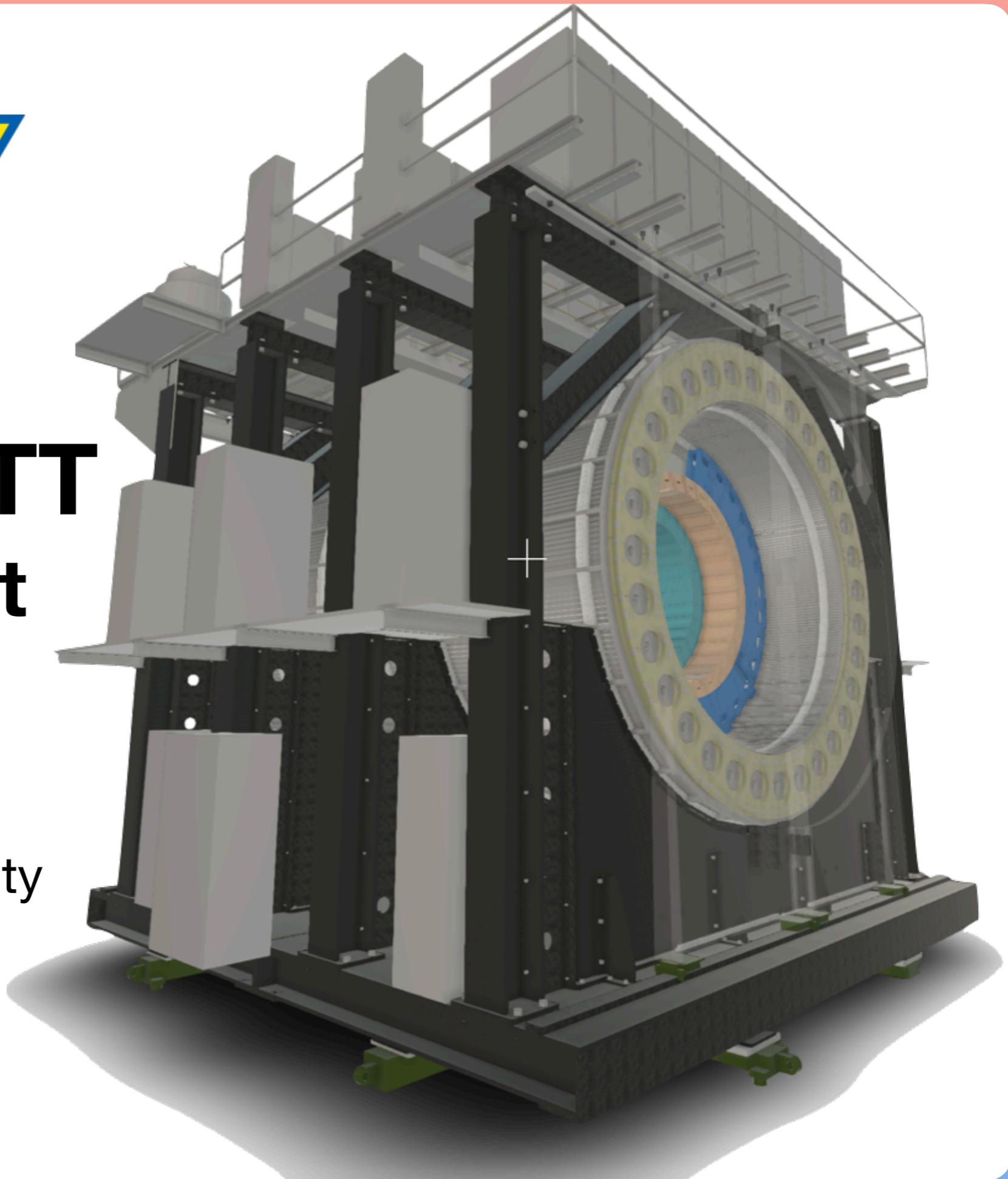# sPHENIX INTT
- Weekly Report

Cheng-Wei Shih,
Chia-Ming Kuo
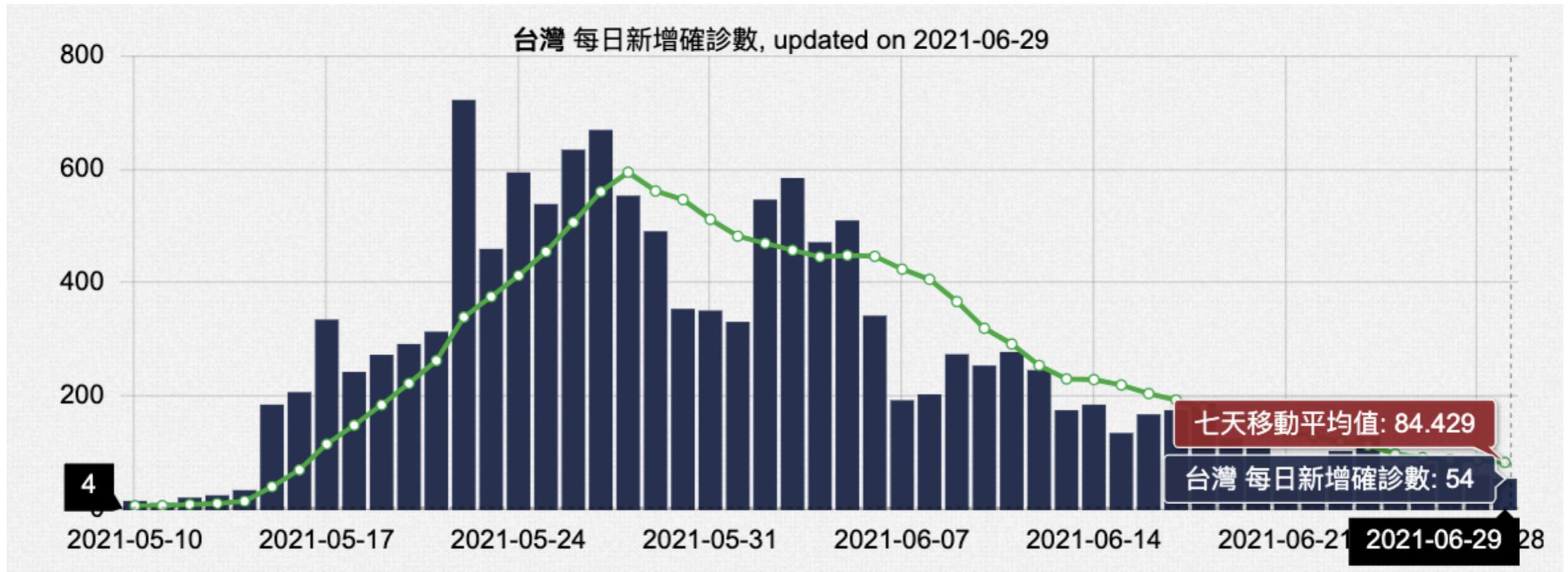
National Central University

2021/6/30

COVID-19 status in Taiwan

- < 100 new COVID-19 cases each day (it's decreasing !).

- National level 3 epidemic warning until 07/12 so far.
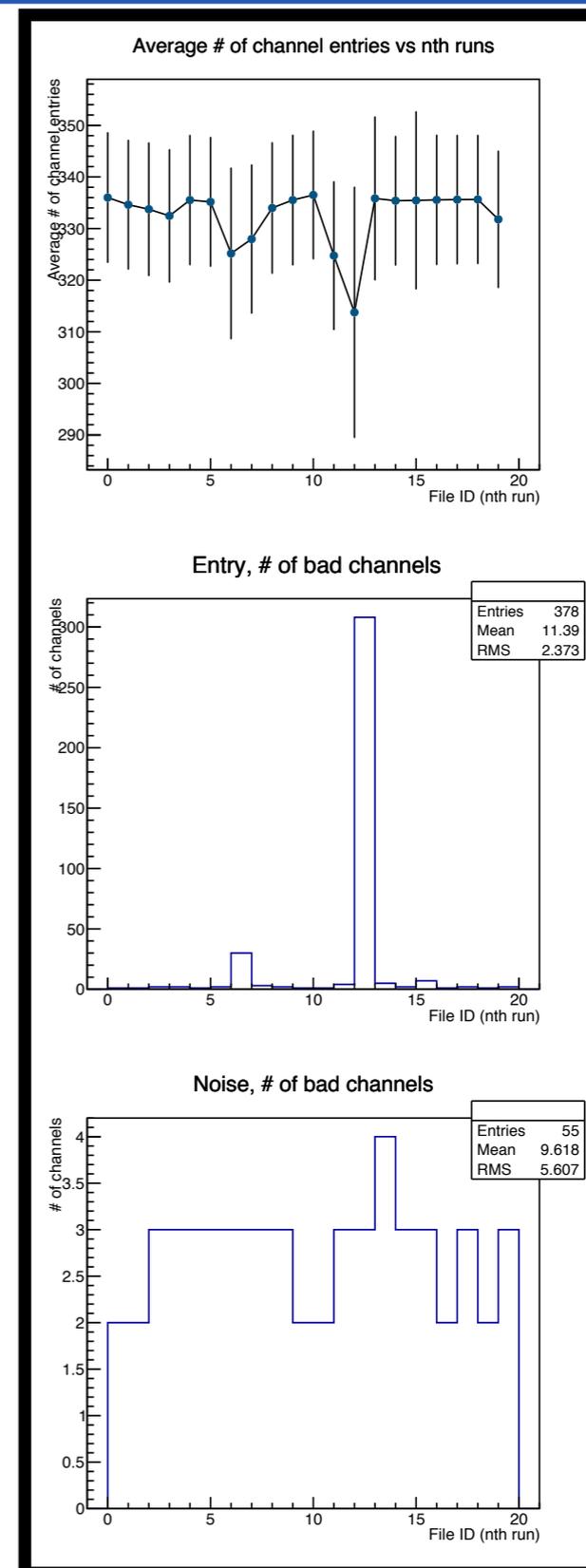 - I will go to NTU starting from next Monday (7/5).

Increase cases

台灣 每日新增確診數, updated on 2021-06-29

七天移動平均值: 84.429

台灣 每日新增確診數: 54

Channel classification v4

- Summary_plots_time.pdf contents 3 plots

- Upper : Average # of channel entries vs file ID

- Middle : # of channels fail in entry criterion vs file ID.

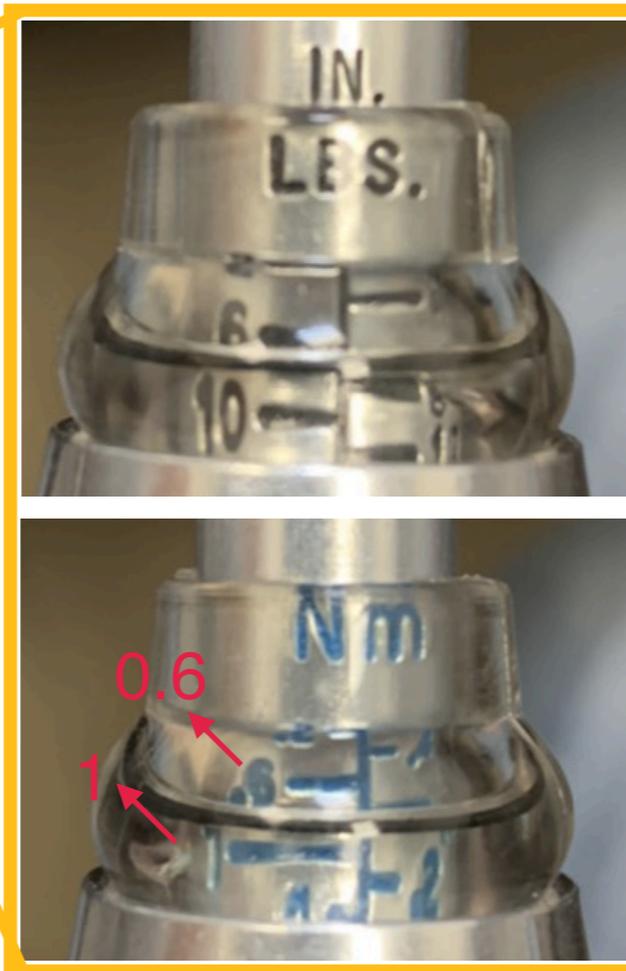- Bottom : # of channels fail in noise criterion vs file ID.

Torque screw driver test

- We used NTU torque screw driver to do the twist test, set at 80cN*m.
- Concern from BNL : the actual torque of NCU driver may be more than 80cN*m.
- So we did the torque competition with 2 torque screw drivers.

BNL screw driver : set at 80cN*m

NCU setting torque(cN)   who is rotated

20-NCU
30-NCU
40-NCU
41-N
42-N
43-B/N
44-B
45-B
46-B
47-B
48-B
49-B
50-BNL
60-BNL
70-BNL
80-BNL
90-BNL

NCU screw driver set at different torque
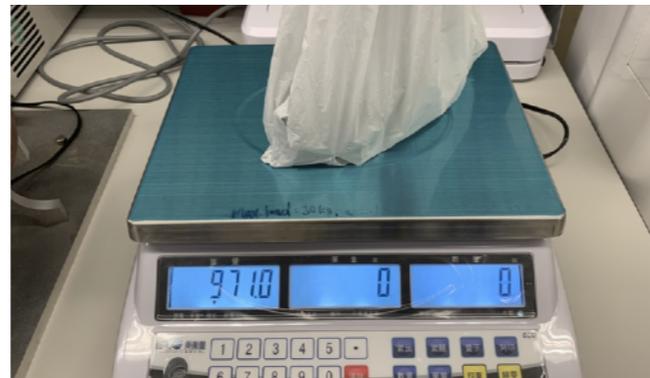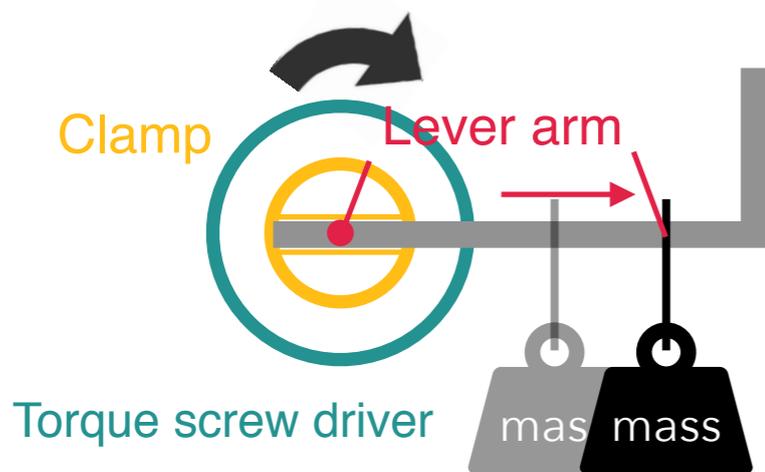
BNL 80 cN*m ~ NTU 43cN*m

Video link of this test

Cheng-Wei Shih (NCUHEP, Taiwan)

Torque screw driver test

- We want to figure out what is the actual torque of 2 torque screw drivers whose setting value are both at 80 cN*m.

Clamp

Lever arm

Torque screw driver

mass mass

- The weight of mass is fixed.

- The mass is moved outward to increase the torque time by time, until the driver can't handle it.

- The video link of the test

Clamp

Torque (N*m): 0.971kg* 9.8N/kg* lever arm(m)

- Maximum distance of lever arm :
  - BNL ~ 4 cm
  - NCU ~ 7cm

- Actual torque at 80cN*m setting value
  - BNL ~ 0.38 N*m
  - NCU ~ 0.7 N*m

Summary

- I will go to NTU starting from next Monday.

- The channel classification macro v4 is uploaded.
  - New feature : histogram plots of # of bad channels vs file ID

- The actual torque of BNL torque screw driver is twice smaller than the setting value.
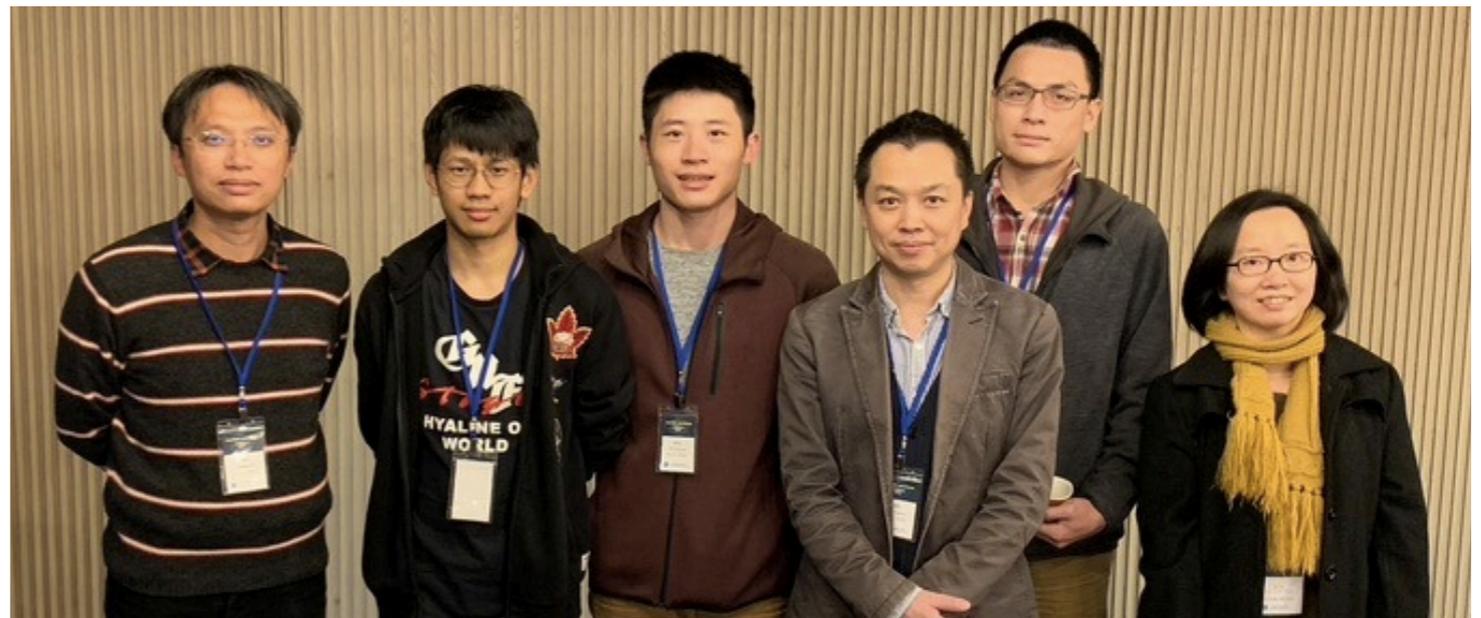
Back up

Taiwan INTT team

Ou-Wei Cheng

Kai-Yu Cheng

Chia-Ming Kuo   Cheng-Wei Shih   Lian-Sheng Tsai
Wei-Che Tang   Rong-Shyang Lu   Jenny Huang

Channel classification v3

- Formate of input file : .dat (not .root)
- Operation root version : 6.01 (after it should be fine)

Principle : the less entries in the plot, the better performance it is.

Channels failed in noise criteria

```
                       0      failed times : 13/20    ratio : 0.65
Noise channel found, chip : 7   channel : 12   failed times : 20/20    ratio : 1
Noise channel found, chip : 19  channel : 36   failed times : 20/20    ratio : 1
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Noise channel, chip : 2 channel : 0
 failed in file index : 2      file name : fphx_raw_20210428-1320_0.root, gaus width : 46.9425
 failed in file index : 3      file name : fphx_raw_20210428-1321_0.root, gaus width : 78.376
 failed in file index : 4      file name : fphx_raw_20210428-1322_0.root, gaus width : 4.47558
 failed in file index : 5      file name : fphx_raw_20210428-1324_0.root, gaus width : 4.59855
 failed in file index : 6      file name : fphx_raw_20210428-1331_0.root, gaus width : 75.7756
 failed in file index : 7      file name : fphx_raw_20210428-1332_0.root, gaus width : 32.8639
 failed in file index : 8      file name : fphx_raw_20210428-1333_0.root, gaus width : 38.3274
 failed in file index : 11     file name : fphx_raw_20210428-1654_0.root, gaus width : 147.086
 failed in file index : 12     file name : fphx_raw_20210428-1656_0.root, gaus width : 127.588
 failed in file index : 14     file name : fphx_raw_20210428-1659_0.root, gaus width : 4.8683
 failed in file index : 15     file name : fphx_raw_20210428-1700_0.root, gaus width : 4.15262
 failed in file index : 17     file name : fphx_raw_20210428-1703_0.root, gaus width : 4.41939
 failed in file index : 19     file name : fphx_raw_20210428-1706_0.root, gaus width : 33.9221
```

Channels failed in entry criteria

```
                   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Weird entries found, chip : 2   channel : 0     failed times : 12/20    ratio : 0.6
Weird entries found, chip : 19  channel : 113   failed times : 20/20    ratio : 1
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Bad entries channel, chip : 2 channel : 0
 bad in file index : 2  file name : fphx_raw_20210428-1320_0.root, entries : 4410
 bad in file index : 3  file name : fphx_raw_20210428-1321_0.root, entries : 5820
 bad in file index : 5  file name : fphx_raw_20210428-1324_0.root, entries : 645
 bad in file index : 6  file name : fphx_raw_20210428-1331_0.root, entries : 7557
 bad in file index : 7  file name : fphx_raw_20210428-1332_0.root, entries : 2104
 bad in file index : 8  file name : fphx_raw_20210428-1333_0.root, entries : 4062
 bad in file index : 11 file name : fphx_raw_20210428-1654_0.root, entries : 20615
 bad in file index : 12 file name : fphx_raw_20210428-1656_0.root, entries : 17784
 bad in file index : 14 file name : fphx_raw_20210428-1659_0.root, entries : 569
 bad in file index : 15 file name : fphx_raw_20210428-1700_0.root, entries : 422
 bad in file index : 17 file name : fphx_raw_20210428-1703_0.root, entries : 467
 bad in file index : 19 file name : fphx_raw_20210428-1706_0.root, entries : 2125
```
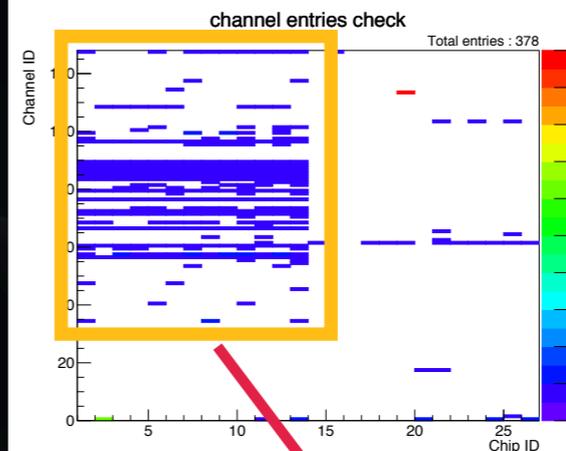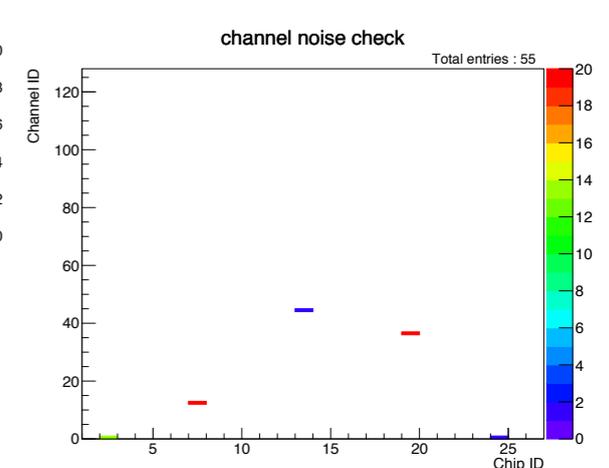
```
======================= Final summary =======================
# of noise channels : 3
# of bad entry chan : 2
# of double counting: 1

Total bad channels : 4
Overall good channel ratio : 3324 / 3328 = 99.880%
======================= Final summary =======================
```

Final result

Summary_entry.pdf

Summary_noise.pdf

Average # of entries of each channel vs file ID.

Summary_average_entry.pdf