Status Report #11
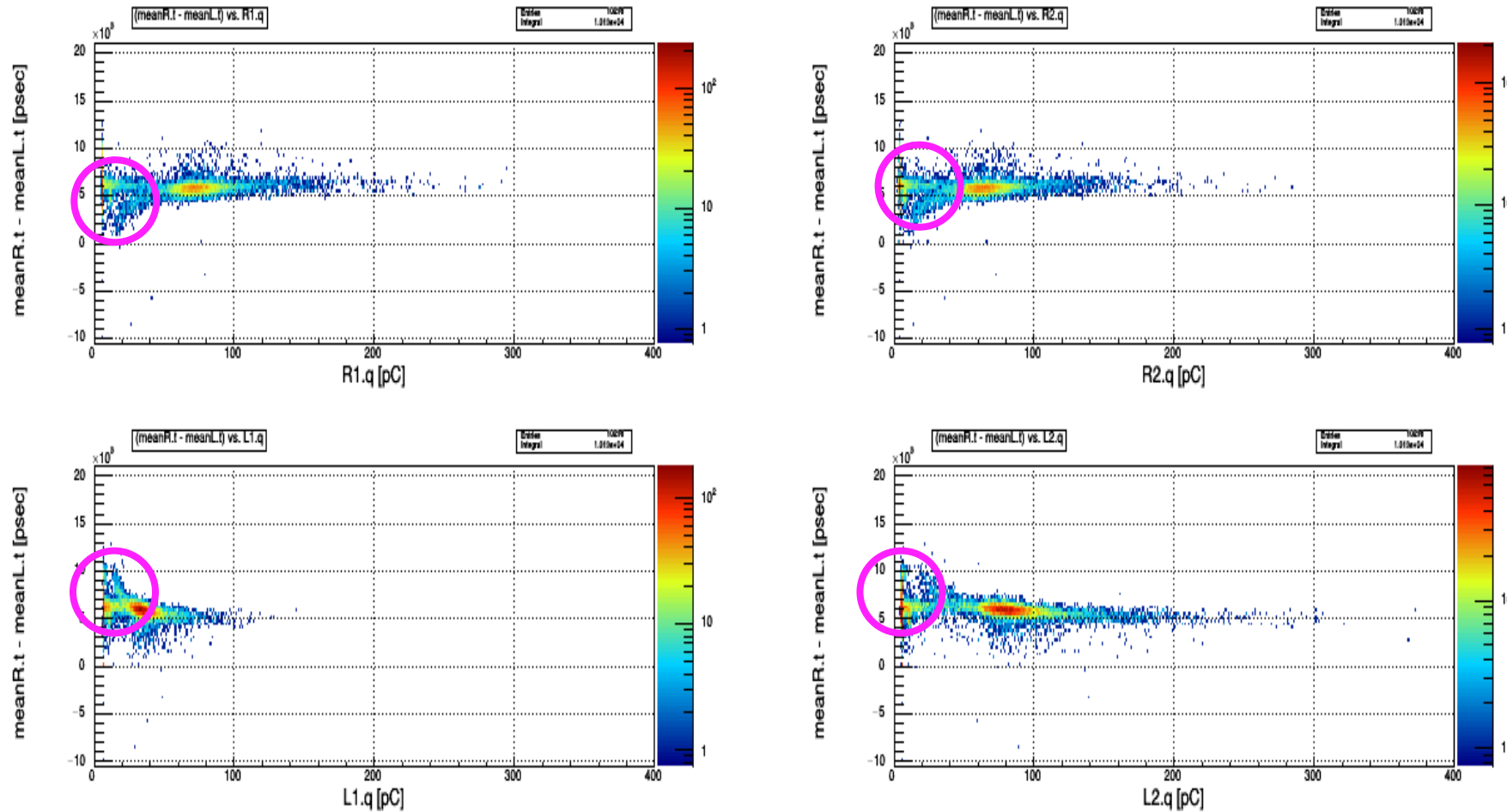
2020. Jan. 17 (Fri)

B4   Tomomasa FUJIWARA
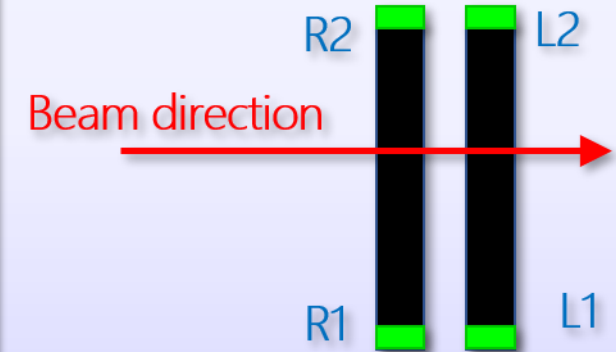
✓ Progress of ToF data analysis
- Bias dependence
- Consideration new(?) method w/ TDC cut

✓ JPS abstract

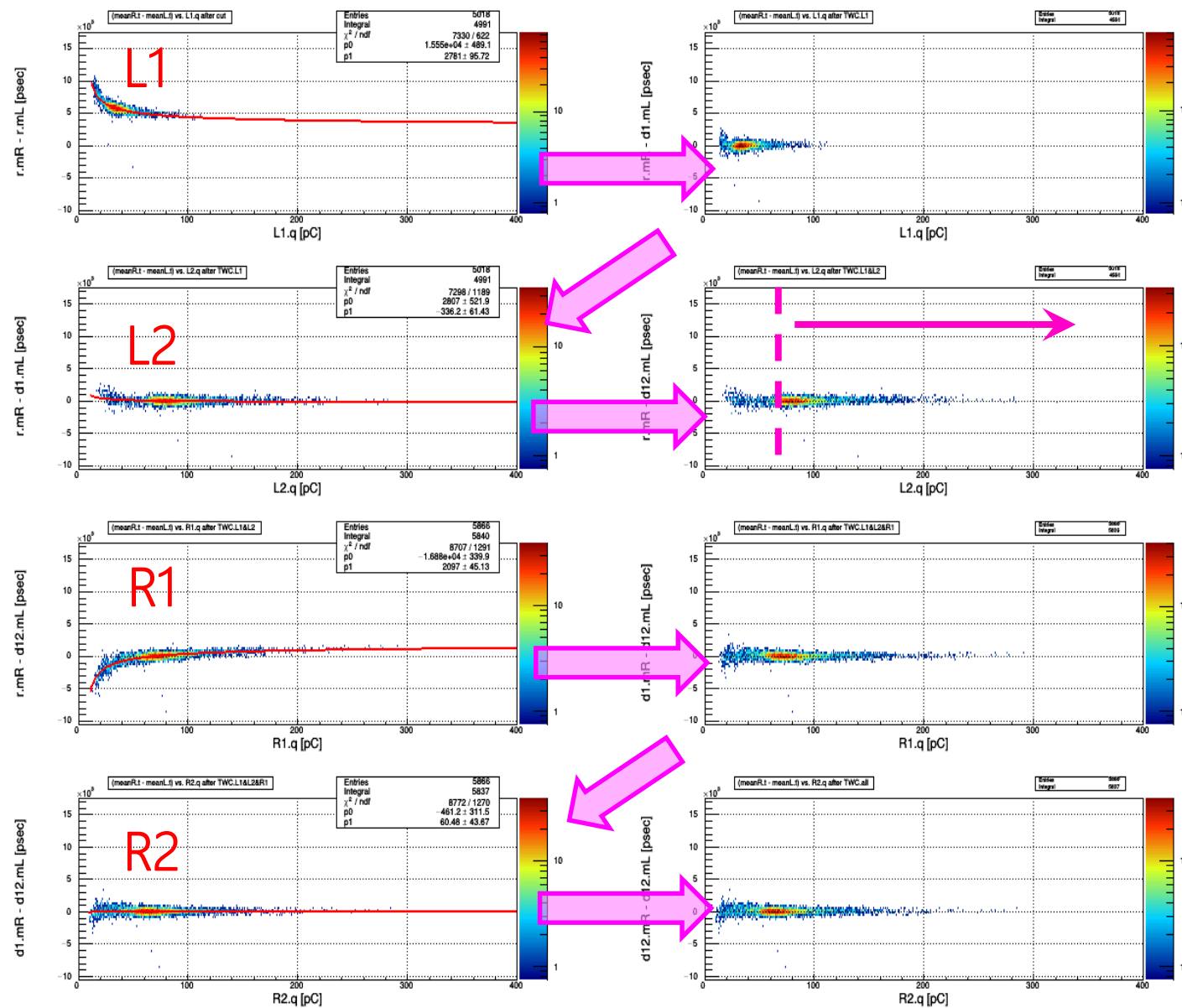✓ Hypernuclear physics seminar

run0123   **Previous result**
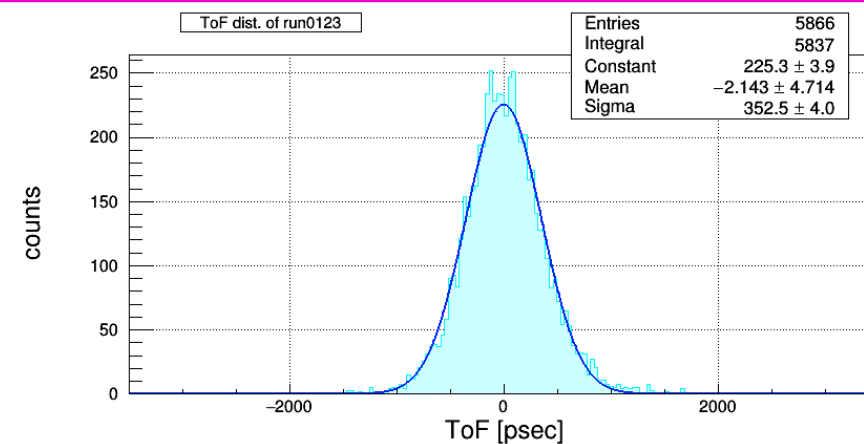

*Ignored strange region
* Time walk correction

*Ignored strange region
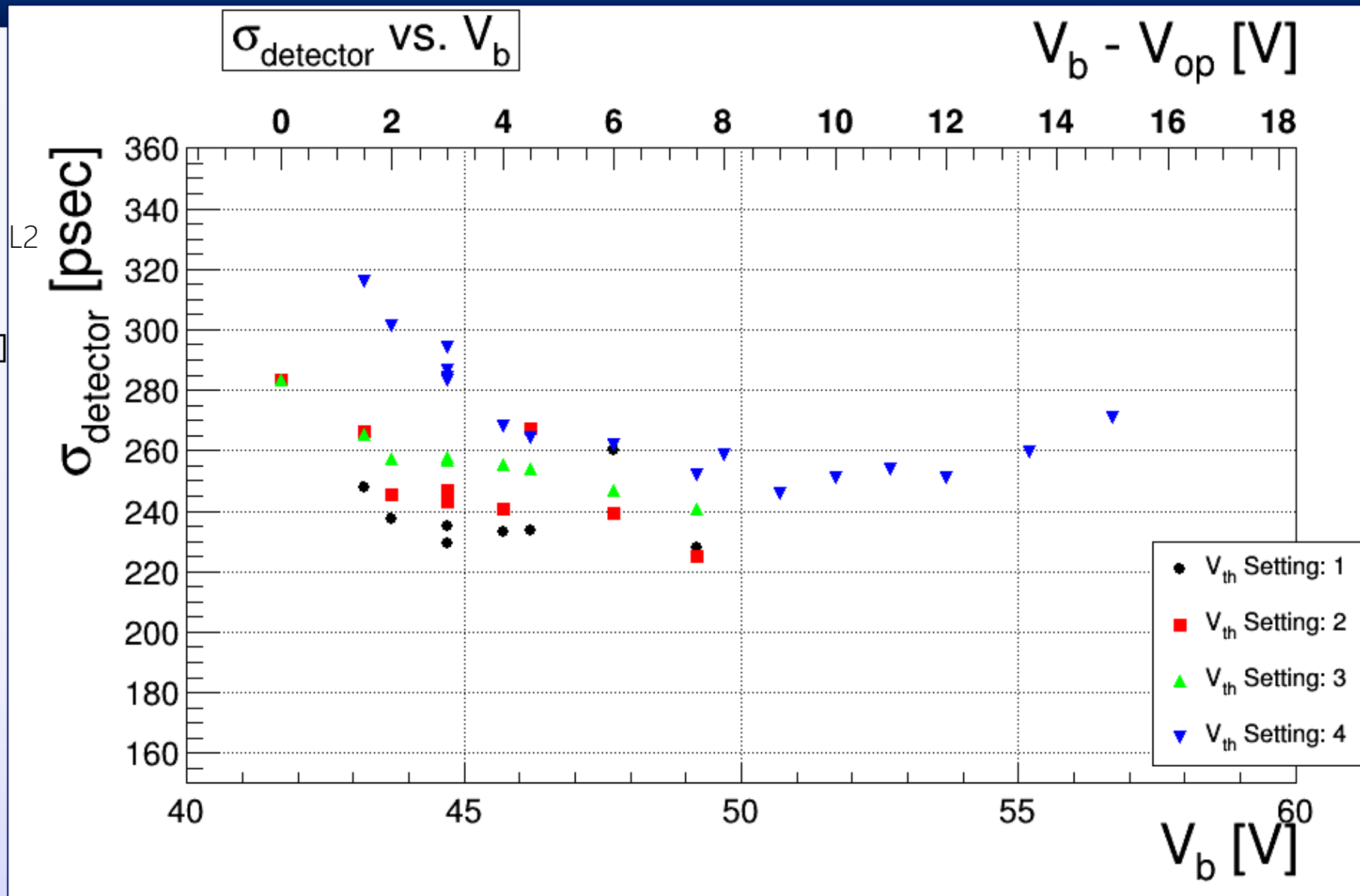* Time walk correction

Result of run123

Bias Voltage: 44.7

R1: -51.1, R2: -45.7, L1: -44.3, L2: -54.7

ToF resolution: 352 [psec]

Intrinsic resolution: 249 [psec]

✓ V_b dependence

- Ignored the strange region.

- V_{th} Setting [mV]→ R1, R2, L1, L2

- Settting1

  -31.1, -25.0, -24.4, -34.7 [mV]

- Settting2

  value of 'setting1' -20mV

- Settting3

  value of 'setting2' -50mV

- Settting4
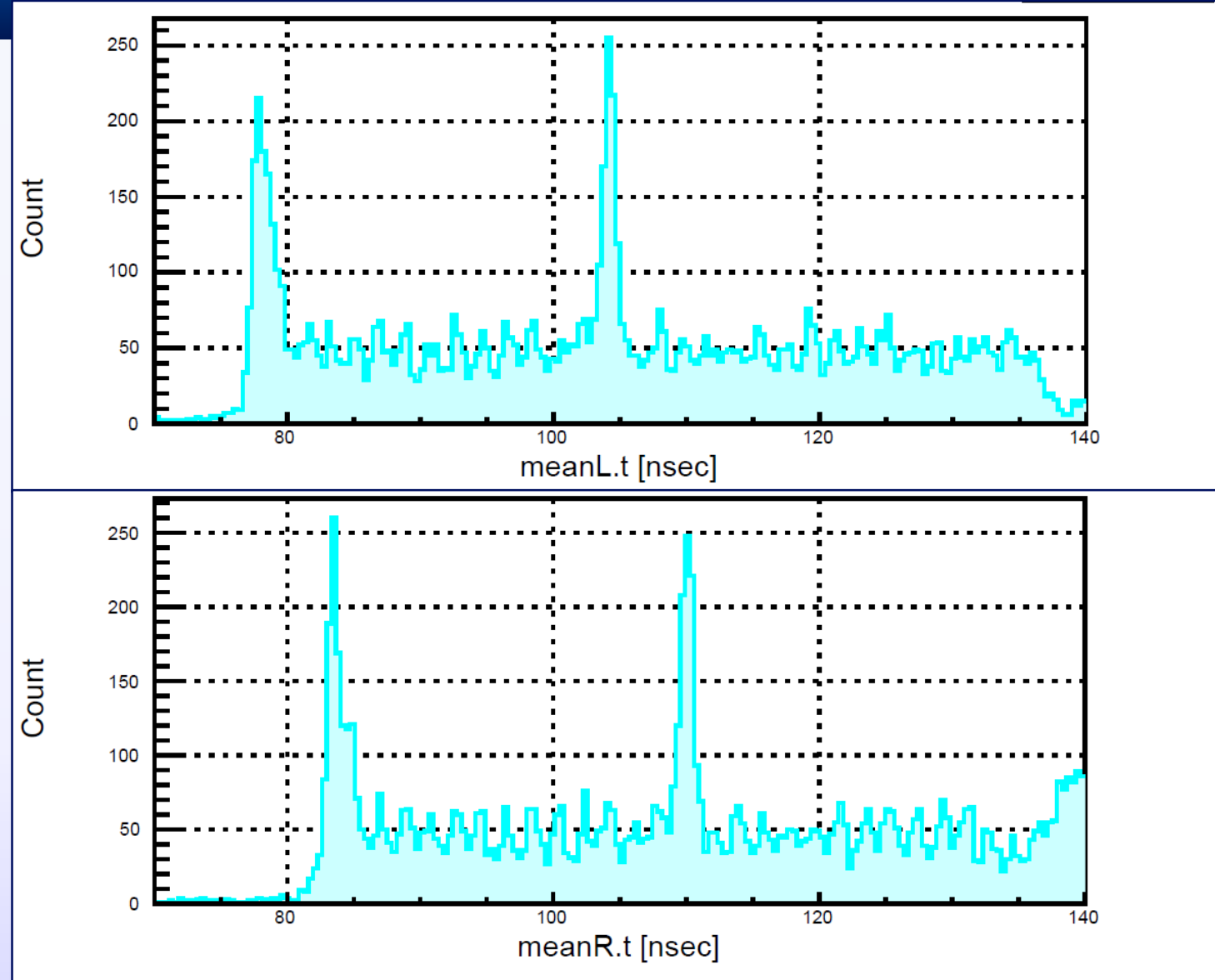
  value of 'setting3'-50mV

$\sigma_{detector}$ vs. V_b

$V_b - V_{op}$ [V]

$\sigma_{detector}$ [psec]

V_b [V]

- V_{th} Setting: 1
- V_{th} Setting: 2
- V_{th} Setting: 3
- V_{th} Setting: 4

✓ **Consideration for TDCcut**

- After last ELS meeting,
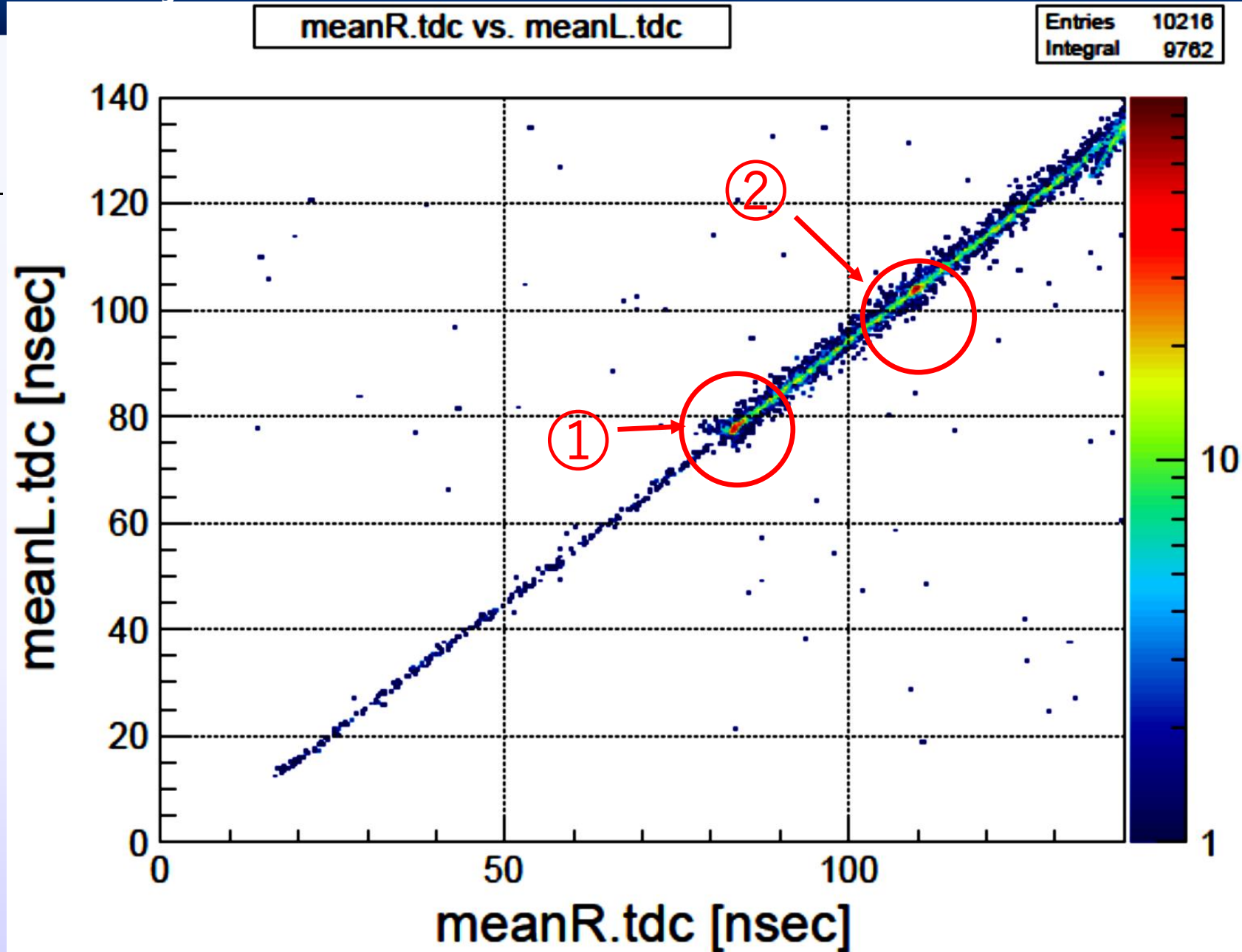
"To apply for TDC-cut, we could select good event."

(by 外山さん)

- Check the distribution of mean TDC
- "meanTDC": defined following,

$$\mathbf{meanR.t} \equiv \mathbf{0.5(R1.tdc + R2.tdc)}$$

- There are 2 peak for each distribution

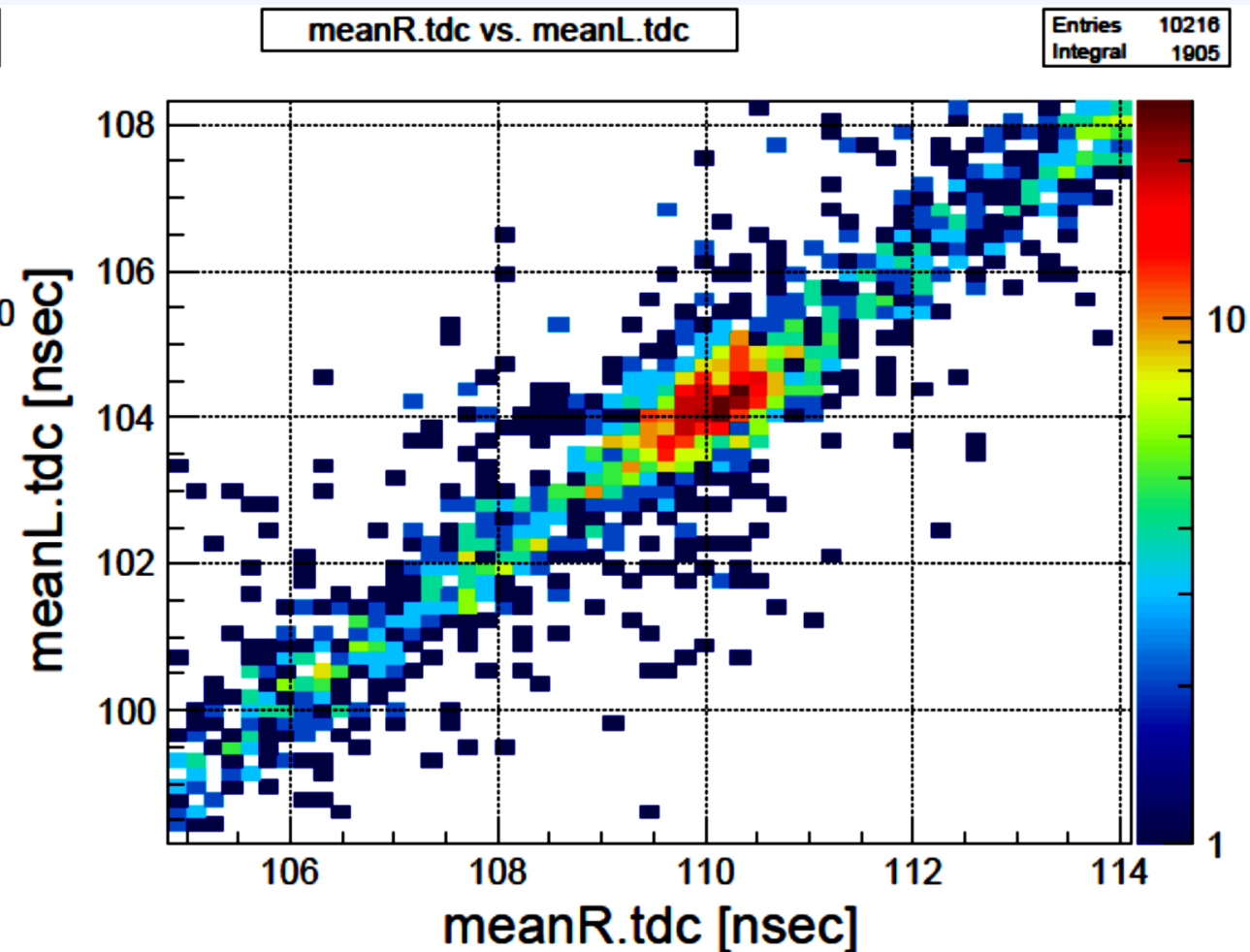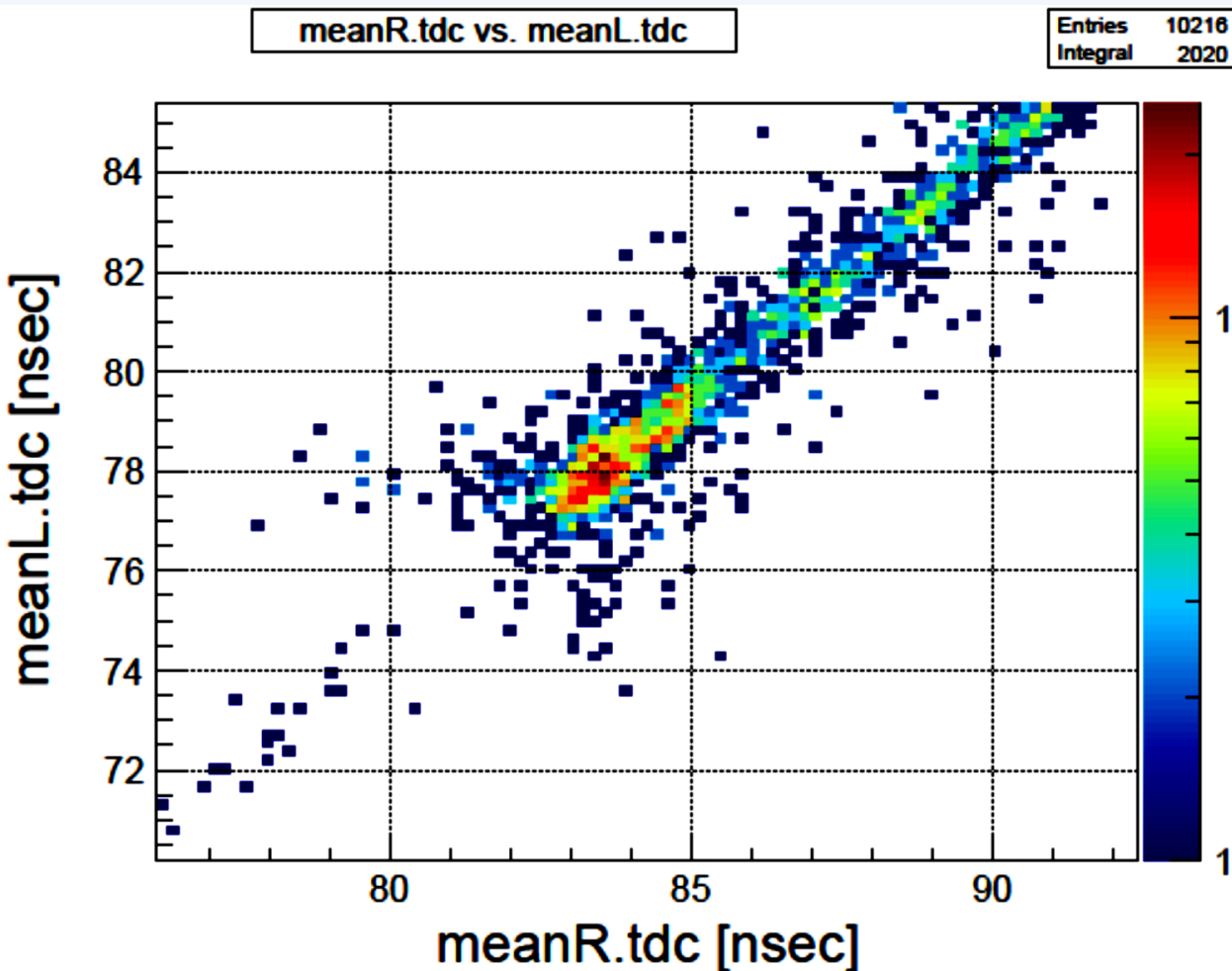✓ Consideration for TDCcut

• Checked the correspond between R and L

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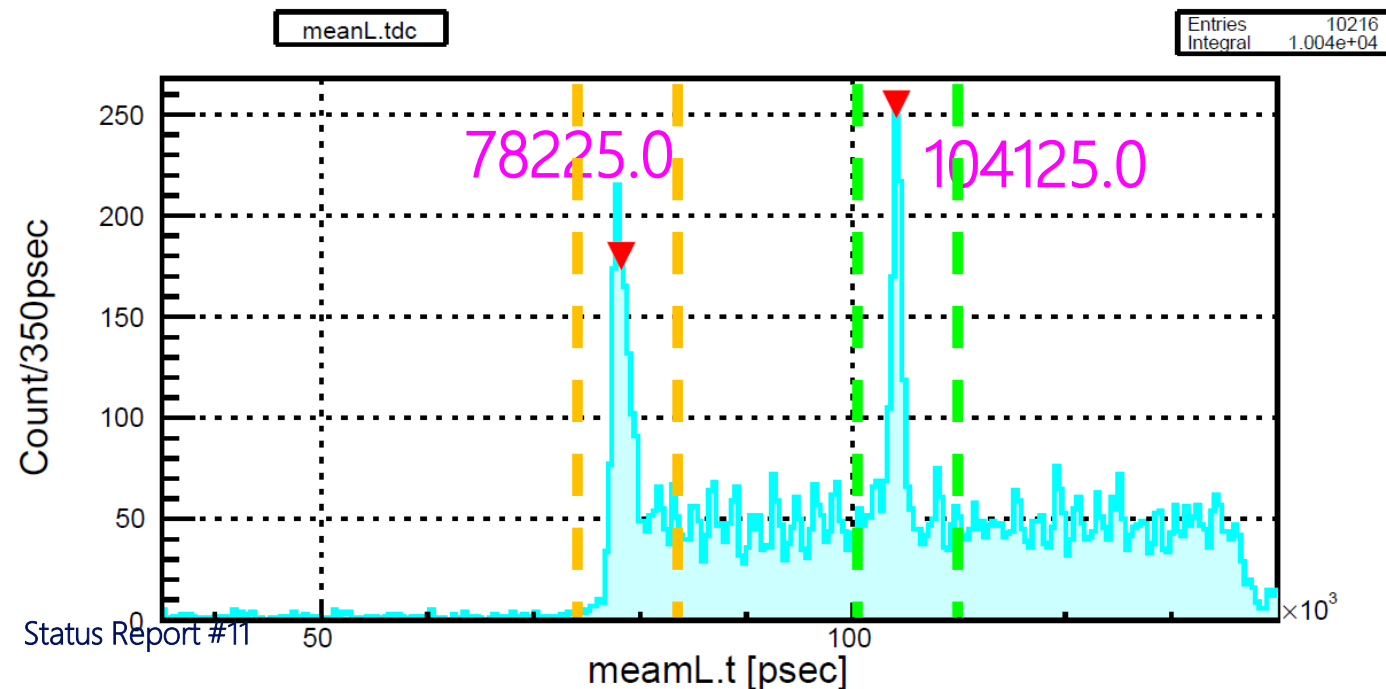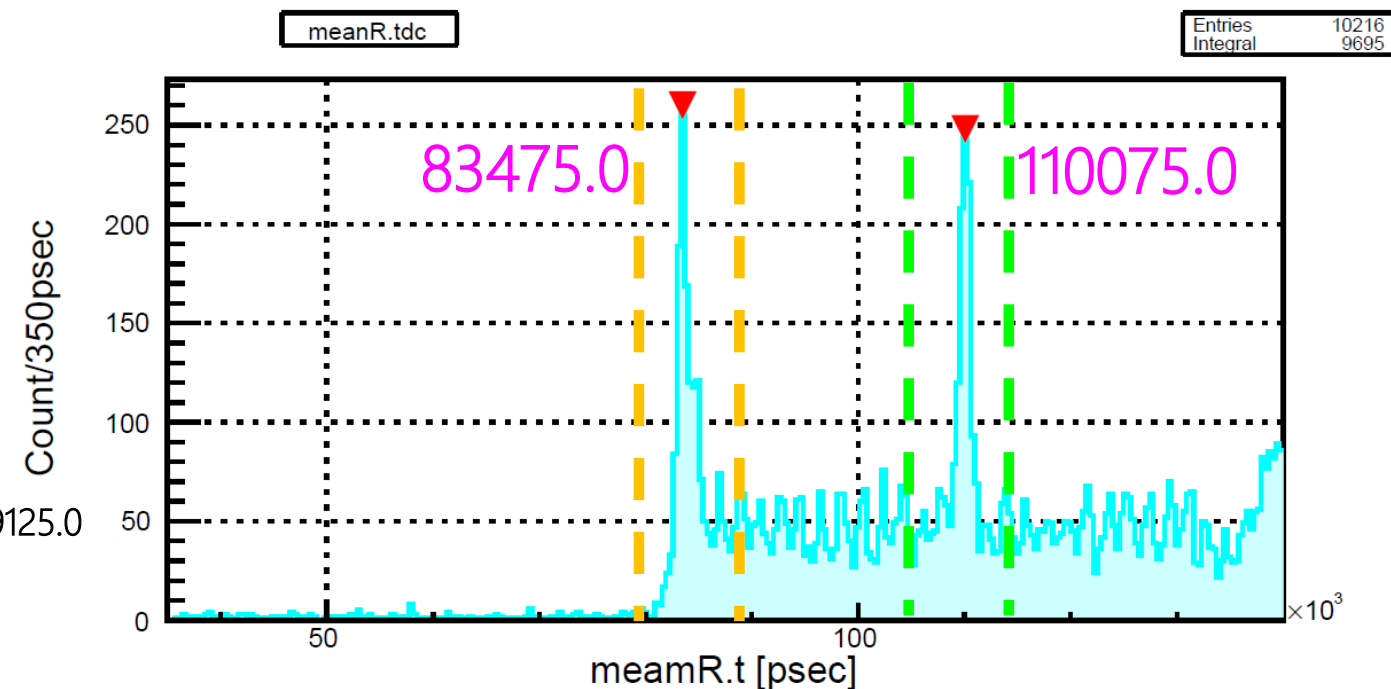
✓ Consideration for TDCcut

- Focused on ① (left fig.) and ② (right fig.)

- Each regions have ~ 2000 events for total ~10000 events (in case run0123)
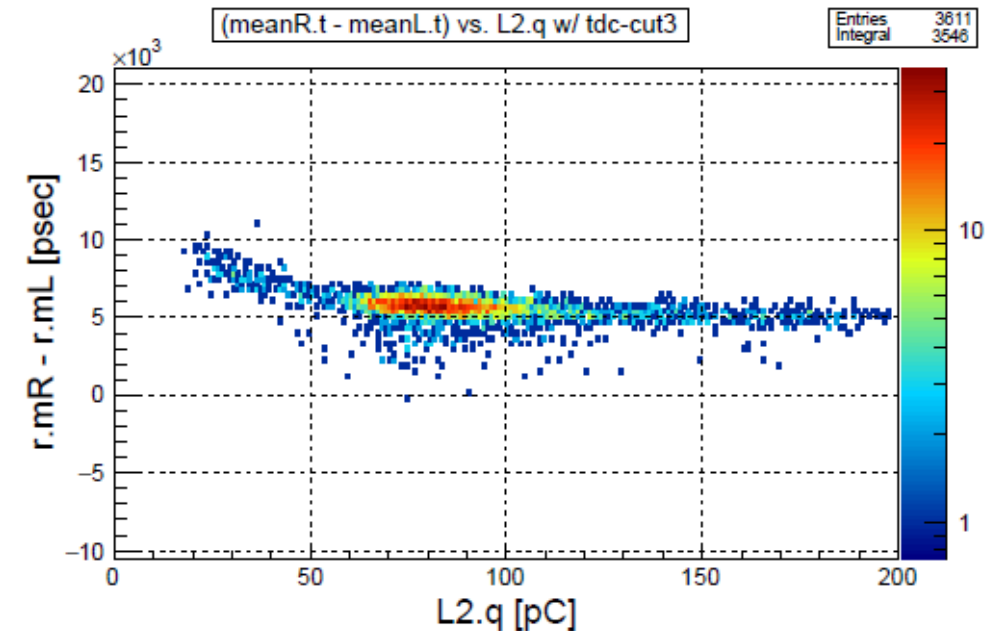
Progress of ToF analysis
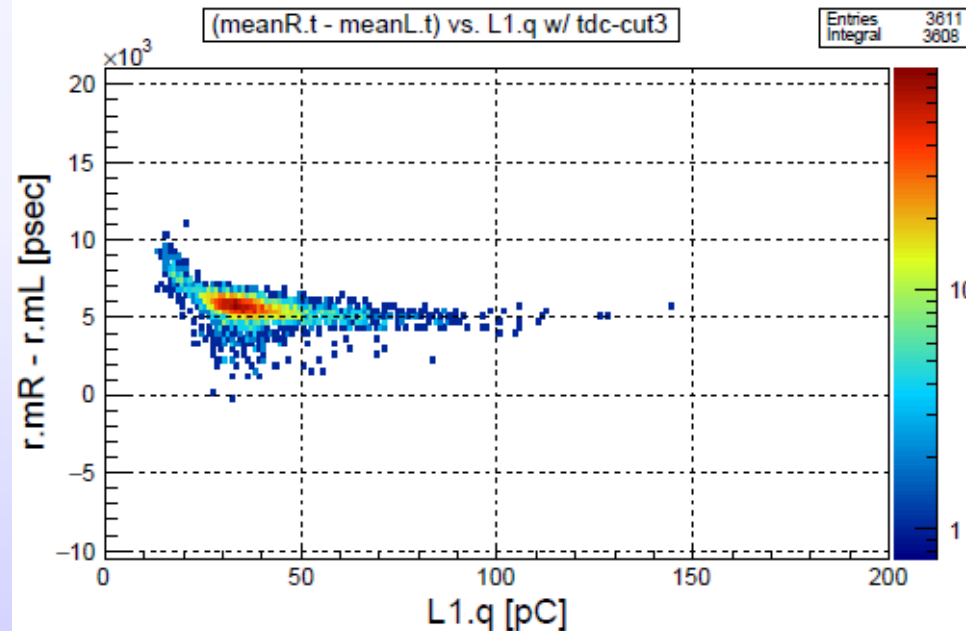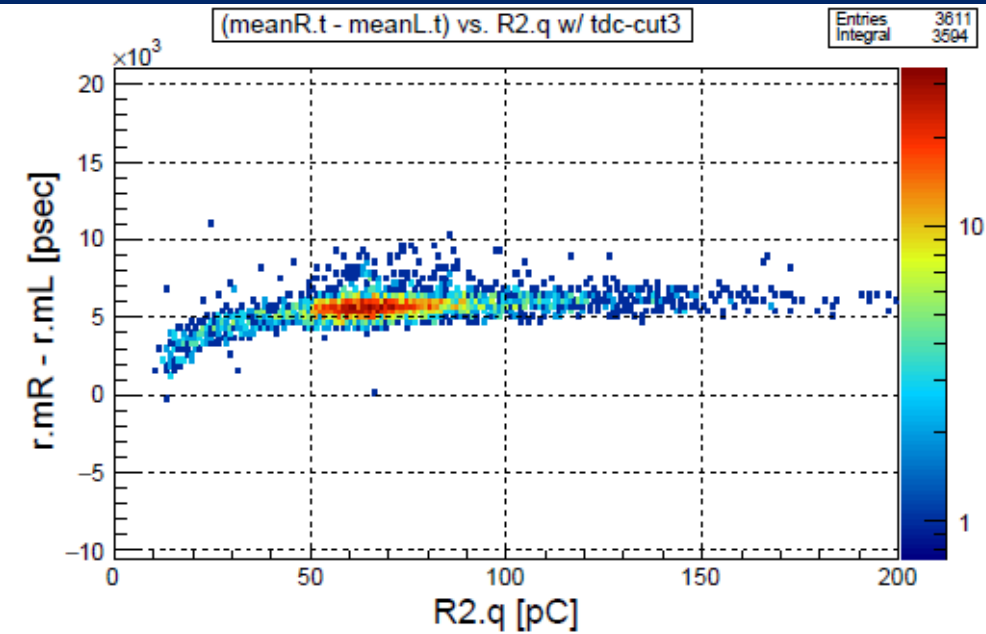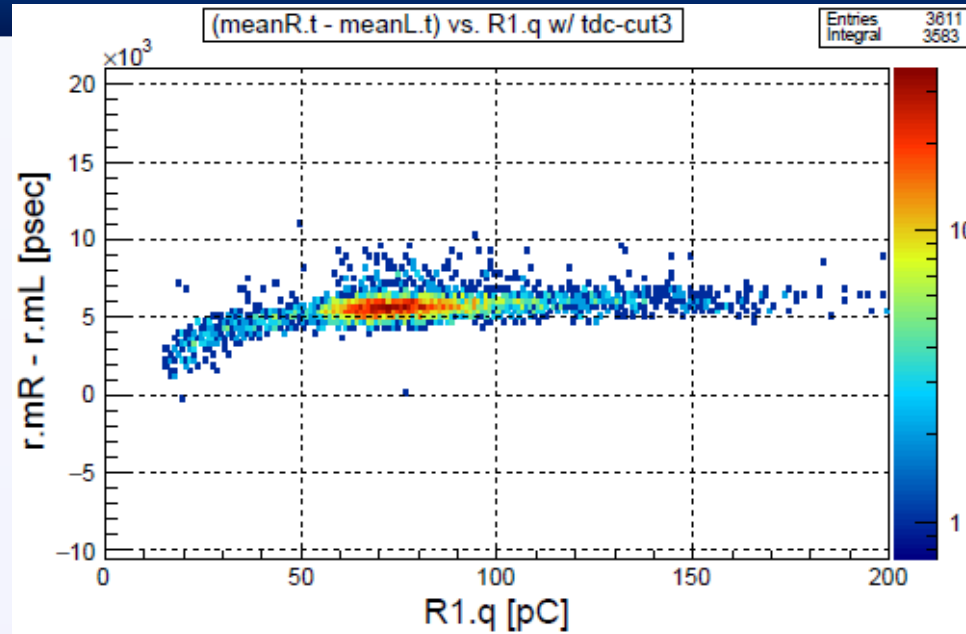
✓ **TDC cut constraint**

- Getting positions of peak

- Set tdc-cutoff to chose peak ± 5nsec region

- test for 3 types tdc-cut

1. 78475.0<Right [psec]<88475.0 && 73225.0<Left [psec]<83225.0

2. 105075.0 < Right [psec] <115075.0 && 99125.0 < Left[psec] <109125.0

3. 1 or 2

- Apply for '3'

- remove the strange region!

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- change the cutoff region form ±5nsec
  to ±10 nsec

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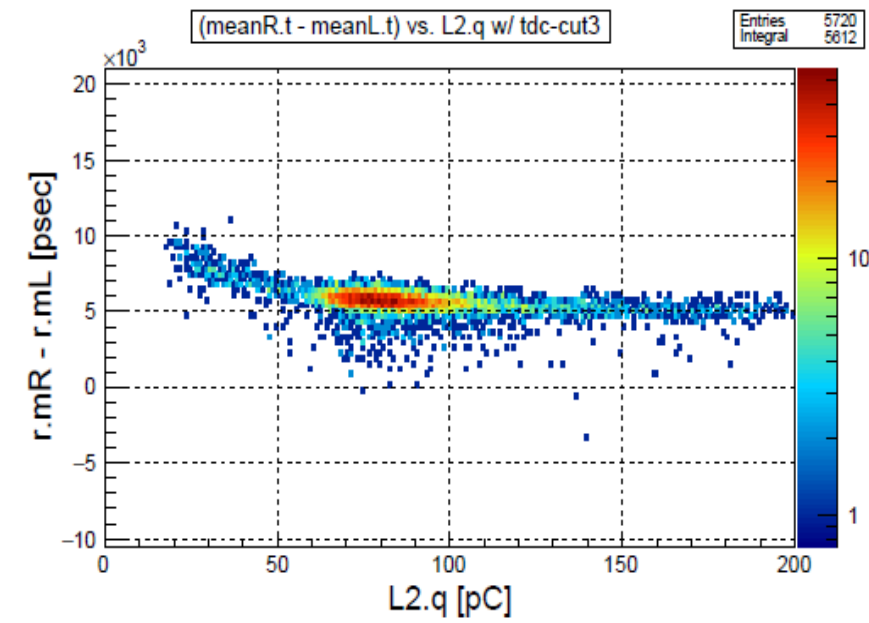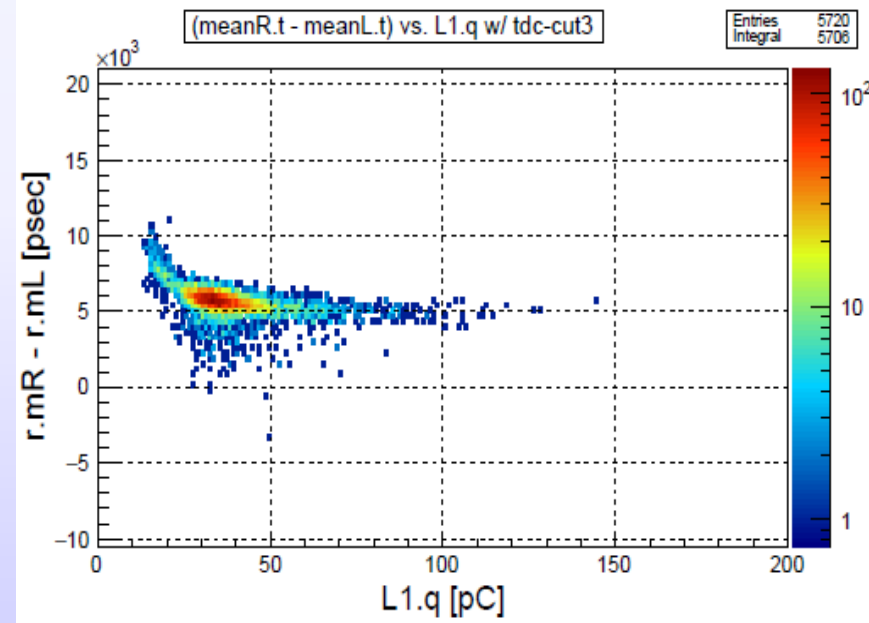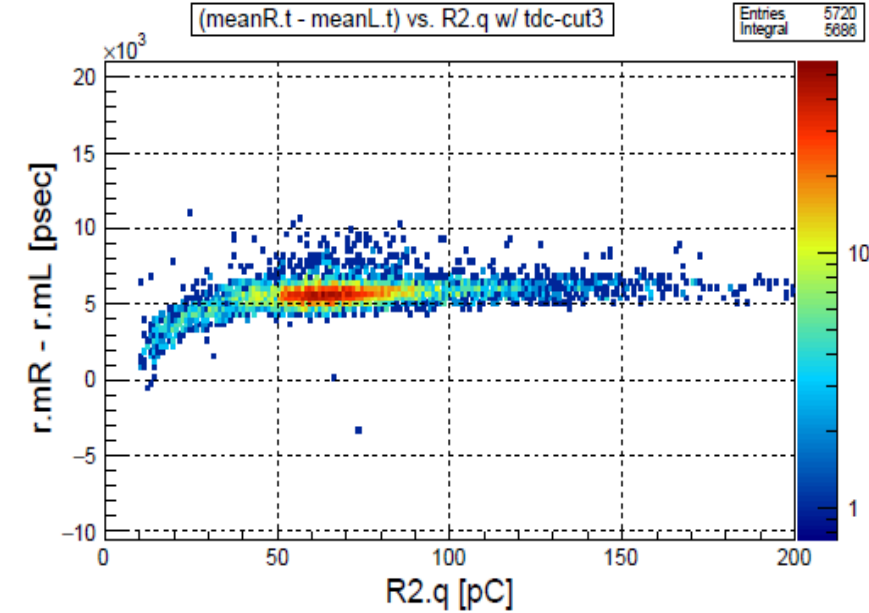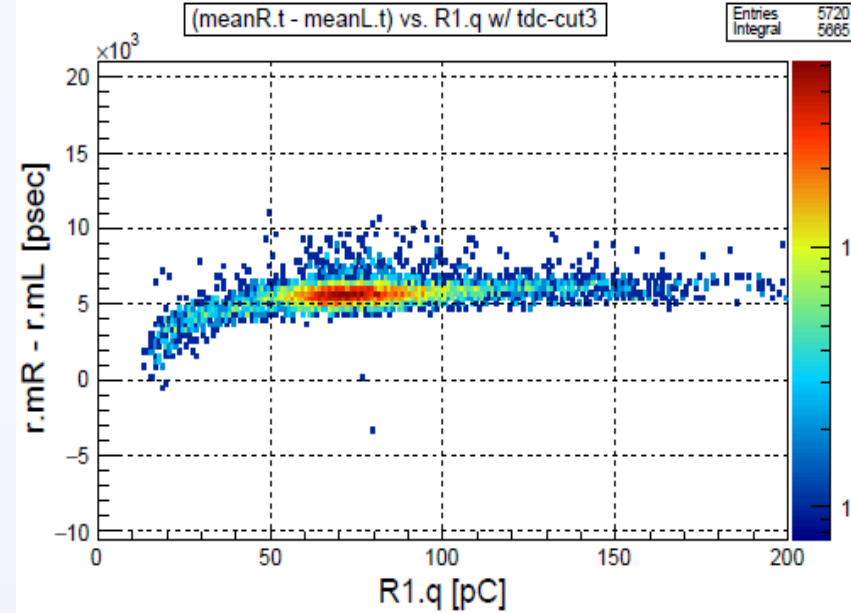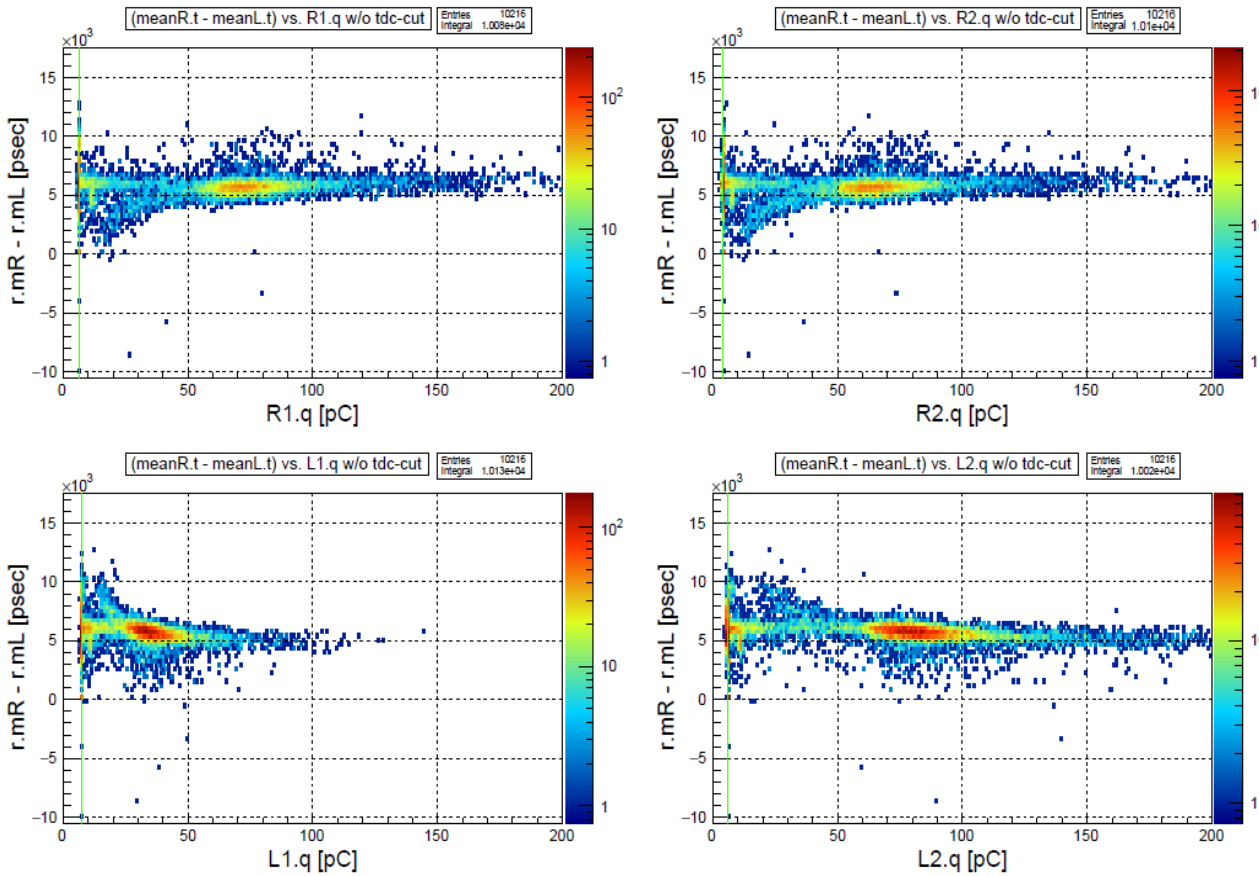
✓ **Before**
✓ **After**
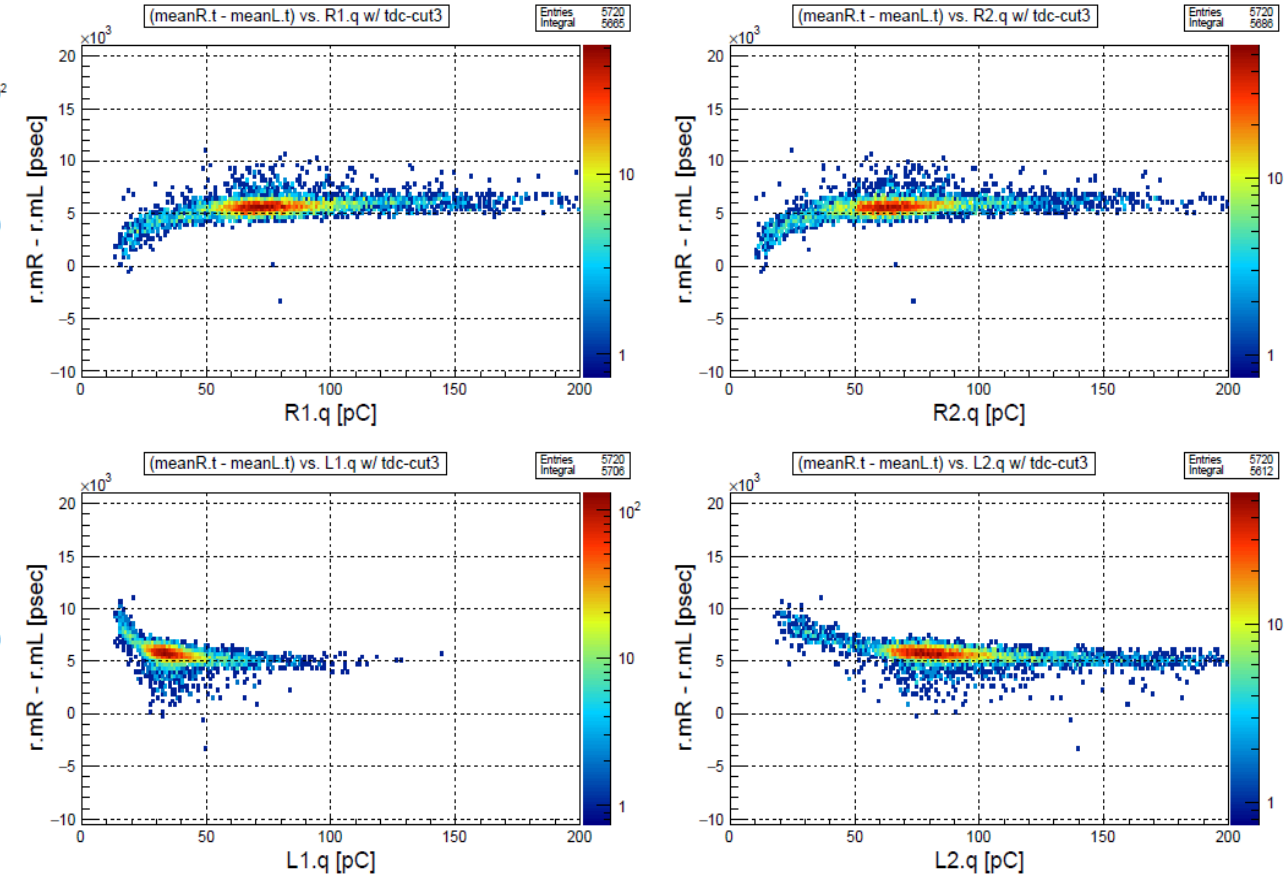
- Time walk correction

- QDC-cut:

Min = 0.7 × (Peak - Pedestal) + Pedestal

Max= 0.5 × (Peak - Pedestal) + Peak

Min < R1.QDC
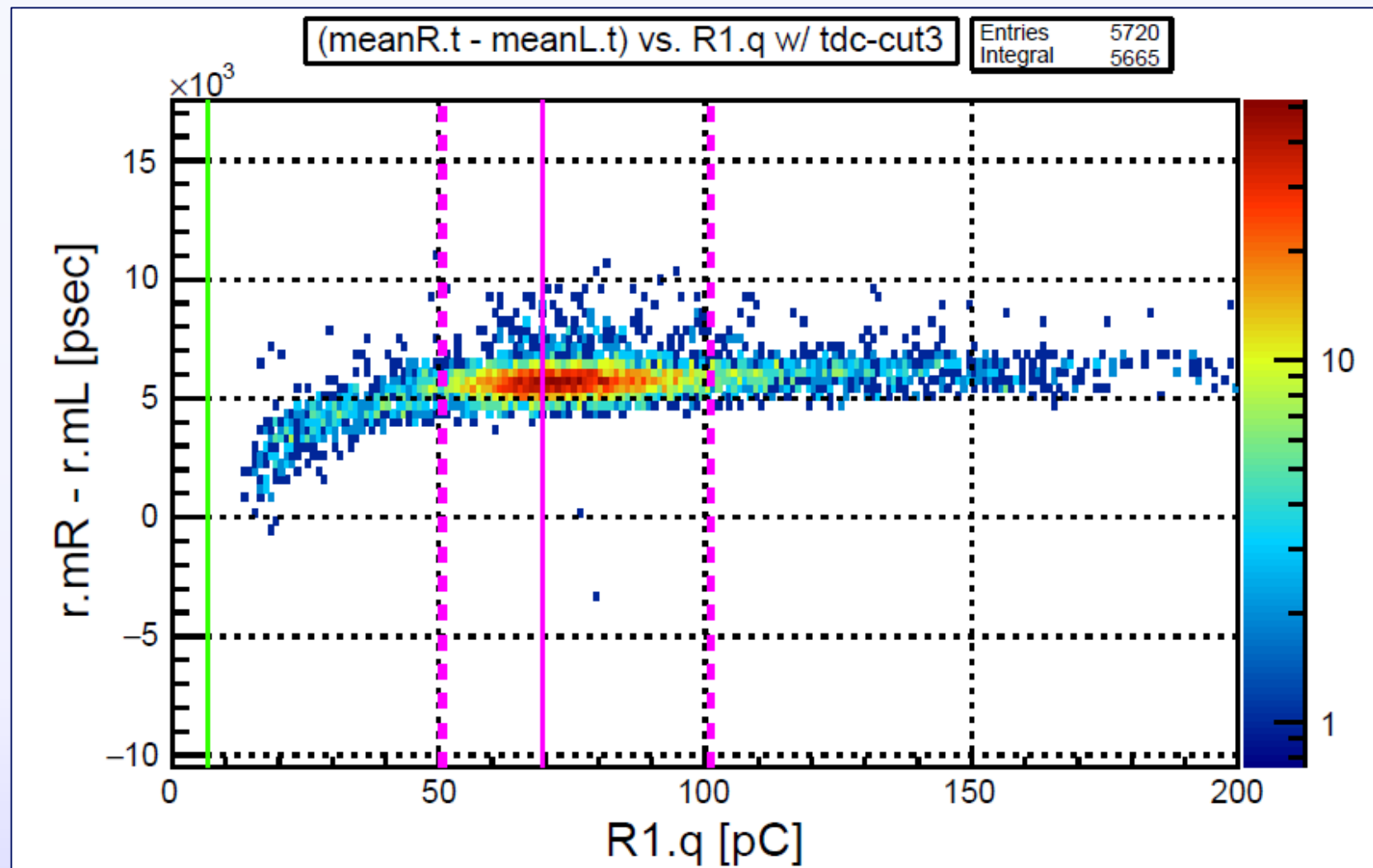
- For L1 & L2
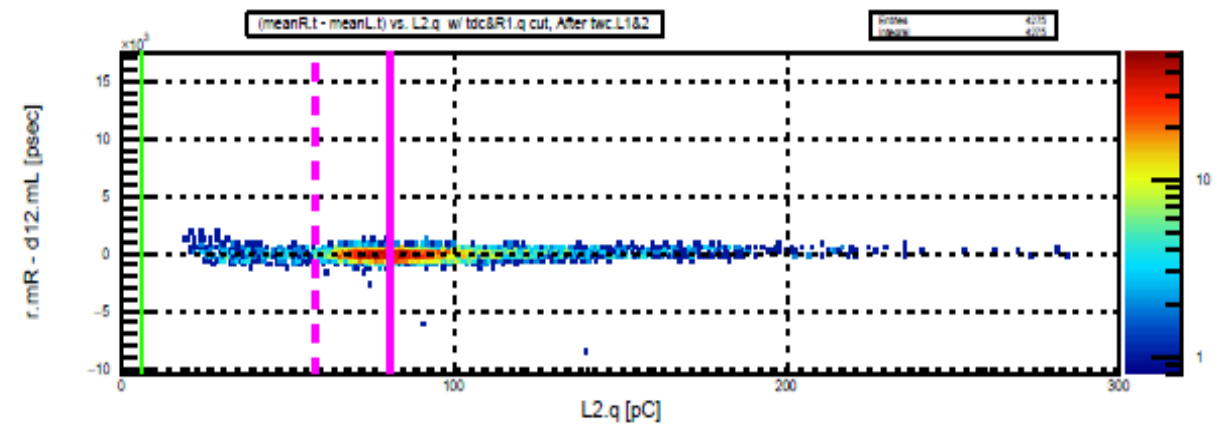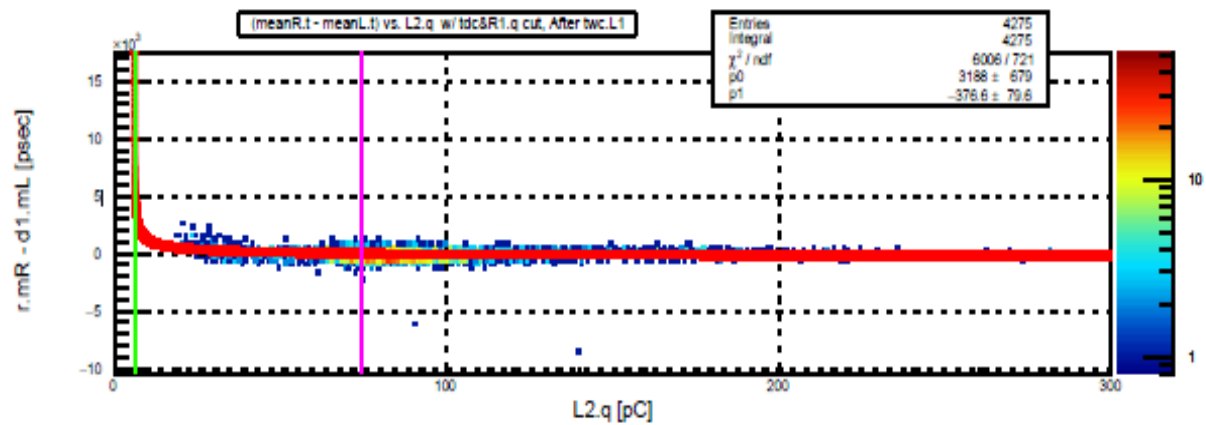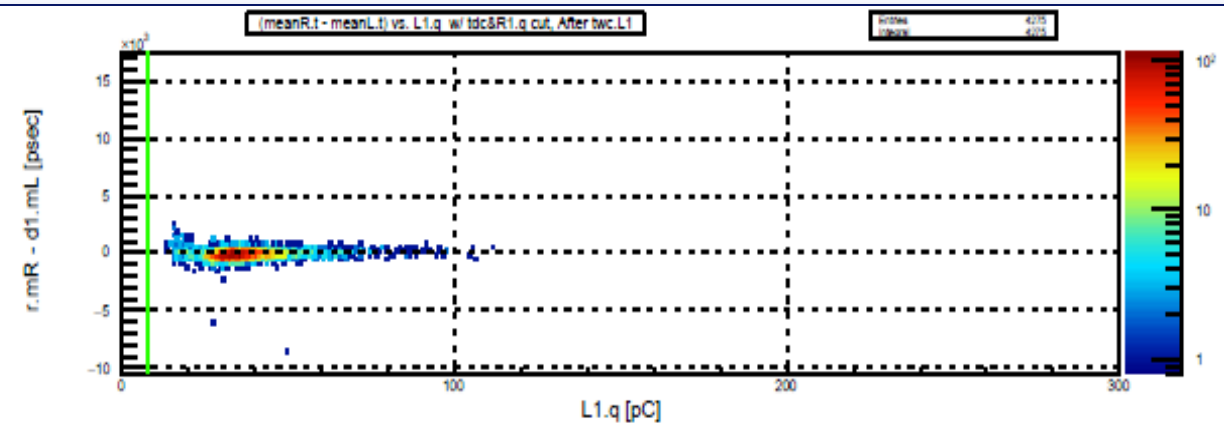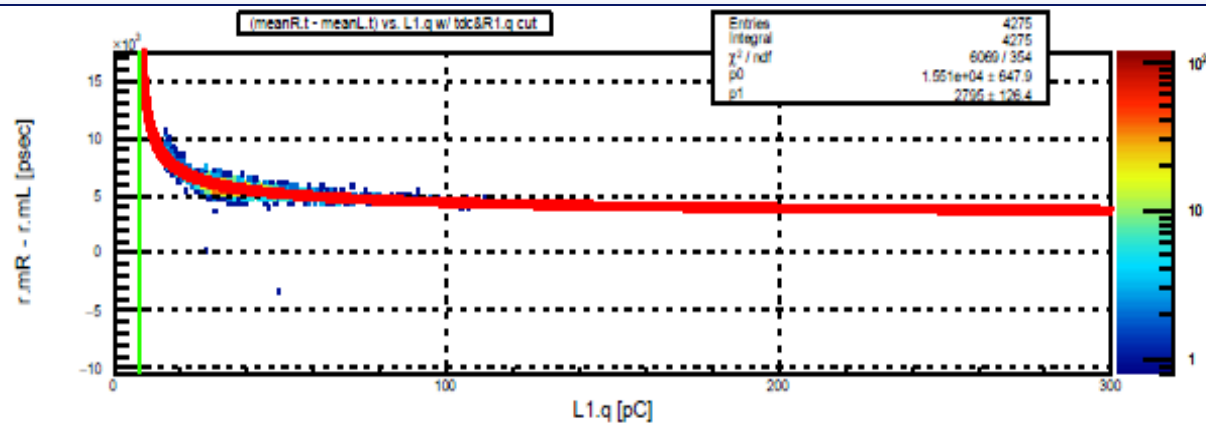
- For R1 & R2
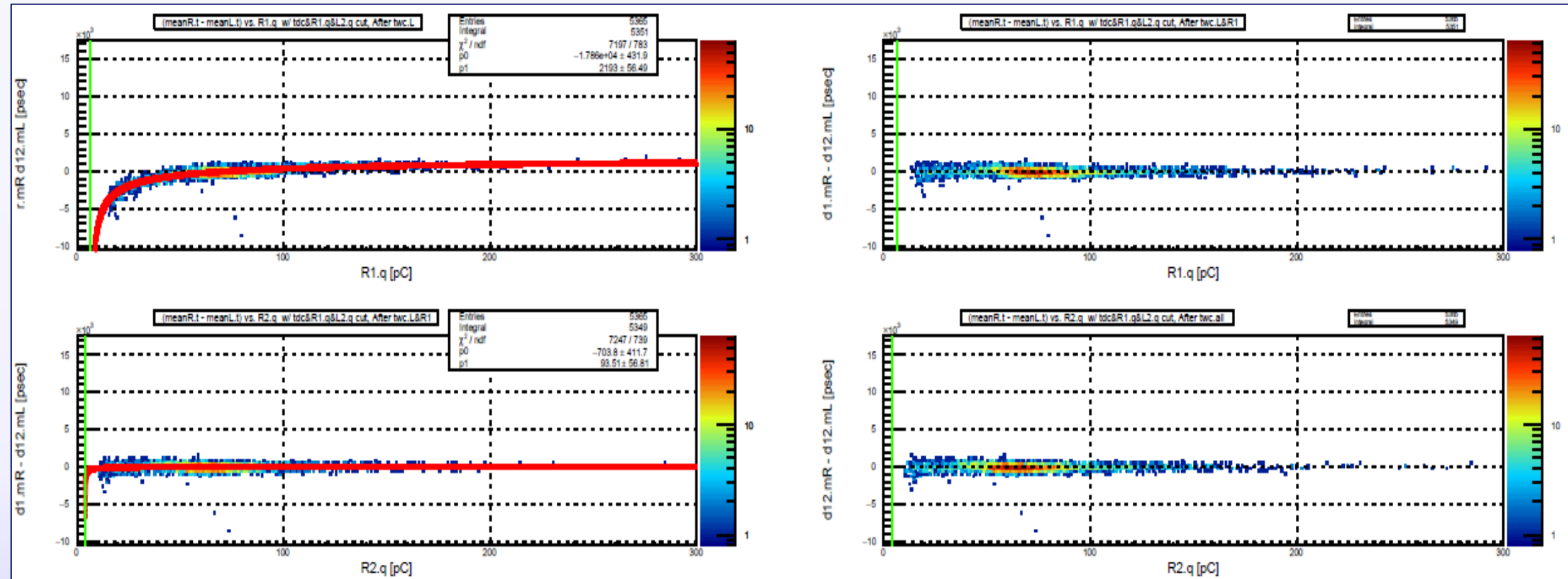
- Final ToF distribution and timing resolution

ToF dist. of run0123

Entries	5720
Integral	5715
χ^2 / ndf	103.2 / 90
Prob	0.1608
Constant	220.6 ± 3.8
Mean	1.033 ± 4.769
Sigma	355.4 ± 3.8
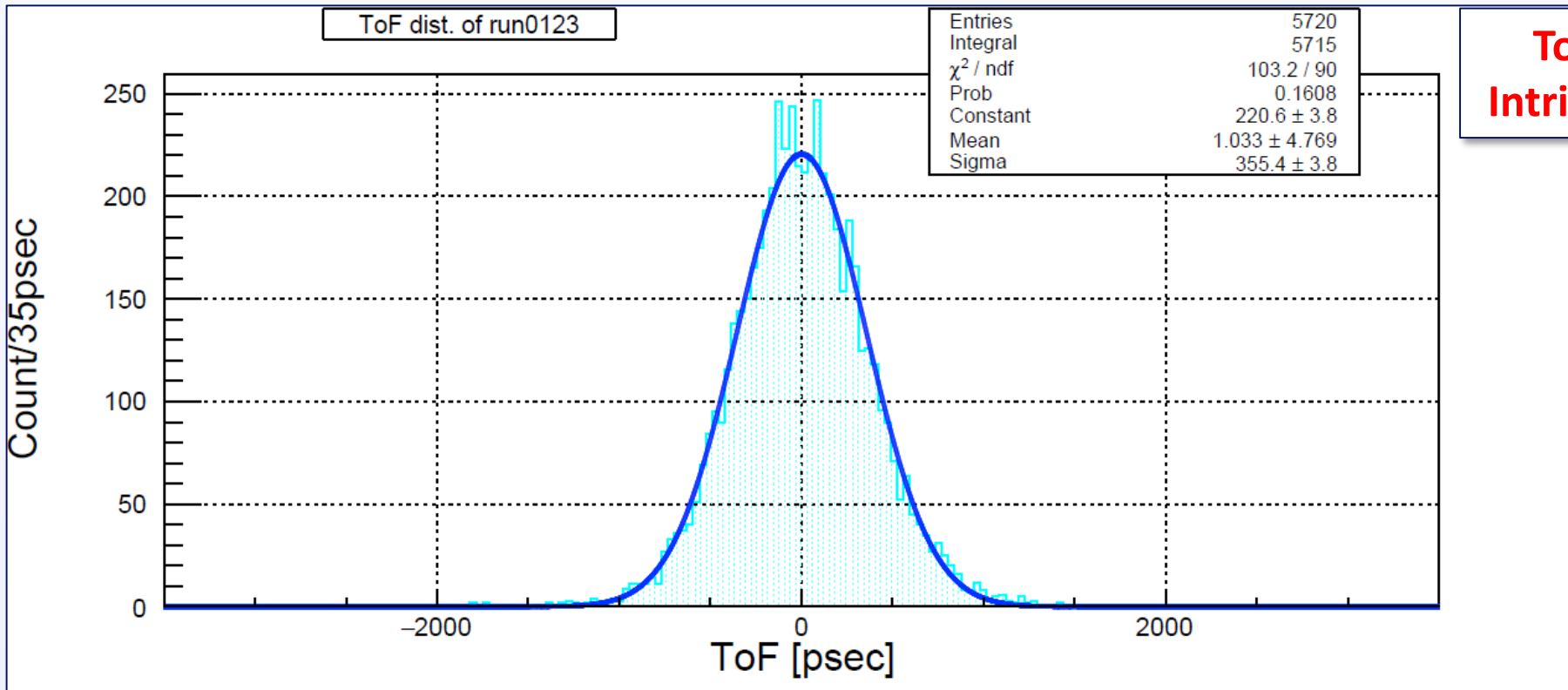
ToF resolution: 355 psec
Intrinsic resolution: 251 psec

Previous result (w/o tdc-cut)

ToF resolution: 352 [psec]

Intrinsic resolution: 249 [psec]

✓ Put together results → check Bias dependence

✓ JPS abstract → submit by next Monday