HGTD Production Database
August 20th 2024

- Luca provided output examples of module analysis results :
  - CERNbox : https://cernbox.cern.ch/s/ddnPMsuC4WOpkxZ

- Has discussed with colleagues testing the ASIC to converge on the same software for data taking and analysis => will follow similar format for producing the test results

- Measurements are stored by type and configuration (e.g. thresScan/B_None_On_all_Inj_col_N_100_Vth_380_Q_36) and then grouped by module (in this case just one module, called module_0).

- The number of the folders maps the slot on the board, and we can for example save automatically in each subfolder a file with the serial number for the DB upload.

- The files to save are "DB_results.csv" and "DB_metadata.yaml" . Please note that the content of "DB_results.csv" changes depending on the type of measurement done.

Name ↓	Shares	Size	Modified	Actions
📁 bump_connection		?	13 hours ago	⋮
📁 chargeScan		?	13 hours ago	⋮
📁 last_vthc		?	13 hours ago	⋮
📁 thresScan		?	13 hours ago	⋮
📁 vthcScan		?	13 hours ago	⋮

thresScan

```
192 Aug 16 13:04 B_None_On_all_Inj_col_N_100_Vth_380_Q_12
192 Aug 16 13:04 B_None_On_all_Inj_col_N_100_Vth_380_Q_36
```

```
5126 Aug 16 13:04 analysis_results.csv
 946 Aug 16 13:04 meas_parameters.yaml
 245 Aug 16 13:04 metadata.txt
 192 Aug 16 13:04 module_0
```

```
  373 Aug 16 13:04 DB_metadata.yaml
 5126 Aug 16 13:04 DB_results.csv
36261 Aug 16 13:04 threshold_map.pdf
37642 Aug 16 13:04 threshold_scan.pdf
```

- In thresScan/B_None_On_all_Inj_col_N_100_Vth_380_Q_36/module_0

Asic 0

Asic 1

- In thresScan/B_None_On_all_Inj_col_N_100_Vth_380_Q_36/module_0

```
  373 Aug 16 13:04 DB_metadata.yaml
 5126 Aug 16 13:04 DB_results.csv
36261 Aug 16 13:04 threshold_map.pdf
37642 Aug 16 13:04 threshold_scan.pdf
```

DB_metadata.yaml

```
asic_0:
  dacVth: 380
  extDiscri: false
  mask: []
  smallCtest: false
  vthcFile: null
asic_1:
  dacVth: 380
  extDiscri: false
  mask: []
  smallCtest: false
  vthcFile: null
common:
  dacCharge: 36
  measType: thresScan
  scanBy: col
  scanRegionOn: auto
  scanRegionVthcToZero: auto
  tag: FFR-FR-051Y_post120_12Ago2024
meta:
  analysis_timestamp: 12/08/2024 15:55:00
```

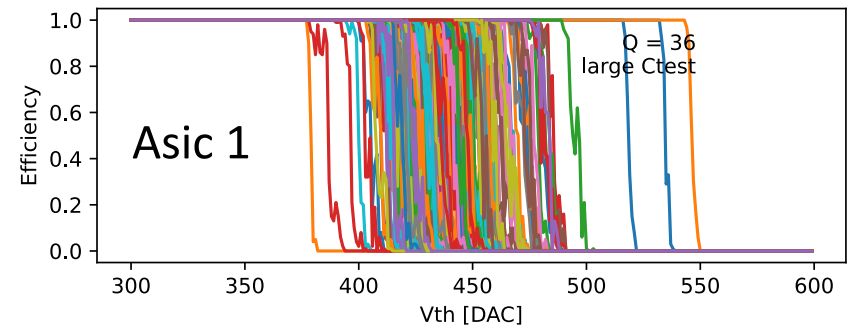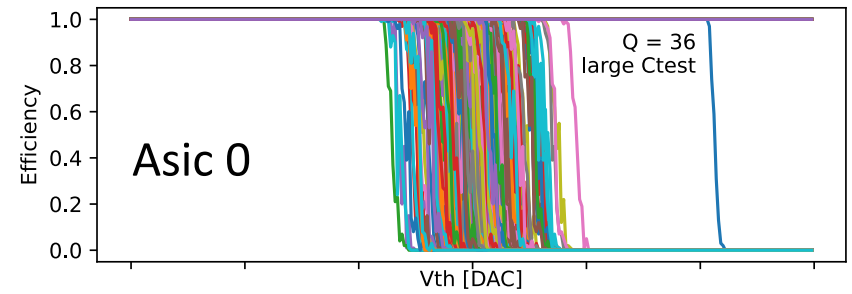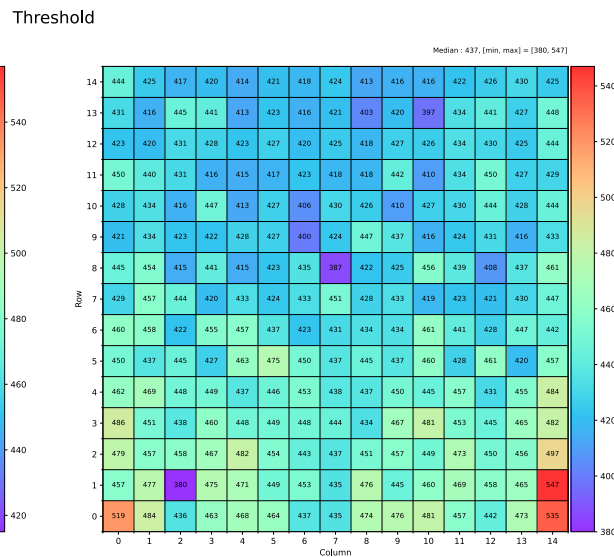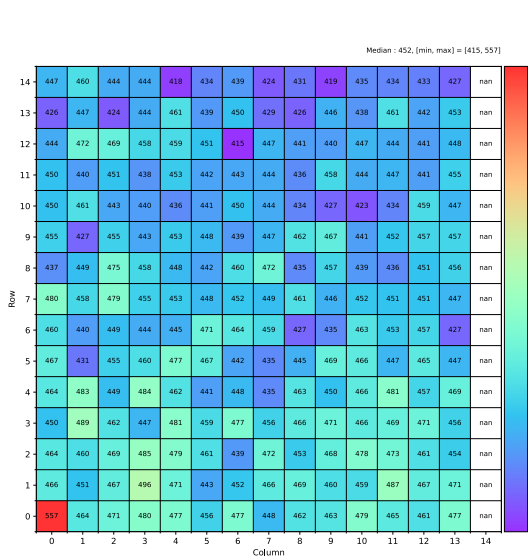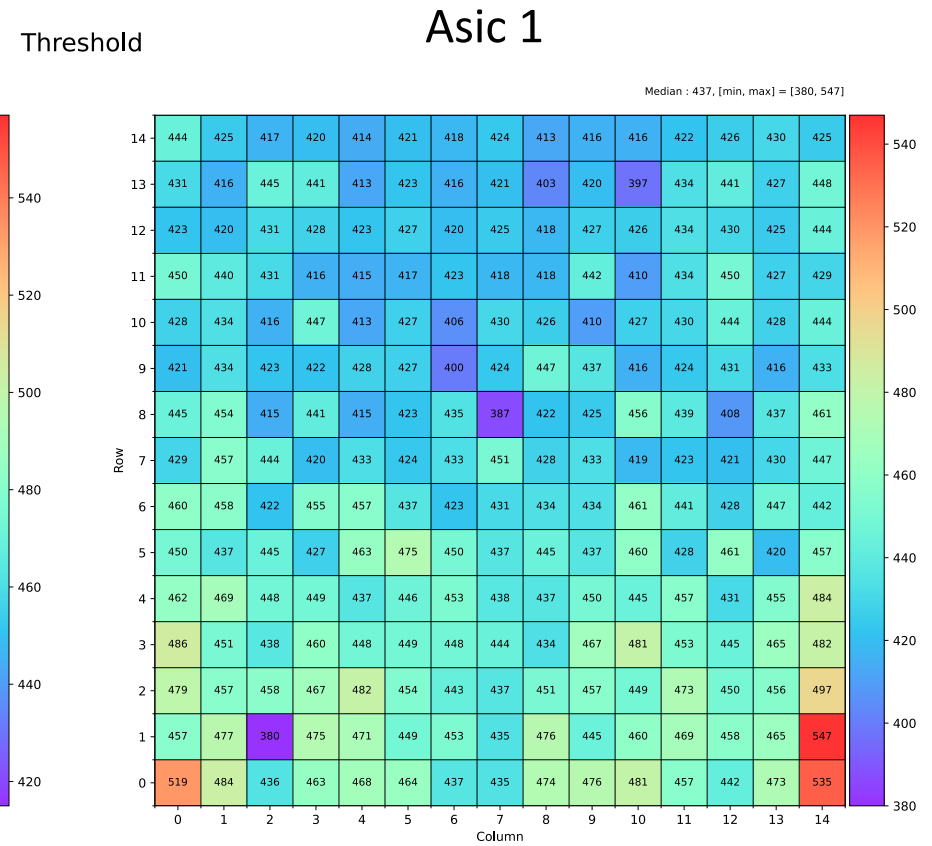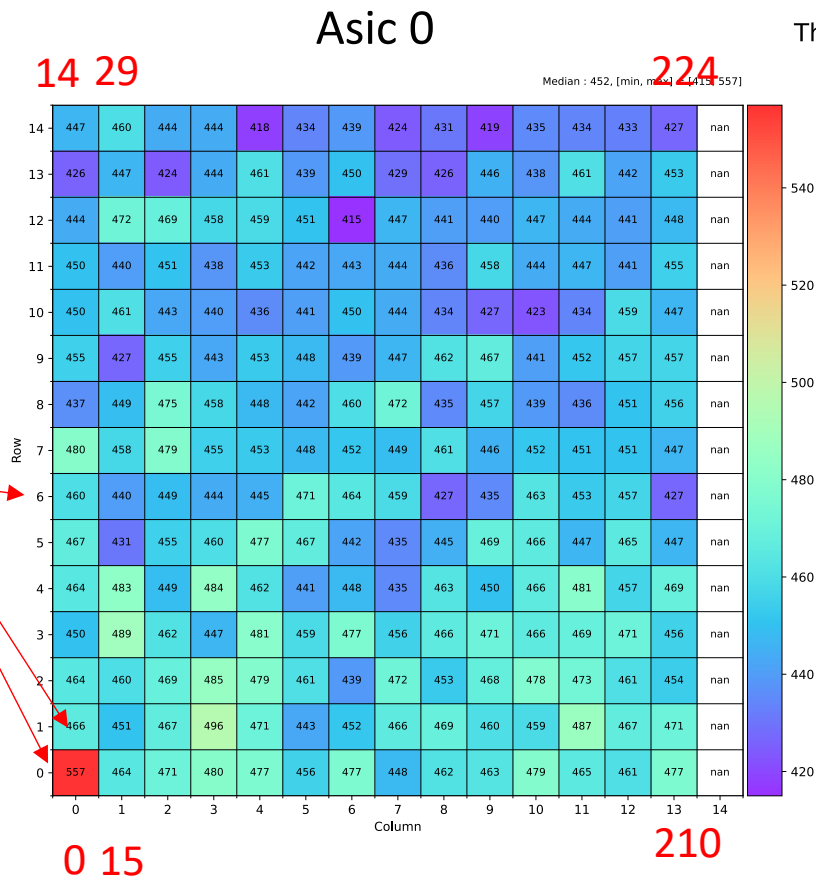- In thresScan/B_None_On_all_Inj_col_N_100_Vth_380_Q_36/module_0

```
  373 Aug 16 13:04 DB_metadata.yaml
 5126 Aug 16 13:04 DB_results.csv
36261 Aug 16 13:04 threshold_map.pdf
37642 Aug 16 13:04 threshold_scan.pdf
```

DB_results.csv

```
asic,pixel,threshold
0,0,557.0
0,1,466.0
0,2,464.0
0,3,450.0
0,4,464.0
0,5,467.0
0,6,460.0
0,7,480.0
0,8,437.0
0,9,455.0
0,10,450.0
0,11,450.0
0,12,444.0
0,13,426.0
0,14,447.0
```

Asic 0

14 29

224

Threshold

Median : 452, [min, max] = [415, 557]

Row	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
14	447	460	444	444	418	434	439	424	431	419	435	434	433	427	nan
13	426	447	424	444	461	439	450	429	426	446	438	461	442	453	nan
12	444	472	469	458	459	451	415	447	441	440	447	444	441	448	nan
11	450	440	451	438	453	442	443	444	436	458	444	447	441	455	nan
10	450	461	443	440	436	441	450	444	434	427	423	434	459	447	nan
9	455	427	455	443	453	448	439	447	462	467	441	452	457	457	nan
8	437	449	475	458	448	442	460	472	435	457	439	436	451	456	nan
7	480	458	479	455	453	448	452	449	461	446	452	451	451	447	nan
6	460	440	449	444	445	471	464	459	427	435	463	453	457	427	nan
5	467	431	455	460	477	467	442	435	445	469	466	447	465	447	nan
4	464	483	449	484	462	441	448	435	463	450	466	481	457	469	nan
3	450	489	462	447	481	459	477	456	466	471	466	469	471	456	nan
2	464	460	469	485	479	461	439	472	453	468	478	473	461	454	nan
1	466	451	467	496	471	443	452	466	469	460	459	487	467	471	nan
0	557	464	471	480	477	456	477	448	462	463	479	465	461	477	nan

Column

0 15

210

Asic 1

Median : 437, [min, max] = [380, 547]

Row	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
14	444	425	417	420	414	421	418	424	413	416	416	422	426	430	425
13	431	416	445	441	413	423	416	421	403	420	397	434	441	427	448
12	423	420	431	428	423	427	420	425	418	427	426	434	430	425	444
11	450	440	431	416	415	417	423	418	418	442	410	434	450	427	429
10	428	434	416	447	413	427	406	430	426	410	427	430	444	428	444
9	421	434	423	422	428	427	400	424	447	437	416	424	431	416	433
8	445	454	415	441	415	423	435	387	422	425	456	439	408	437	461
7	429	457	444	420	433	424	433	451	428	433	419	423	421	430	447
6	460	458	422	455	457	437	423	431	434	434	461	441	428	447	442
5	450	437	445	427	463	475	450	437	445	437	460	428	461	420	457
4	462	469	448	449	437	446	453	438	437	450	445	457	431	455	484
3	486	451	438	460	448	449	448	444	434	467	481	453	445	465	482
2	479	457	458	467	482	454	443	437	451	457	449	473	450	456	497
1	457	477	380	475	471	449	453	435	476	445	460	469	458	465	547
0	519	484	436	463	468	464	437	435	474	476	481	457	442	473	535

Column

chargeScan

- In chargeScan/B_None_On_all_Inj_col_N_100_Vth_380_Q_12/module_0

DB_metadata.yaml

```yaml
asic_0:
  dacVth: 380
  extDiscri: false
  mask:
  - 210
  - 211
  - 212
  - 213
  - 214
  - 215
  - 216
  - 217
  - 218
  - 219
  - 220
  - 221
  - 222
  - 223
  - 224
  smallCtest: false
  vthcFile: analysis/results/FFR-FR-051Y_post120_12Ago2024/last_vthc/asic0_vthc.txt
asic_1:
  dacVth: 380
  extDiscri: false
  mask: []
  smallCtest: false
  vthcFile: analysis/results/FFR-FR-051Y_post120_12Ago2024/last_vthc/asic1_vthc.txt
common:
  dacCharge: 12
  measType: chargeScan
  scanBy: col
  scanRegionOn: auto
  scanRegionVthcToZero: auto
  tag: FFR-FR-051Y_post120_12Ago2024
meta:
  analysis_timestamp: 12/08/2024 16:14:05
```

- In chargeScan/B_None_On_all_Inj_col_N_100_Vth_380_Q_12/module_0

DB_results.csv

	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	asic	pixel	threshold	A	mu	sigma	counts	toa_mean_al	toa_std_all	tot_mean_all	tot_std_all	toa_mean_in	toa_std_inj	tot_mean_inj	tot_std_inj
2	0	0	10	0.999838605	10.77197872	0.412303235	100	13.06	13.06	10.68	10.68	13.06	13.06	10.68	10.68
3	0	1	11	0.999914973	11.17328797	1.073640860	100	11.52	11.52	18.49	18.49	11.52	11.52	18.49	18.49
4	0	2	10	0.999246210	10.73131614	1.038075985	100	11.56	11.56	18.9	18.9	11.56	11.56	18.9	18.9
5	0	3	10	0.997737214	10.61610647	0.678290473	100	10.93	10.93	18.54	18.54	10.93	10.93	18.54	18.54
6	0	4	11	1.000452538	12.05018551	1.172726155	100	11.59	11.59	19.09	19.09	11.59	11.59	19.09	19.09
7	0	5	12	1.000235455	12.16256292	1.050011457	100	14.01	14.01	19.08	19.08	14.01	14.01	19.08	19.08
8	0	6	11	0.999779620	11.59296650	0.987538701	100	12.04	12.04	19.36	19.36	12.04	12.04	19.36	19.36
9	0	7	12	1.000346646	12.59968732	1.146049891	100	12.4	12.4	18.29	18.29	12.4	12.4	18.29	18.29
10	0	8	11	1.000053149	11.67121161	1.172052906	100	12.77	12.77	18.9	18.9	12.77	12.77	18.9	18.9
11	0	9	10	0.999510324	10.87584600	0.947801757	100	13.53	13.53	19.67	19.67	13.53	13.53	19.67	19.67
12	0	10	12	1.000670817	12.31656984	1.3215519	100	12.49	12.49	18.68	18.68	12.49	12.49	18.68	18.68
13	0	11	13	0.999091817	13.33811037	0.587189646	100	13.64	13.64	18.59	18.59	13.64	13.64	18.59	18.59
14	0	12	13	1.000454657	13.16778869	0.891270043	100	13.06	13.06	18.09	18.09	13.06	13.06	18.09	18.09
15	0	13	13	0.999125627	13.86882818	0.869608898	100	11.76	11.76	18.09	18.09	11.76	11.76	18.09	18.09
16	0	14	12	1.001026272	12.54405040	1.250370742	100	11.41	11.41	19.06	19.06	11.41	11.41	19.06	19.06

- There are several chargeScan map results

- Need to better understand the output results format
- How to associate the metadata to the measured results

HGTD Production DataBase User Meeting

Participants	Monday			Tuesday						Thursday				Friday		
	29 Jul 10:00-11:00	29 Jul 11:00-12:00	29 Jul 12:00-13:00	30 Jul 10:00-11:00	30 Jul 11:00-12:00	30 Jul 12:00-13:00	30 Jul 15:00-16:00	30 Jul 16:00-17:00	30 Jul 17:00-18:00	1 Aug 10:00-11:00	1 Aug 11:00-12:00	1 Aug 12:00-13:00	1 Aug 17:00-18:00	2 Aug 13:00-14:00	2 Aug 14:00-15:00	2 Aug 17:00-18:00
Annika Stein	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✗	✗	✓	✗
Hendrik	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓
Imran	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗	✓	✗	✗	✓
Imran	✗	✗	✓	✗	✗	✓	✓	✓	✓	✗	✗	✓	✓	✗	✗	✓
Irena Nikolic	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✓	✓	✗
Jessica Höfner	✓	✓	✓	✗	✓	✓	✓	✗	✗	✗	✓	✓	✗	✓	✗	✗
Kiran Farman	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	✓
Lailin Xu	✗	✗	✓	✗	✗	✓	✓	✓	✓	✗	✗	✓	✓	✗	✗	✓
Luca Cadamuro	✗	✓	✗	✗	✓	✗	✓	✓	✗	✗	✓	✗	✗	✓	✓	✗
Lucia Masetti	✓	✓	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓	✗	✗	✗	✓
Marco Leite	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗	✓	✗	✓	✓
Sebastian Grinstein	✗	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Song-Ming Wang																
yunju	✓	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗	✓	✓	✓	✓
Total	6/14	7/14	7/14	4/14	4/14	5/14	12/14	10/14	7/14	4/14	6/14	6/14	6/14	5/14	6/14	8/14

- Best time slot is Tuesday 15:00 CERN time

Retrieve IV Data from Database

- Example to show how to retrieve the IV data from DB for a given sensor with python script? (from YanWen)

- To download the IV data from the frontend page ?
- Run a script on lxplus to download IV data ?