Service Work on LumiBelle2

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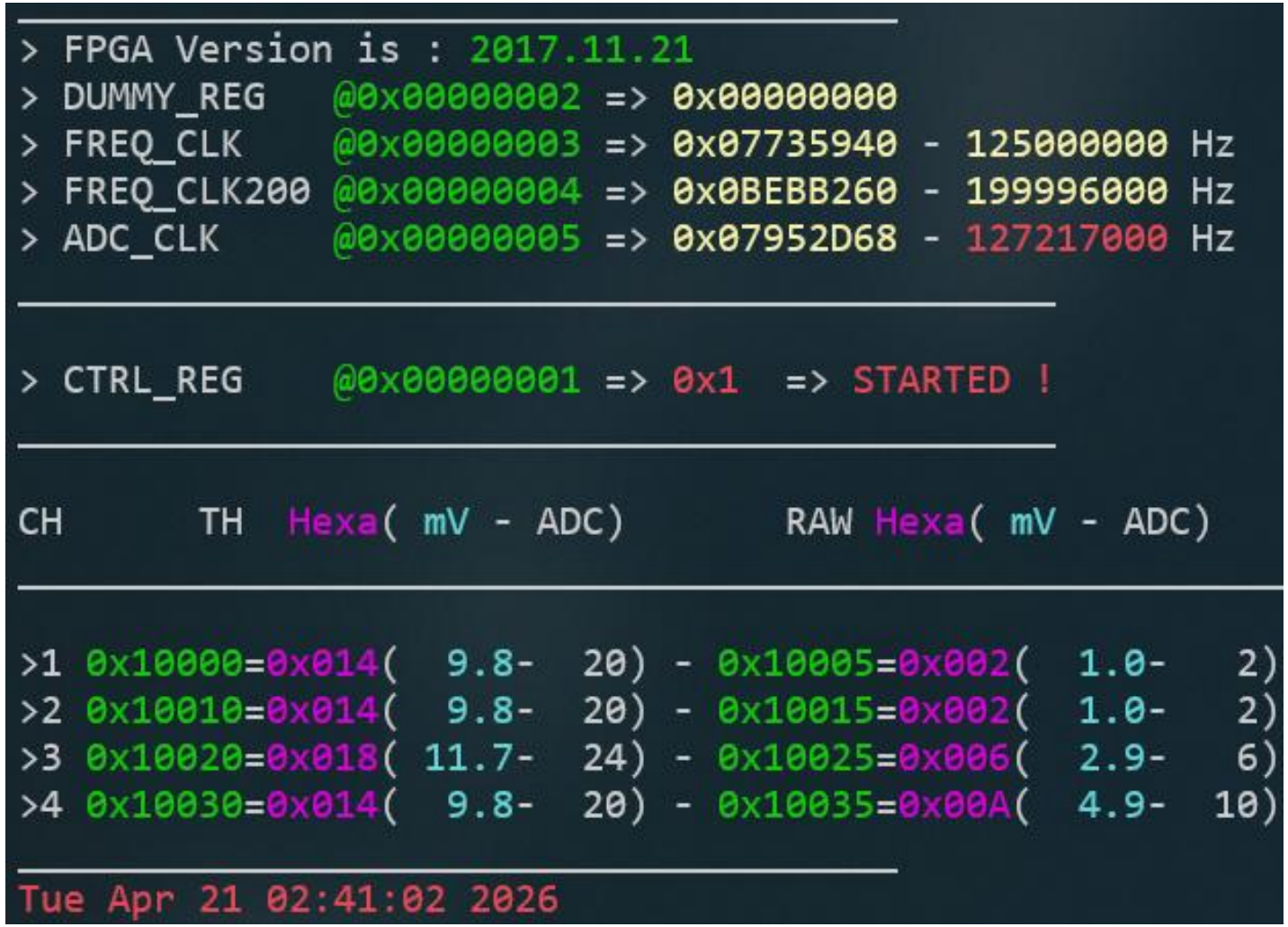
April 29st, 2026

Set Up for Thresholds



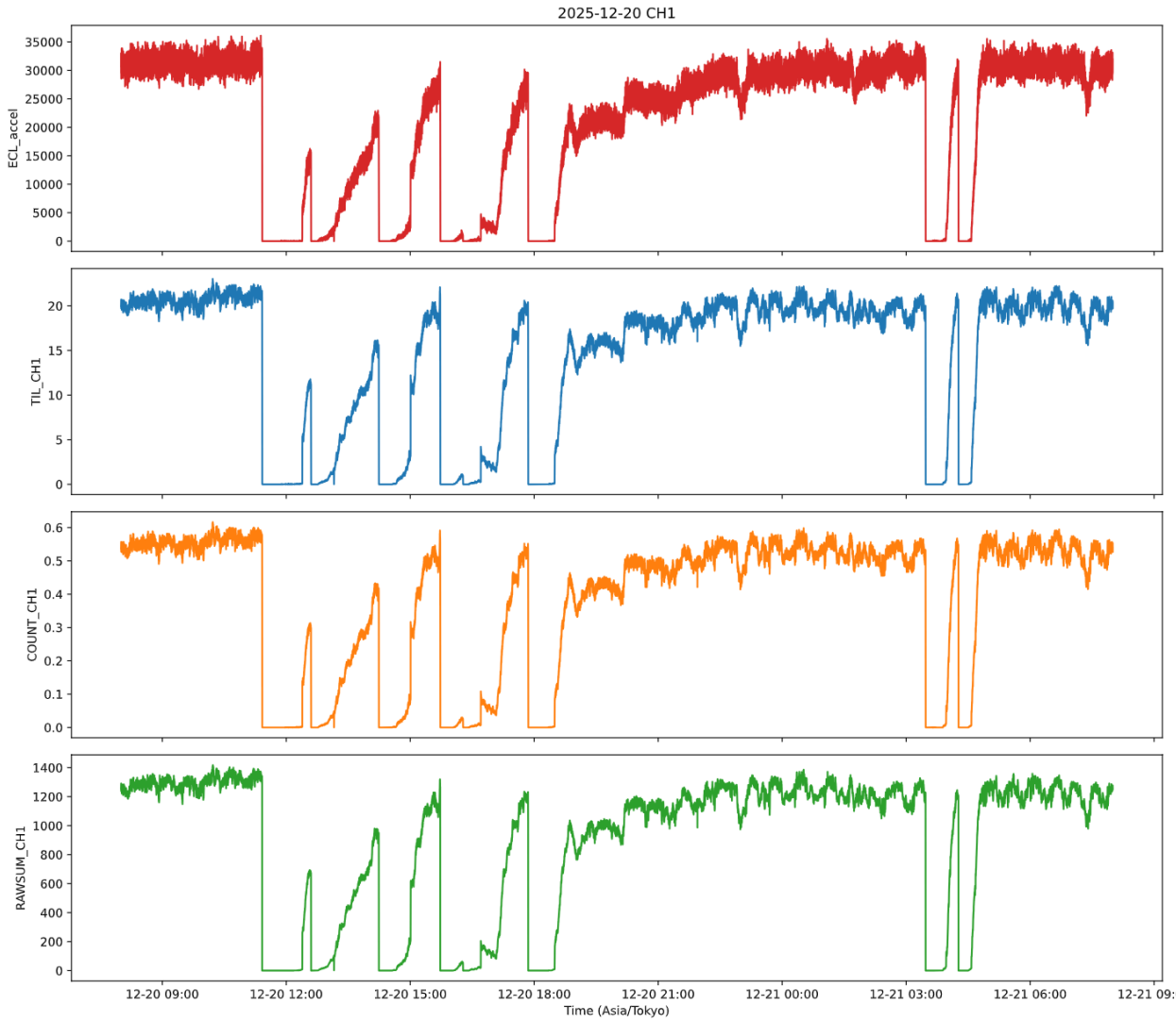
Many thanks to Robert for finding a way to adjust the thresholds for each channel remotely.

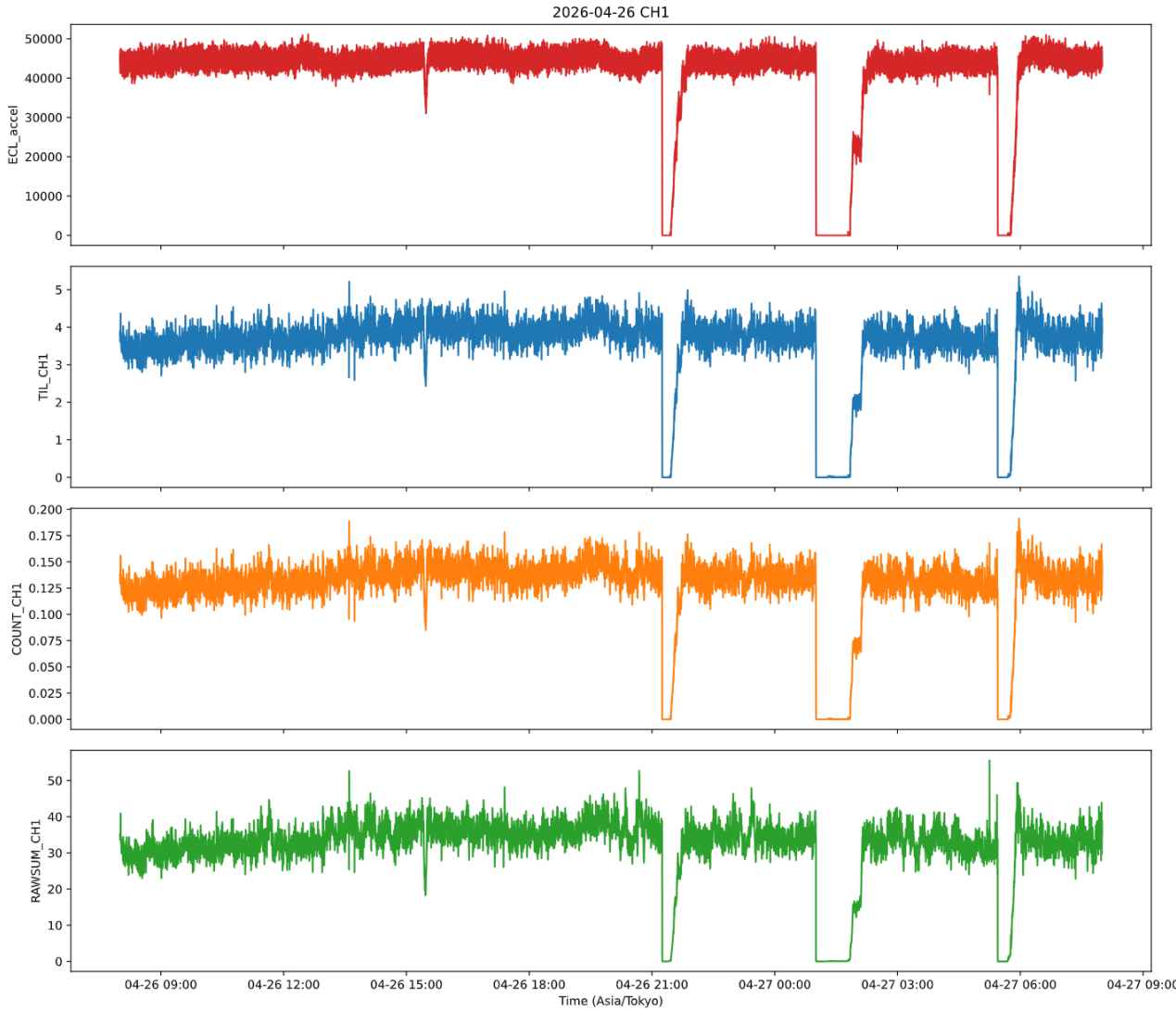
The simple_all_PV_1Hz data collected after Apr. 20th looks better.

Thresholds before Apr. 20th : 59.6 mV for all channels

A comparison of ECL_accel and the LumiBelle2 TIL, COUNT, RAWSUM data before and after the access in March

CH1



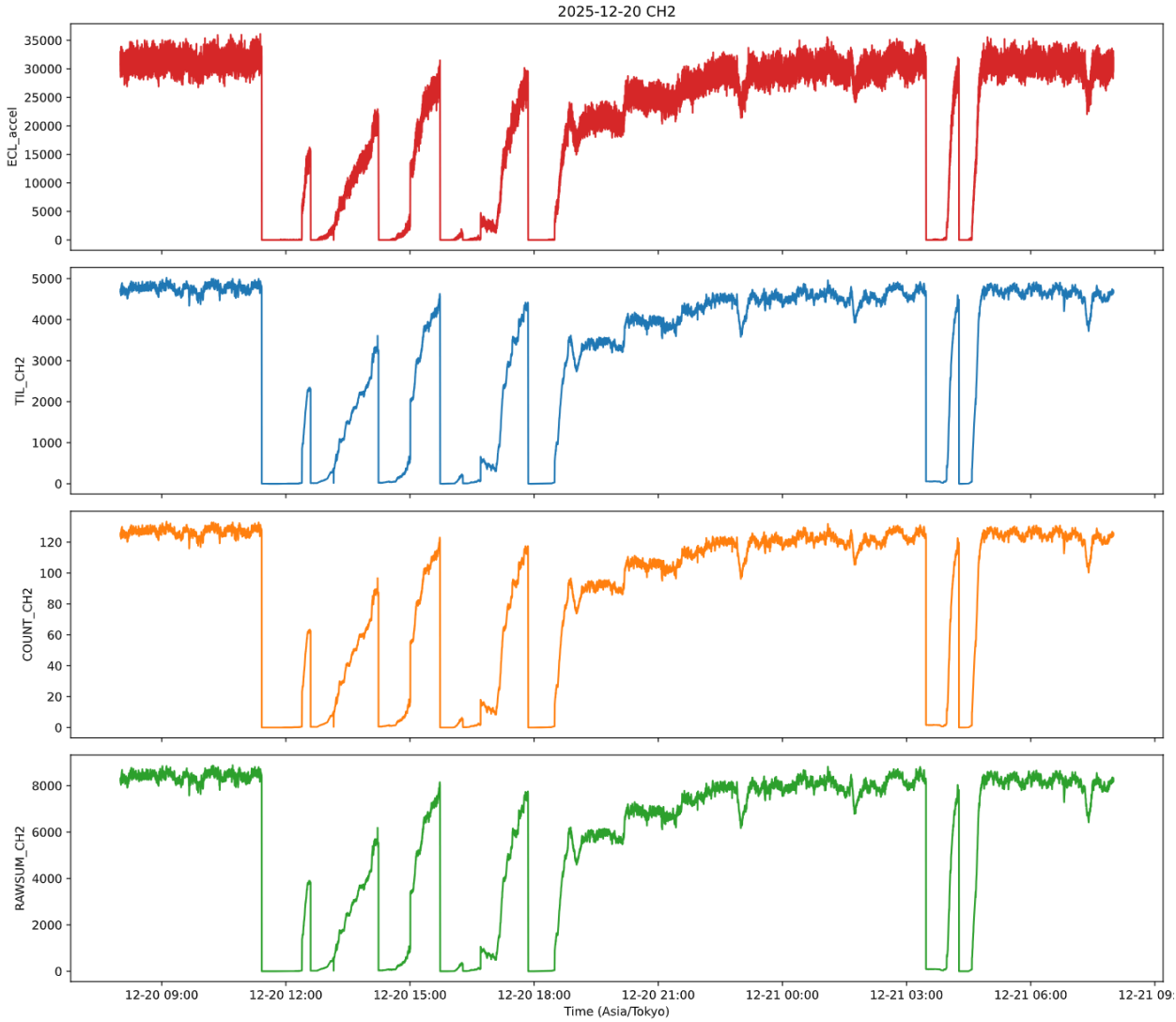


2025-12-20

2026-04-26

A comparison of ECL_accel and the LumiBelle2 TIL, COUNT, RAWSUM data before and after the access in March

CH2

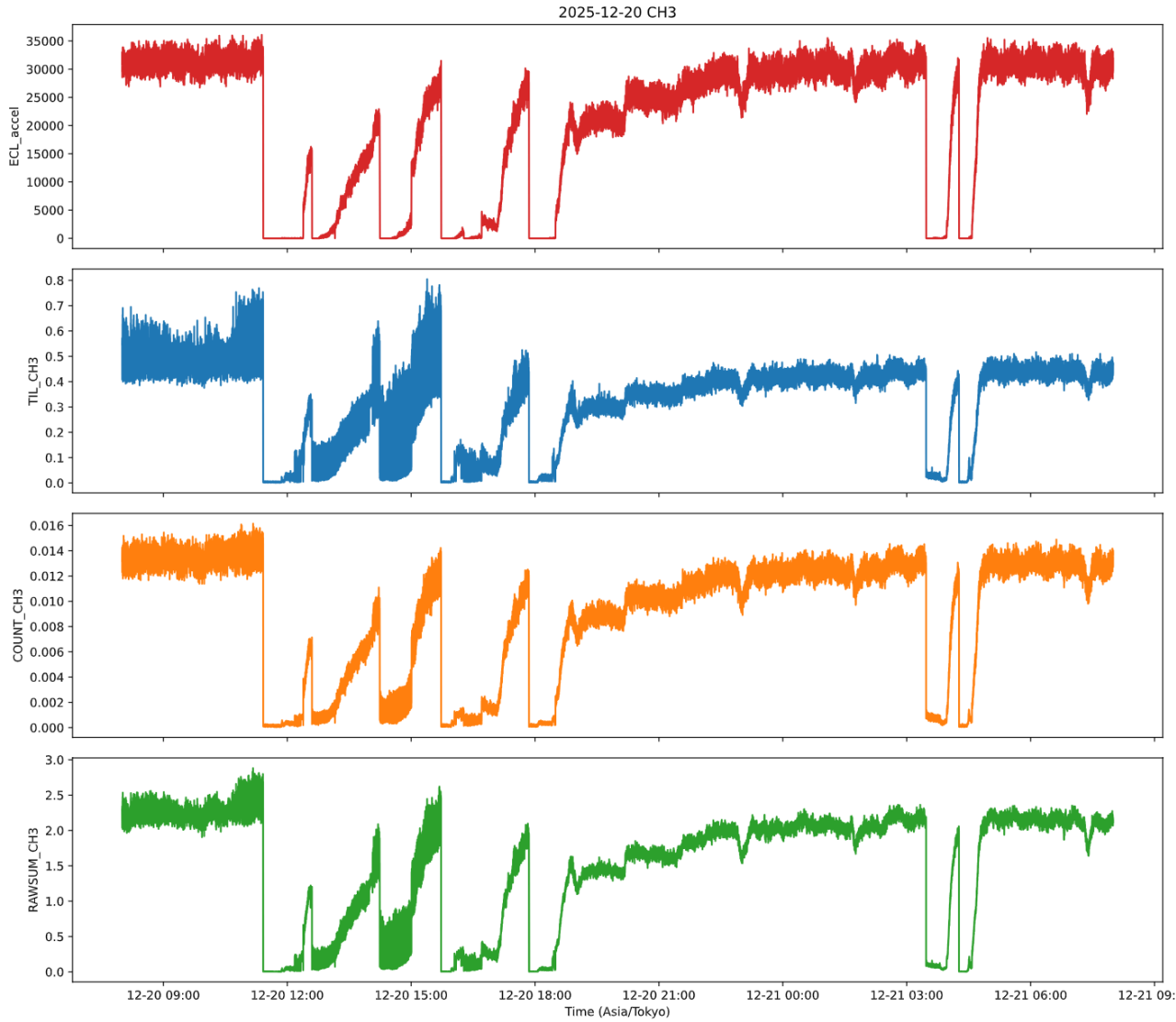


2025-12-20

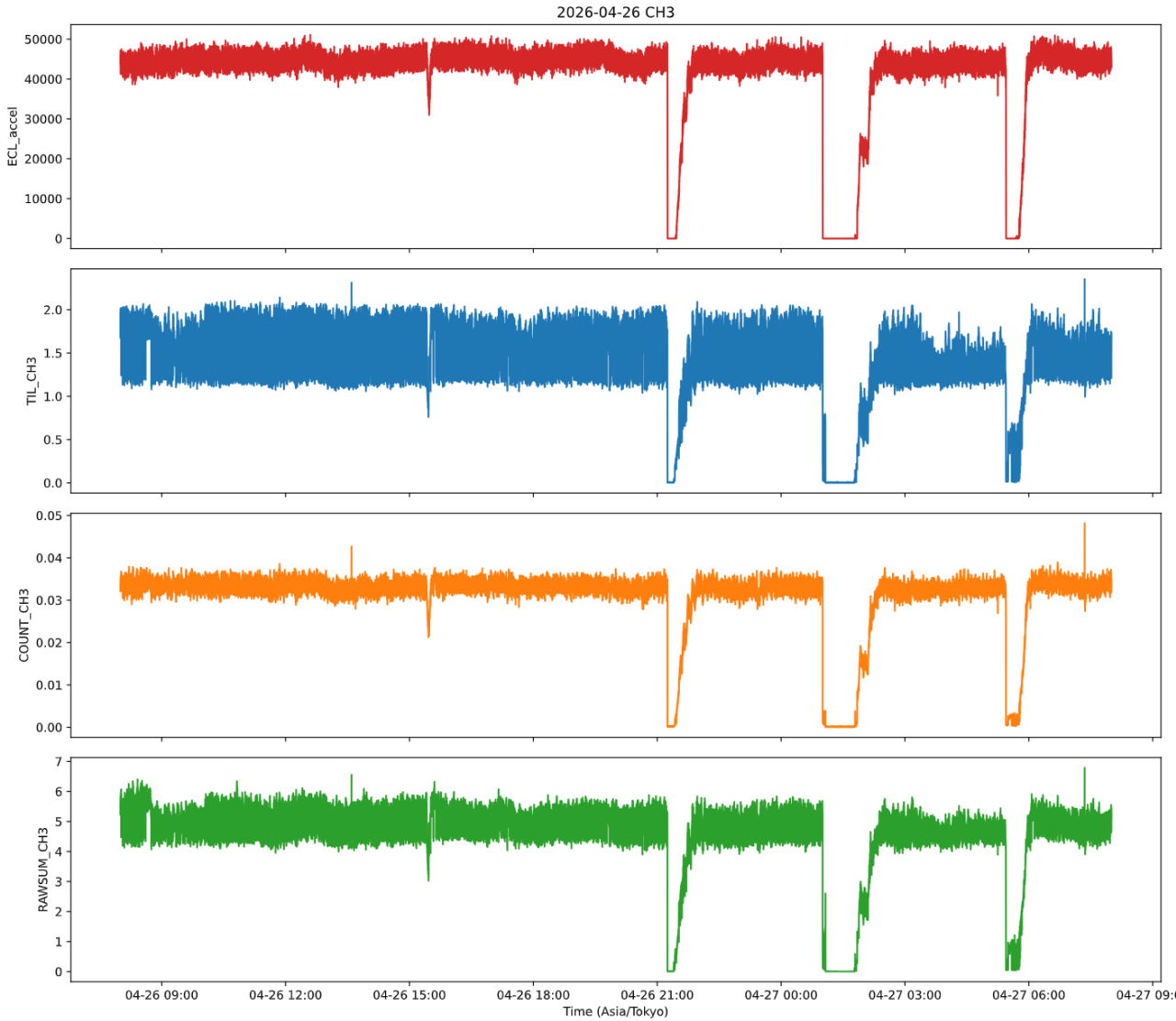
2026-04-26

A comparison of ECL_accel and the LumiBelle2 TIL, COUNT, RAWSUM data before and after the access in March

CH3



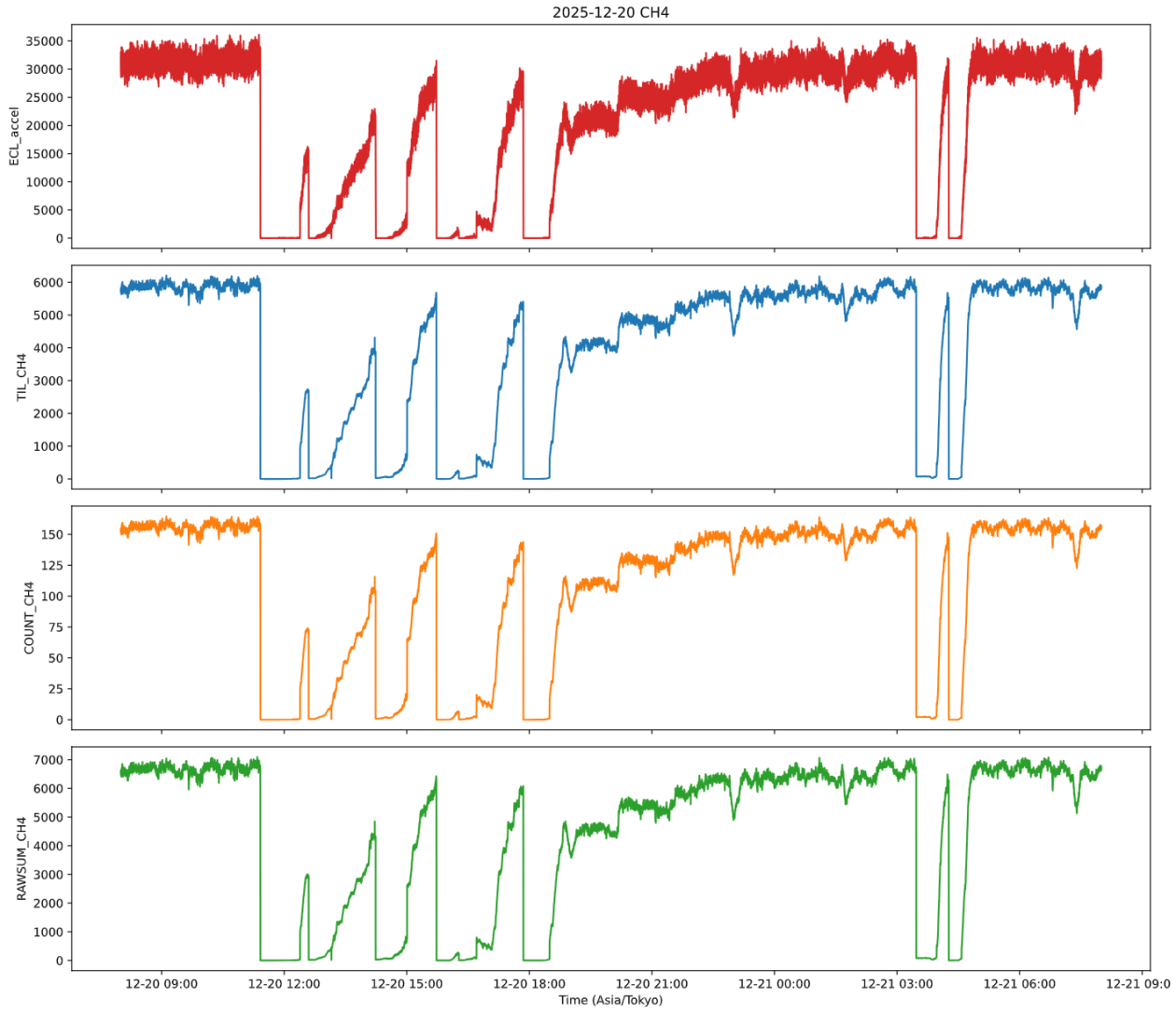
2025-12-20

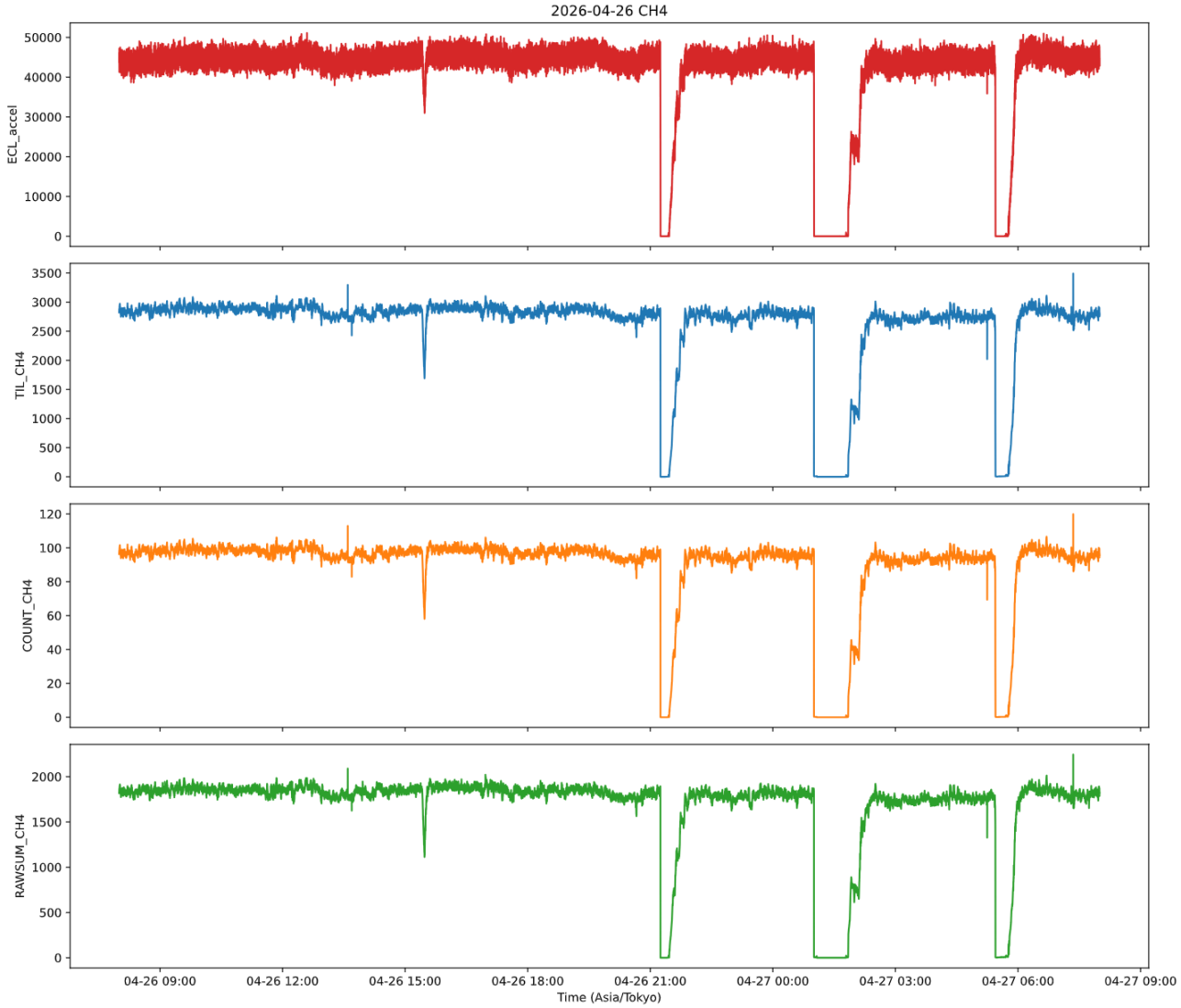


2026-04-26

A comparison of ECL_accel and the LumiBelle2 TIL, COUNT, RAWSUM data before and after the access in March

CH4





2025-12-20

2026-04-26

Time Interval Selection:

$$\text{Sensitivity}=\frac{\text{mean(COUNT in 120s)}}{\text{mean(ECL in 120s)}}$$

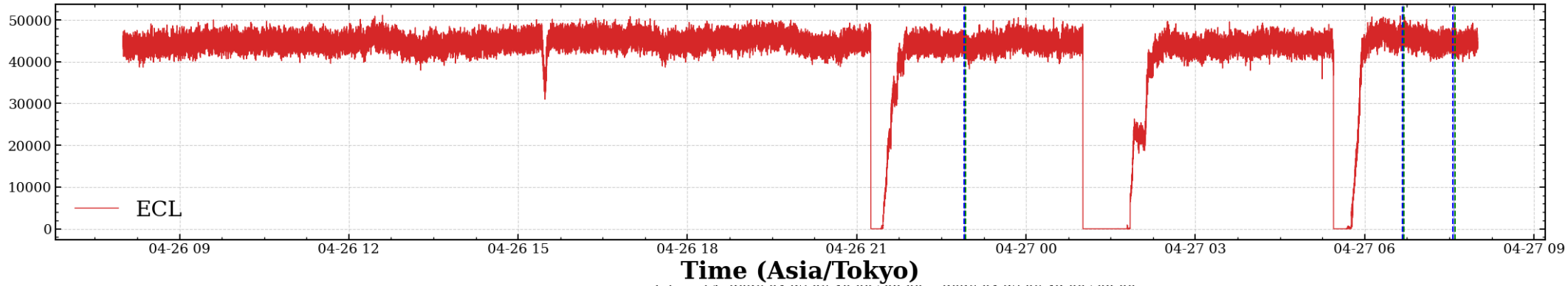
$$\text{RSD}=\frac{\text{RMS(1kHz TIL in 120s)}}{\text{mean(1kHz TIL in 120s)}}$$

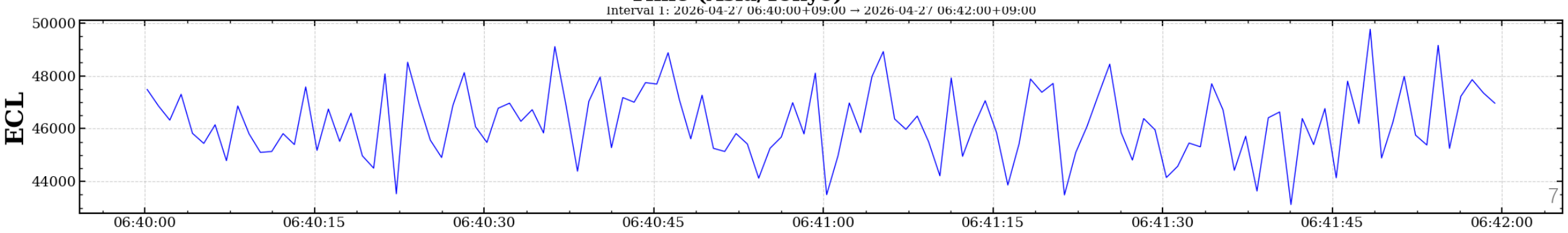
Use the method proposed by Anass

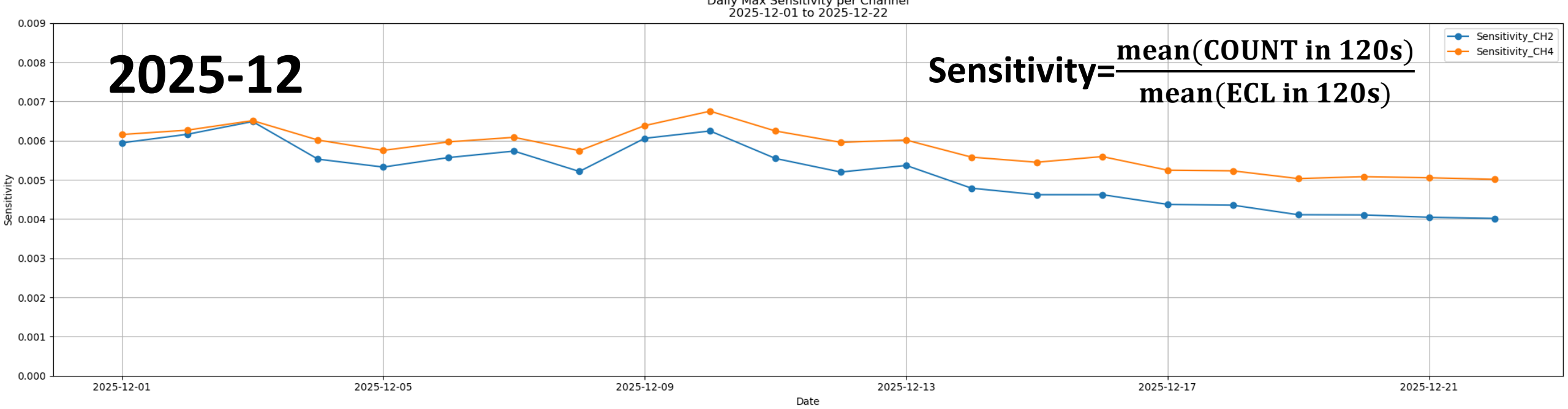
Each time interval contains 120 seconds

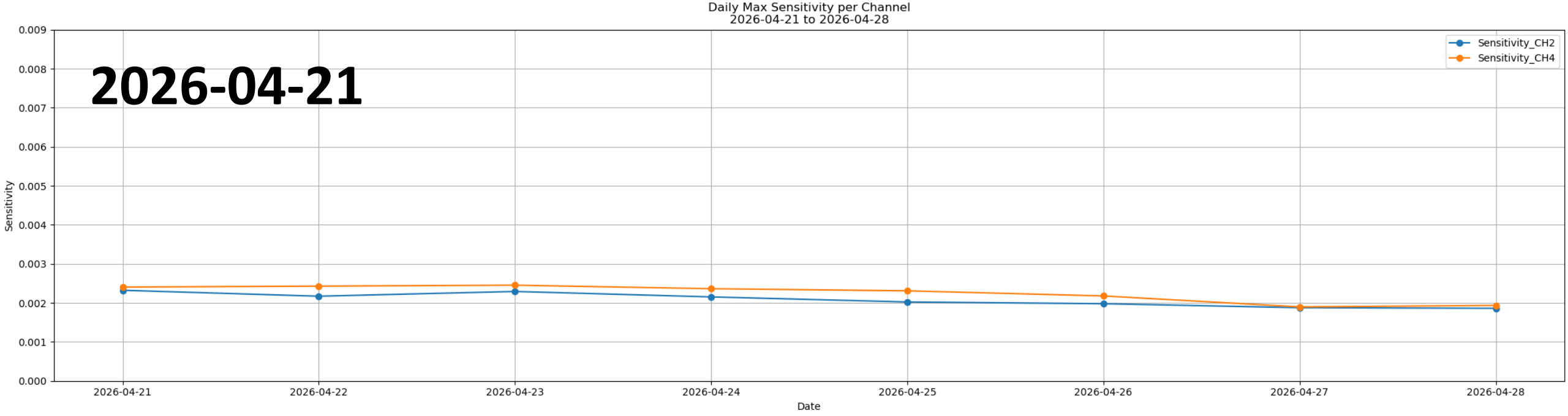
Score (window ranking)

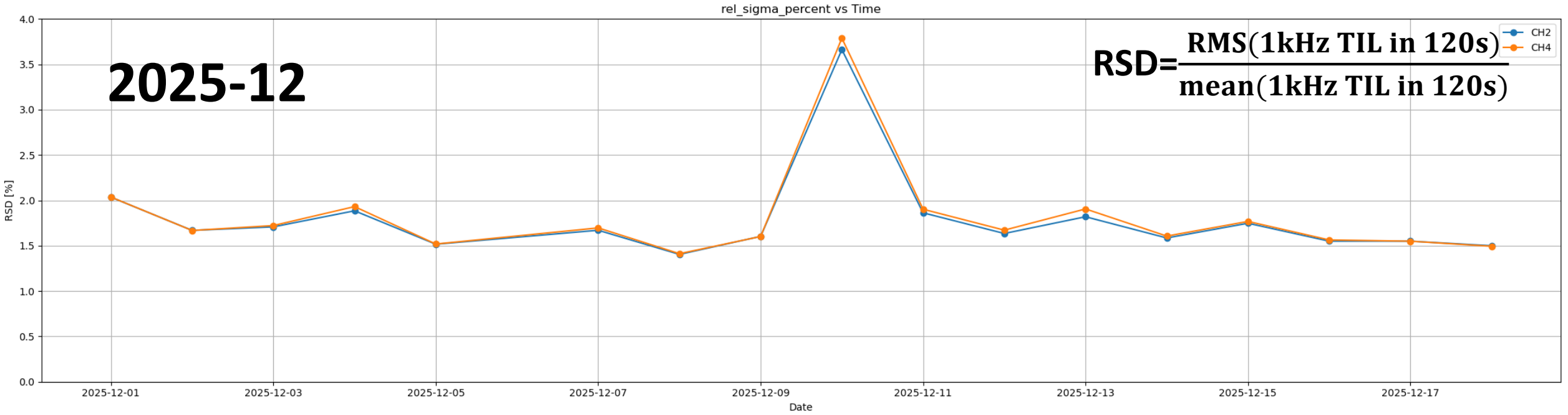
$$S = \left[W_{\text{RSD}} \left(\frac{\text{RSD}}{\text{RSD}_{\text{STABLE}}} \right)^2 + W_{\text{SLOPE}} \left(\frac{|a|}{\text{SLOPE}_{\text{MAX}}} \right)^2 \right] \left(\frac{L_{\text{ref}}}{|\bar{y}| + \varepsilon} \right)^{W_{\text{ECL}}}$$

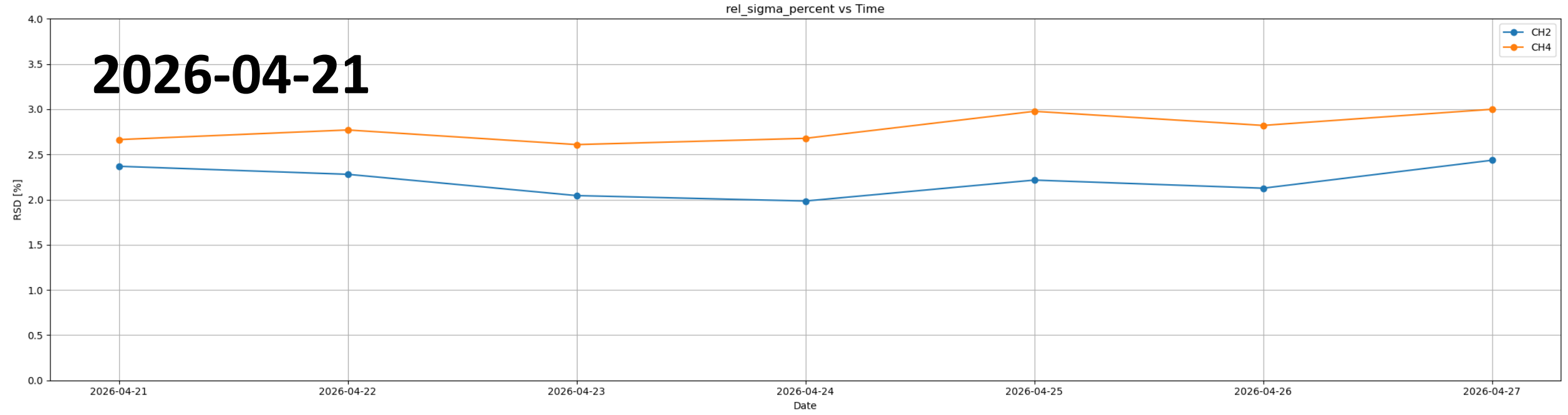





Daily Max Sensitivity per Channel
2025-12-01 to 2025-12-22
2025-12
Sensitivity=mean(COUNT in 120s) / mean(ECL in 120s)
Sensitivity_CH2
Sensitivity_CH4
Sensitivity
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
2025-12-01
2025-12-05
2025-12-09
2025-12-13
2025-12-17
2025-12-21
Date

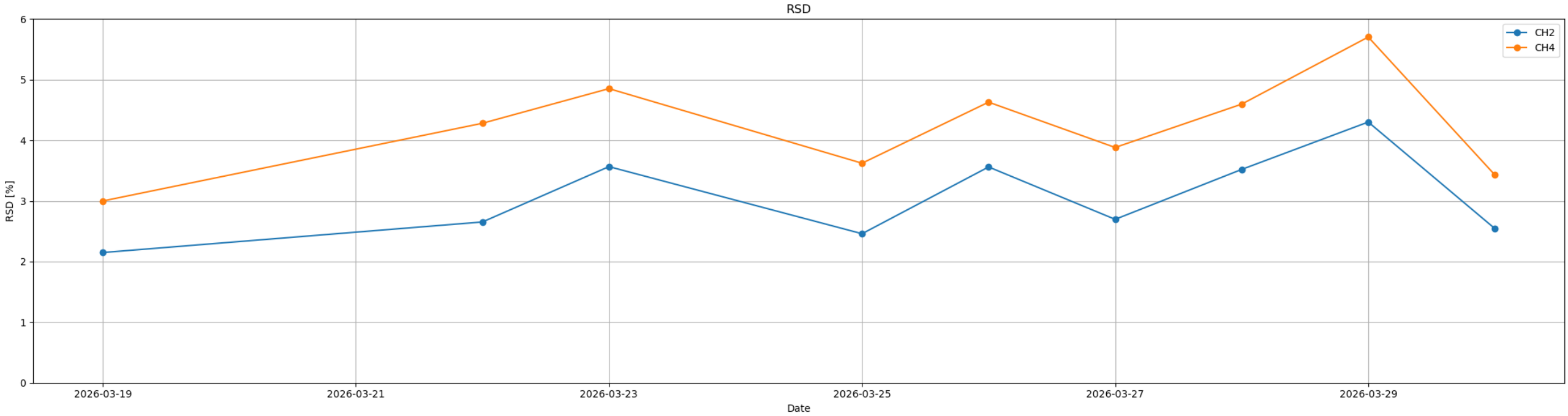

Daily Max Sensitivity per Channel
2026-04-21 to 2026-04-28
2026-04-21
Sensitivity_CH2
Sensitivity_CH4
Sensitivity
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
2026-04-21
2026-04-22
2026-04-23
2026-04-24
2026-04-25
2026-04-26
2026-04-27
2026-04-28
Date


rel_sigma_percent vs Time
2025-12
RSD=RMS(1kHz TIL in 120s) / mean(1kHz TIL in 120s)
CH2
CH4
RSD [%]
Date
2025-12-01
2025-12-03
2025-12-05
2025-12-07
2025-12-09
2025-12-11
2025-12-13
2025-12-15
2025-12-17


rel_sigma_percent vs Time
2026-04-21
CH2
CH4
RSD [%]
Date
2026-04-21
2026-04-22
2026-04-23
2026-04-24
2026-04-25
2026-04-26
2026-04-27

2026-03-19 to 2026-03-30

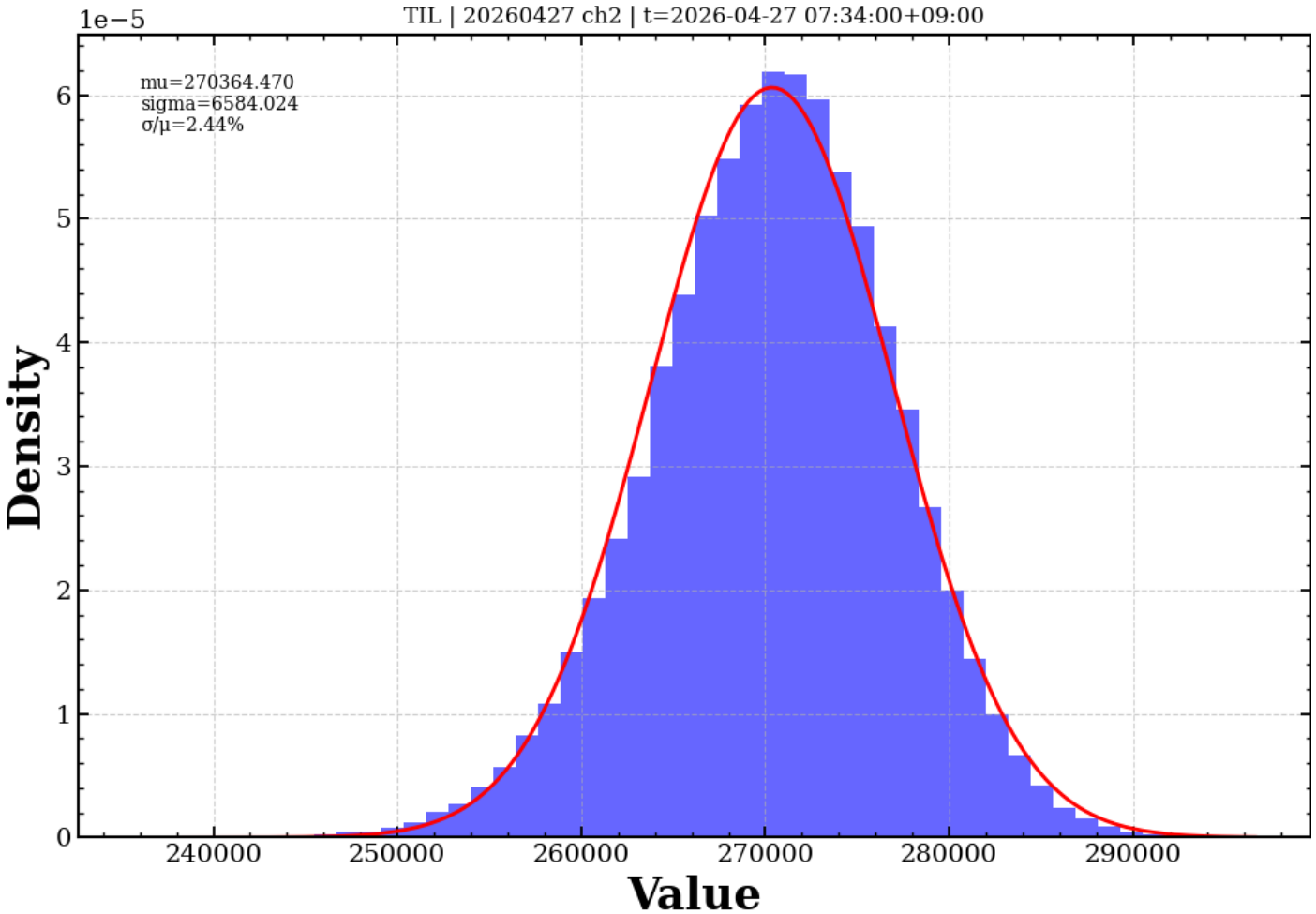
$$\mathrm{RSD}=\frac{\mathrm{RMS(1kHz\ TIL\ in\ 120s)}}{\mathrm{mean(1kHz\ TIL\ in\ 120s)}}$$



The 1 kHz TIL data seems to be working well

Summary

- New LGAD sensors work well and simple_all_PV_1Hz data looks better after adopting the reasonable thresholds for each channel.
- Signal amplitudes of new LGAD sensors are lower than old LGADs.
- The sensitivity of new LGADs are worse than the old LGADs.
- The RSD determined by Gaussian fit to 1kHz TIL data are worse than the old LGADs.
- 1kHz TIL Data before April 20th may still reliable.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1e−5
mu=270364.470
sigma=6584.024
σ/μ=2.44%
Density
Value
0
1
2
3
4
5
6
240000
250000
260000
270000
280000
290000