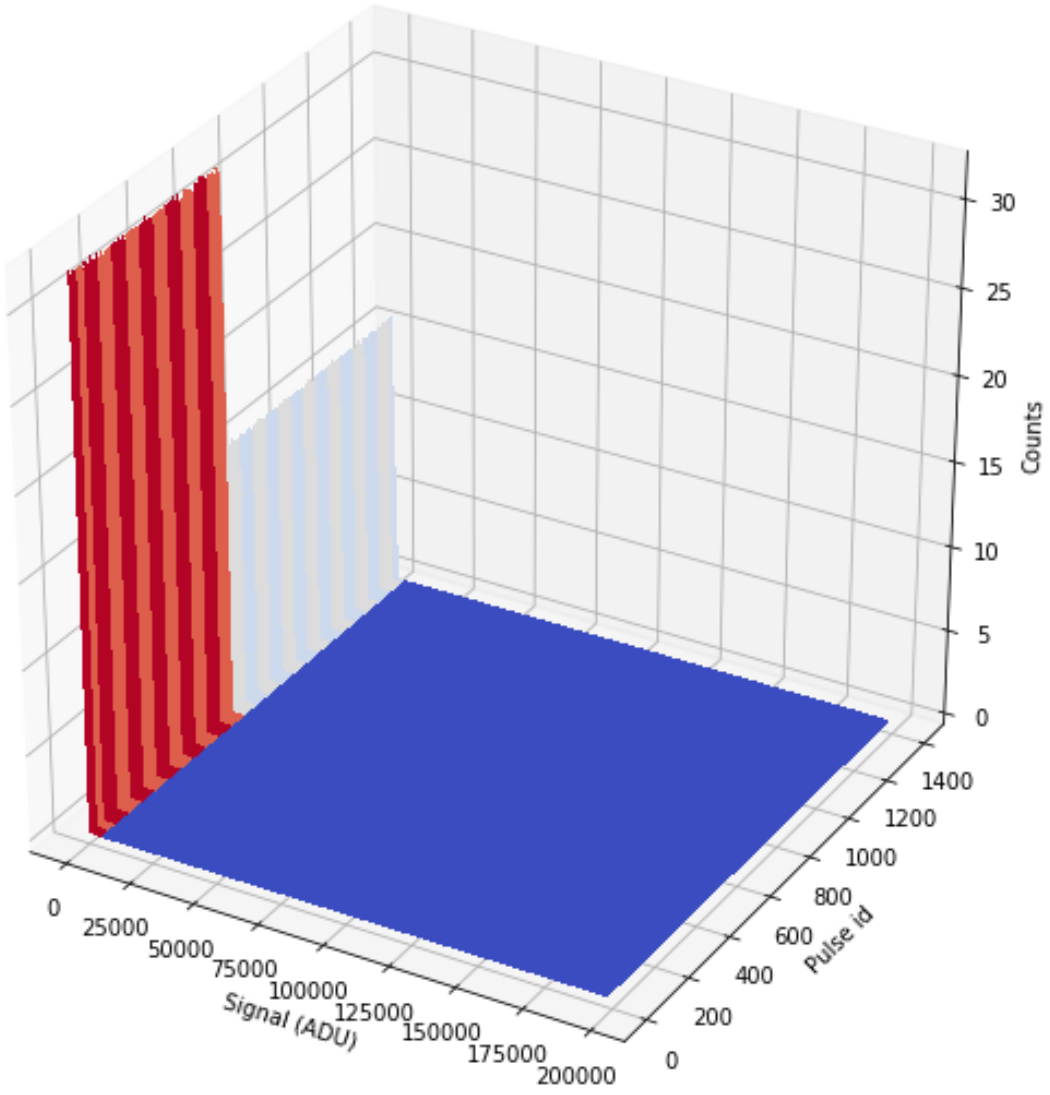


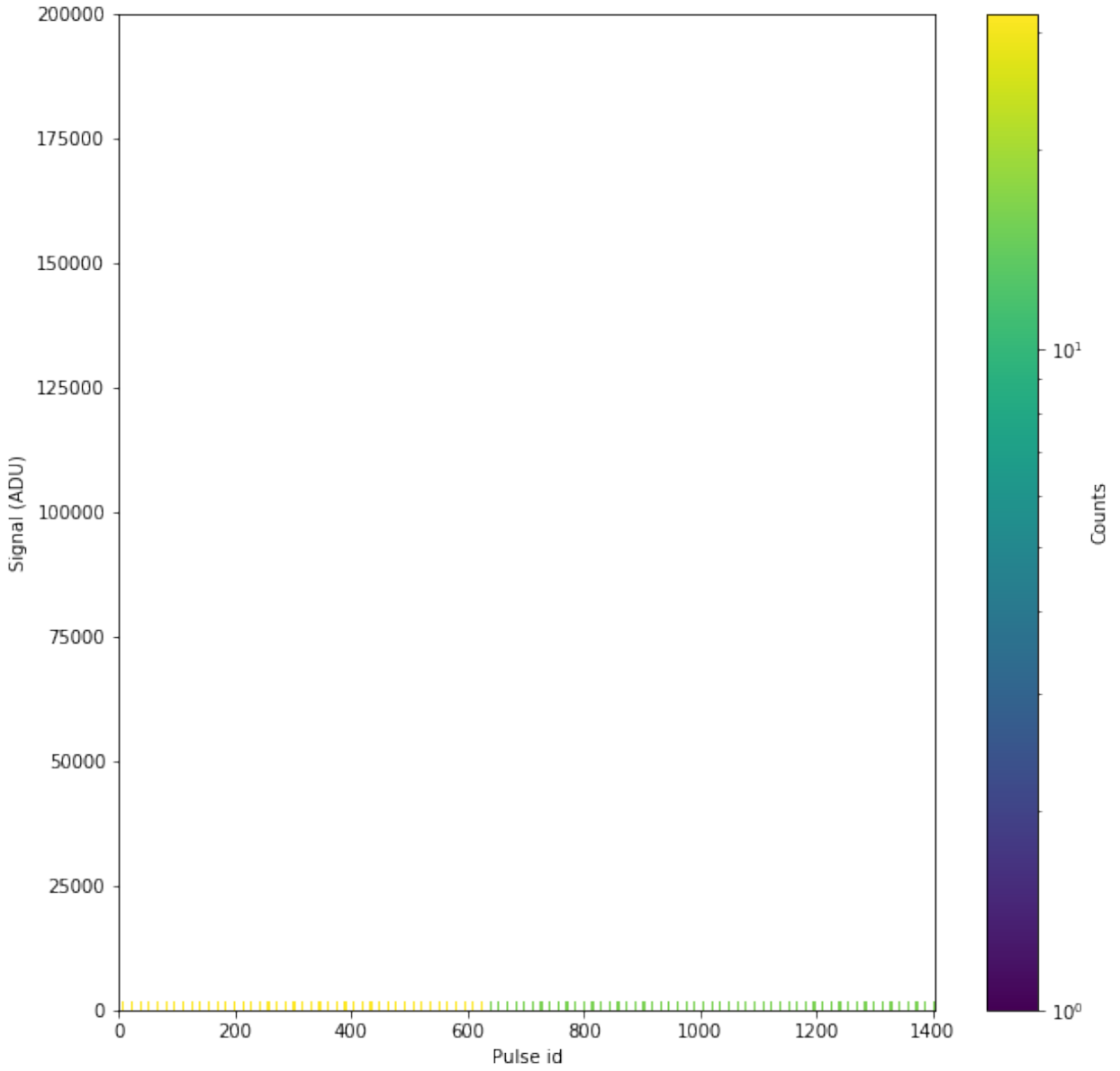
8.4 Mean Intensity per Pulse

The following plots show the mean signal for each pulse in a detailed and expanded intensity region.


30
25
20
15
10
5
0
Counts
0
200
400
600
800
1000
Signal (ADU)
0
200
400
600
800
1000
1200
1400
Pulse id

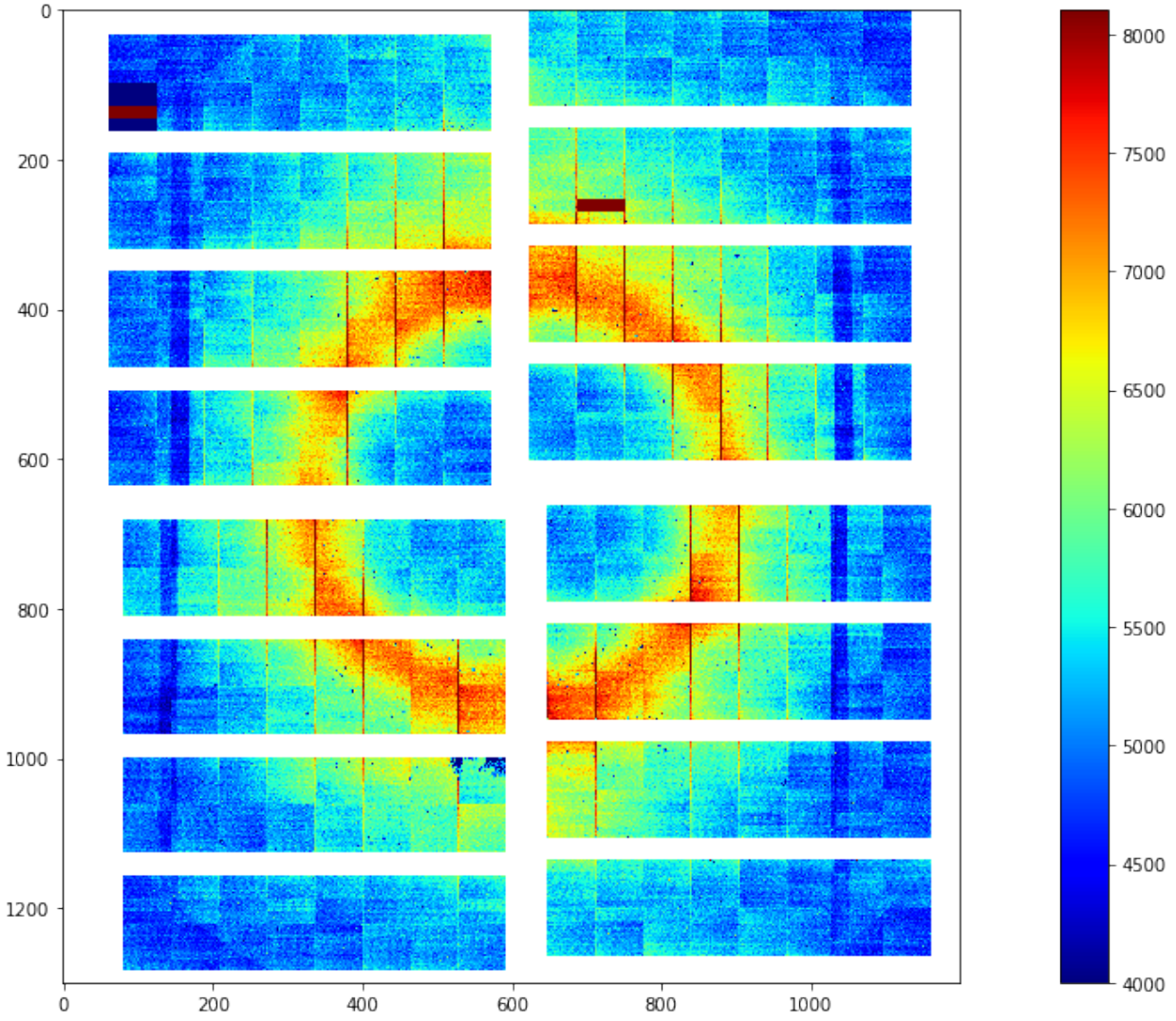

1000
800
600
400
200
0
Signal (ADU)
0
200
400
600
800
1000
1200
1400
Pulse id
10^1
10^0
Counts


Counts
30
25
20
15
10
5
0
Pulse id
1400
1200
1000
800
600
400
200
0
Signal (ADU)
0
25000
50000
75000
100000
125000
150000
175000
200000



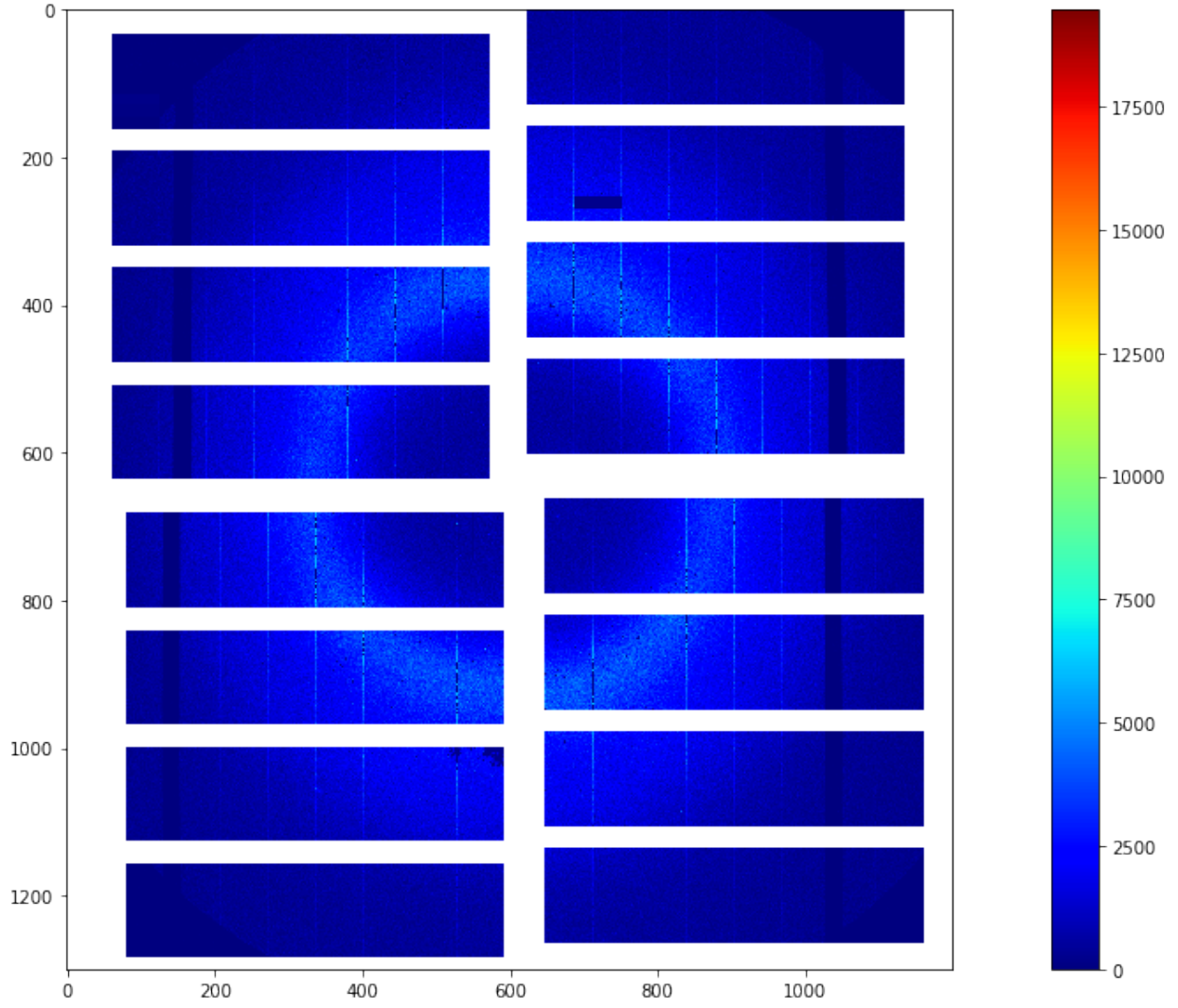
8.4.1 Mean RAW Preview

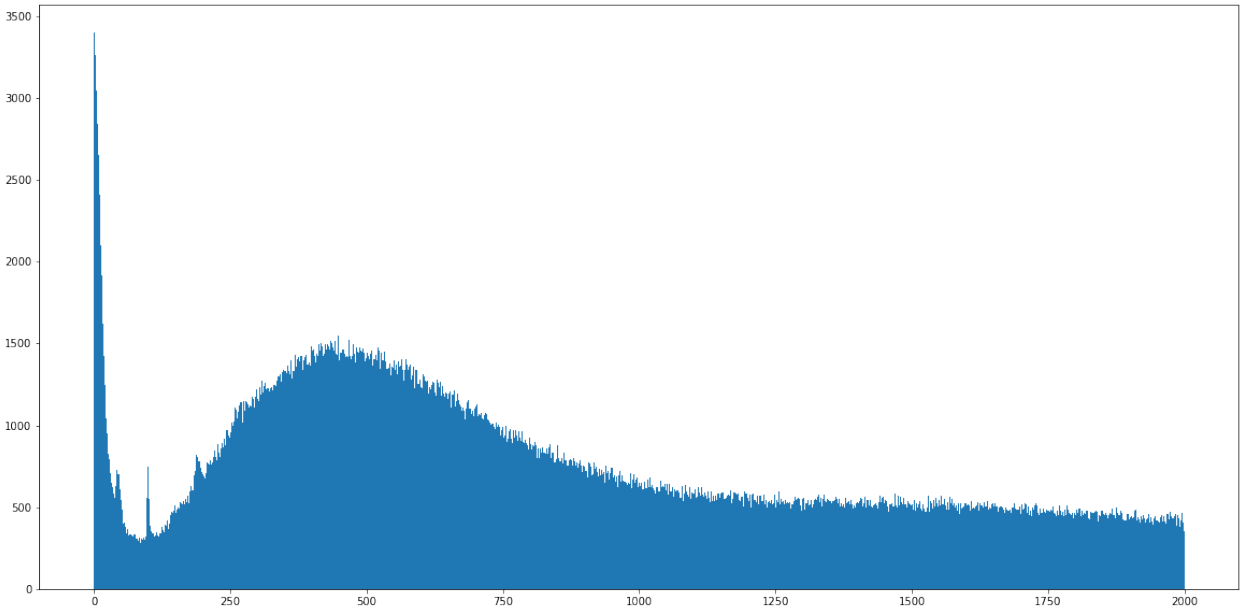
The per pixel mean of the first 128 images of the RAW data



8.4.2 Single Shot Preview

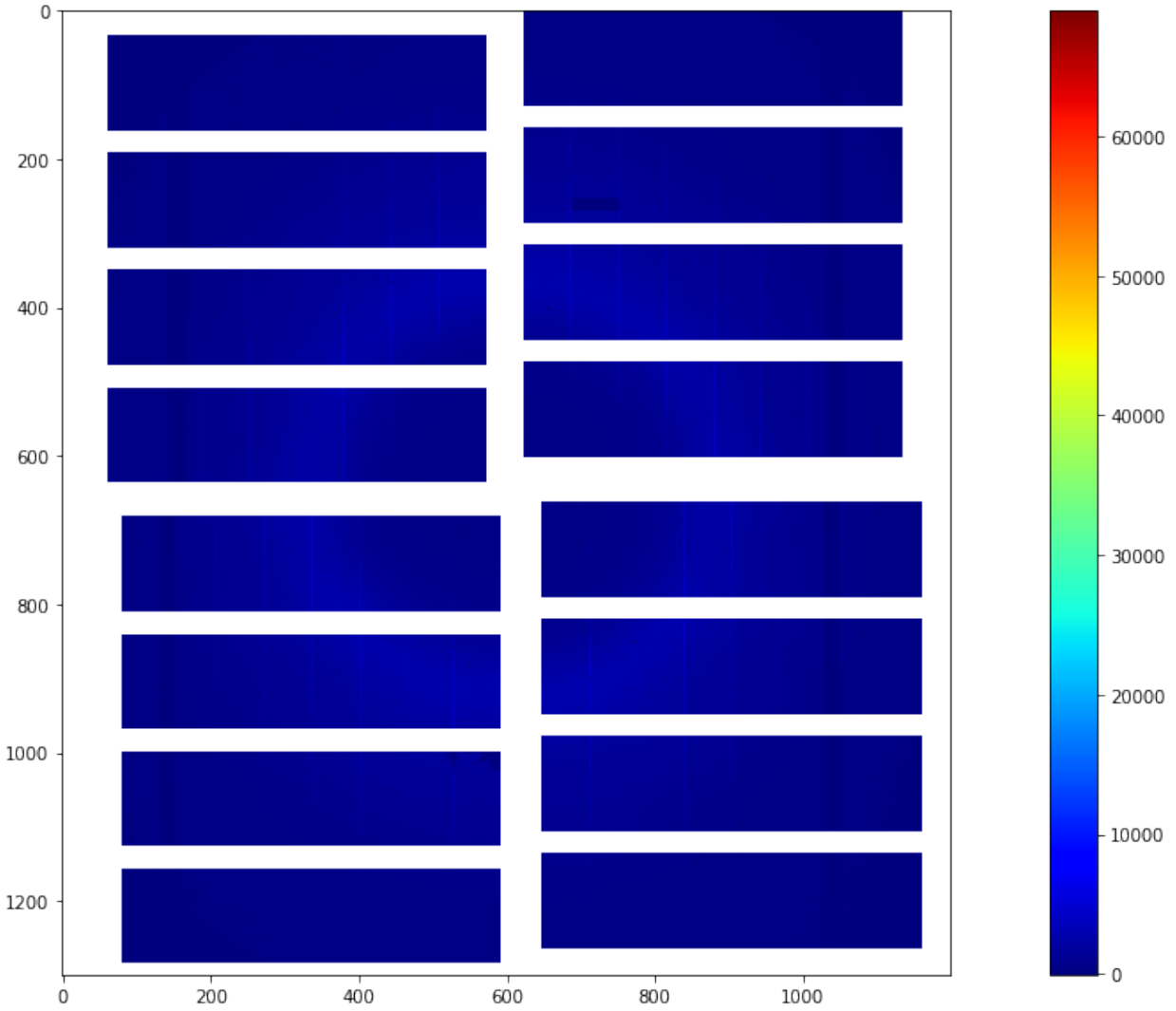
A single shot image from cell 12 of the first train

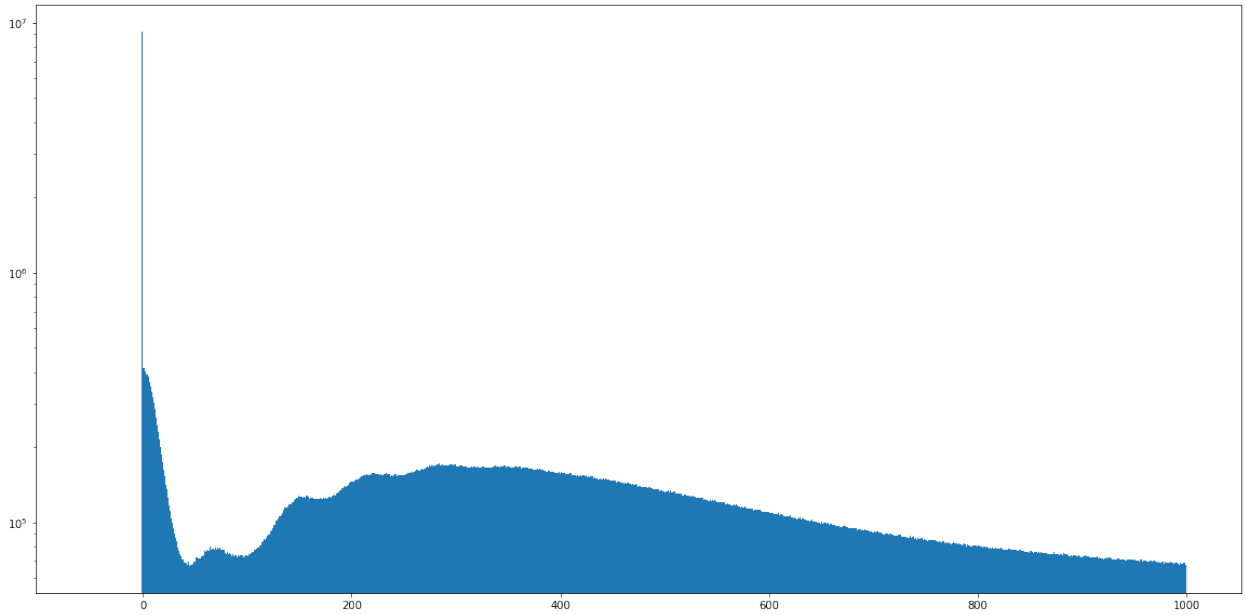

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
17500
15000
12500
10000
7500
5000
2500
0


3500
3000
2500
2000
1500
1000
500
0
0
250
500
750
1000
1250
1500
1750
2000

8.4.3 Mean CORRECTED Preview

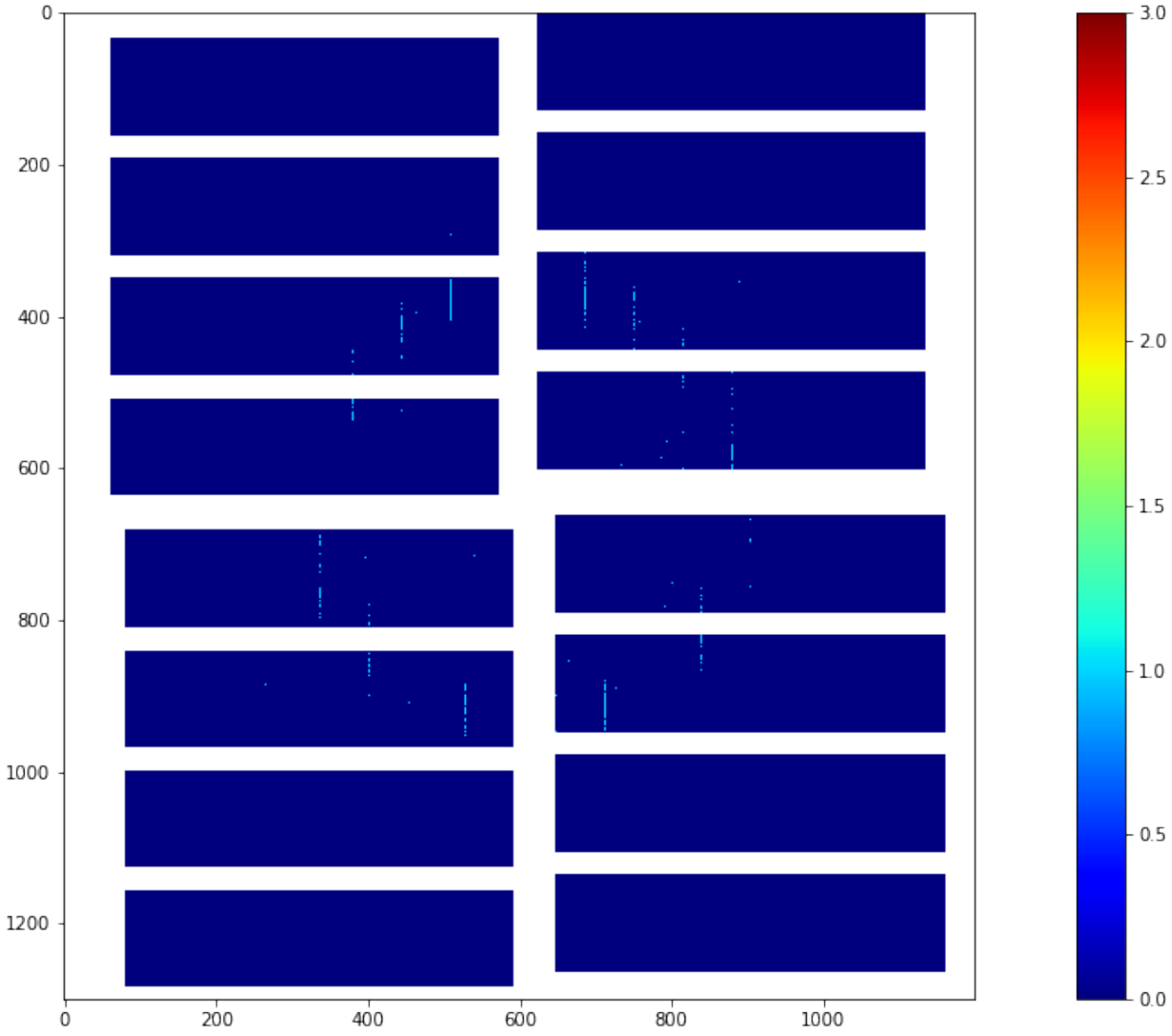
The per pixel mean of the first 128 images of the CORRECTED data





8.4.4 Maximum GAIN Preview

The per pixel maximum of the first 128 images of the digitized GAIN data


0
200
400
600
800
1000
1200
0
200
400
600
800
1000
3.0
2.5
2.0
1.5
1.0
0.5
0.0

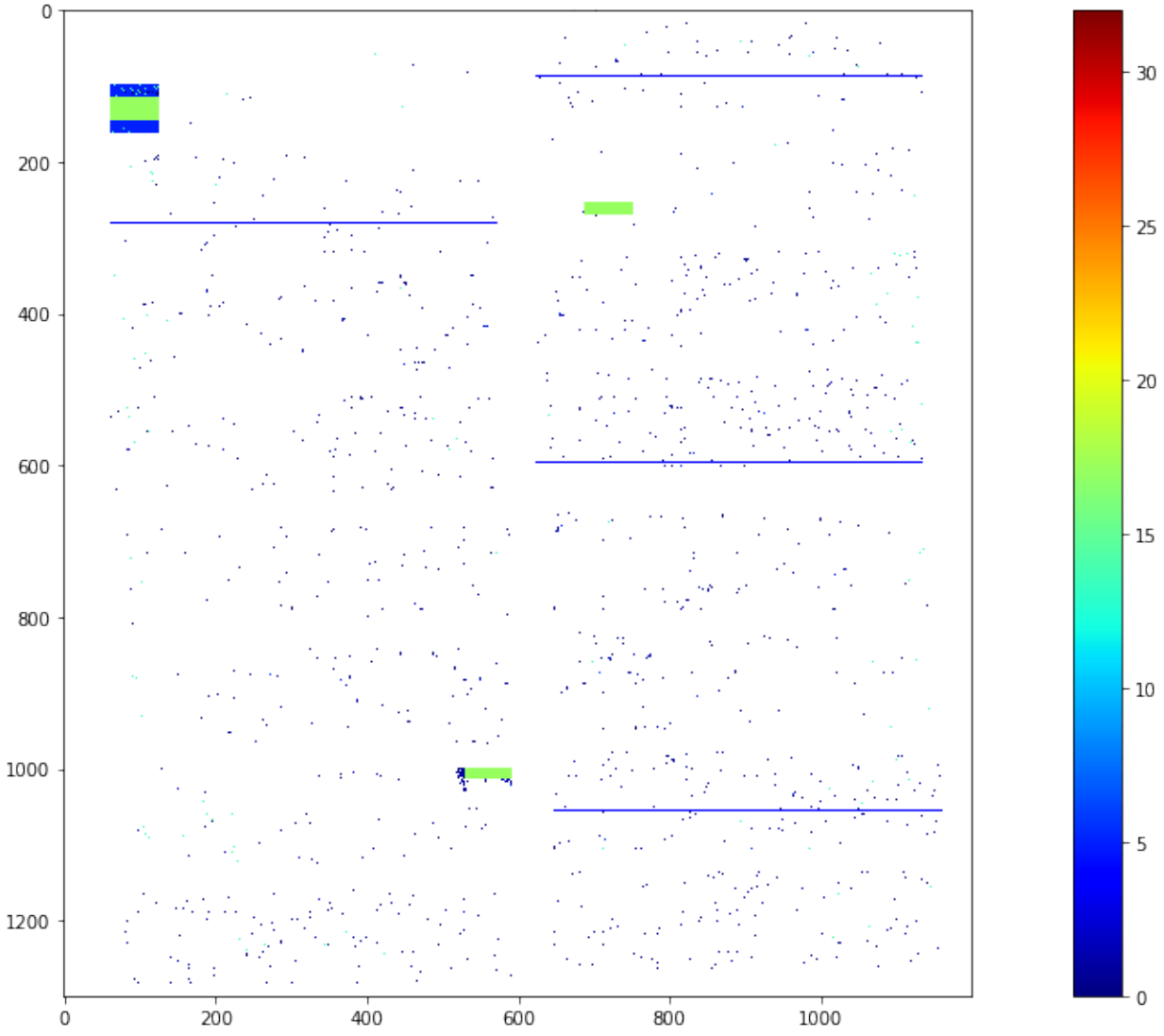
8.5 Bad Pixels

The mask contains dedicated entries for all pixels and memory cells as well as all three gains stages. Each mask entry is encoded in 32 bits as:

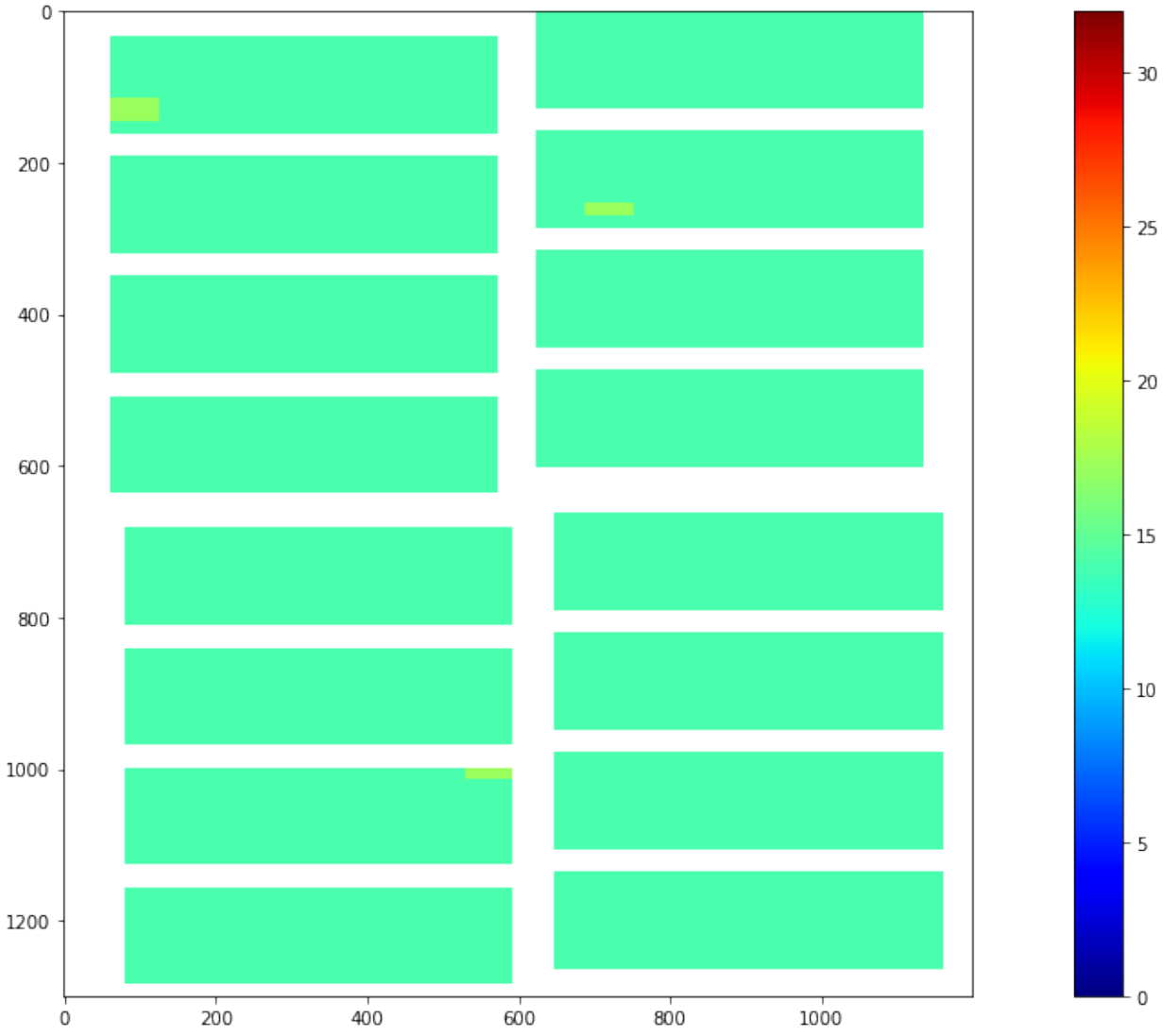
Bad pixel type	Bit mask
OFFSET_OUT_OF_THRESHOLD	0000000000000001
NOISE_OUT_OF_THRESHOLD	0000000000000010
OFFSET_NOISE_EVAL_ERROR	0000000000000100
NO_DARK_DATA	0000000000001000
CI_GAIN_OF_OF_THRESHOLD	0000000000010000
CI_LINEAR_DEVIATION	0000000000100000
CI_EVAL_ERROR	0000000001000000
FF_GAIN_EVAL_ERROR	0000000010000000
FF_GAIN_DEVIATION	0000000100000000
FF_NO_ENTRIES	0000001000000000
CI2_EVAL_ERROR	0000010000000000
VALUE_IS_NAN	0000100000000000
VALUE_OUT_OF_RANGE	0001000000000000
GAIN_THRESHOLDING_ERROR	0010000000000000
DATA_STD_IS_ZERO	0100000000000000
ASIC_STD_BELOW_NOISE	1000000000000000
INTERPOLATED	10000000000000000
NOISY_ADC	100000000000000000
OVERSCAN	1000000000000000000
NON_SENSITIVE	10000000000000000000
NON_LIN_RESPONSE_REGION	100000000000000000000

8.5.1 Single Shot Bad Pixels

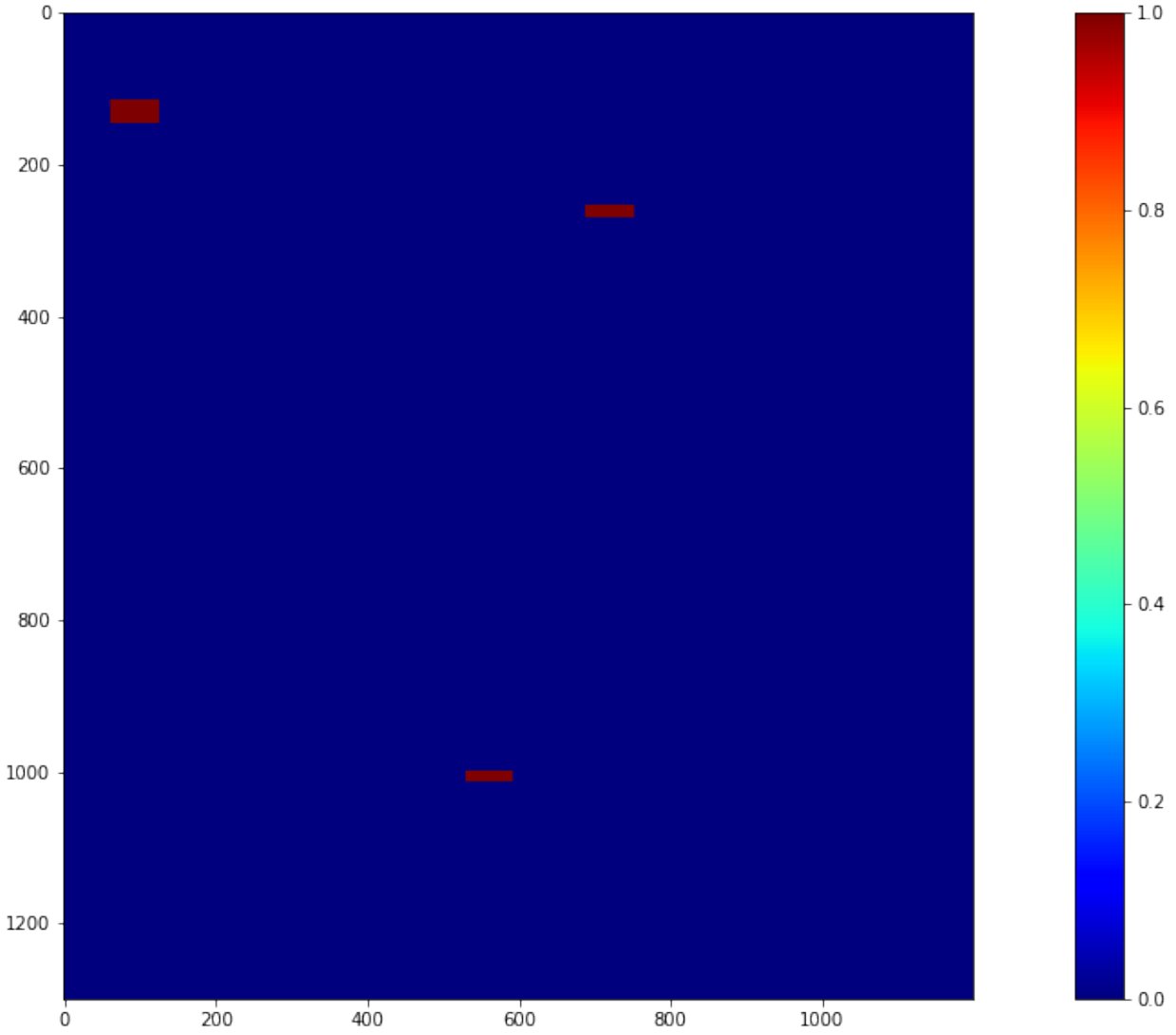
A single shot bad pixel map from cell 4 of the first train

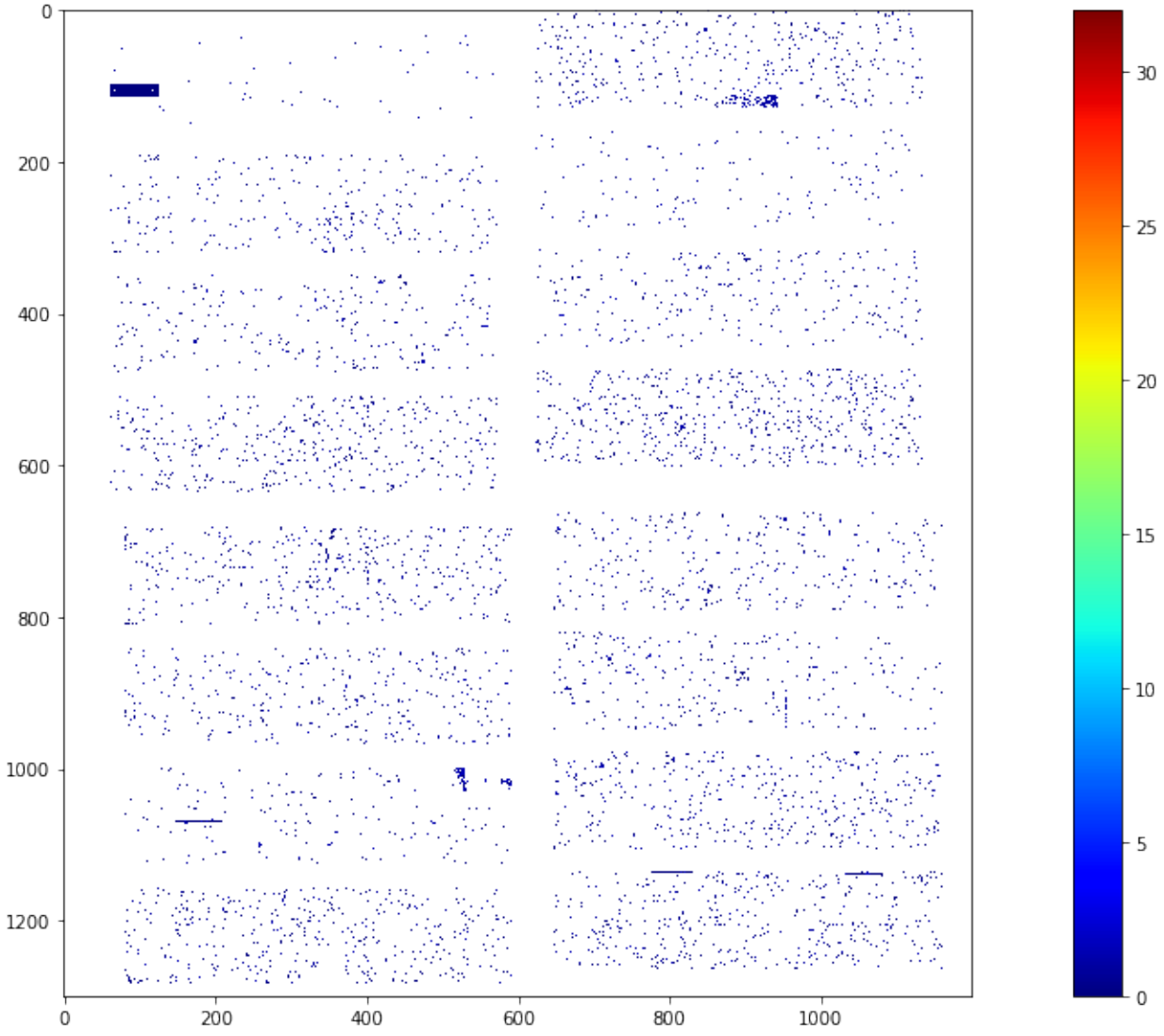

0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

8.5.2 Full Train Bad Pixels



8.5.3 Full Train Bad Pixels - Only Dark Char. Related




0
200
400
600
800
1000
1200
0
200
400
600
800
1000
30
25
20
15
10
5
0

CHAPTER

NINE

SUMMARY OF THE AGIPD OFFLINE CORRECTION

```
offset were injected on:
```

Time stamps	Modules and sequences
20-03-04 15:33	All modules

```
slopesPC were injected on:
```

Time stamps	Modules and sequences
19-11-25 21:00	S0: ['Q2M2'], S1: ['Q2M2'], S2: ['Q2M2'], S3: ['Q2M2'], S4: ['Q2M2'], S5: ['Q2M2'], S6: ['Q2M2'], S7: ['Q2
19-11-25 21:04	S0: ['Q3M1'], S1: ['Q3M1'], S2: ['Q3M1'], S3: ['Q3M1'], S4: ['Q3M1'], S5: ['Q3M1'], S6: ['Q3M1'], S7: ['Q3
19-11-25 21:05	S0: ['Q2M4'], S1: ['Q2M4'], S2: ['Q2M4'], S3: ['Q2M4'], S4: ['Q2M4'], S5: ['Q2M4'], S6: ['Q2M4'], S7: ['Q2
19-11-25 21:09	S0: ['Q2M3'], S1: ['Q2M3'], S2: ['Q2M3'], S3: ['Q2M3'], S4: ['Q2M3'], S5: ['Q2M3'], S6: ['Q2M3'], S7: ['Q2
19-11-25 21:24	S0: ['Q1M2'], S1: ['Q1M2'], S2: ['Q1M2'], S3: ['Q1M2'], S4: ['Q1M2'], S5: ['Q1M2'], S6: ['Q1M2'], S7: ['Q1
19-11-25 21:30	S0: ['Q2M1'], S1: ['Q2M1'], S2: ['Q2M1'], S3: ['Q2M1'], S4: ['Q2M1'], S5: ['Q2M1'], S6: ['Q2M1'], S7: ['Q2
19-11-25 21:33	S0: ['Q4M2'], S1: ['Q4M2'], S2: ['Q4M2'], S3: ['Q4M2'], S4: ['Q4M2'], S5: ['Q4M2'], S6: ['Q4M2'], S7: ['Q4
19-11-25 21:34	S0: ['Q3M2'], S1: ['Q3M2'], S2: ['Q3M2'], S3: ['Q3M2'], S4: ['Q3M2'], S5: ['Q3M2'], S6: ['Q3M2'], S7: ['Q3
19-11-25 21:40	Rest of the modules
19-11-25 21:42	S0: ['Q4M3'], S1: ['Q4M3'], S2: ['Q4M3'], S3: ['Q4M3'], S4: ['Q4M3'], S5: ['Q4M3'], S6: ['Q4M3'], S7: ['Q4
19-11-25 21:58	S0: ['Q3M4'], S1: ['Q3M4'], S2: ['Q3M4'], S3: ['Q3M4'], S4: ['Q3M4'], S5: ['Q3M4'], S6: ['Q3M4'], S7: ['Q3
19-11-25 21:59	S0: ['Q4M4'], S1: ['Q4M4'], S2: ['Q4M4'], S3: ['Q4M4'], S4: ['Q4M4'], S5: ['Q4M4'], S6: ['Q4M4'], S7: ['Q4
19-11-25 22:00	S0: ['Q3M3'], S1: ['Q3M3'], S2: ['Q3M3'], S3: ['Q3M3'], S4: ['Q3M3'], S5: ['Q3M3'], S6: ['Q3M3'], S7: ['Q3
19-11-25 22:01	S0: ['Q1M4'], S1: ['Q1M4'], S2: ['Q1M4'], S3: ['Q1M4'], S4: ['Q1M4'], S5: ['Q1M4'], S6: ['Q1M4'], S7: ['Q1
19-11-25 22:07	S0: ['Q4M1'], S1: ['Q4M1'], S2: ['Q4M1'], S3: ['Q4M1'], S4: ['Q4M1'], S5: ['Q4M1'], S6: ['Q4M1'], S7: ['Q4

```
slopesFF were injected on:
```

Time stamps	Modules and sequences
NA	All modules

CHAPTER

TEN

RUNTIME SUMMARY

JobID	Elapsed	Suspended
4658789	02:29:51	00:00:00
4658790	02:24:19	00:00:00
4658791	02:21:01	00:00:00
4658792	02:03:01	00:00:00
4658793	02:03:55	00:00:00
4658794	02:03:27	00:00:00
4658795	01:42:41	00:00:00
4658796	00:00:21	00:00:00