Weekly_MT_20250625

- ASAGI : No Progress
- E80-TC : Raw Signals and Analog Outputs from SONY-ASD
- E80-CDC : Plan (先週と同じ内容)
- ToDo

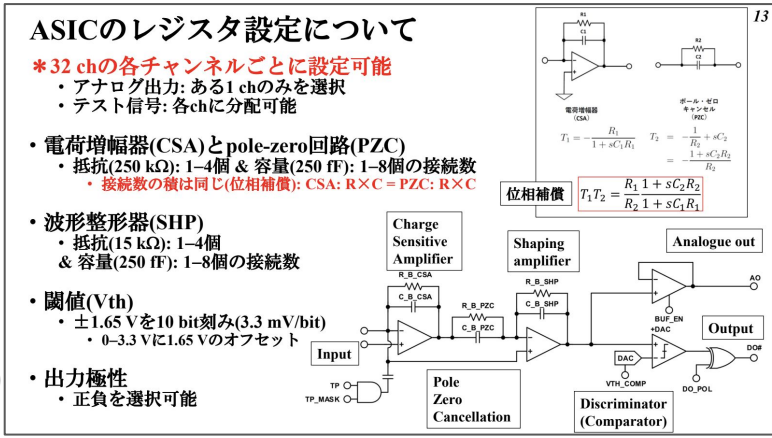
“TC” = “Test Chamber”

Yuto Kimura (Tohoku, D1)

ASAGI

- It’s better with E80-TC ?
  -
- with a function generator and the injector
  - charge 1, 2, 3pC (amplitude of square waves: 1 ~3V)
  - requirement
    - 位相補償ver. (CSA:R*C=PZC:R*C)
    - 長いテールをキャンセル ver.

      (PZC:R*C / CSA:R*C = 2)



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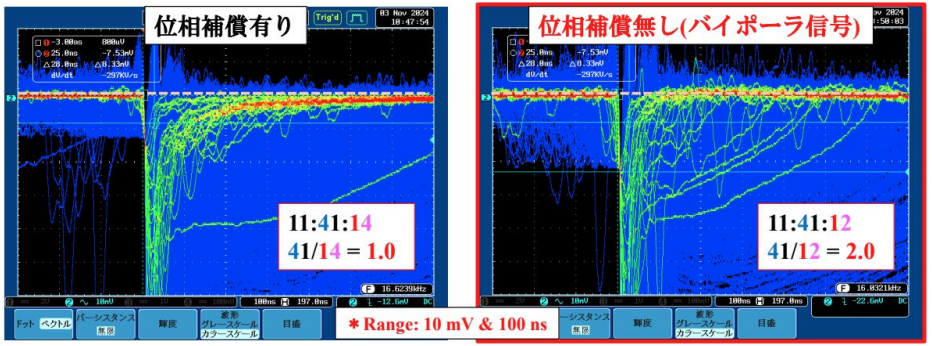
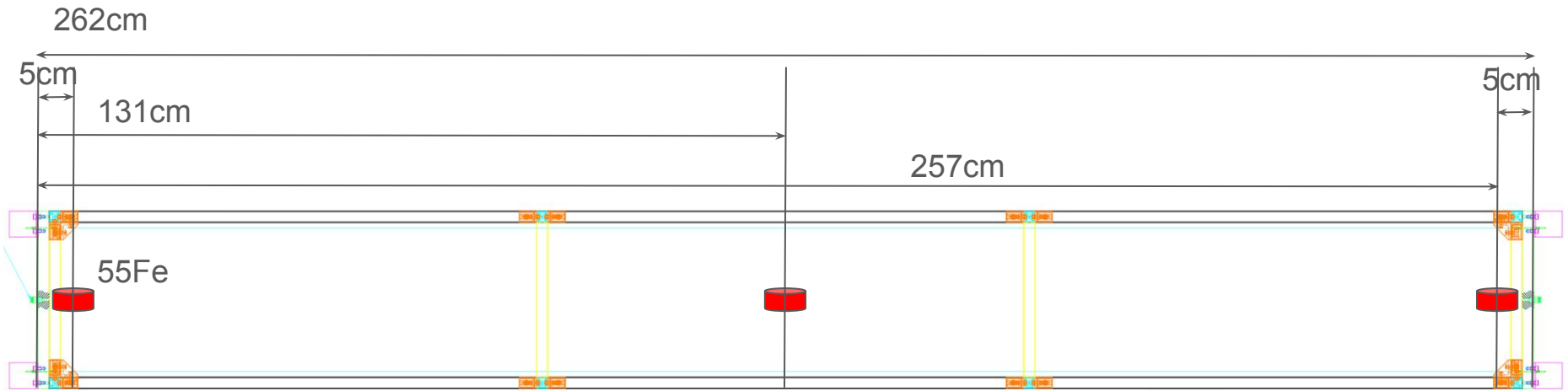


＊具体的な設定
⇒ CSA(分母)に対するPZC(分子)の伝搬関数の式の比を2にする

$$T_1T_2 = \frac{R_1}{R_2}\frac{1+sC_2R_2}{1+sC_1R_1}$$

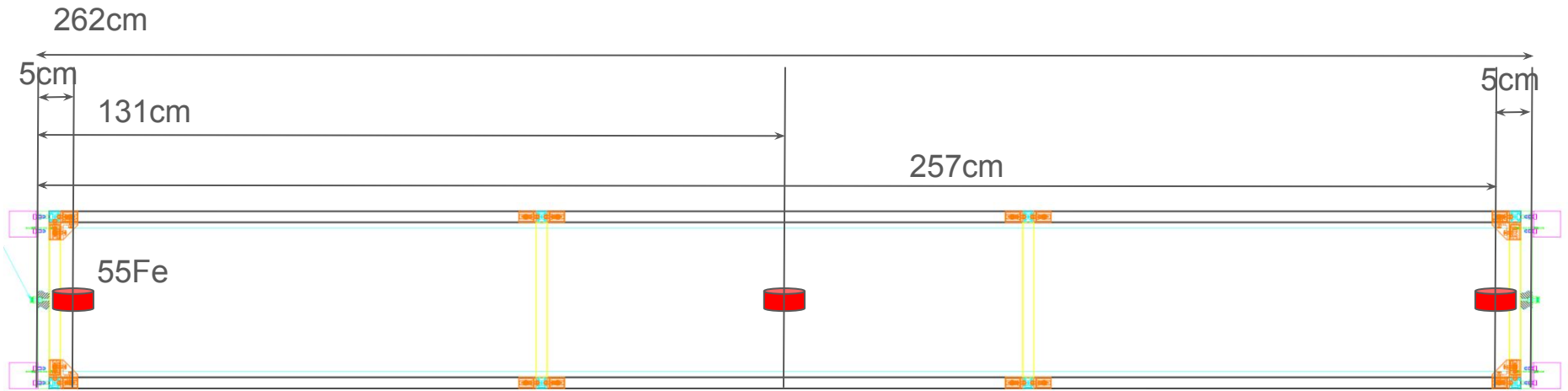
E80-TC

- Checked raw signals and analog outputs
  - Ar-C2H6(50:50) at 25 mL/min typically
  - 2600V, 2700V, 2800V (HV current was ~0.02uA.)
  - The 55Fe were placed at 5, 131 and 257cm from the edge of the signal-side endplate.
  - Trigger level in oscilloscope was fixed at -1.3mV(for raw sig) and -30mV(for analog out).



E80-TC

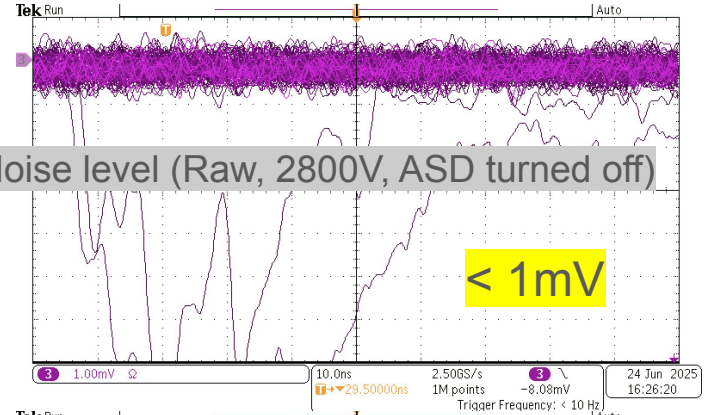
- Time discrepancy between first and second pulse
  - case1 “Sig-side” : 3.5 ns/m *((262 +257) - 5) /100 m = 3.5 ns/m *514/100 m = ~ 18 ns
  - case2 “Center” : 3.5 ns/m *((262 +131) -131) /100 m = 3.5 ns/m *262/100 m = ~ 9 ns
  - case3 “HV-side” : 3.5 ns/m *((262 + 5) -257) /100 m = 3.5 ns/m * 10/100 m = ~ 0.3 ns
  - one round trip : 3.5 ns/m *262 *2 /100 m = ~ 18 ns



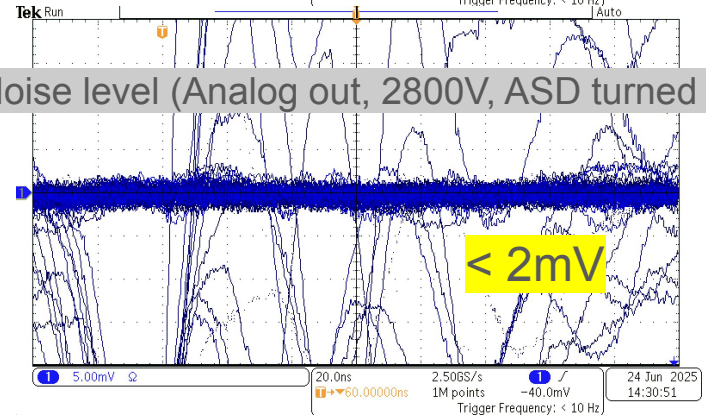
E80-TC

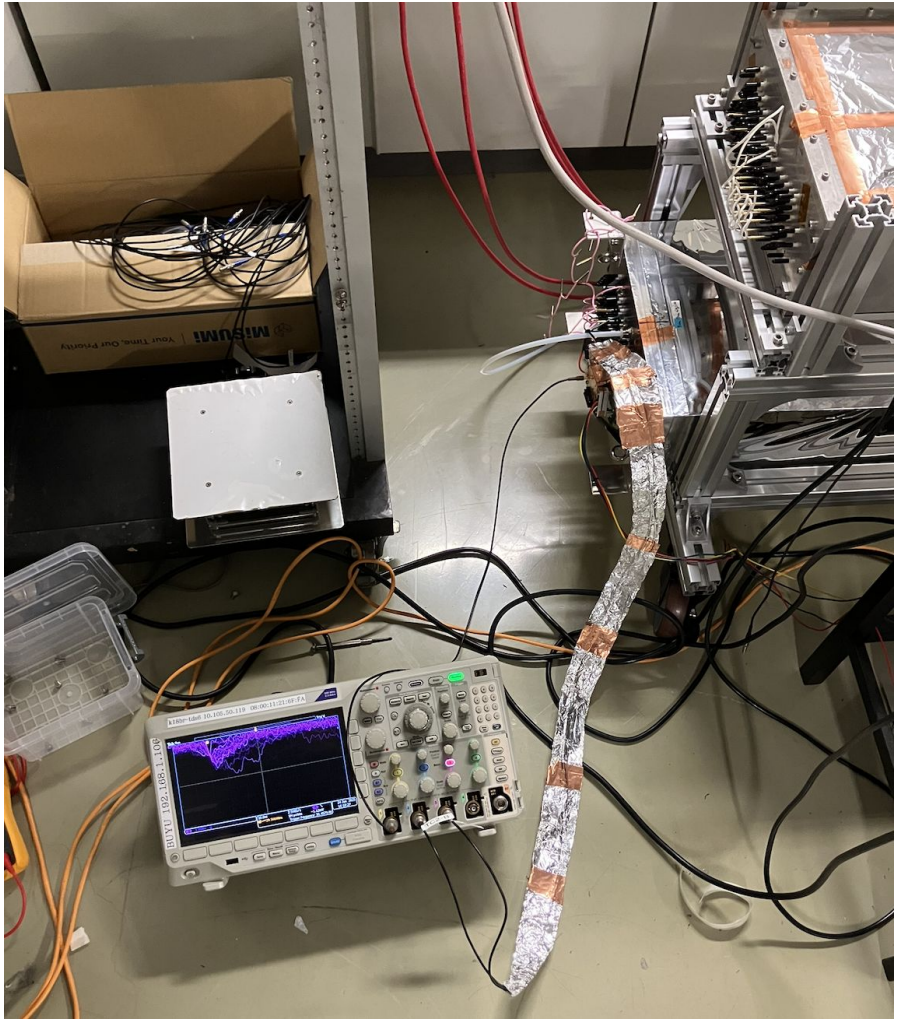
Noise was reduced by wrapping LEMO cables with aluminum foil and grounding them to the E80-TC chassis.

Noise level (Raw, 2800V, ASD turned off)

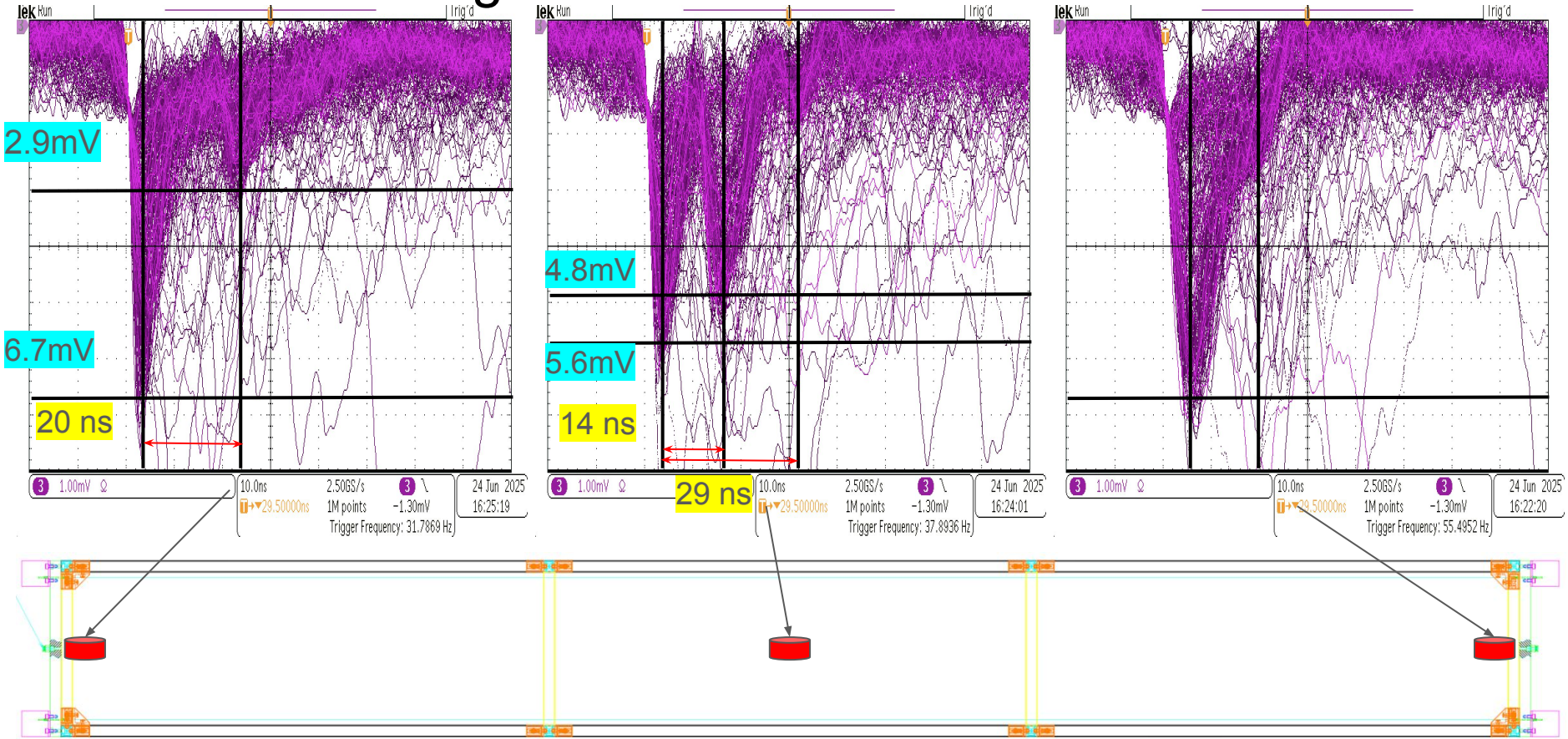


Noise level (Analog out, 2800V, ASD turned on)





E80-TC : Raw Signals from a Sense Wire



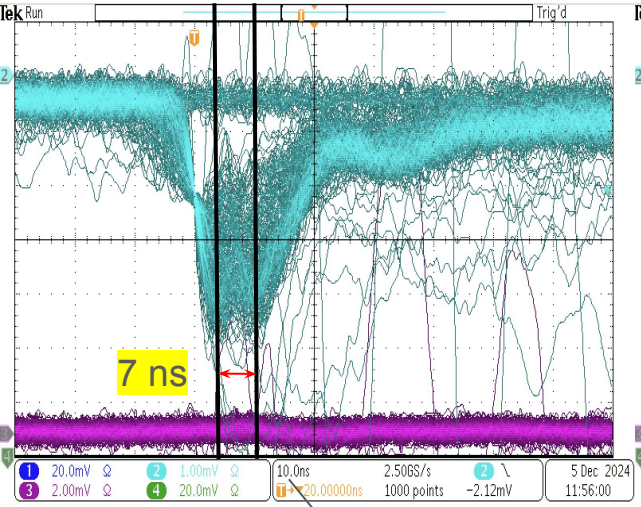
signal-side

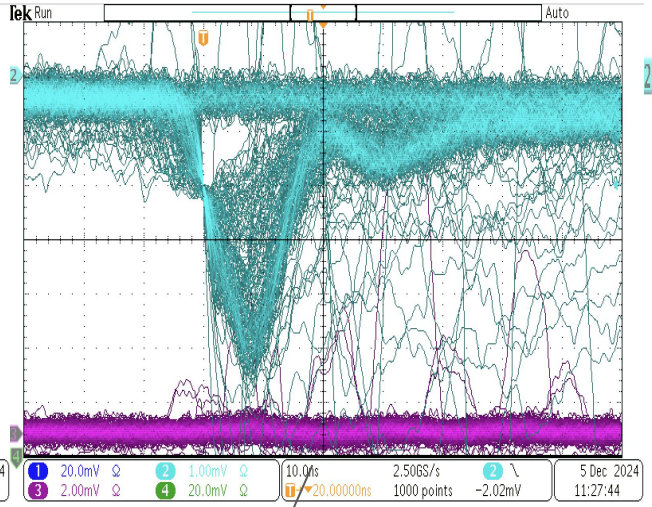
There seems to be a mismatch in timing…

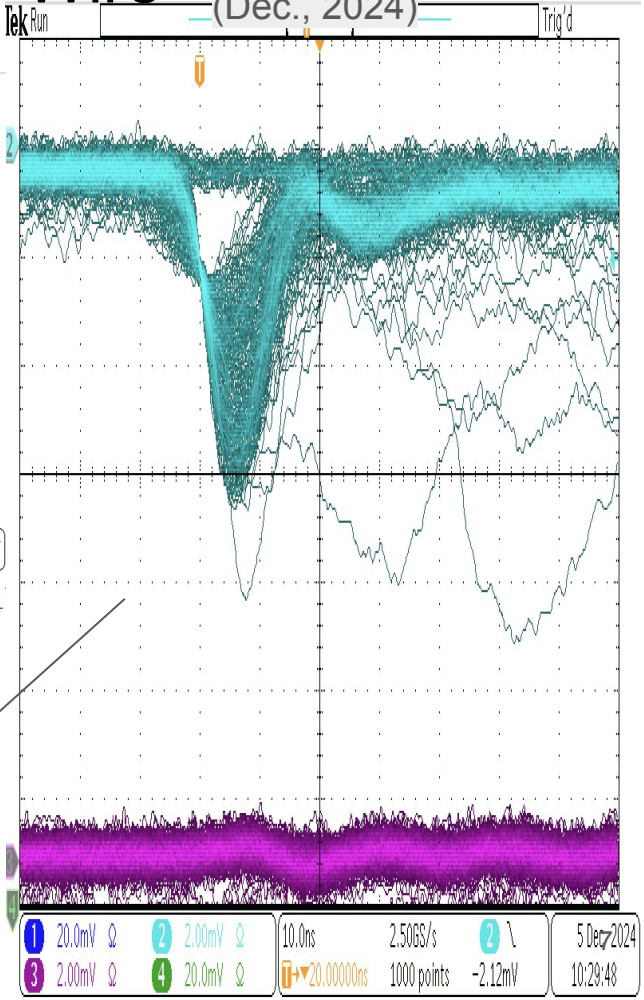
HV-side

c.f.)E15-TC : Raw Signals from a Sense Wire

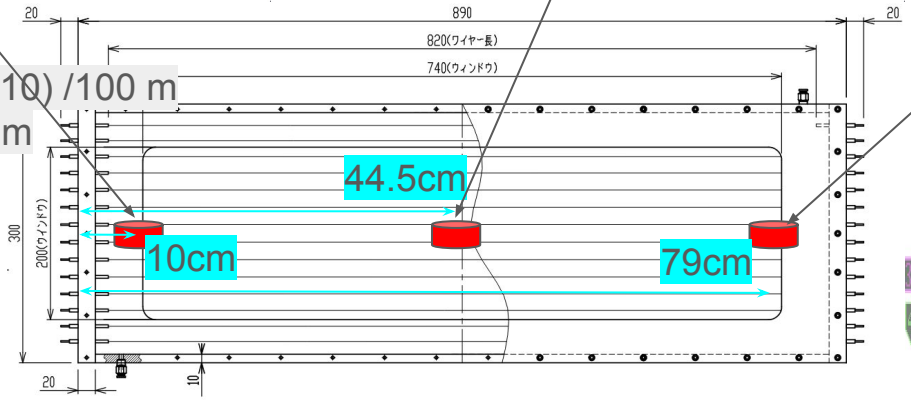
Ar-CO2(90:10), 2300V
(Dec., 2024)



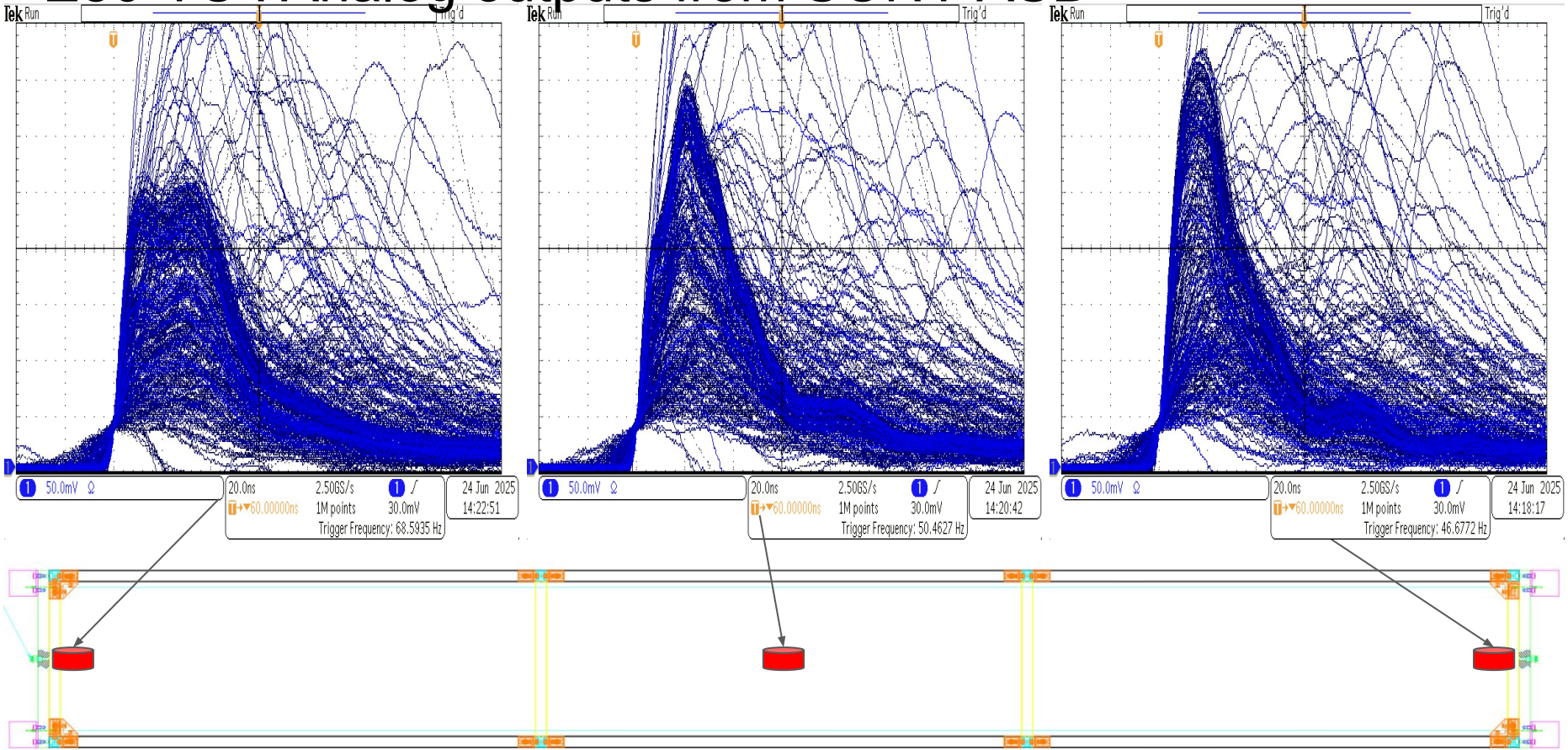




3.5 ns/m *((89 +79) -10) /100 m
= 3.5 ns/m *158/100 m
= ~ 5.5 ns



E80-TC : Analog outputs from SONY-ASD

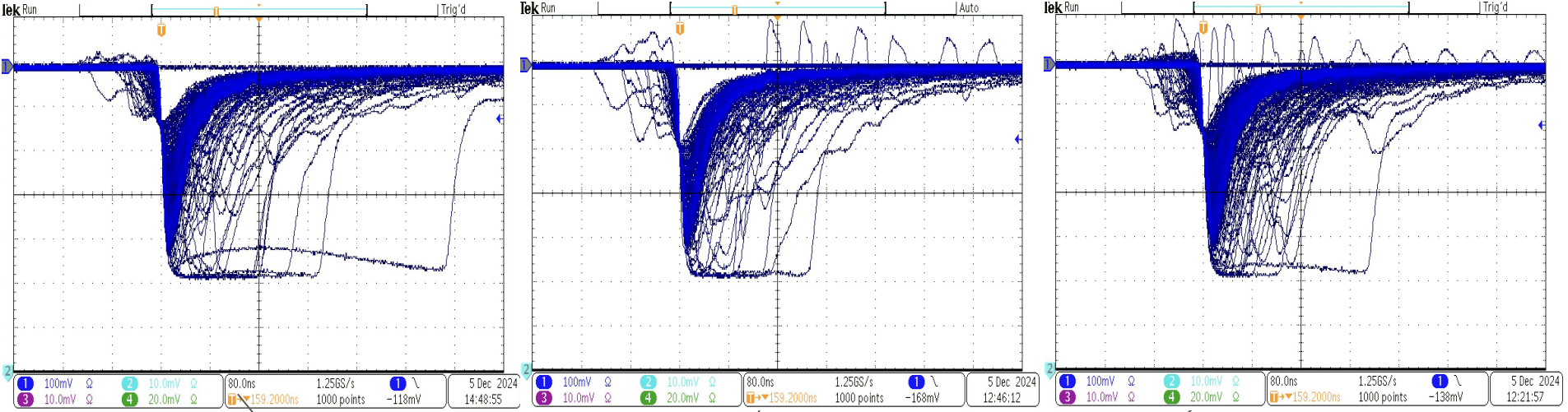


There seems to be a mismatch in timing…

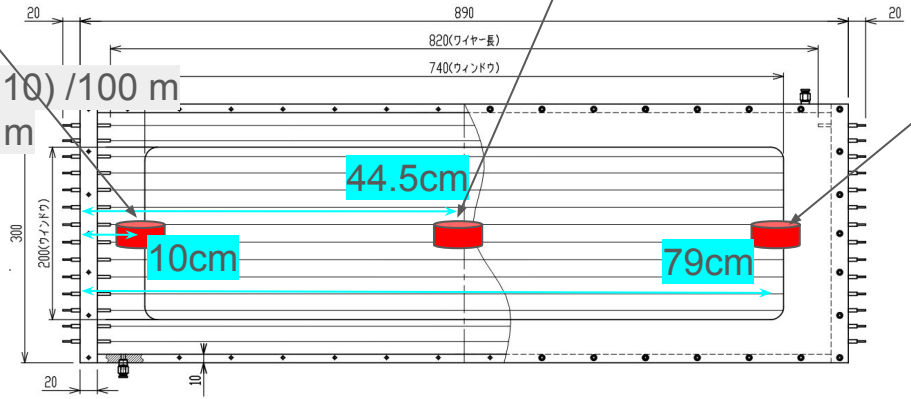
Wave disturbance appeared.

c.f.)E15-TC : Analog outputs from SONY-ASD

Ar-CO2(90:10), 2300V
(Dec., 2024)



3.5 ns/m *((89 +79) -10) /100 m
= 3.5 ns/m *158/100 m
= ~ 5.5 ns



Wave disturbing was not seen.

*The polarity of the analog output was inverted using a NIM module.

E80-CDC

- Plan
  - July 1~3 (J-PARC on-site)
    - start to flow Ar-C2H6 (50:50) and prepare HV moduals
    - construct the HV monitoring system
  - After the power outage in J-PARC
    - HV conditioning(ある程度ガス変わってからの方がいいかな)
  - Obon Ake~?
    - Once we gain confidence in E80-TC, let’s observe the raw signals and pre-amp output in E80-CDC as well.

ToDo

- HYP2025 abstract : E80-CDS, ~ June 30
  - ver.0 → ver.1 shared
- JPS application : (検出器セッション), ~ July 3
  - ver.0 shared
  - title: …長すぎる、座長やりたくない。..
  - CDC: Ar-C2H6 で見えてます。
  - CNC:最低限の性能はでてます。製作に入ってます。
  - Mag: 磁場測定までできてます。
  - summary: 来年のインストールに向けて着々と進んでます。
- Summary of the gas study
  - still summarizing
- (RIKEN Discovery Evening : Poster, July 4
  -)

Back up