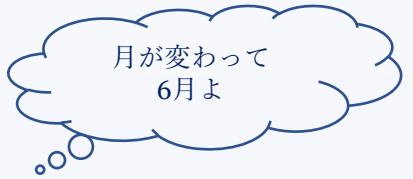


Status report #30

- ToF: new setup
- Tuning amp circuit for MPPC

2020. 06. 05 (Fri)

Tohoku Univ.　M1

Tomomasa FUJIWARA

Consistency check for MPPCx4s board

- Checked again.
- Setup:
  ToFR(upstream): 5 × 11 × 300 [mm3], mppcx1s
  ToFL(downstream): 5 × 22 × 300 [mm3], mppcx4s
  ※ Both of them used new board (designed Fujiwara)

- V_b-V_{op} [V/mppc]: +9.0(Lside), +3.0(Rside)
- Taking 3-runs (~1run/day)

- Analysis: assuming Rside has the same resolusion with Mar. data (~ 115 ps)

Run num.	$\sigma_{detector}$ [psec]
177	146.21 ± 2.44
178	147.33 ± 2.95
179	141.29 ± 2.94
Ave.	~145

Comparison to the data

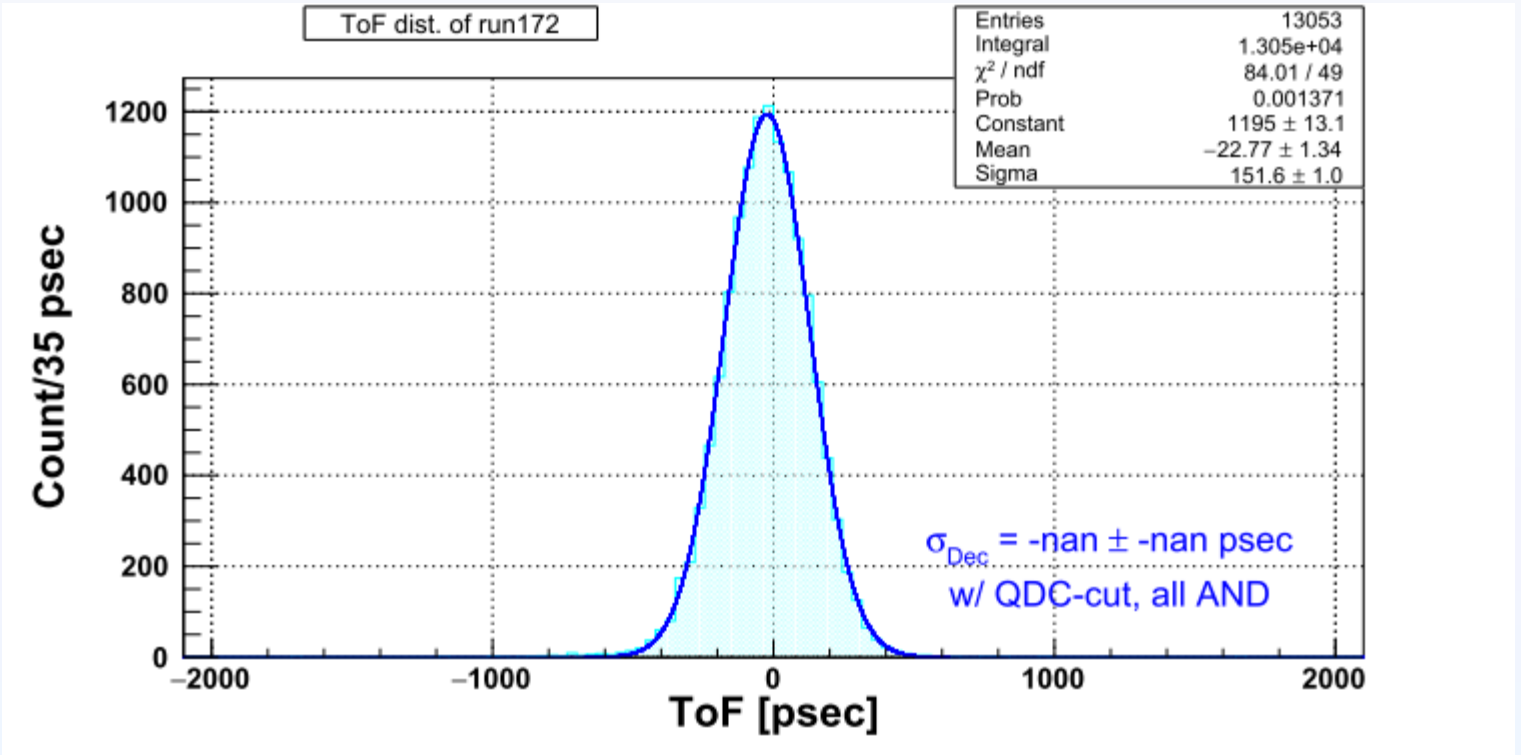
The run that has problem

⇒ σ of TOF(not intrinsic) = 151.6 ps

- Using only these 3 points

⇒ Intrinsic resolusion ~ 44 psec @ 44.7 V

- aaaaa



Run num.	$\sigma_{detector}$ [psec]
177	146.21 ± 2.44
178	147.33 ± 2.95
179	141.29 ± 2.94
Ave.	~145

Comparison to the data

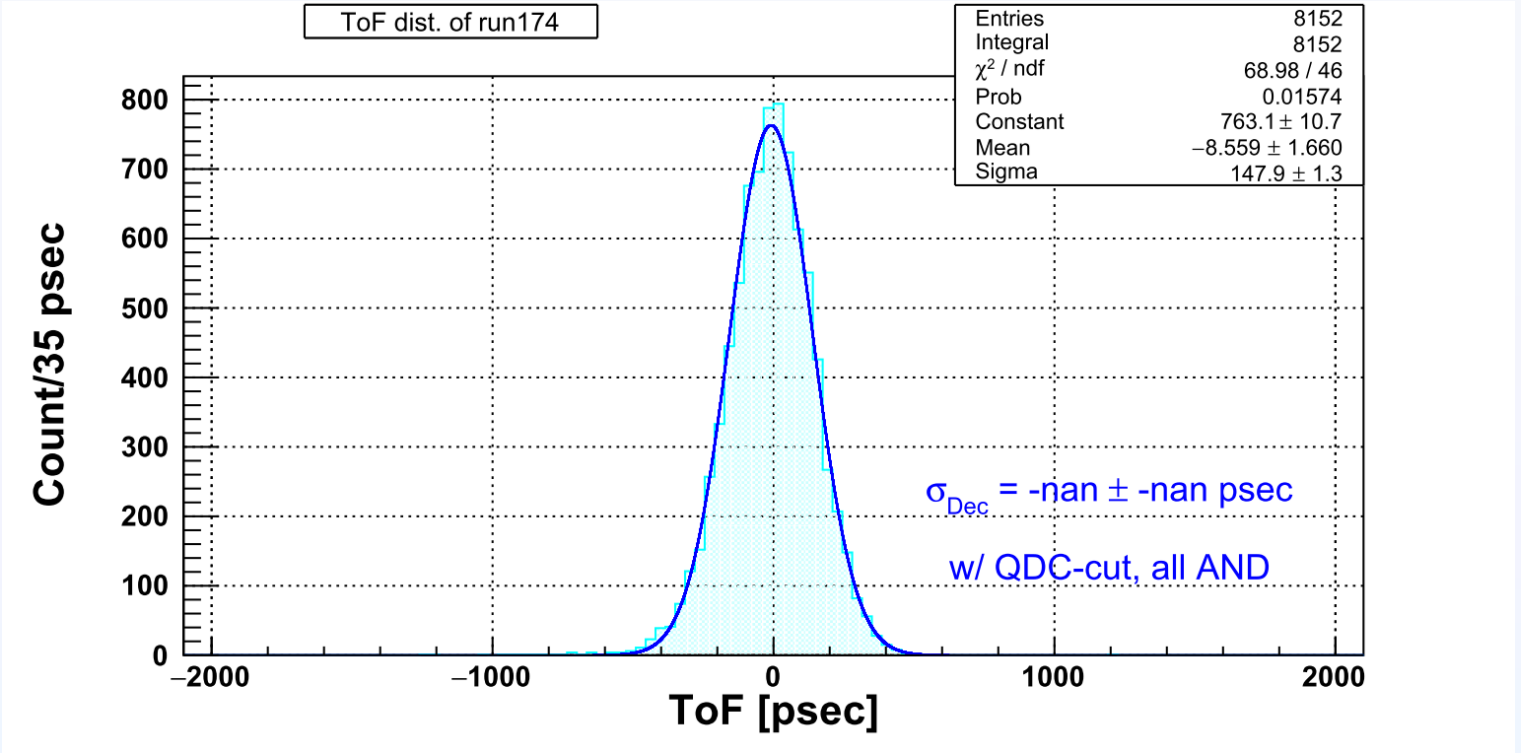
For higher bias run (+9.0 V/MPPC)

⇒ σ of TOF(not intrinsic) = 147.6 ps

- ギリギリ計算できるかどうかの値

- 改めて5×11×300 [mm3], MPPCx1s

での測定を行う必要有と判断した



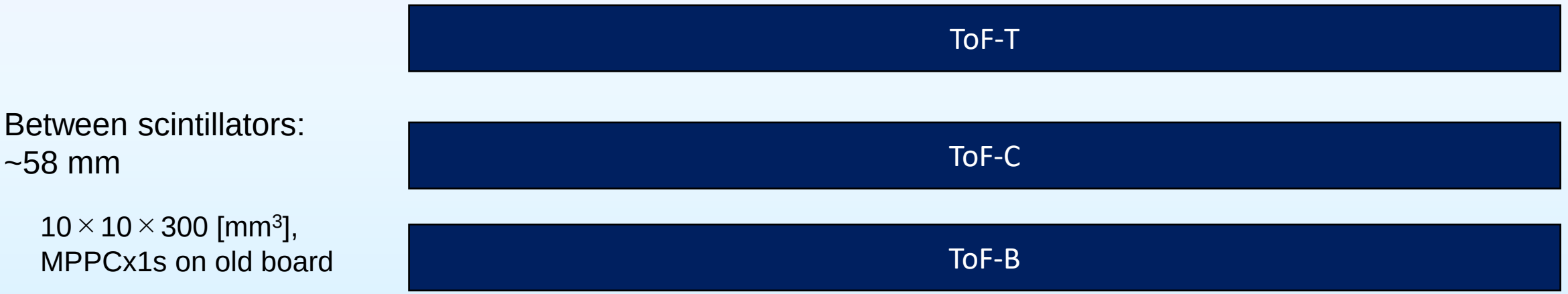
Run num.	$\sigma_{detector}$ [psec]
177	146.21 ± 2.44
178	147.33 ± 2.95
179	141.29 ± 2.94
Ave.	~145

New setup for ToF measurement

- Conventional setup: 2-scintillators ⇒ analysis: assuming that we know already resolusion one of them.
- New setup: 3-scintillators ⇒ calculation mathematical.
- Conbination: Target of test + reference × 2

  reference: 10 × 10 × 300 [mm^3], MPPCx1s on old board
- Setup for measurement: underconstructing

  5 × 11 × 300 [mm^3], MPPCx1s on new board



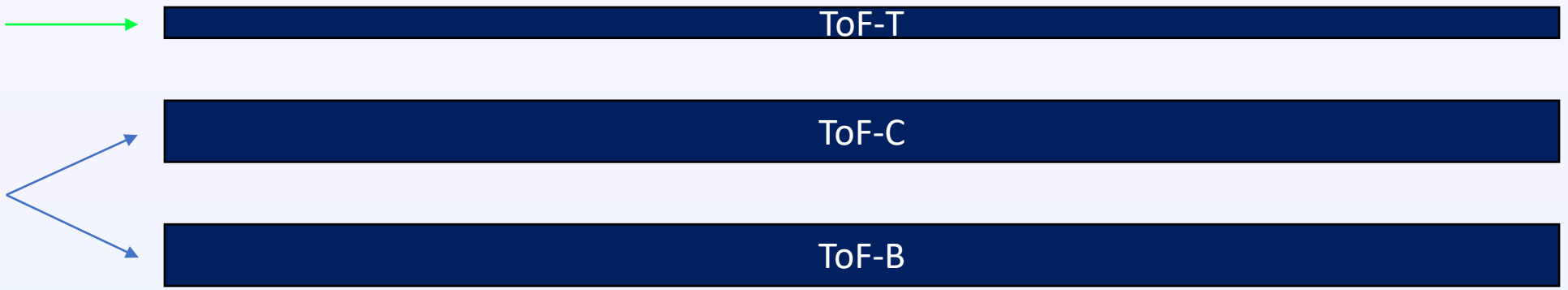
New setup for ToF measurement

✓ Trigger logic

- Coincidence of 4-CHs of reference ⊕ clock. (carryout from scaler 0.5 Hz)

$5 \times 11 \times 300$ [mm^3],
MPPCx1s on new board

$10 \times 10 \times 300$ [mm^3],
MPPCx1s on old board

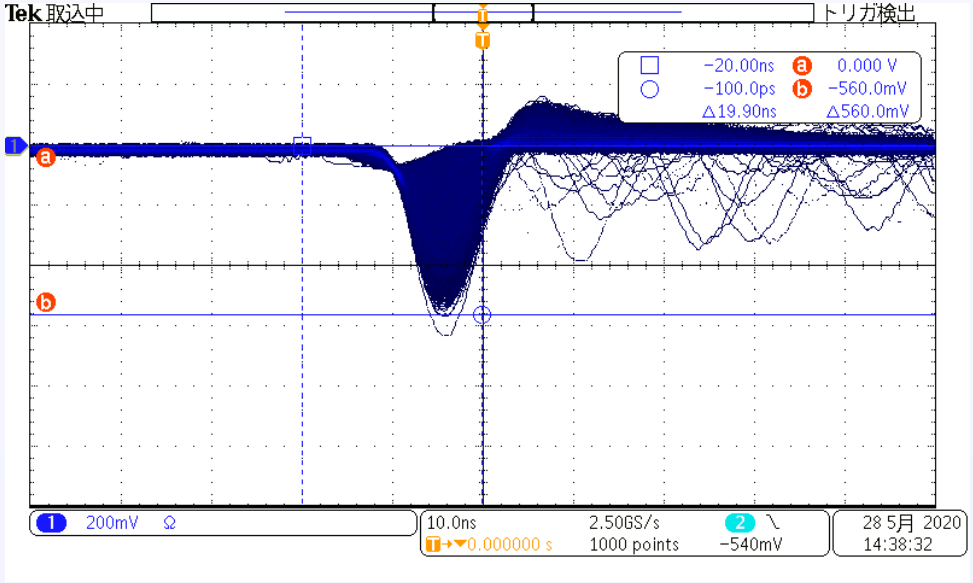


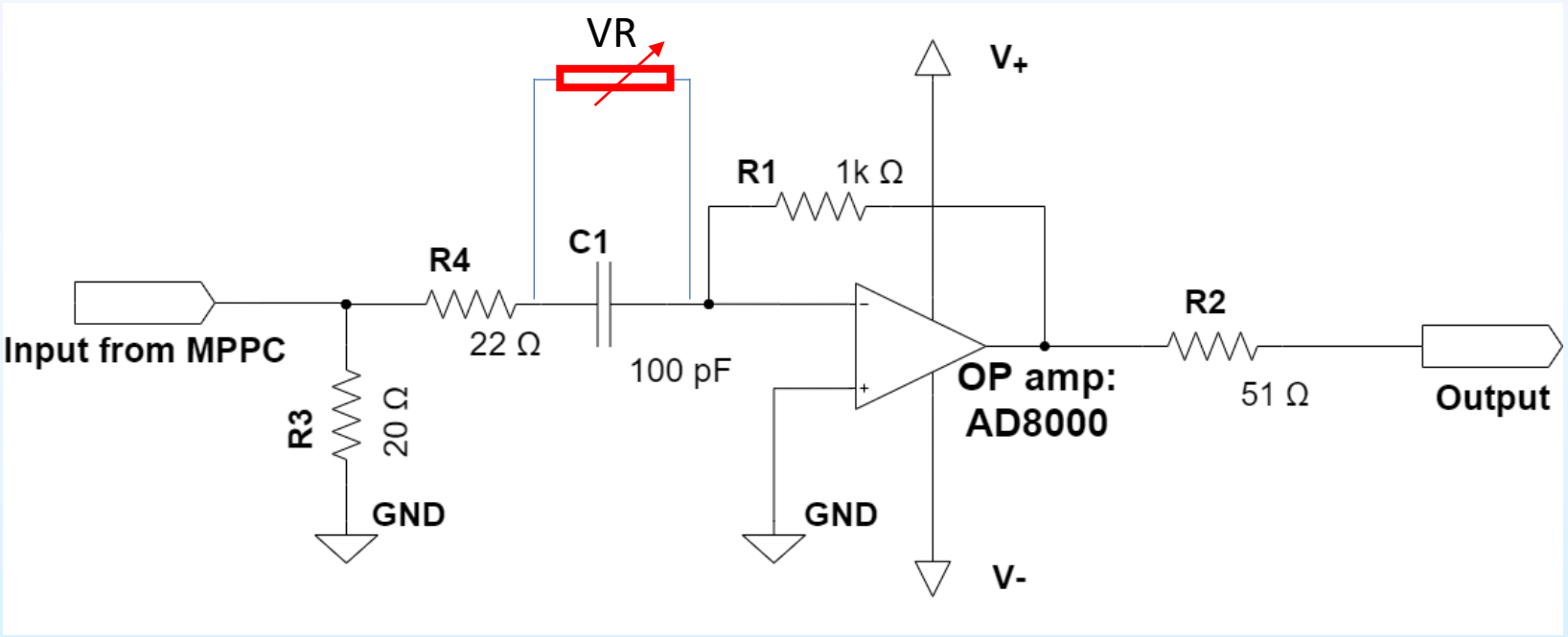
- First plan: All coin. of 6-CHs ⊕ clock.
- But too low event rate (1147 events for ~ 14 hours run ⇒ ~1.4counts/min.)

- Now testing for data taking.

Tuning for amp circuit for MPPC

- Problem of MPPC amp circuit: Large over shoot
- Adding variable resistance ⇒ pole zero correction



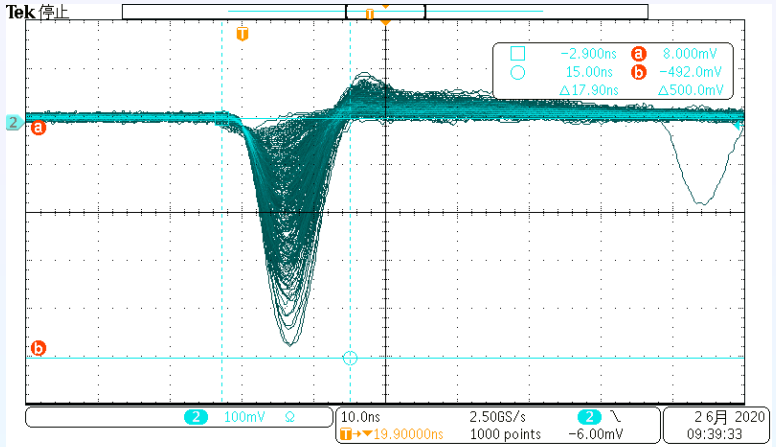


M1 Tomomasa FUJIWARA

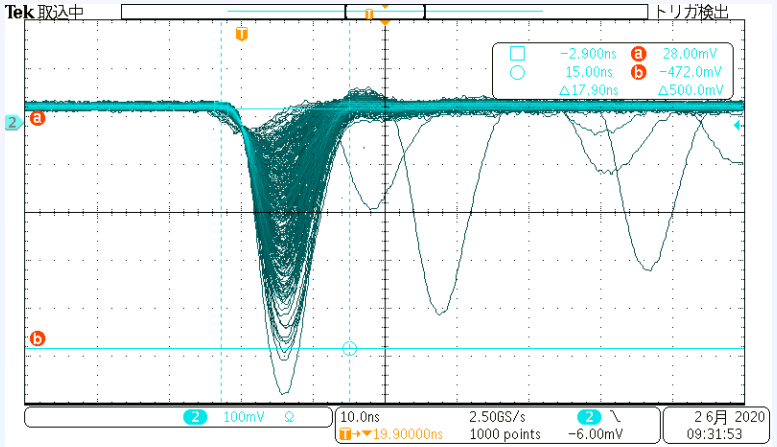
Tuning for amp circuit for MPPC

- Comparison for various value

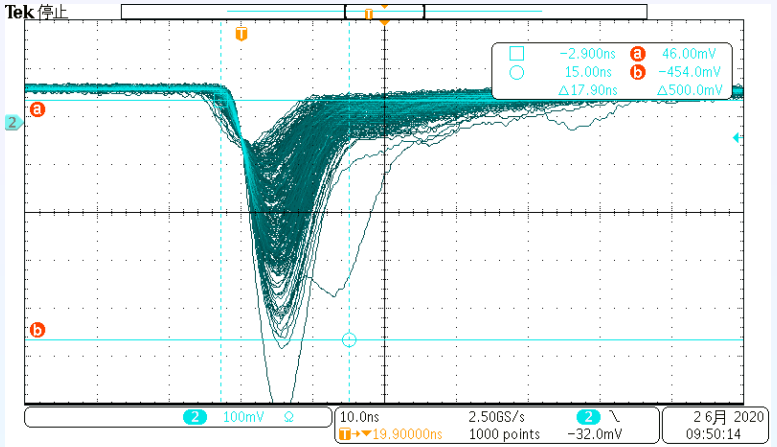
407Ω



203 Ω



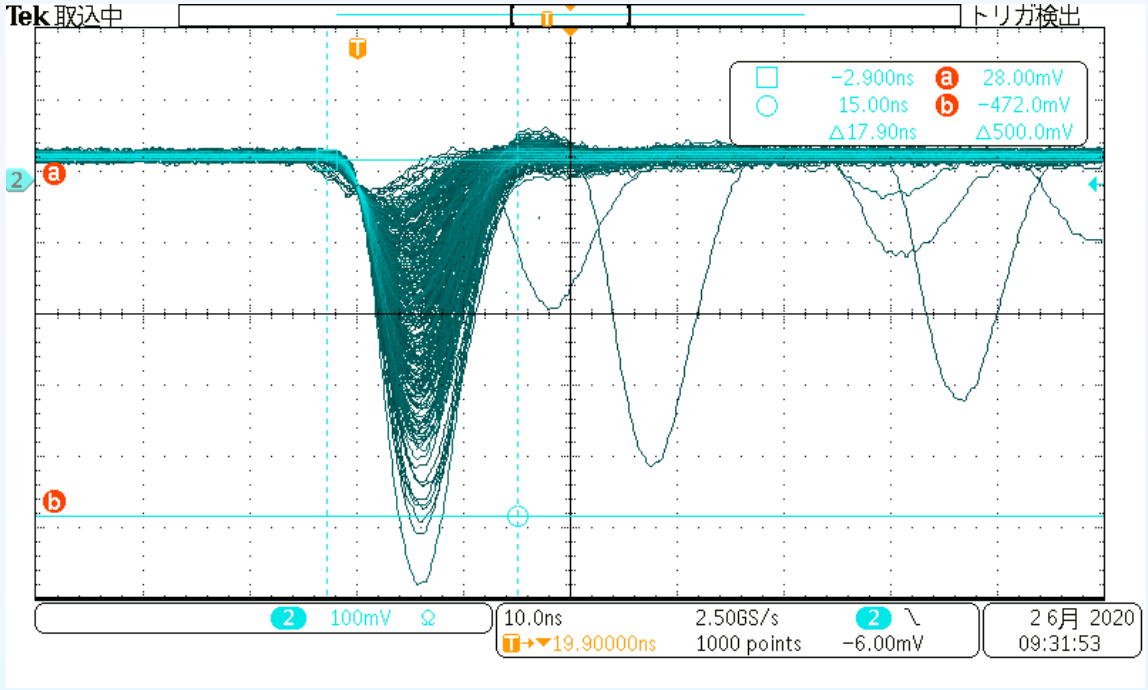
96 Ω



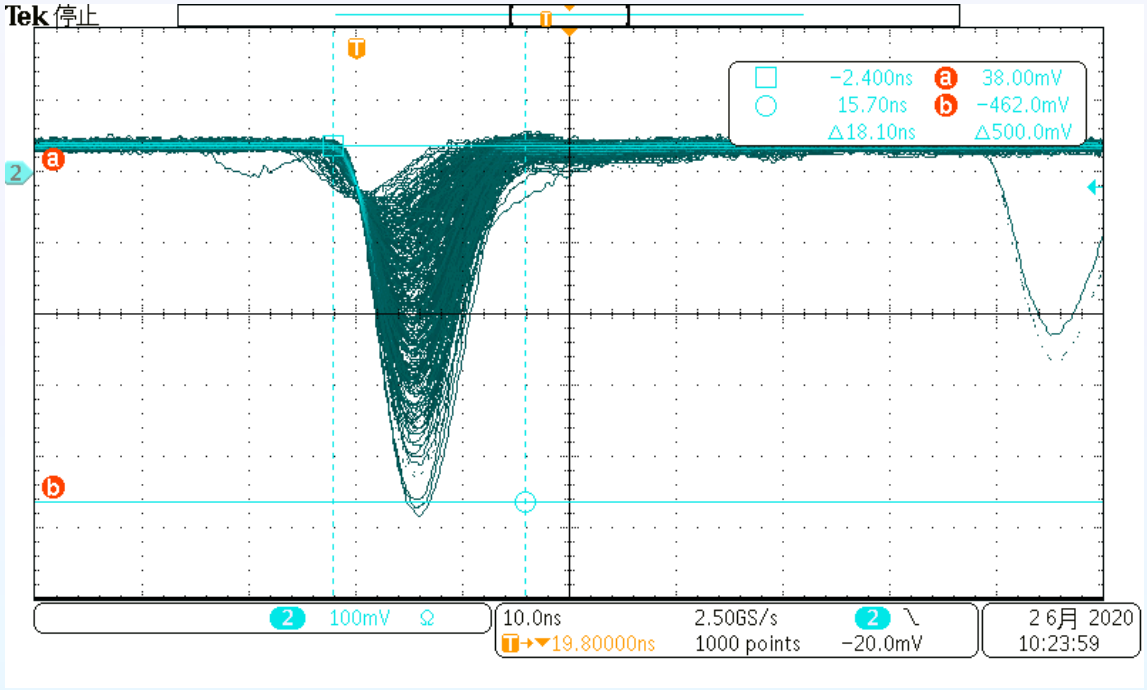
Tuning for amp circuit for MPPC

- Comparison for various value

203 Ω



177 Ω



⇒ Employed 170-177 Ω

Others

- JPS application:

  Title

  Japanese:「ELPHにおけるΛハイパー核実験のためのMPPCを用いた新ToF測定器の開発」

  English: “Development of a new ToF counter with MPPC for Λ hypernuclear experiments at ELPH”

- Hypernuclear physics seminar (today)

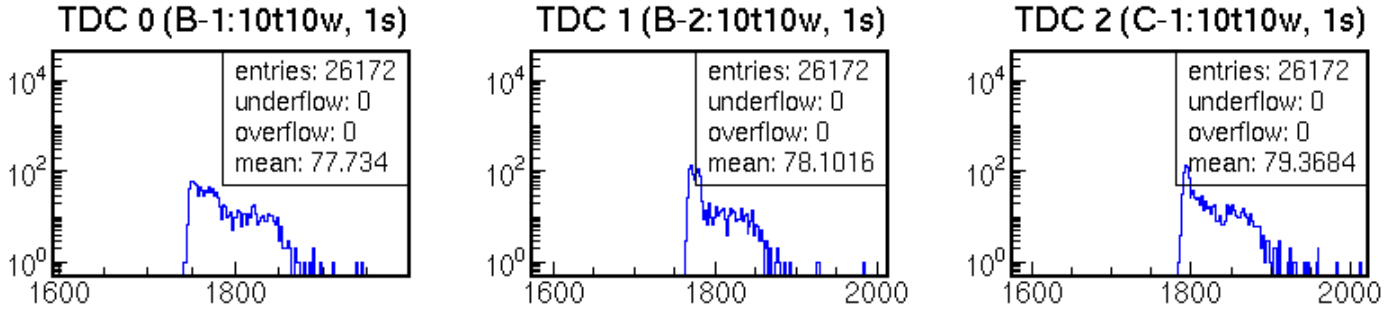
localhost:1234 (dhcp27e0.npex.prv:1 (unidaq)) - VNC Viewer

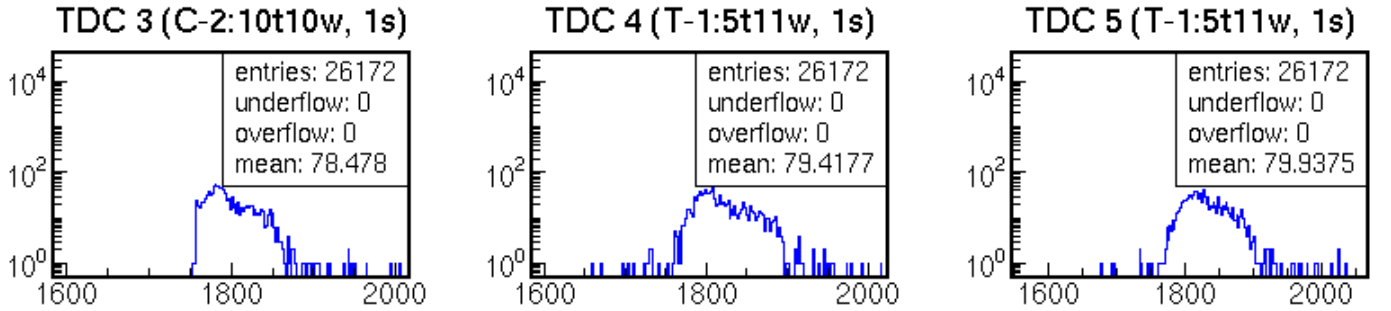
アプリケーション　場所　viewer　en　木曜日 12：53

viewer

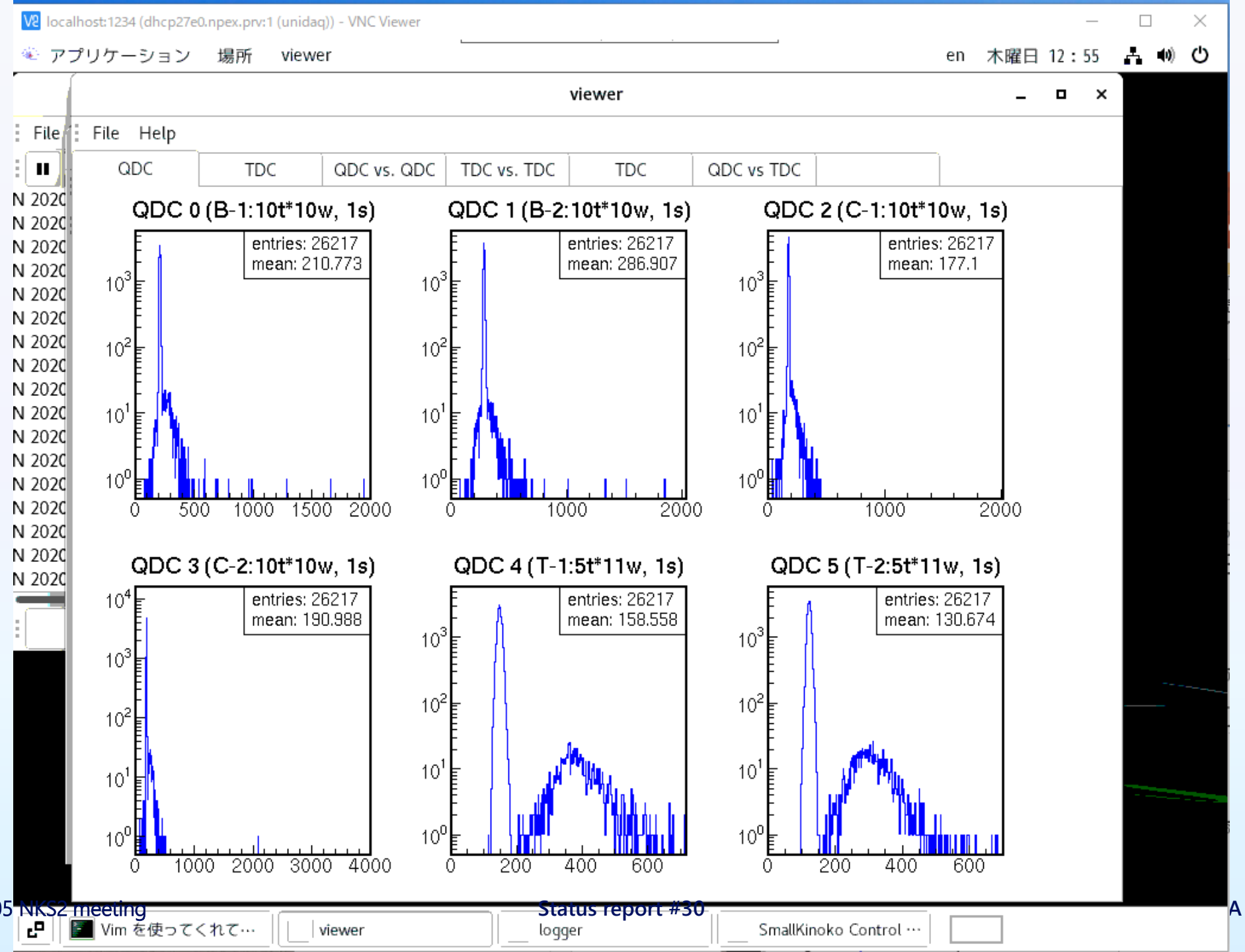
File　File　Help

QDC | TDC | QDC vs. QDC | TDC vs. TDC | TDC | QDC vs TDC





Vim を使ってくれて…　viewer　logger　SmallKinoko Control …


localhost:1234 (dhcp27e0.npex.prv:1 (unidaq)) - VNC Viewer
アプリケーション 場所 viewer
en 木曜日 12：55
viewer
File File Help
QDC TDC QDC vs. QDC TDC vs. TDC TDC QDC vs TDC
QDC 0 (B-1:10t*10w, 1s)
entries: 26217
mean: 210.773
QDC 1 (B-2:10t*10w, 1s)
entries: 26217
mean: 286.907
QDC 2 (C-1:10t*10w, 1s)
entries: 26217
mean: 177.1
QDC 3 (C-2:10t*10w, 1s)
entries: 26217
mean: 190.988
QDC 4 (T-1:5t*11w, 1s)
entries: 26217
mean: 158.558
QDC 5 (T-2:5t*11w, 1s)
entries: 26217
mean: 130.674
Vim を使ってくれて…
viewer
logger
SmallKinoko Control …