
'AGIPD Offline Correction' Documentation

Release 1.0

'European XFEL Detector Group'

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Contents:

INPUT PARAMETERS

the folder to read data from, required

```
in_folder = '/gpfs/xfel/exp/SPB/201831/p900039/raw/'
```

runs to process, required

```
run = 412
```

the folder to output to, required

```
out_folder = '/gpfs/xfel/data/scratch/haufs/test/'
```

path to calibration file. Leave empty if all data should come from DB

```
calfile = '/gpfs/xfel/data/scratch/haufs/agipd_on_demand/agipd_store.h5'
```

sequences to correct, set to -1 for all, range allowed

```
sequences = [0]
```

memory cells in data

```
mem_cells = 176
```

whether data is in interlaced layout

```
interlaced = False
```

set to True if existing data should be overwritten

```
overwrite = True
```

do not do relative gain correction

```
no_relative_gain = False
```

None

```
cluster_profile = 'slurm_prof_795f4123-d890-4c77-a106-c27aabafd494'
```

None

```
max_pulses = 500
```

None

```
local_input = False
```

None

```
bias_voltage = 300
```

the database interface to use

```
cal_db_interface = 'tcp://max-exfl016:8015#8025'
```

use the creation data of the input dir for database queries

```
use_dir_creation_date = True
```

number of sequence files per cluster node if run as slurm job, set to 0 to not run SLURM parallel

```
sequences_per_node = 2
```

photon energy in keV

```
photon_energy = 9.2
```

version of RAW index type

```
index_v = 2
```

if set only file-based constants will be used

```
nodb = False
```

if set, baseline correction via noise peak location is attempted

```
blc_noise = True
```

above this mean signal intensity now baseline correction via noise is attempted

```
blc_noise_threshold = 5000
```

if set, base line correction via histogram matching is attempted

```
blc_hist = False
```

if set, inner ASIC borders are matched to the same signal level

```
match_asics = False
```

if set, diagonal drop offs on ASICs are corrected

```
corr_asic_diag = False
```

if set to "none" snowy pixels are identified and resolved to NaN, if set to "interpolate", the value is interpolated from neighbouring pixels

```
melt_snow = ''
```

in milli seconds

```
cal_db_timeout = 300000
```

set to a value different than -1 to use this value for dark data DB queries

```
max_cells_db_dark = 176
```

set to a value different than 0 to use this value for DB queries

```
max_cells_db = 0
```

chunking size of imaging dimension, adjust if user software is sensitive to this.

```
chunk_size_idim = 32
```

AGIPD OFFLINE CORRECTION. SEQUENCES = 0

Author: European XFEL Detector Group, Version: 1.0

Offline Calibration for the AGIPD Detector

```
/home/haufs/calkarabo/karabo/extern/lib/python3.4/importlib/_bootstrap.py:321: FutureWarning
    return f(*args, **kwargs)
```

```
Connecting to profile slurm_prof_795f4123-d890-4c77-a106-c27aabafd494_0
Using 2018-09-10 04:06:56.468877 as creation time
Working in IL Mode: False. Actual cells in use are: 176
Outputting to /gpfs/xfel/data/scratch/haufs/test//r0412
```

2.1 Processed Files

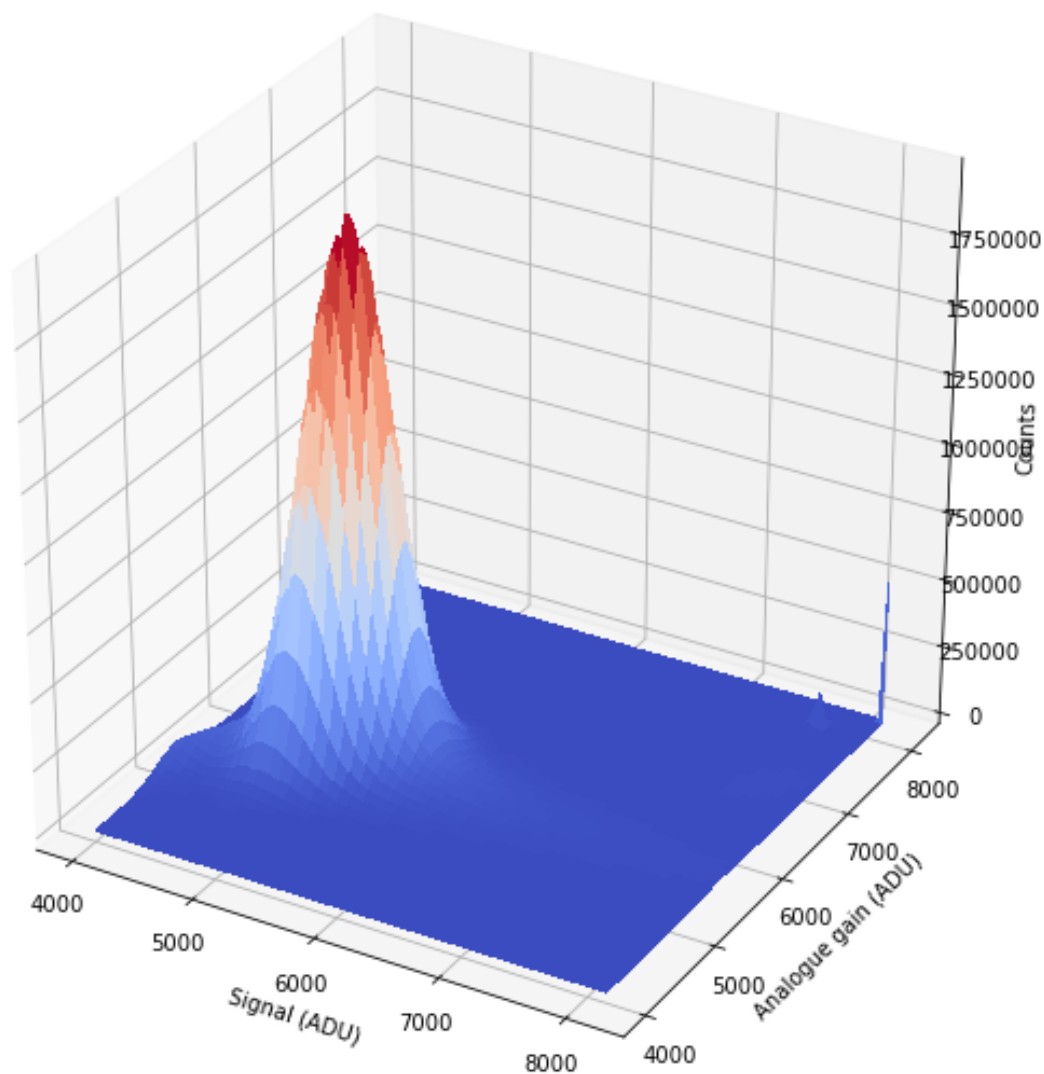
```
Processing a total of 16 sequence files in chunks of 16
```

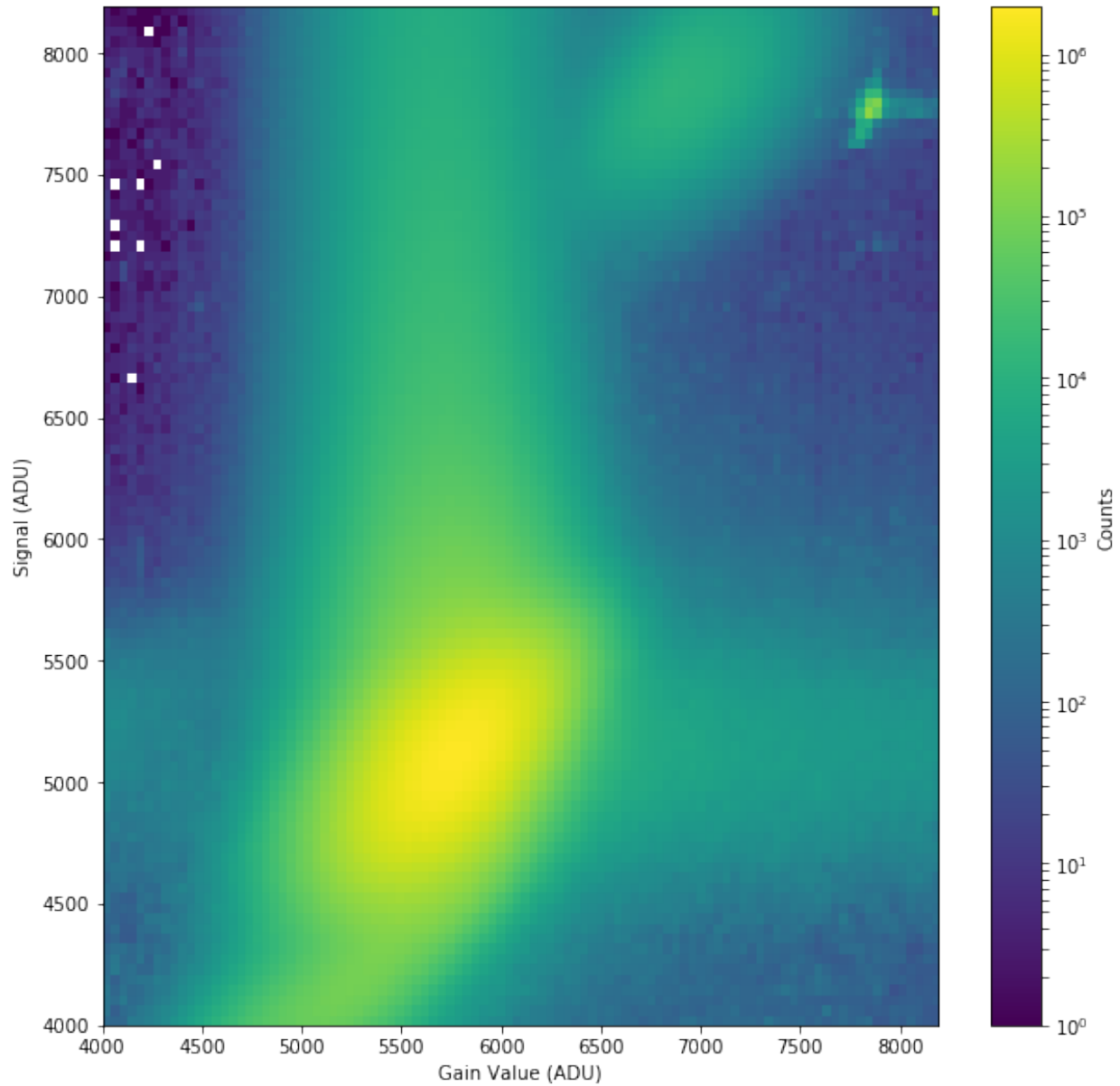
#	module	# module	file
0	Q1M1	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD00-S00000.h5
1	Q1M2	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD01-S00000.h5
2	Q1M3	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD02-S00000.h5
3	Q1M4	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD03-S00000.h5
4	Q2M1	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD04-S00000.h5
5	Q2M2	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD05-S00000.h5
6	Q2M3	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD06-S00000.h5
7	Q2M4	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD07-S00000.h5
8	Q3M1	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD08-S00000.h5
9	Q3M2	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD09-S00000.h5
10	Q3M3	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD10-S00000.h5
11	Q3M4	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD11-S00000.h5
12	Q4M1	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD12-S00000.h5
13	Q4M2	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD13-S00000.h5
14	Q4M3	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD14-S00000.h5
15	Q4M4	0	/gpfs/xfel/exp/SPB/201831/p900039/raw/r0412/RAW-R0412-AGIPD15-S00000.h5

```
Running 16 tasks parallel
```

2.2 Signal vs. Analogue Gain

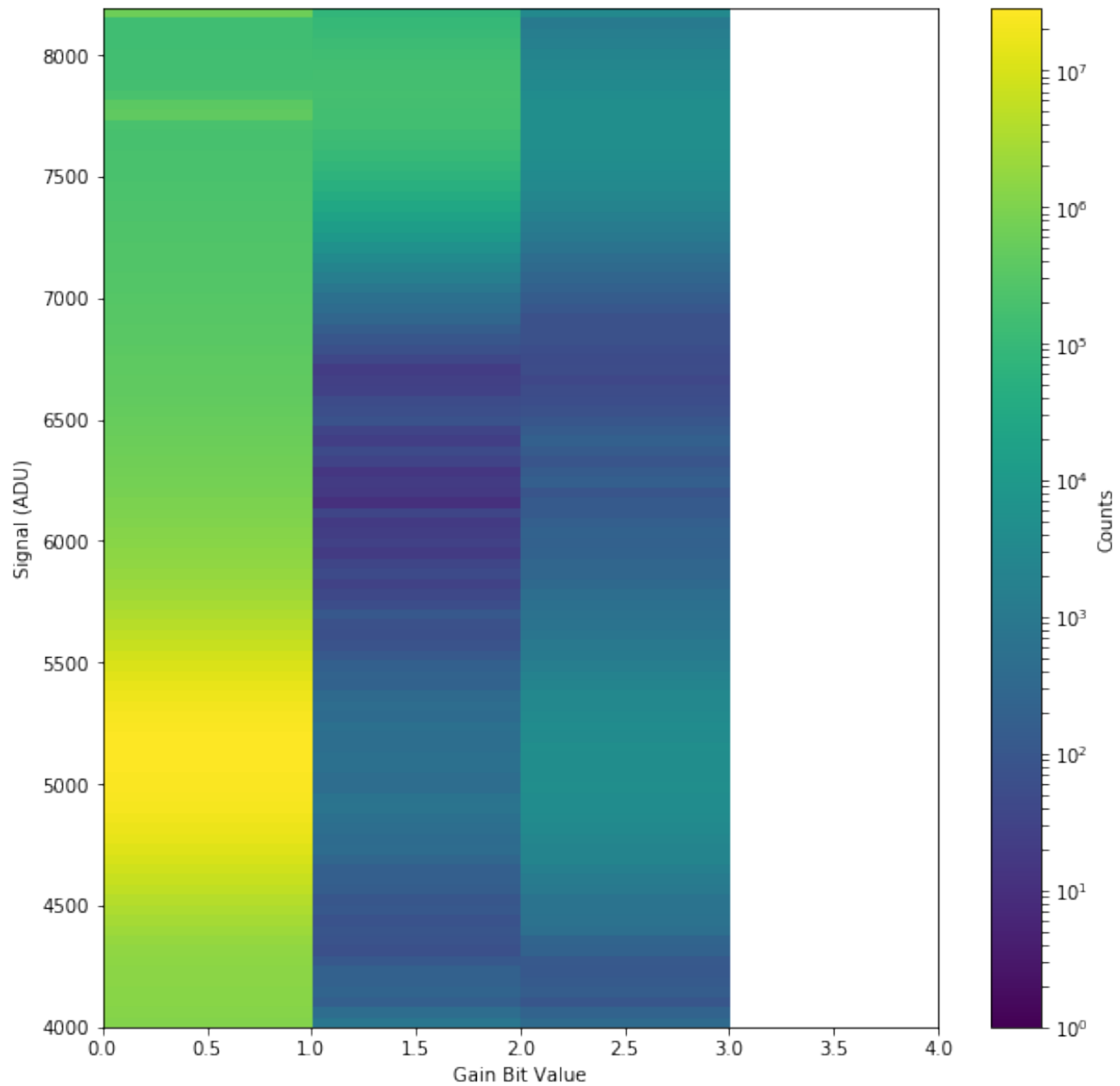
The following plot shows plots signal vs. gain for the first 128 images.





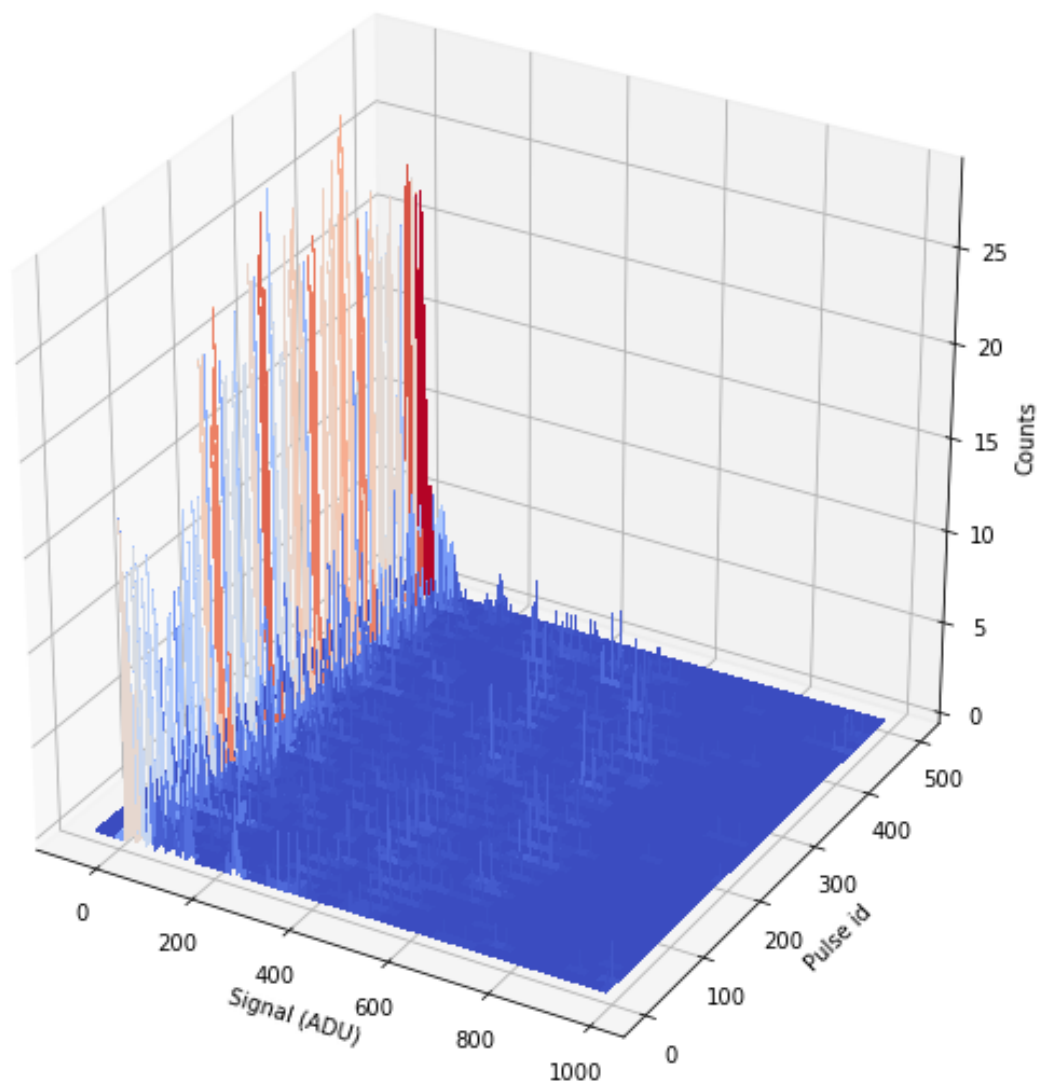
2.3 Signal vs. Digitized Gain

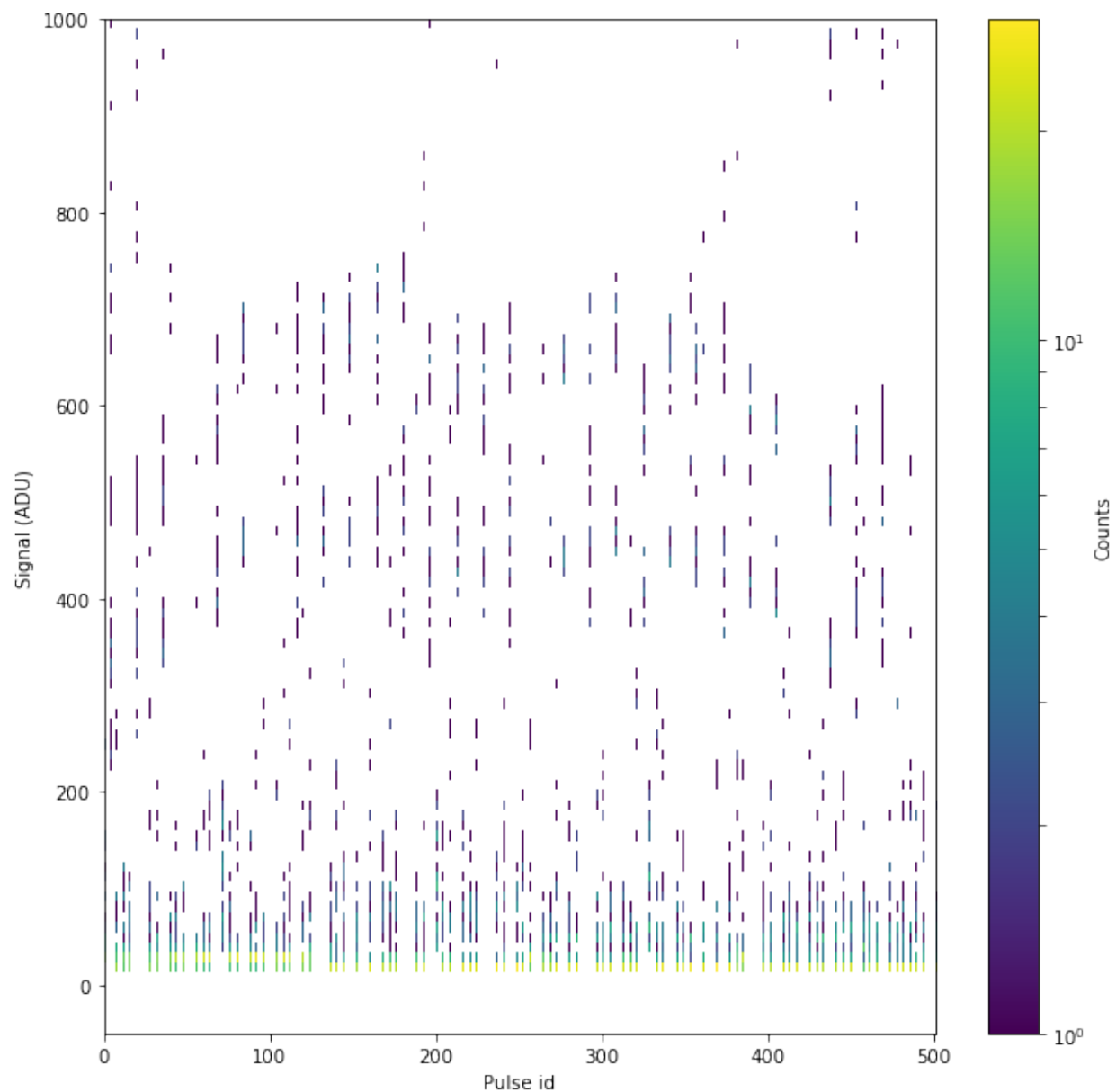
The following plot shows plots signal vs. digitized gain for the first 128 images.

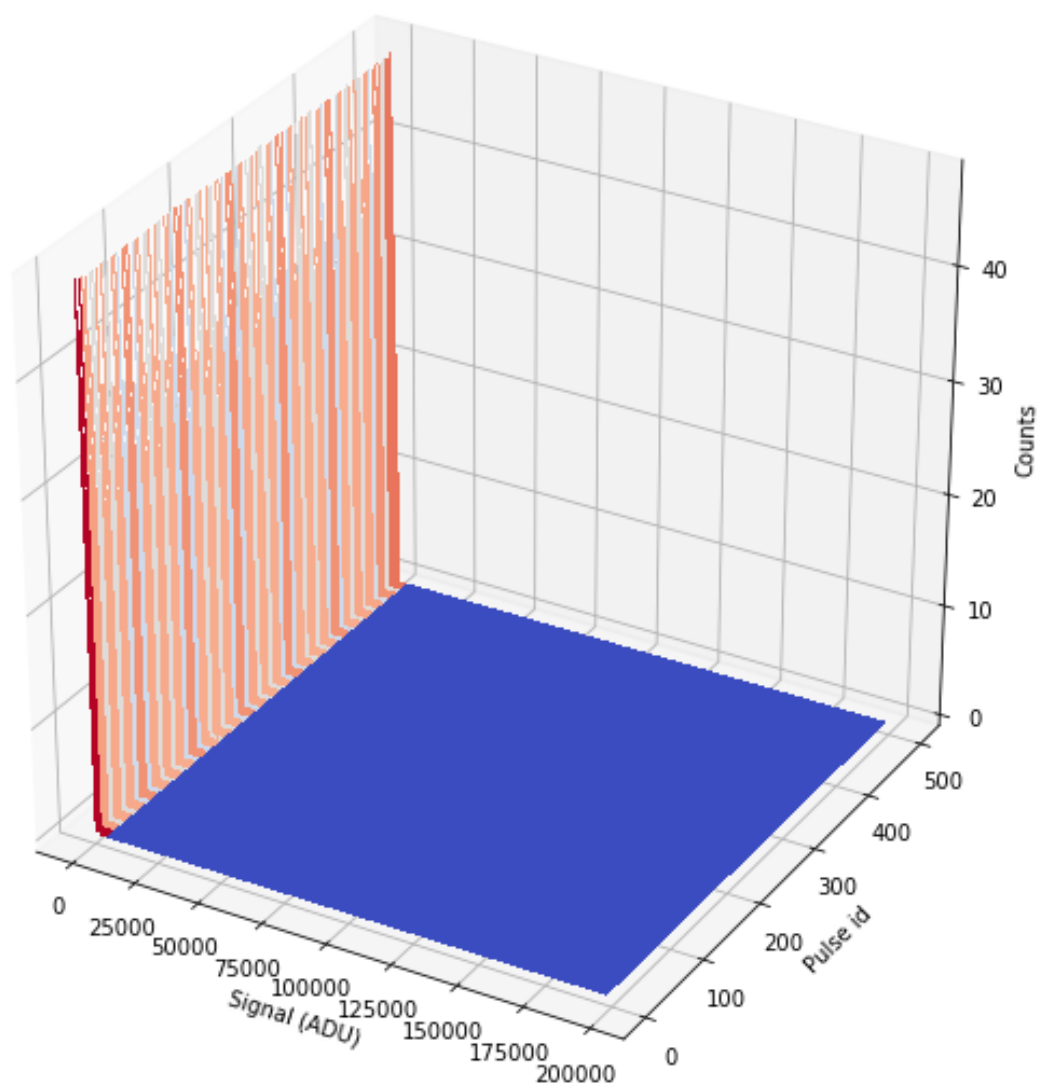


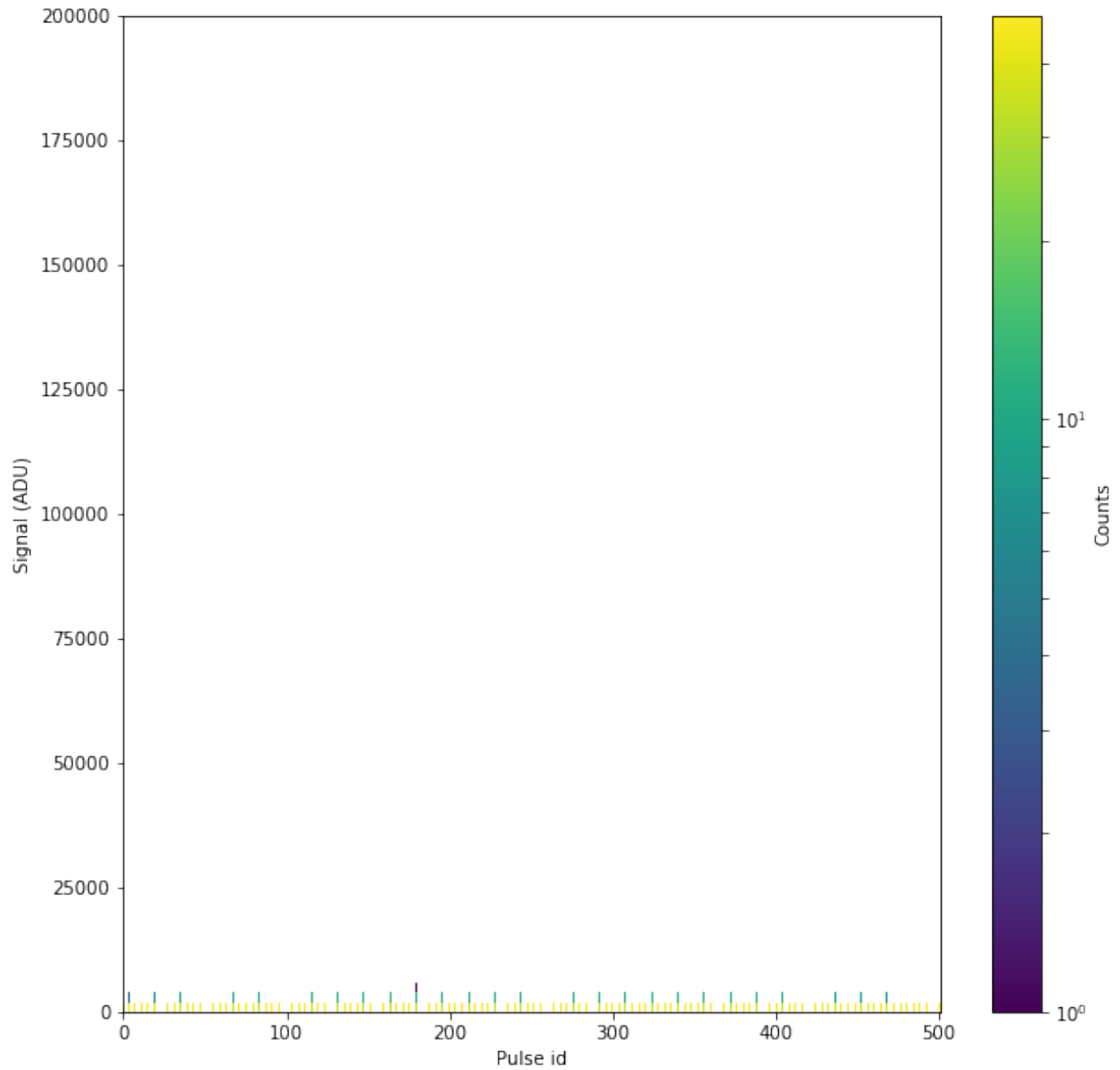
2.4 Mean Intensity per Pulse

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



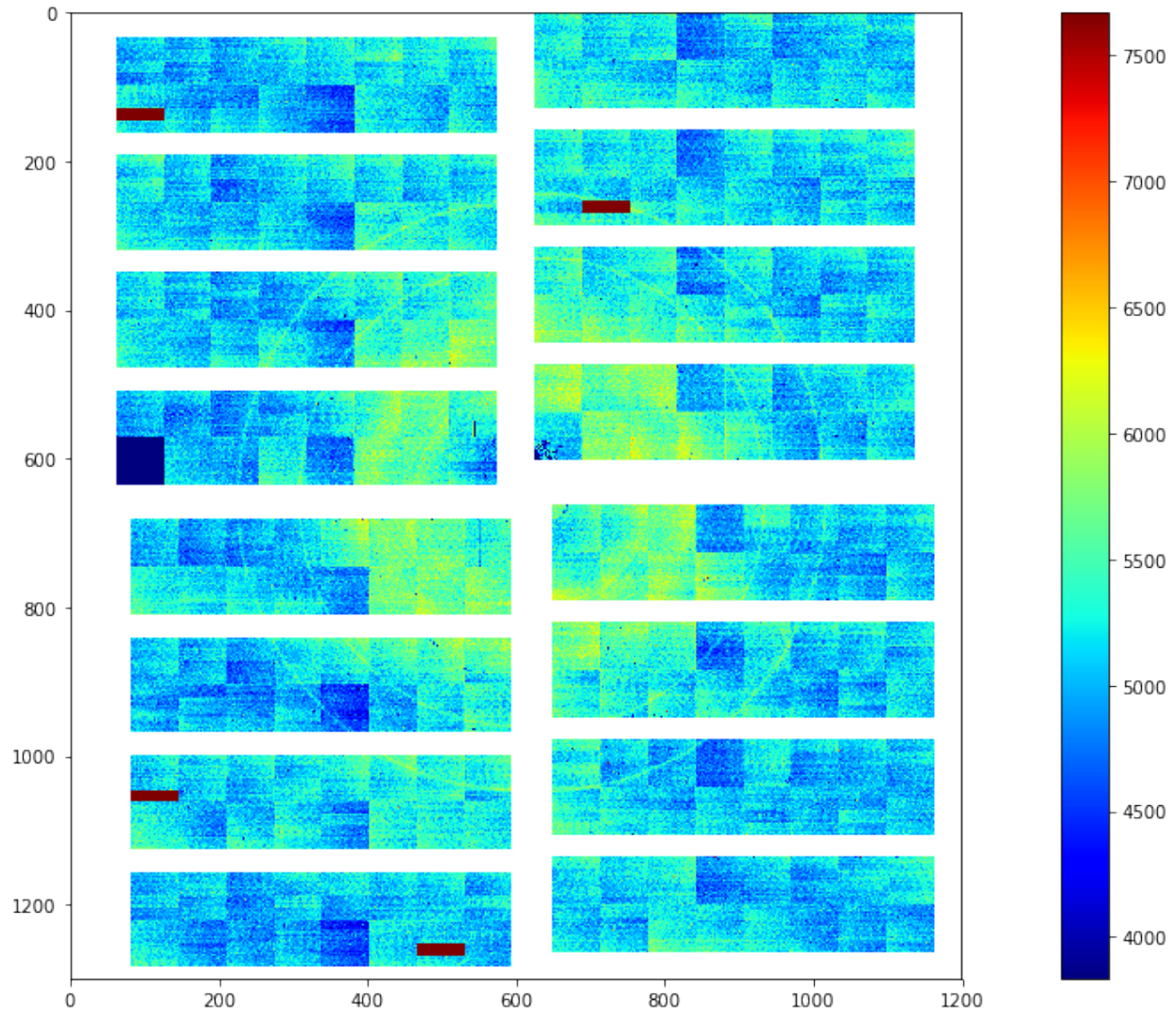






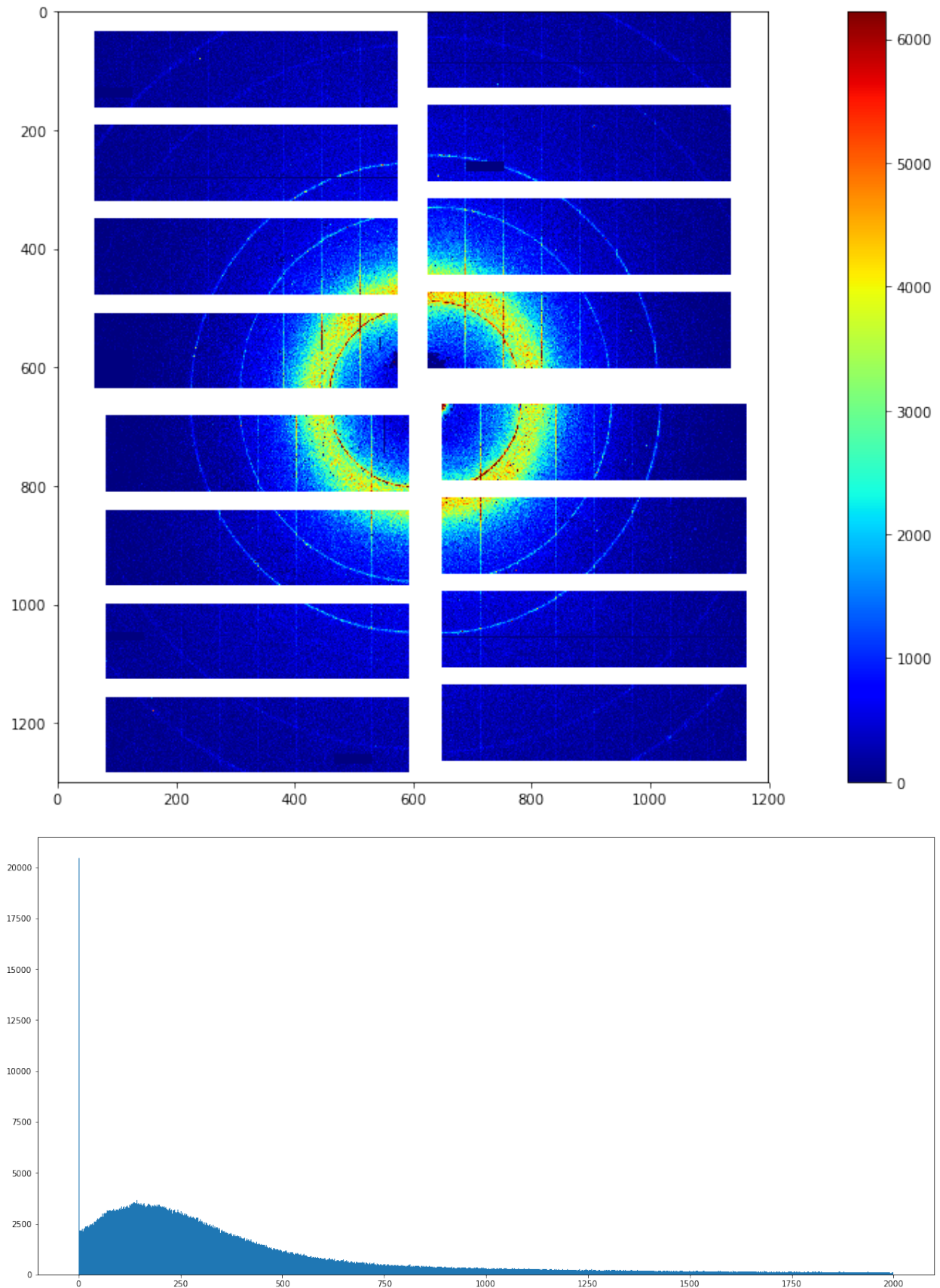
2.4.1 Mean RAW Preview

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



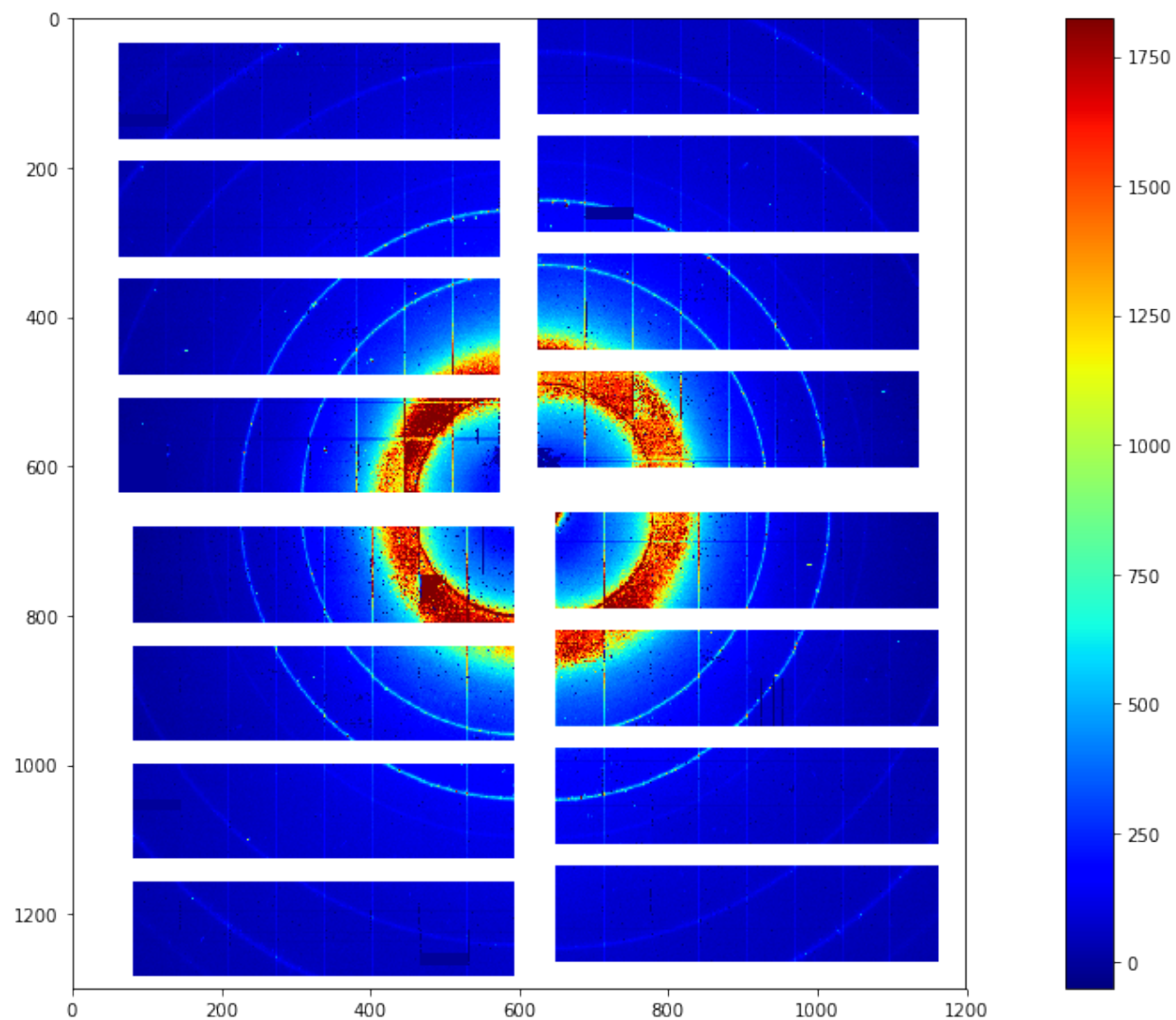
2.4.2 Single Shot Preview

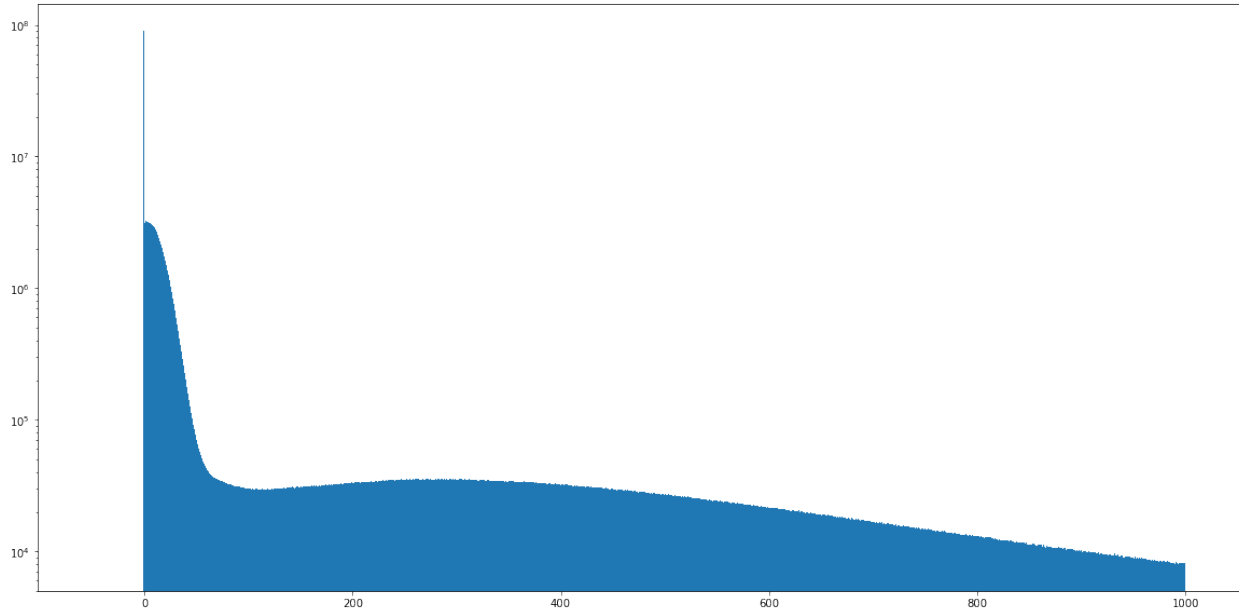
A single shot image from cell 12 of the first train



2.4.3 Mean CORRECTED Preview

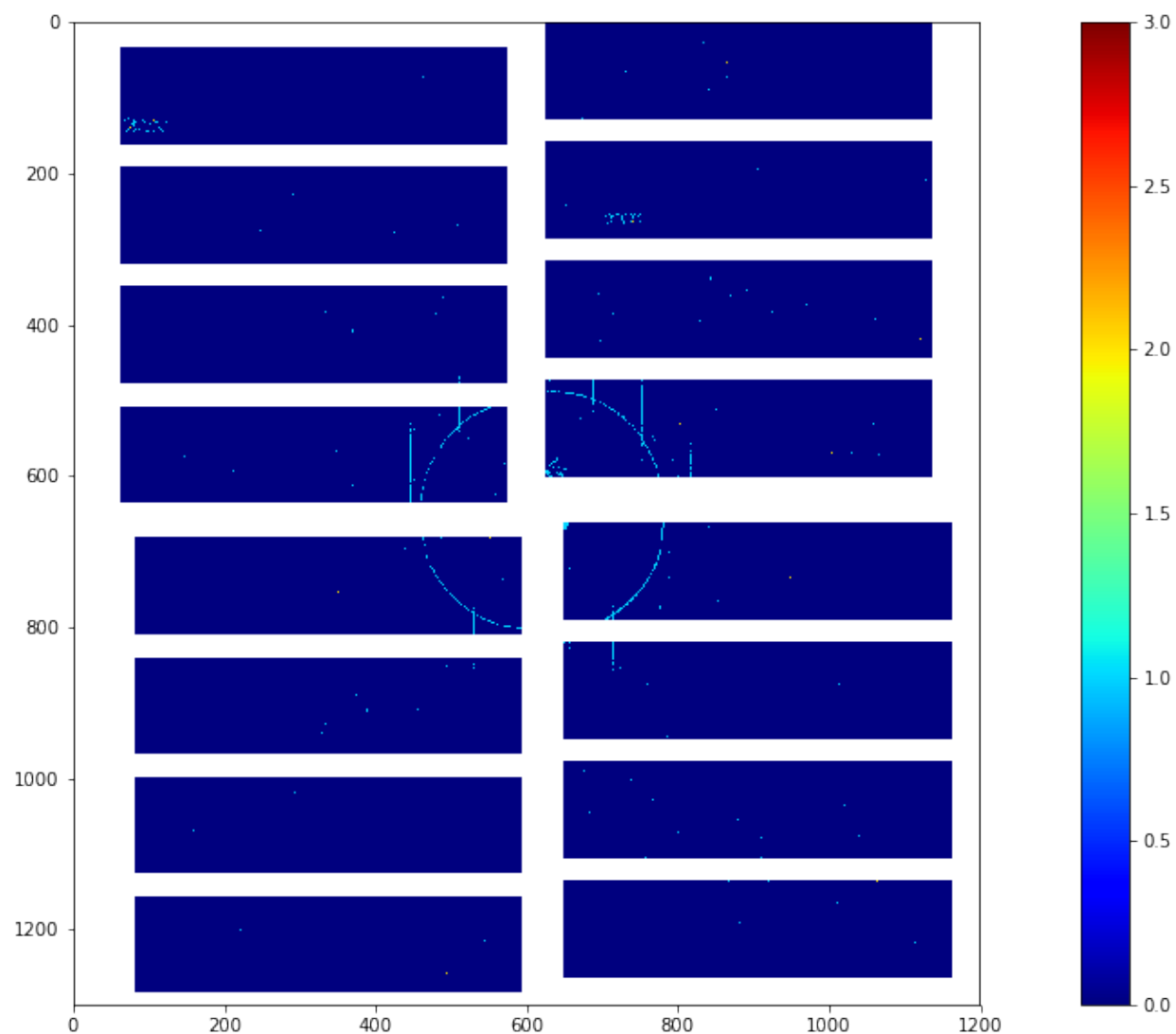
The per pixel mean of the first 128 images of the CORRECTED data





2.4.4 Maximum GAIN Preview

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



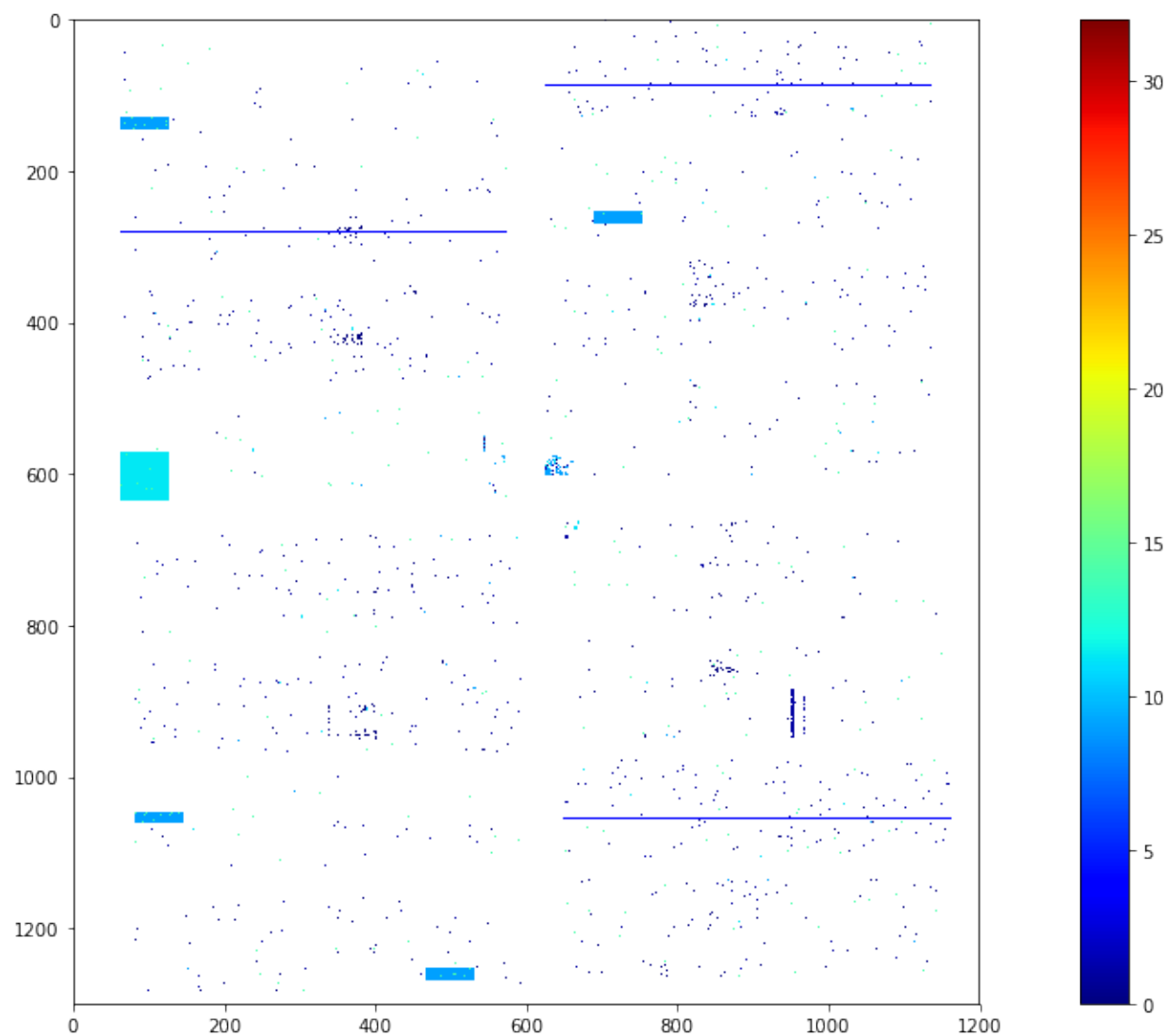
2.5 Bad Pixels

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	000000000000000001
NOISE_OUT_OF_THRESHOLD	000000000000000010
OFFSET_NOISE_EVAL_ERROR	000000000000000100
NO_DARK_DATA	0000000000000001000
CI_GAIN_OF_OF_THRESHOLD	00000000000010000
CI_LINEAR_DEVIATION	00000000000100000
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	1000000000000000

2.5.1 Single Shot Bad Pixels

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



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