

Weekly_MT_20250521

- Gas study w/ test chamber : summarizing now
- Test chamber 2 : Arrived at RIKEN, Design of the frame.
- E80-CDC : No progress
- ToDo list
- Schedule

Gas study

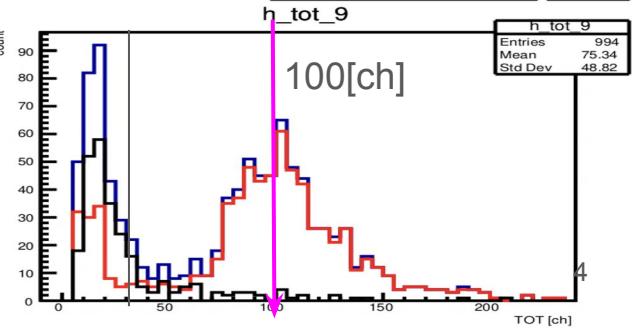
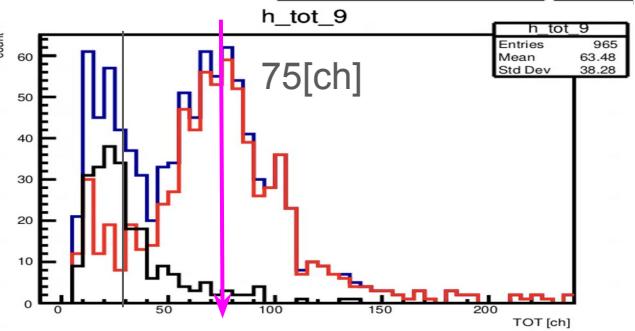
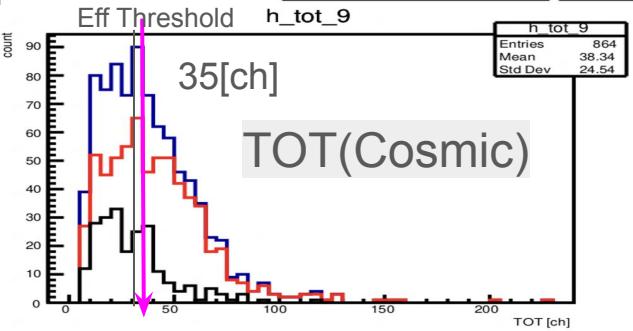
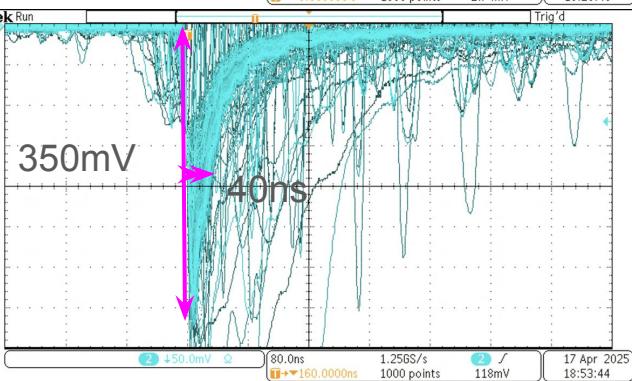
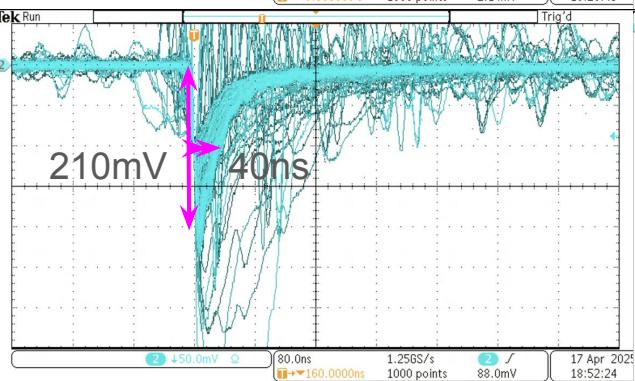
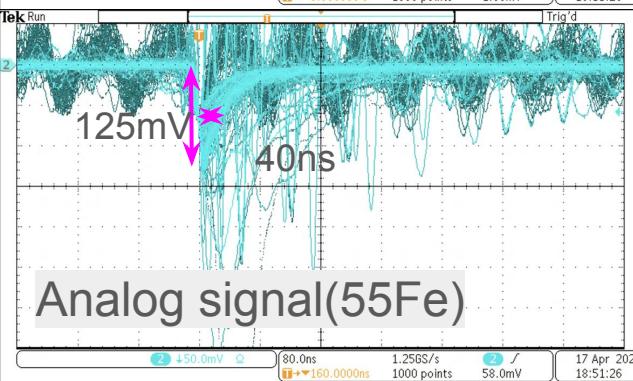
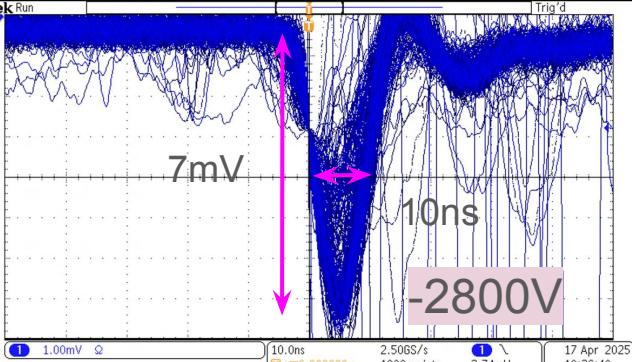
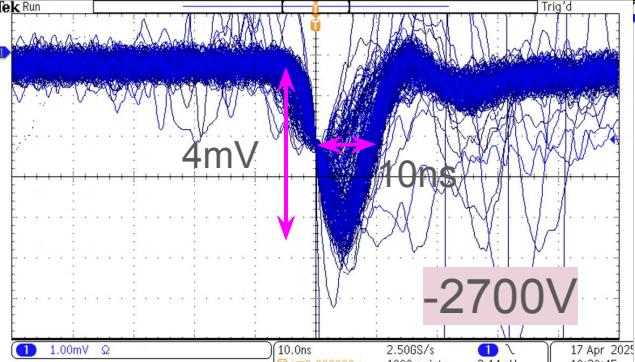
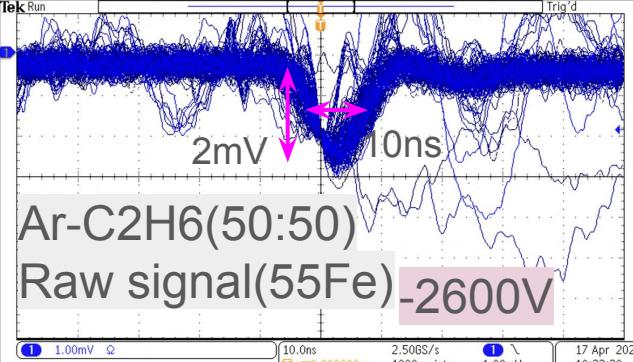
All necessary cosmic-ray data taking will be completed by tomorrow morning.

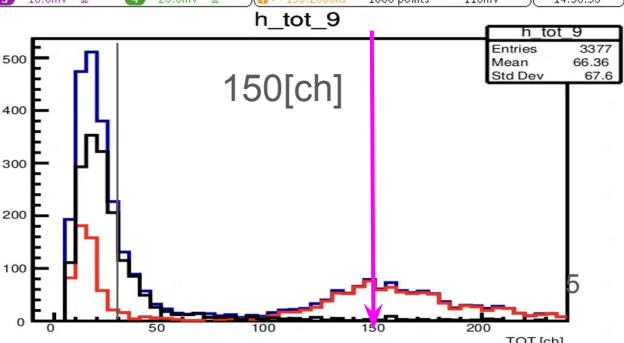
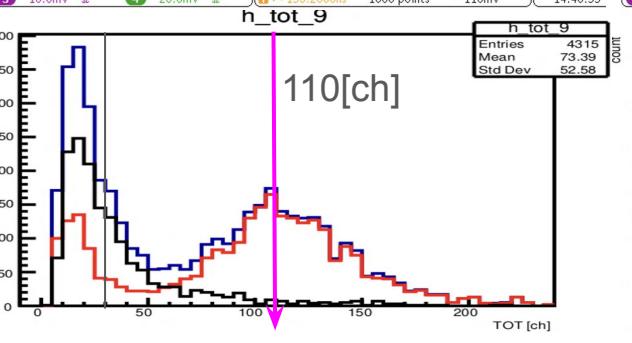
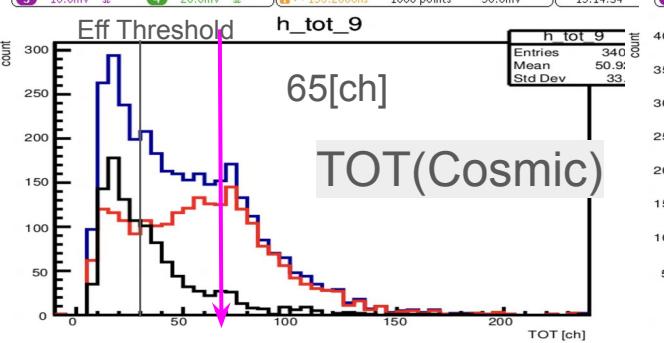
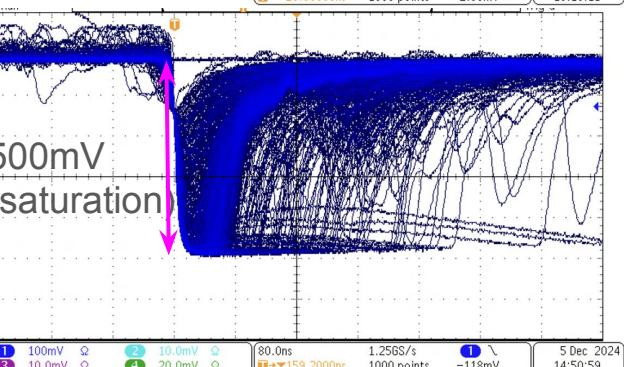
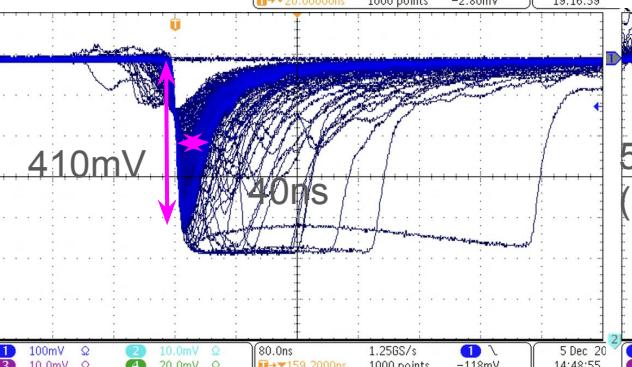
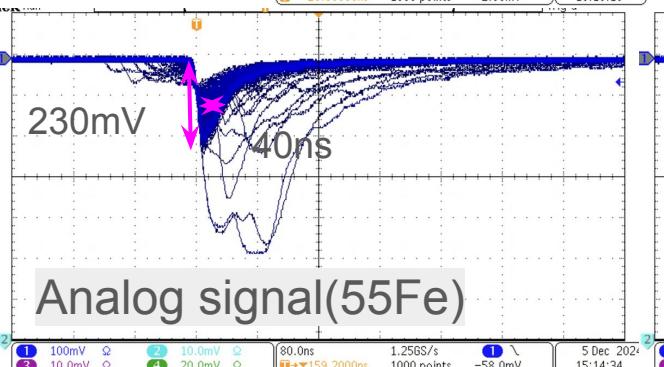
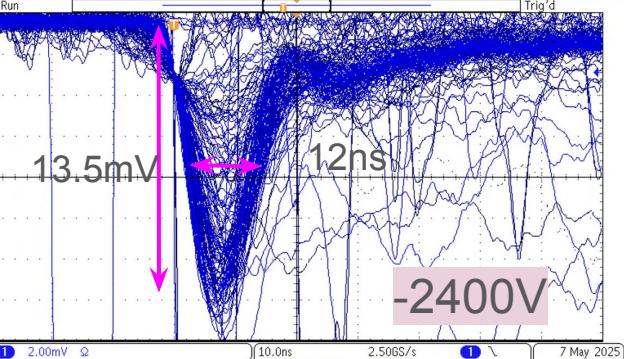
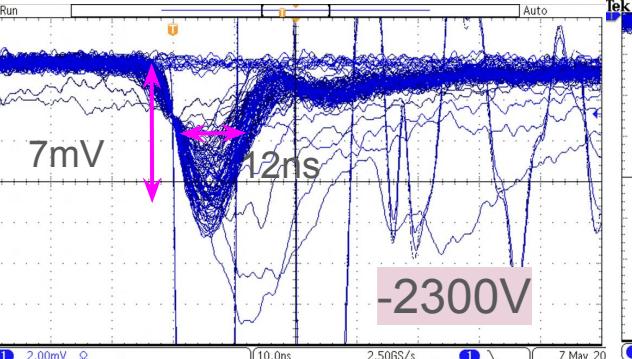
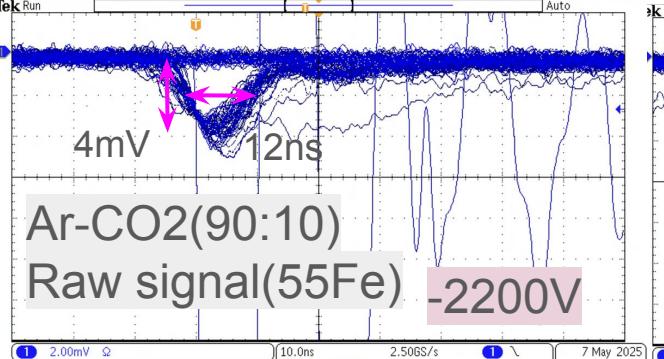
The goal of this measurement is
to clarify **the reason for the lower efficiency**
observed with Ar-CO₂(90:10) compared to Ar-C₂H₆(50:50),
using only the test chamber.

The recent tasks I've done are as follows;

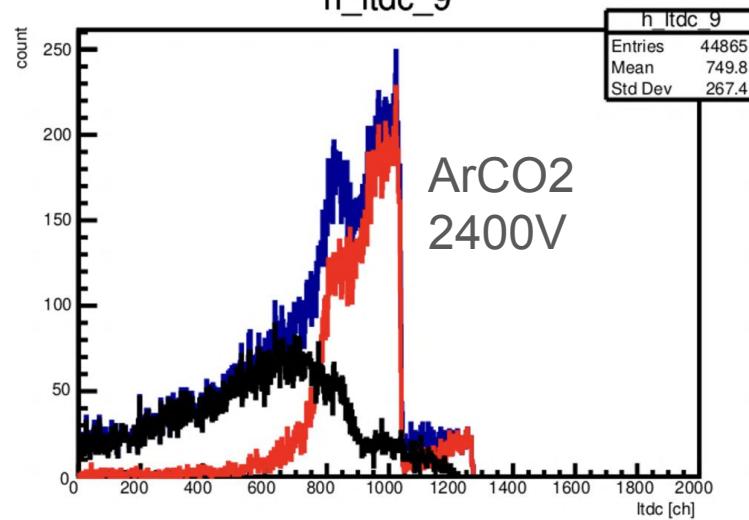
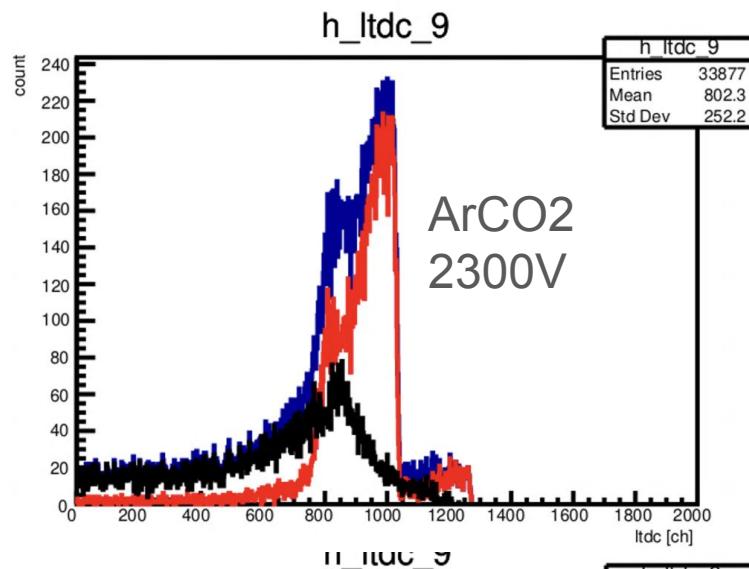
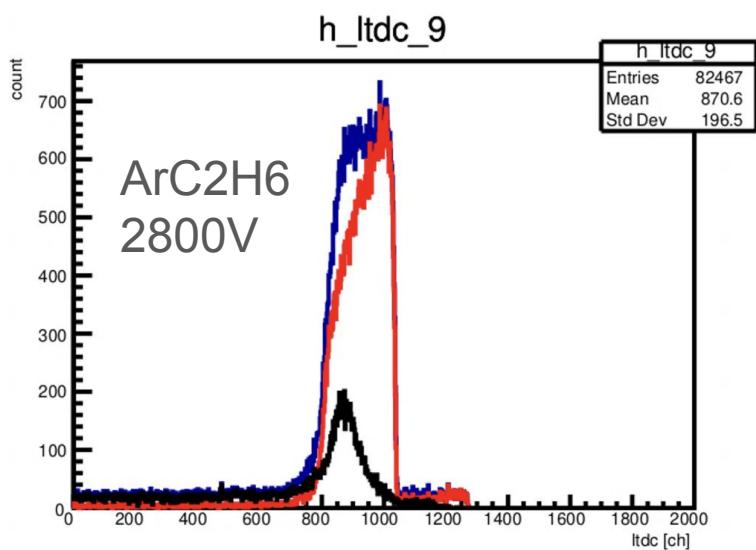
- 1. Rechecking the raw and analog-output signals**
- 2. Performing a HV scan of the cosmic-ray TDC data**
- 3. Checking the reproducibility by wire efficiency**
(with Ar-CO₂(50:50) and Ar-C₂H₆(50:50))

Let's set aside the result of E15-CDC for now.





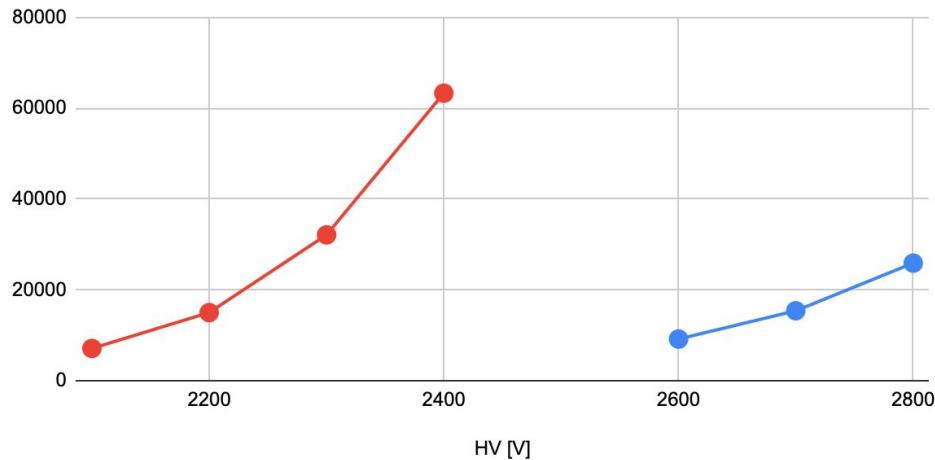
Typical Leading TDC (90Sr) (cosmicは統計少ないので)



Measured gain(2024.12) vs HV

Gain

ArC2H6 ArCO2

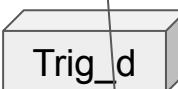
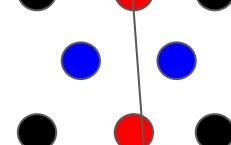


Correlation Plots between HV - Gain - TOT peak - Wire Efficiency

Way to calculate the wire Efficiency



Sense wires

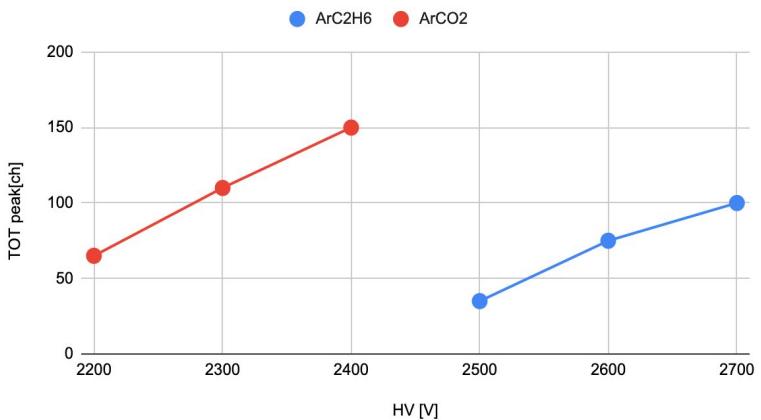


Required:
Trig_u and _d,
Red wires (and)

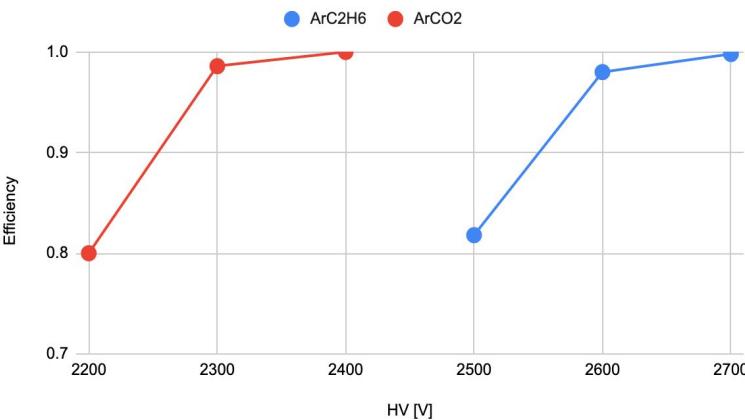
Not required:
Black wires (and)

Judged:
Blue wires (or)

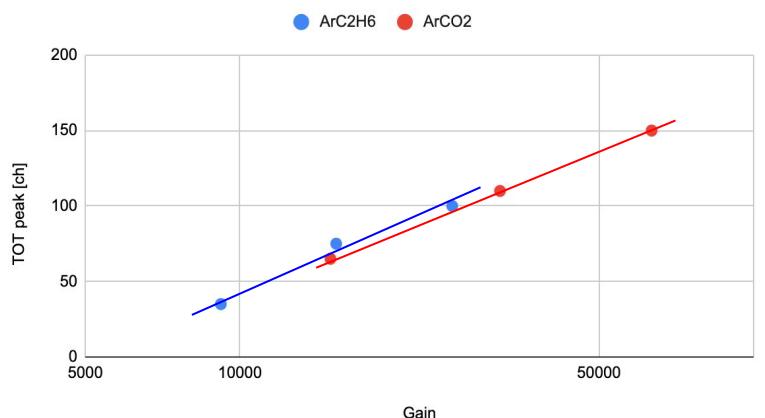
TOT vs HV



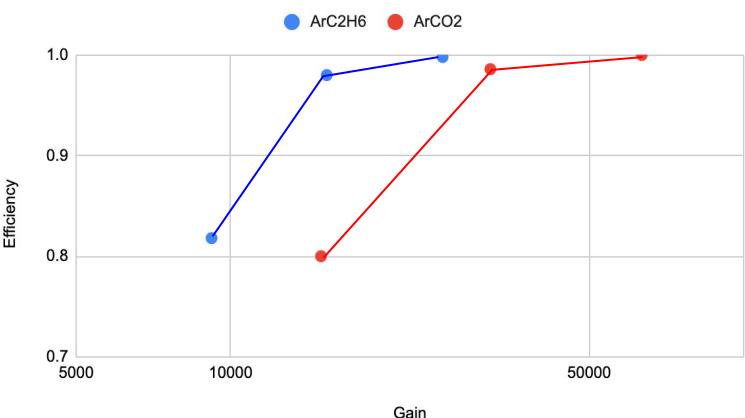
Efficiency(Cosmic) vs HV



TOT vs Gain



Efficiency (Cosmic) vs Gain

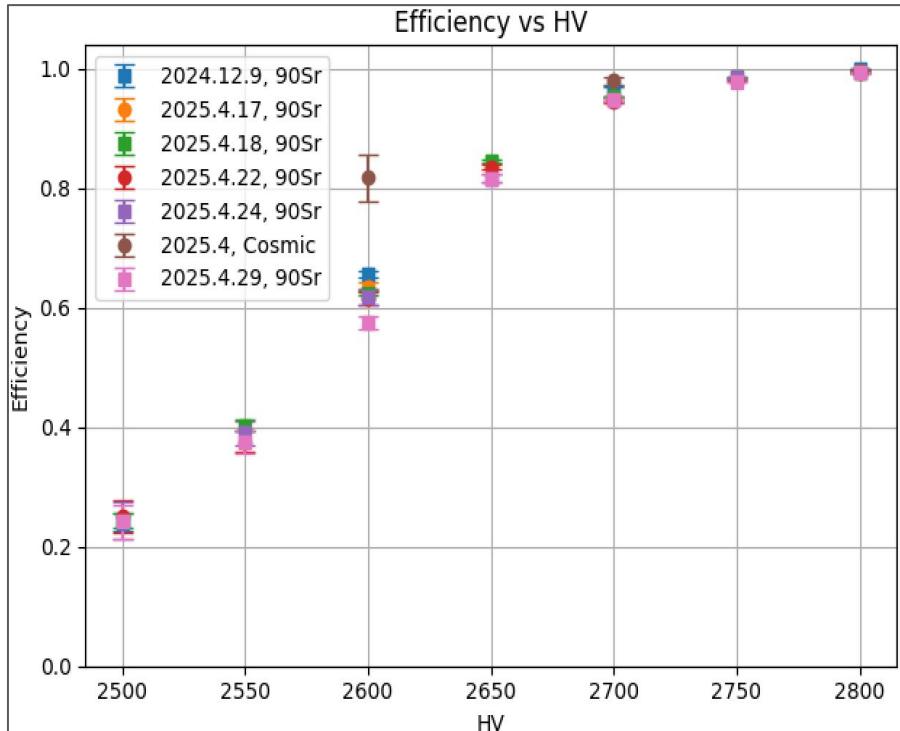


Checking reproducibility using wire efficiency with 90Sr

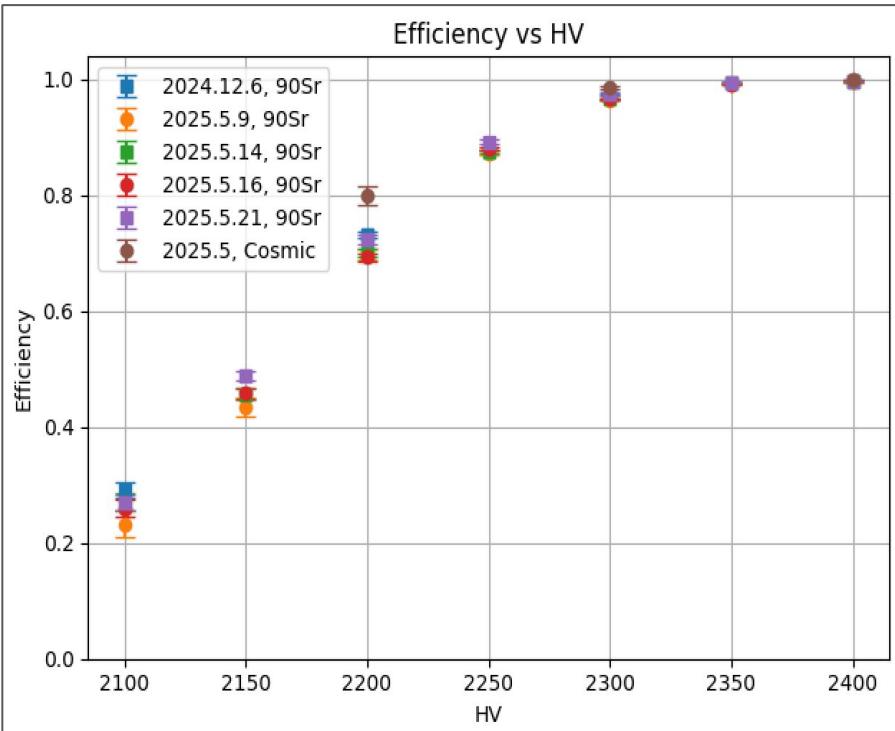
→ Looks good. Gas and the other conditions were not changed drastically.

***Data taking timing is when HV is changed.

Ar-C2H6(50:50)



Ar-CO2(90:10)



Conclusion about “Ar-C2H6(50:50) vs Ar-CO2(90:10)”

- About the wave form with Ar-CO₂,
 - widths of the raw signals are a little wider than Ar-C₂H₆.
 - the rising edges of the analog outputs are slower than Ar-C₂H₆.
- The correlation between gain and TOT peak appears consistent between the two gases — that is, the TOT peak occurs at the same position when the gain is the same.
- In the TOT spectra, the peak for Ar-CO₂ is broader than Ar-C₂H₆. Therefore, the number of hits below the TOT threshold increase, in the case of Ar-CO₂.
That's why we can't achieve sufficient efficiency with Ar-CO₂, compared to Ar-C₂H₆.
- As a result, we need bigger HV with Ar-CO₂, and there is a lot of noise.

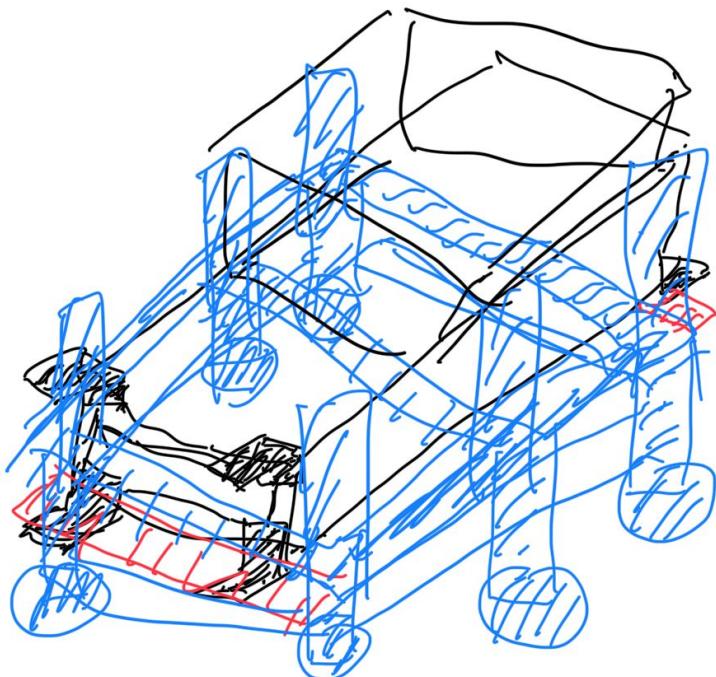
Test chamber 2

Test chamber 2

- Yesterday, it came to RIKEN.
- Wire connection → No problem
- There are some bolts or nuts inside the chamber...
But anyway there is no effect to electric field.
- We roughly sat up the gas supply line.
 - one flow meter (needle type)
 - two mass flow meter and a logger (not setted up yet)
 - Gas is not flowing yet.
- Plan:
 - I'm designing the frame for it and old test chamber, considering various practical aspects.



何も考えず二段(高さ0.7m)で良いかも。
下にchamber2、上にold chamber。
old chamberは簡単に移動できるようにしたい。



ToDo

- DC2 : Done

My Schedule

- Now : Tokai
- 2025/5/23 : move to Saitama
- ~ : RIKEN

Back up

What we need for test chamber @RIKEN

- ASAGI, 変換基板, ASAGA sys用cable? → 白鳥さん??
- HUL & DTL
- test chamber1 → RIKEN
- SONY ASD, 変換基板 2セット分 → ASD(テスト用のやつ)磯部さんにいくつか貸す
- Repeater : ×1 (Repeaterのクレート? 今はBPCに使ってたやつ)
- Power Supply
 - CAENクレート (Pot Wire用) (今準備棟にあるやつ)
 - for repeater (SONY ASD用)
 - 5.29V : ×1
 - 5.49V, 1.02A : ×1
 - for ASAGI
 - +5.0V, 0.5A : ×1
 - for SONY ASD
 - +3.0V, 0.38A : ×1
 - -3.0V, 0.13A : ×1
 - Vth 1~10V, 0~0. A : ×1
- Gas system
 - Ar-C2H6 : ×1
 - レギュレータ(可燃) : ×1
 - Flow meter (needle式) : ×1
 - 1/4ガスチューブ
 - バブラー, 油 : ×1 (油はJ-PARCから持っていく)
- Cable
 - SONY ASD用
 - 6m flat cable : ×2
 - 16ch×2 <-> 32ch flat cable : ×2
 - Lemo類
 - SHVとか
 - Trig counter ×2
- NIMビン、モジュール式
 - 赤HV, clock, discri, divider, coin, fan-in-fan-out, gate-generator, scaler, ECL->NIM (NIM->ECLも欲しい...) etc...

青はもう理研にあるもの