Analysis Status

Y. Kato*, K. Goto, T. Suehara

Kyushu University

The University of Tokyo*
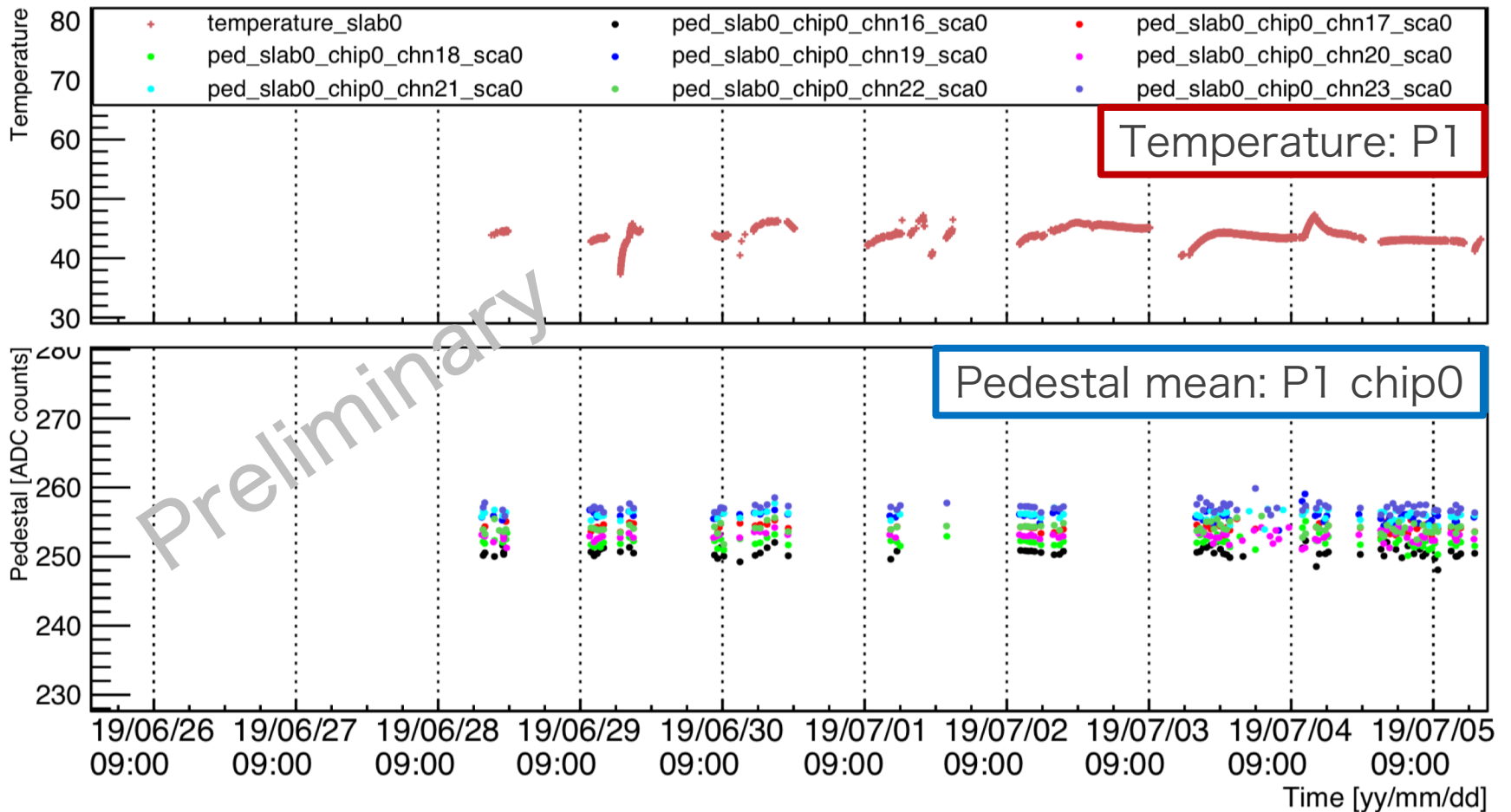
Analysis meeting TB2019 DESY #2
Sep. 20, 2019

katou@icepp.s.u-tokyo.ac.jp

Status Report

➢ Pedestal monitor

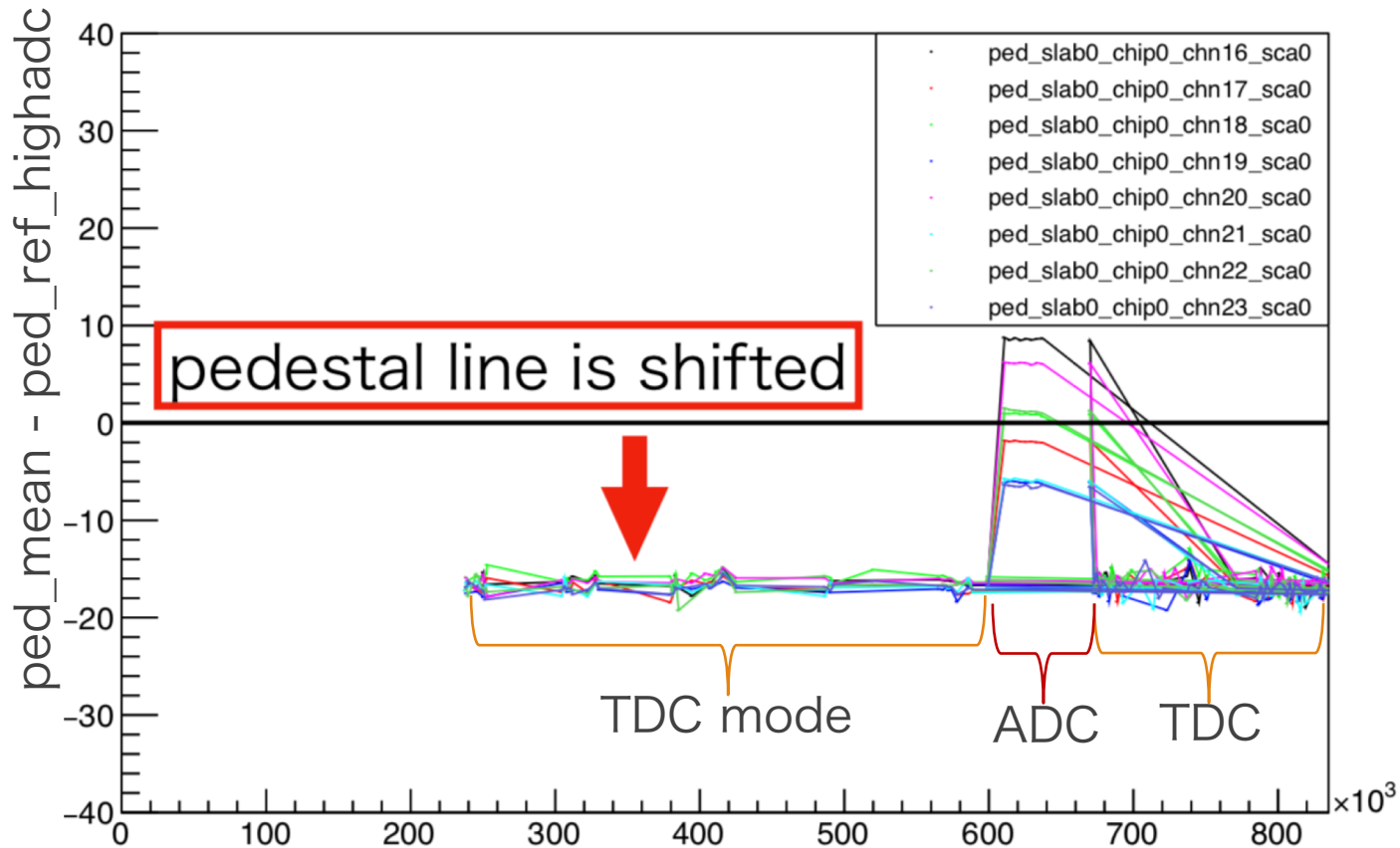➢ MIP calibration

➢ Simulation status

Pedestal / Temperature monitor

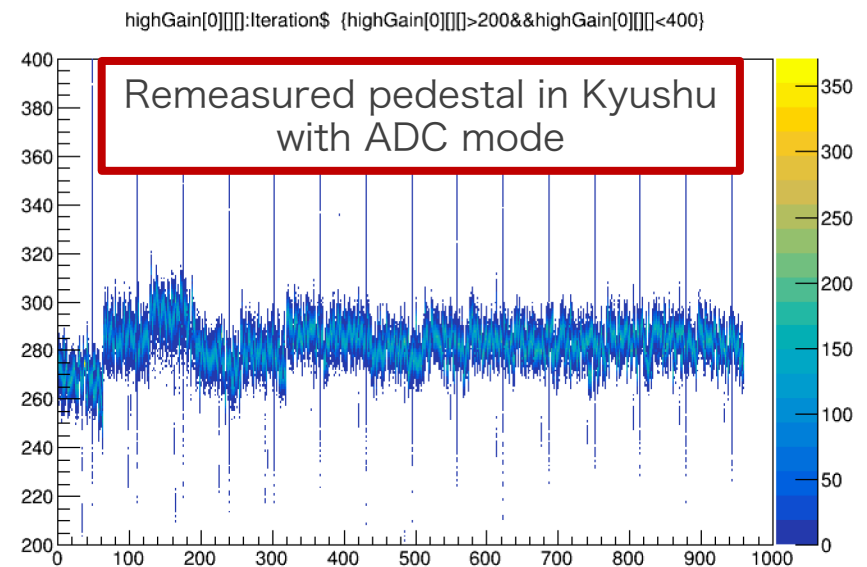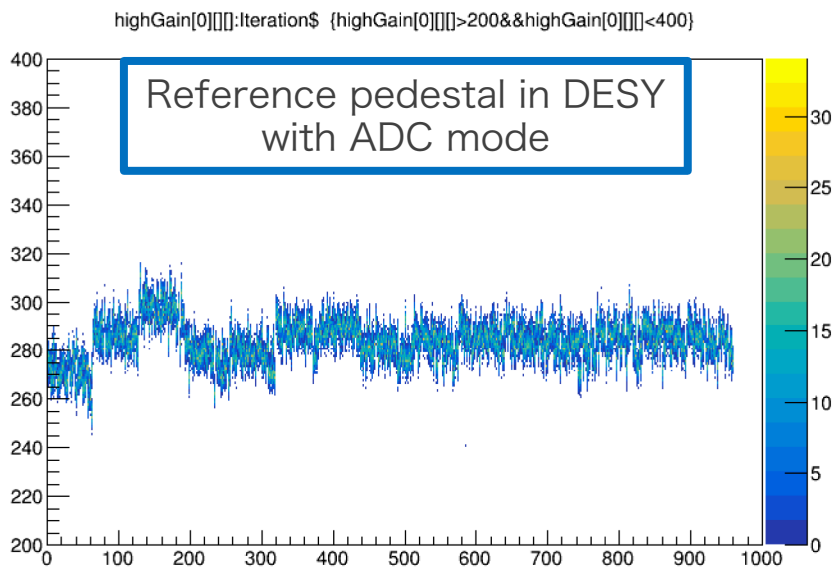- We are developing Pedestal & Temperature monitor.

Pedestal difference between ADC/TDC mode

- We found pedestal shift in relative plot.

Pedestal difference between ADC/TDC mode

- Pedestal measurement was redone with ADC/TDC mode in Kyushu.

- First, we checked the difference of pedestal in ADC mode between in DESY and in Kyushu.

- Tendency of Ped_mean looks almost same.

- Ped_width are worse in Kyushu than DESY.

highGain[0][][]:Iteration$ {highGain[0][][]>200&&highGain[0][][]<400}

highGain[0][][]:Iteration$ {highGain[0][][]>200&&highGain[0][][]<400}

Reference pedestal in DESY with ADC mode
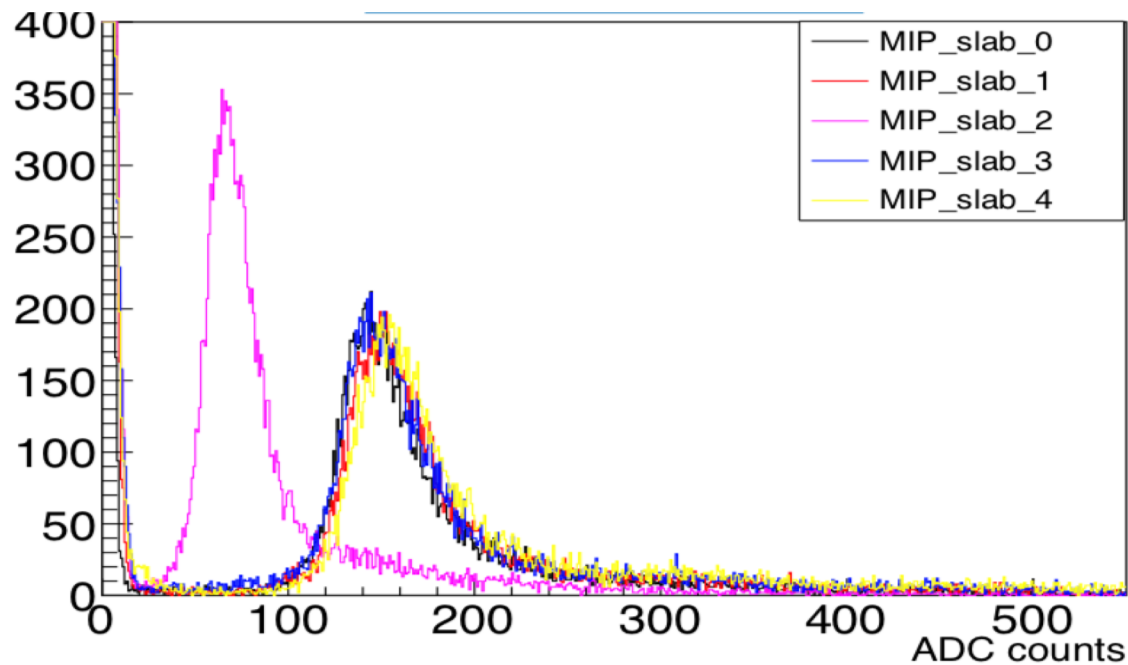
Remeasured pedestal in Kyushu with ADC mode

Pedestal difference between ADC/TDC mode

- Pedestal measurement was redone with ADC/TDC mode in Kyushu.
- Next, we compared pedestal behavior between ADC and TDC mode.
- Memory-cell dependence is not same. Why?
- In the first memory cell, the difference of typical Ped_mean is ~15.
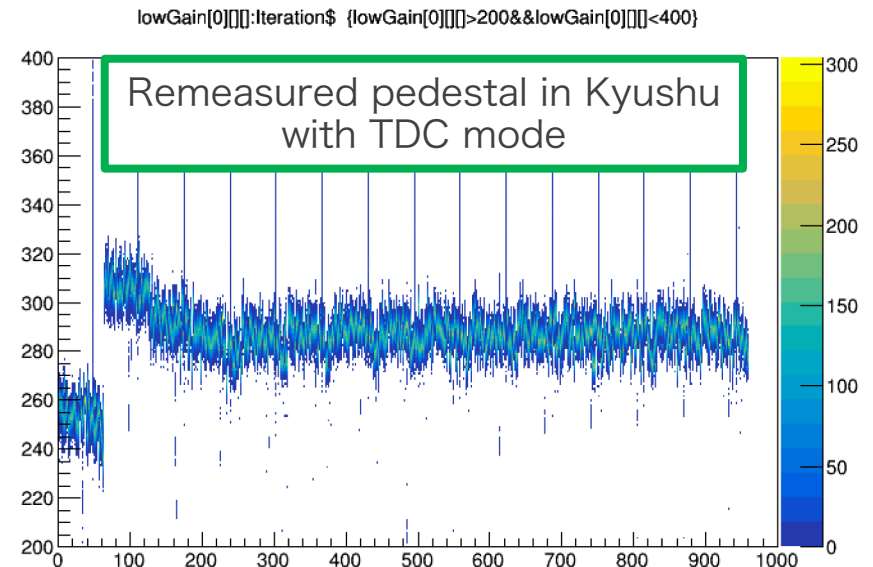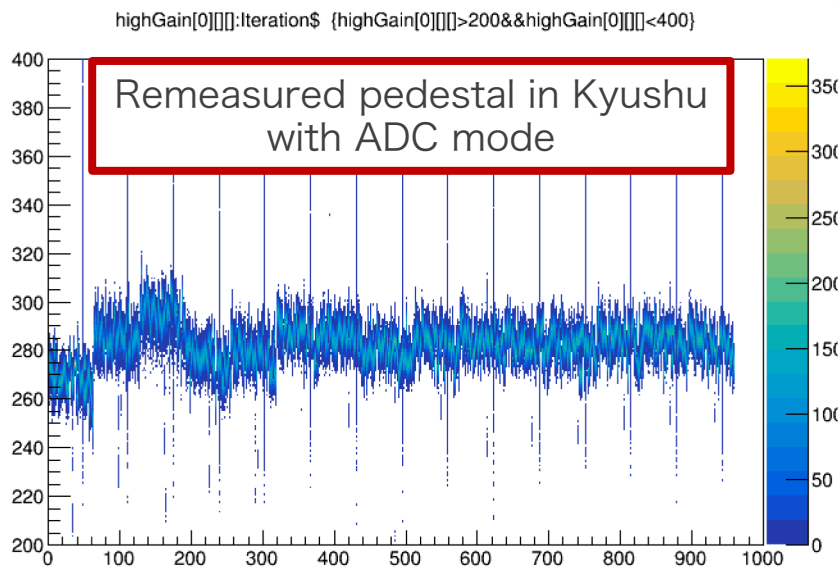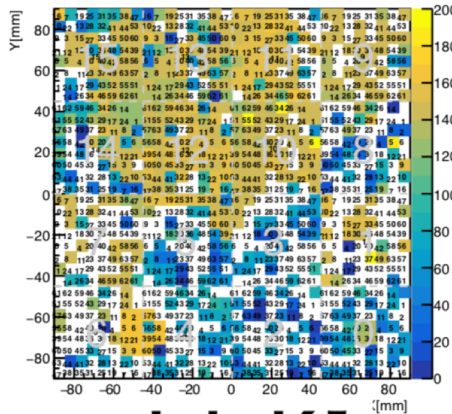
MIP calibration

slab	P1	P2	P3	K1	K2
thickness	650μm	650μm	320μm	650μm	650μm
MPV	146.5	144.9	71.3	141.4	146.1
Ped_width	3.0	3.0	3.3	2.8	3.1
S/N	49.0	48.9	21.7	50.2	47.5

MIP calibration

- MPV map: it looks uneven in thick slabs… by fitting? statistics? or gain?
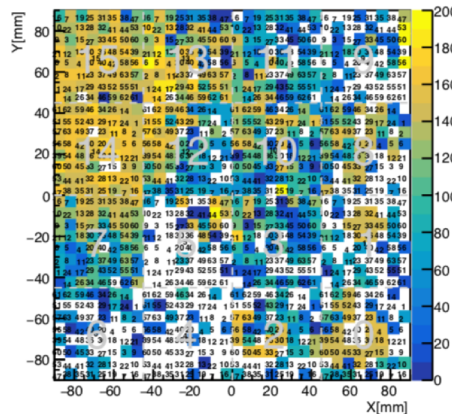
MIP calibration

- MPV map: it looks uneven in thick slabs... by fitting? statistics? or gain?

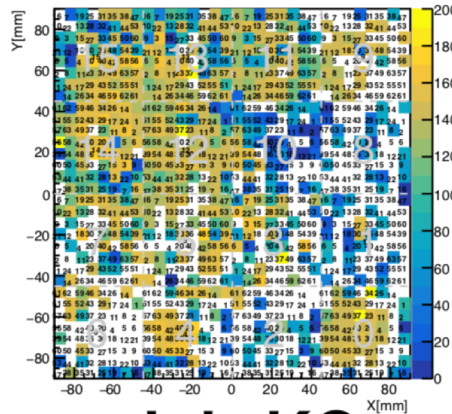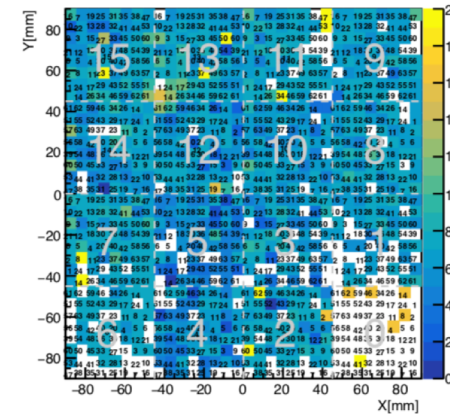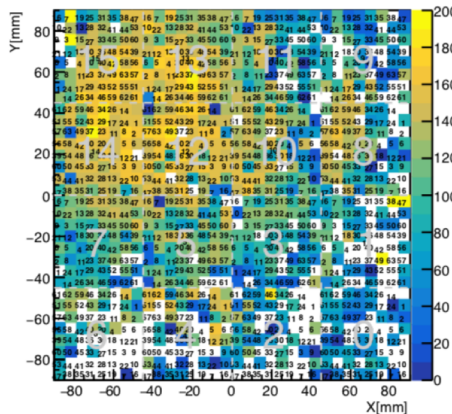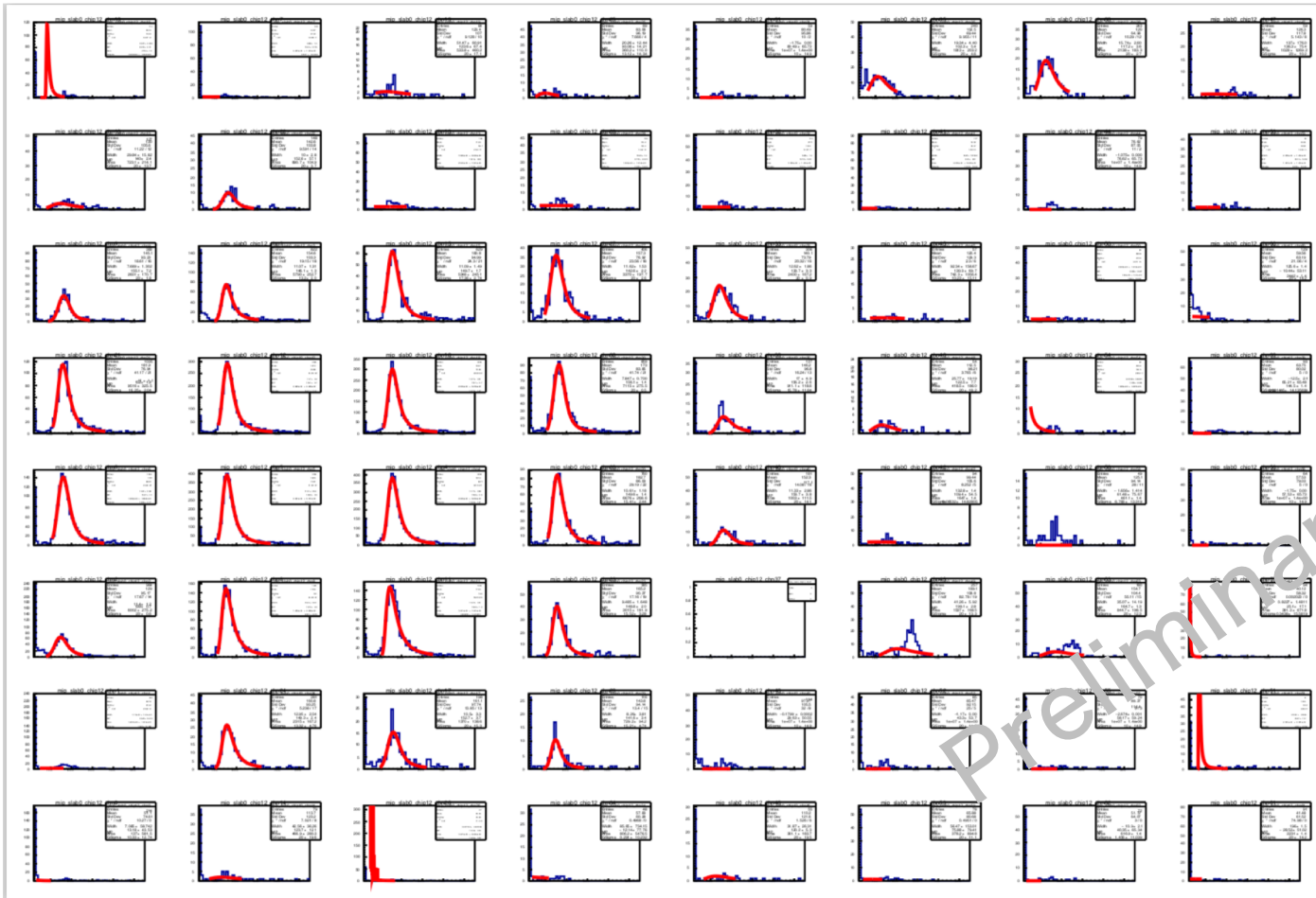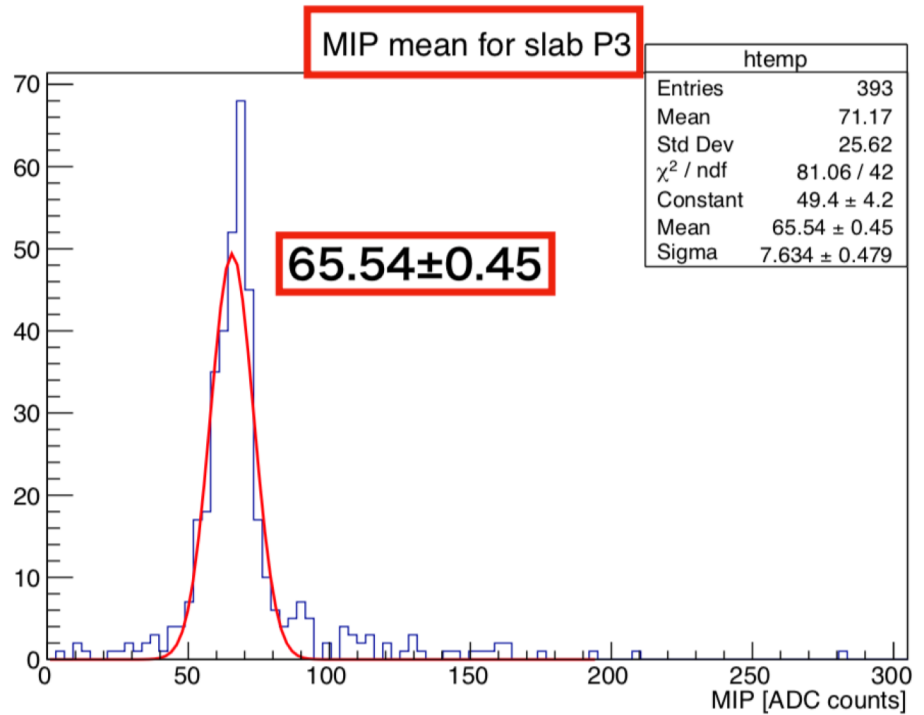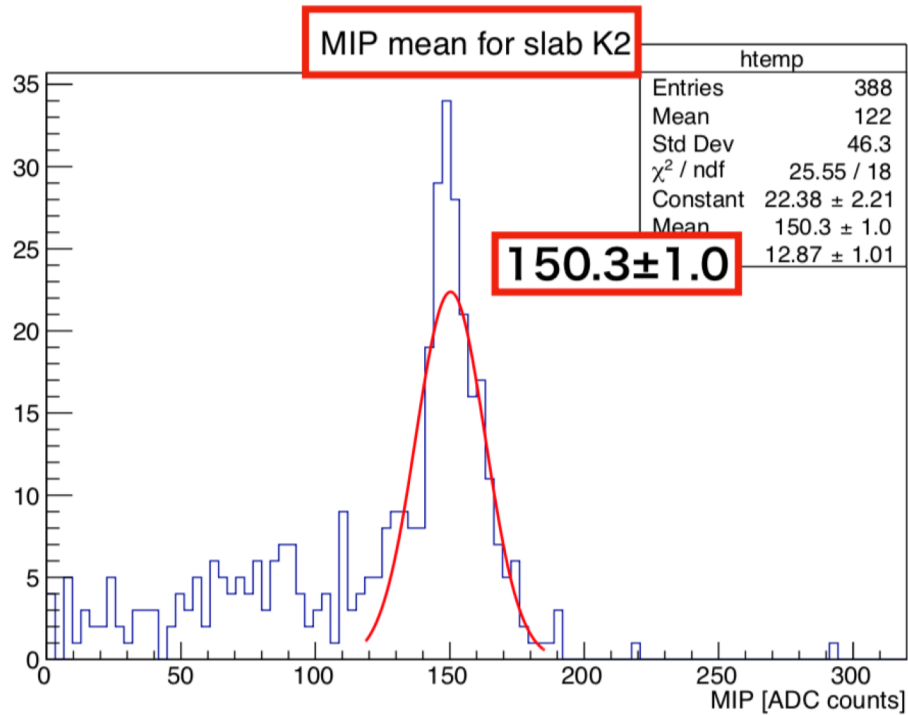# MIP calibration

- MPV map: it looks uneven in thick slabs... by fitting? statistics? or gain?

Simulation with DDSim in iLCSoft

- Daniel gave us the previous simulation codes for CERN2018.

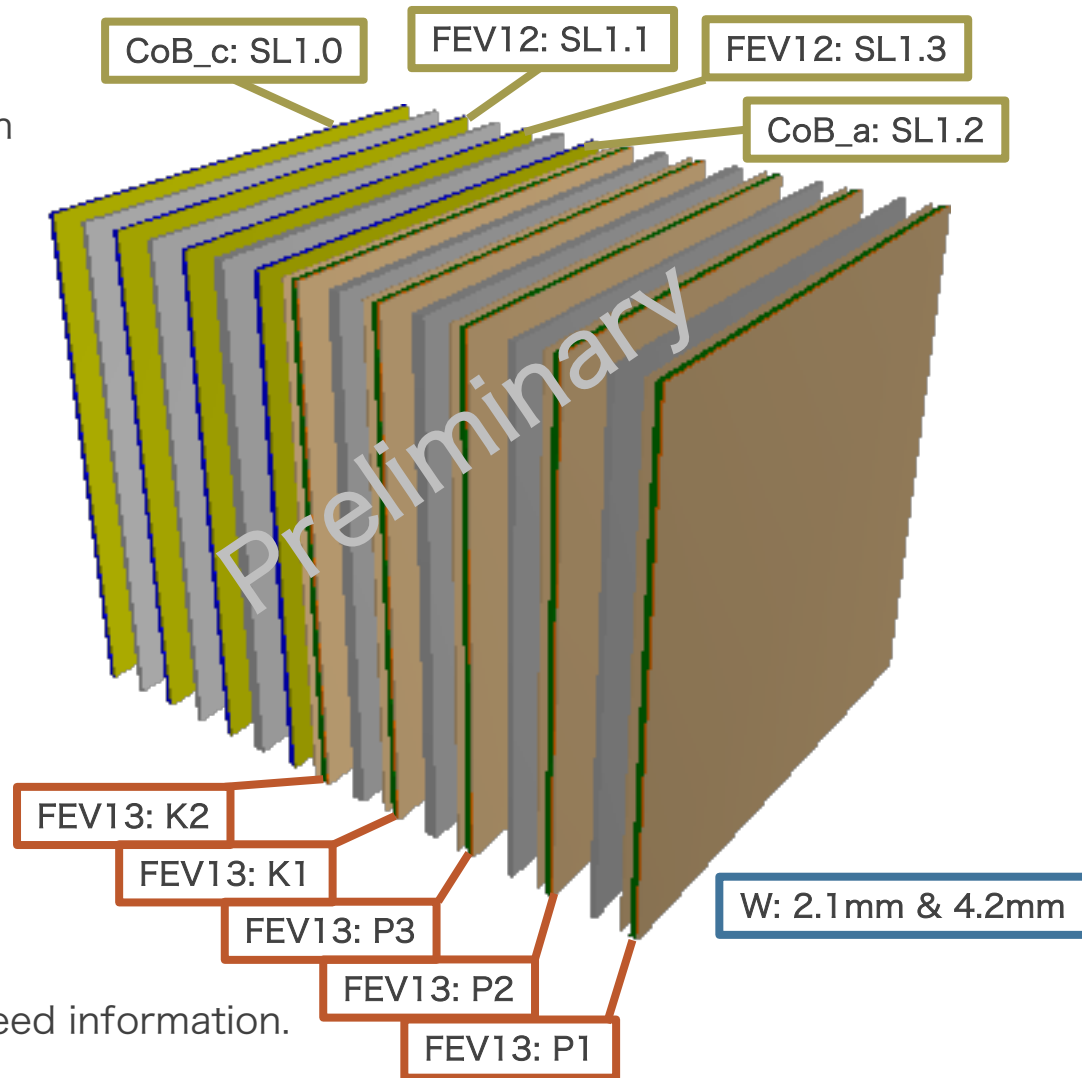- We modified parameters to match setups of this BT.

- FEV13:
  - CF: 0.6mm
  - Electronics(Air)
  - PCB: K1: 1.6mm, others: 1.8mm
  - Glue(Air): 0.08mm
  - Si: 0.32mm or 0.65mm
  - Glue(Air): 0.08mm
  - Kapton(Cu): 0.06mm
  - CF: 0.6mm
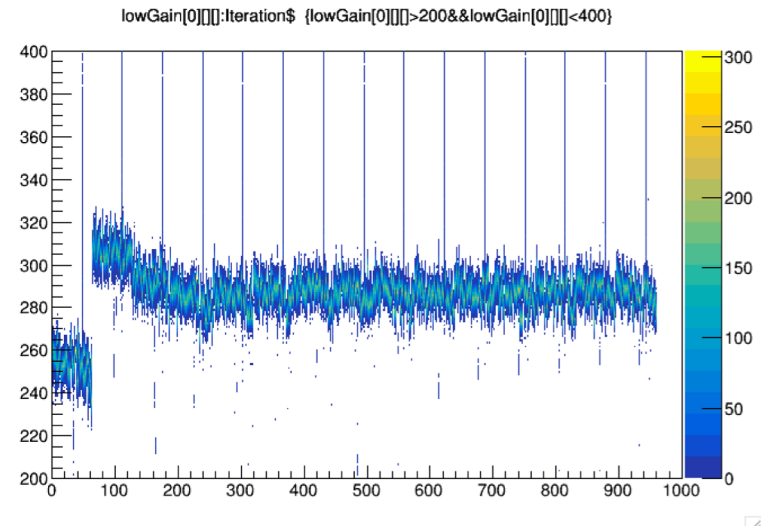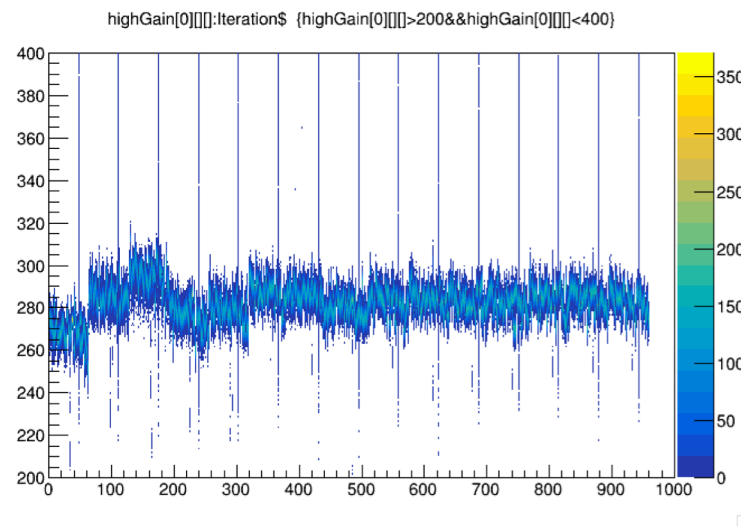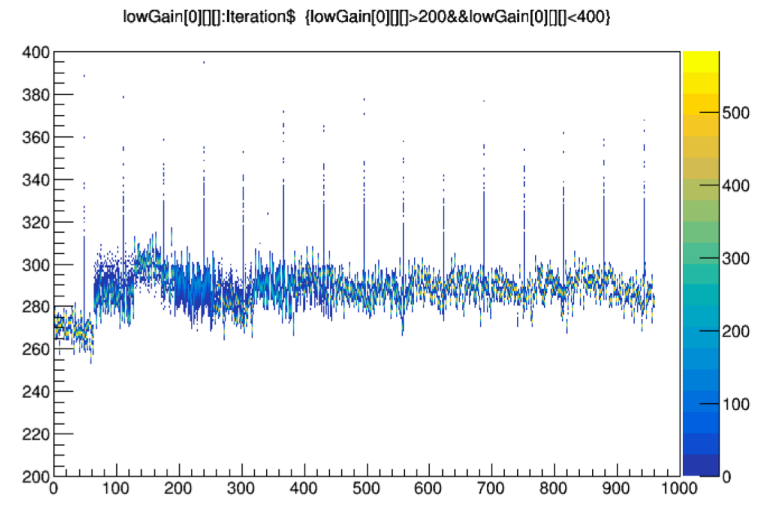 - Plastic(polyethylene): 5mm
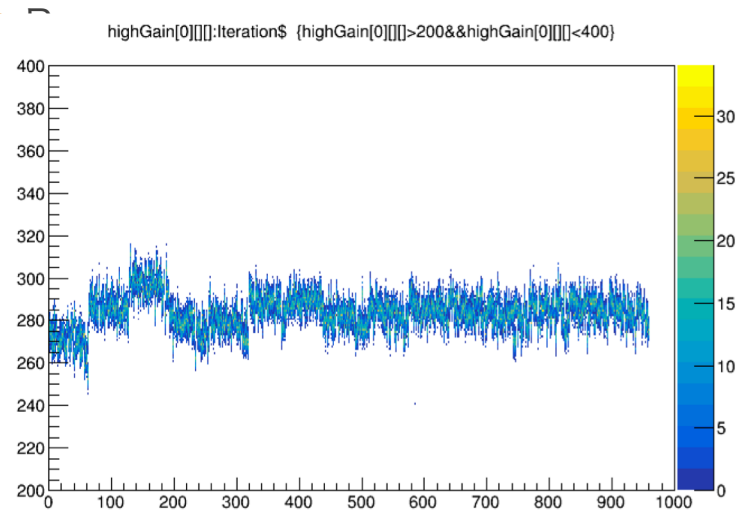
- FEV12:
  - Electronics(Air)
  - PCB: 1.6mm
  - Glue(Air): 0.08mm
  - Si: 0.32mm
  - Glue(Air): 0.08mm
  - Kapton(Cu): 0.06mm
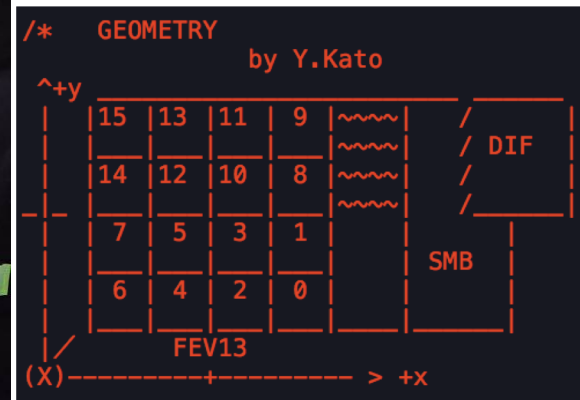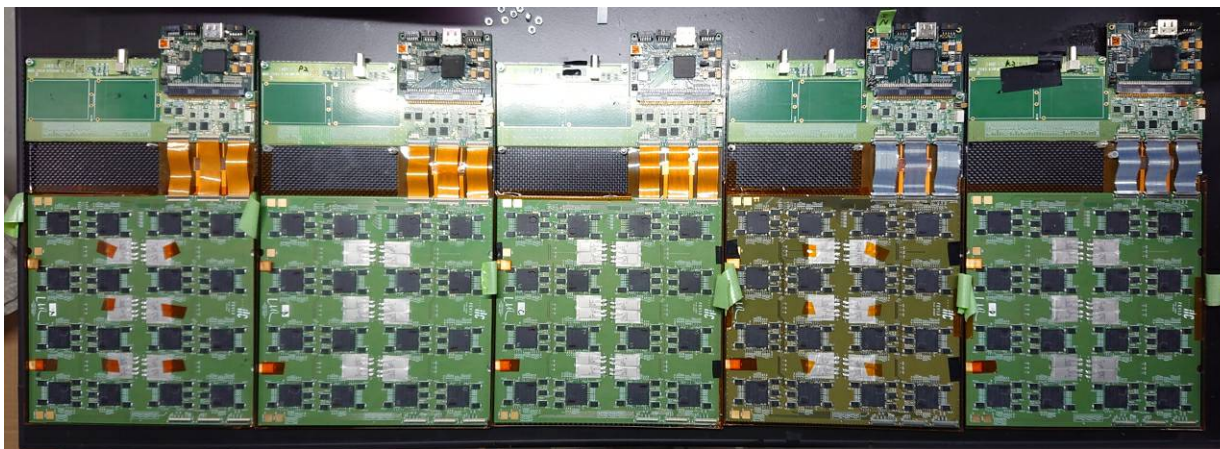 - Plastic(polyethylene): 5mm

- CoB: I need information.

CoB_c: SL1.0   FEV12: SL1.1   FEV12: SL1.3

CoB_a: SL1.2

Preliminary

FEV13: K2

FEV13: K1

FEV13: P3

FEV13: P2

FEV13: P1

W: 2.1mm & 4.2mm

backup

Pedestal difference between ADC/TDC mode

FEV13

P1	P2	P3	K1	K2
dif_1_1_1	dif_1_1_2	dif_1_1_3	dif_1_1_4	dif_1_1_5
650 μm	650 μm	320 μm	650 μm	650 μm

↑ beam direction is from front to back

- We used 5 FEV13 slabs.
- There are 2 types of Silicon thickness.
- Slab position against e- beam: →
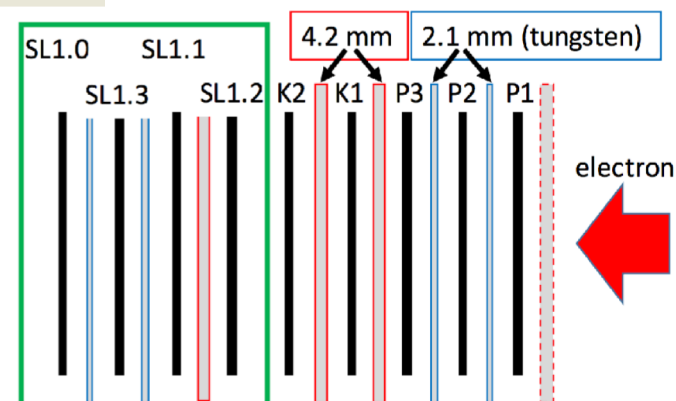
Remain Tasks

- rotated: 25 deg.
  - cross talk check
  - sensitive thickness

- shower w/ Tungsten
  - tracking
    - event build
    - event display
    - efficiency
  - energy measurement

- others
  - pedestal vs temperature
  - feedback & compensation cap.
  - individual threshold adjustment
  - re-triggering
    - hit flag & badbcid
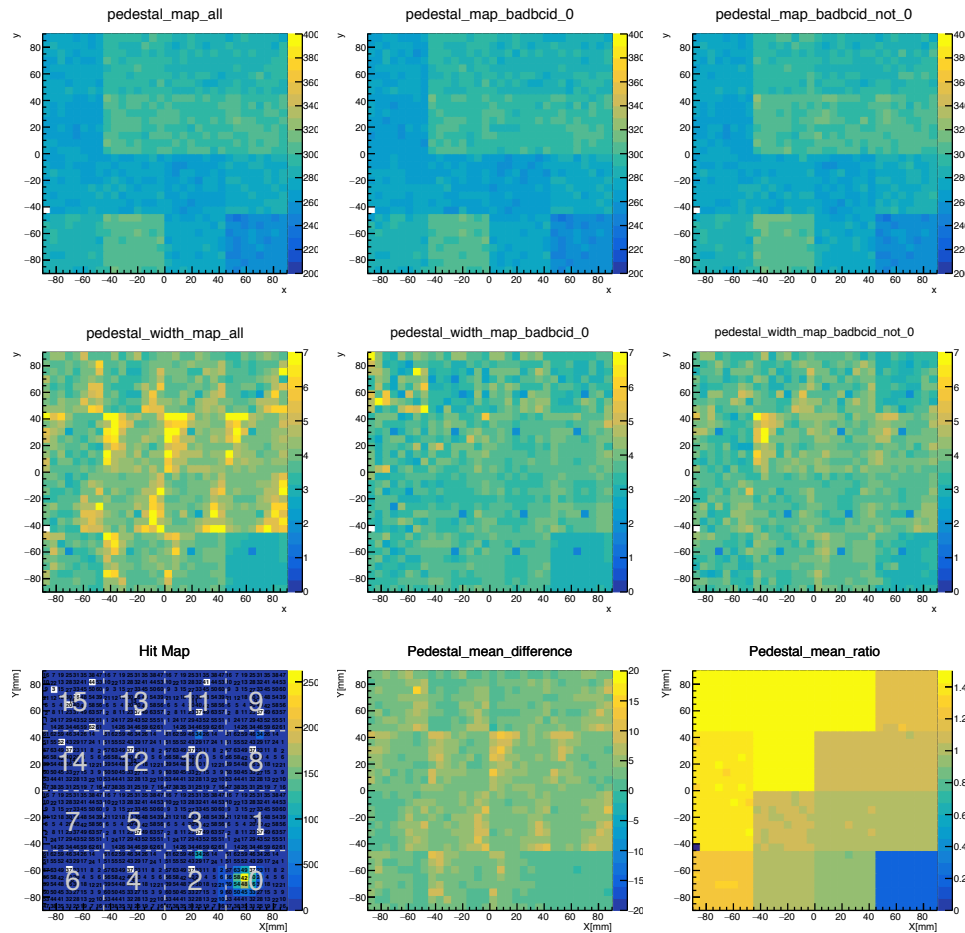   - double pedestal
  - square event

Data Summary

- All the run information is summarized on
  https://drive.google.com/file/d/1uQojlu9KlS9badhVrBf1LRFNt-kz62vV/view?usp=sharing .
  - not perfect, could be improved.

- June 27: DIF on P2 had broken down → June 28: replaced DIF and recovered

- June 28: made script to record temperature & start measurement

- July 1: Data transition from P1 was sometimes lost because of bad connection of HDMI
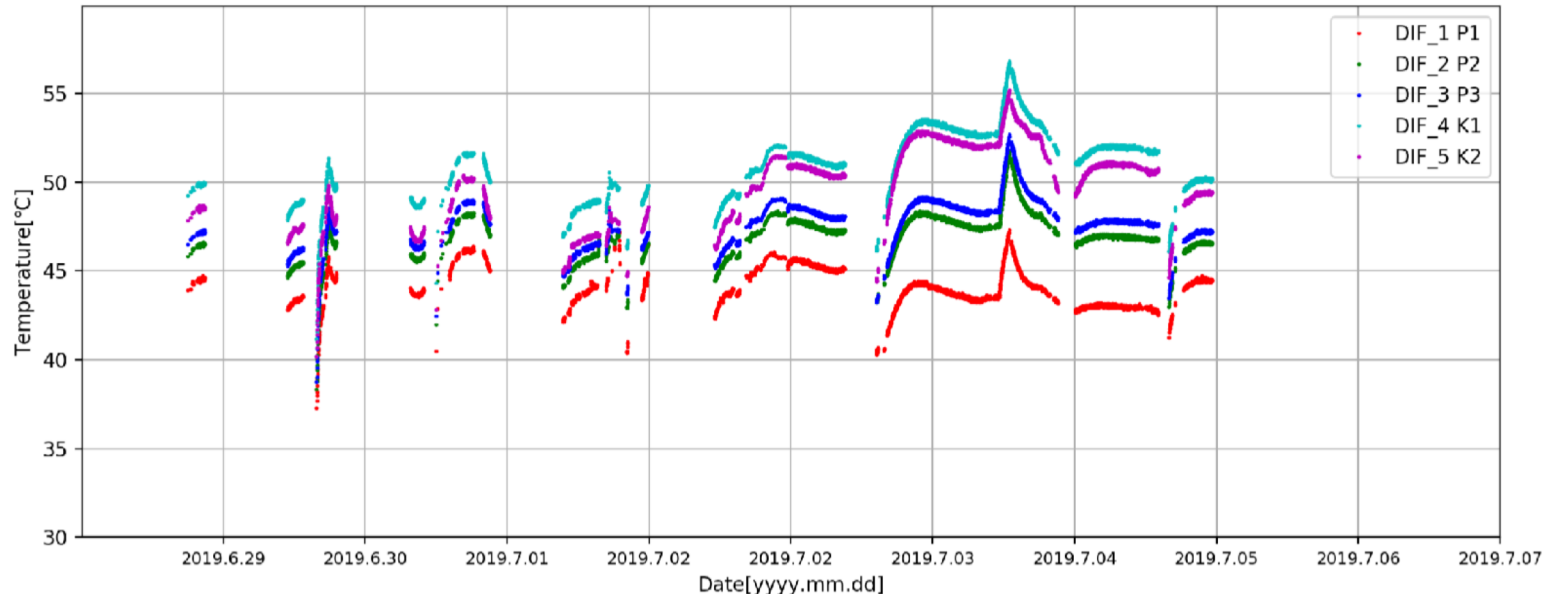
Pedestal Analysis

- We generated pedestal maps for all runs.

run_30003-006
_dif_1_1_1 (P1)