

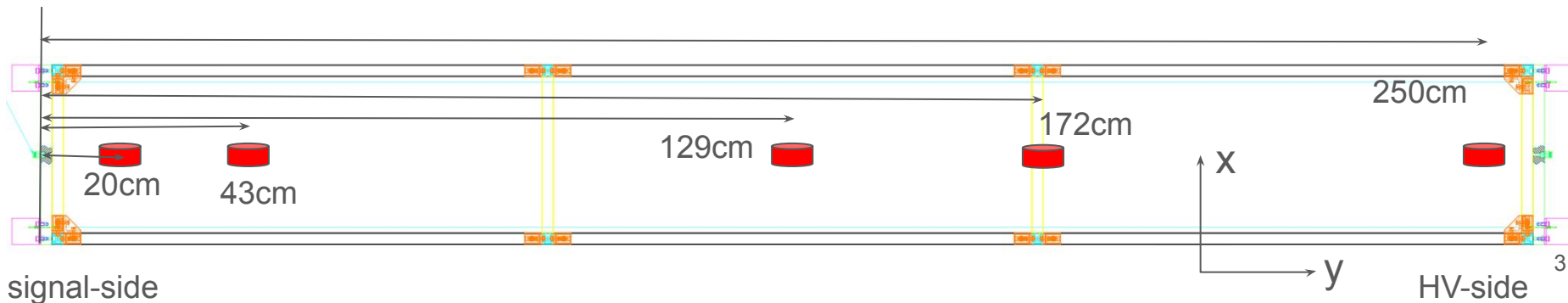
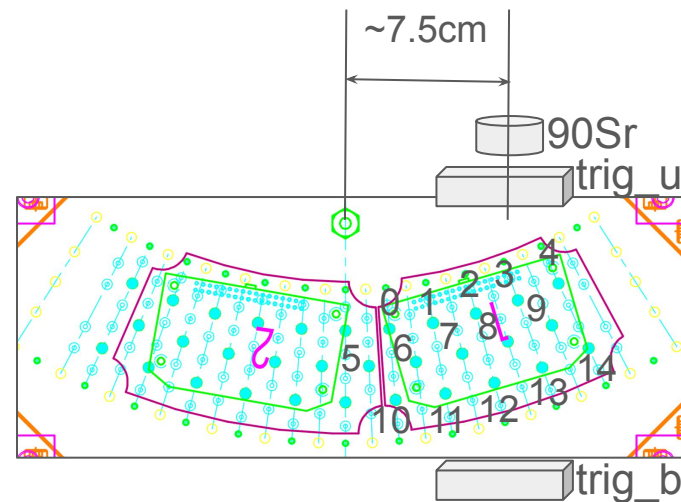
Weekly_20250730

- TC : TDC analysis → ToT(, Multiplicity) and Efficiency
- ASAGI : TDC with several parameters
- CDC : Status
- To do

Test Chamber

E80-TC : TDC analysis

- Goal:
 - Position Dependence of Efficiency
 - Comparison between E80-TC and E15-TC
- Set up:
 - ^{90}Sr
 - Trigger = Two scintillators' coincidence
 - SONY's ASD, $V_{th} = -1.5 \text{ V}$
 - Wires $\rightarrow$ #0 $\sim$ #14 in right figure
 - $\sim 50\text{k}$ events, 3 $\sim$ 5 mins, trig rate $\sim 200 \text{ Hz}$
 - pos = 20, 43, 129, 172, 250 cm
 - HV = 2600, 2700, 2800 V

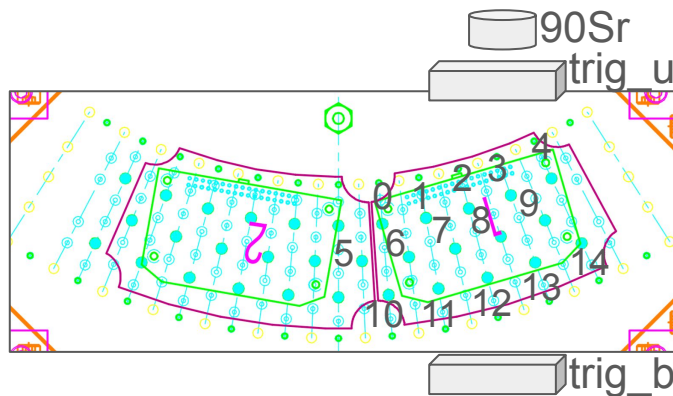


HV-side
(E80-TC: “pos=250cm”, E15-TC: “pos=79cm”)

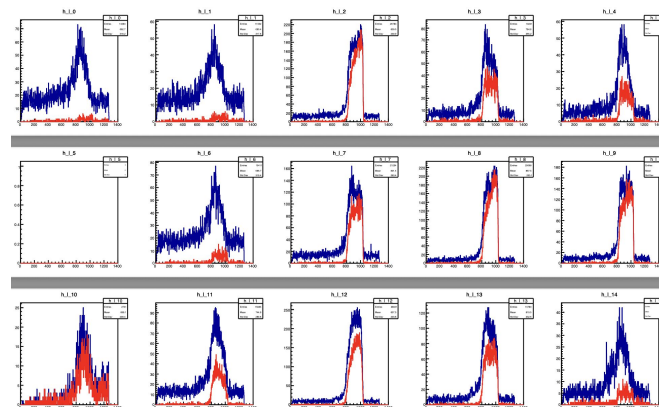
Typical LTDC spectra -2800V, $V_{th}=-1.5V$, 90Sr, pos= HV-side

— raw

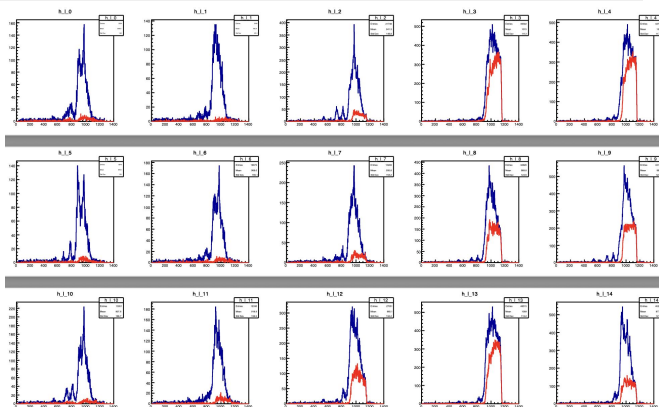
— tot range



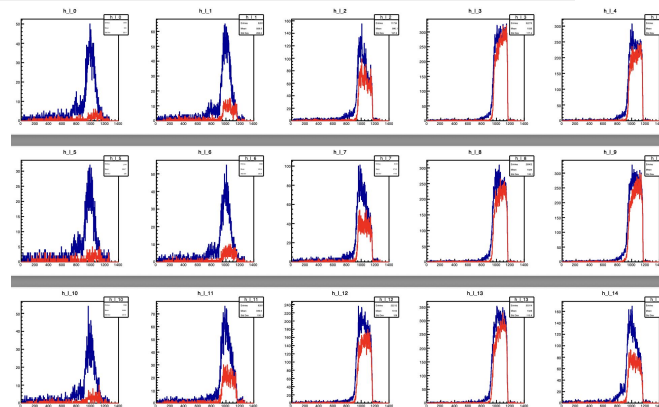
E15-TC (at J-PARC), pos=79cm



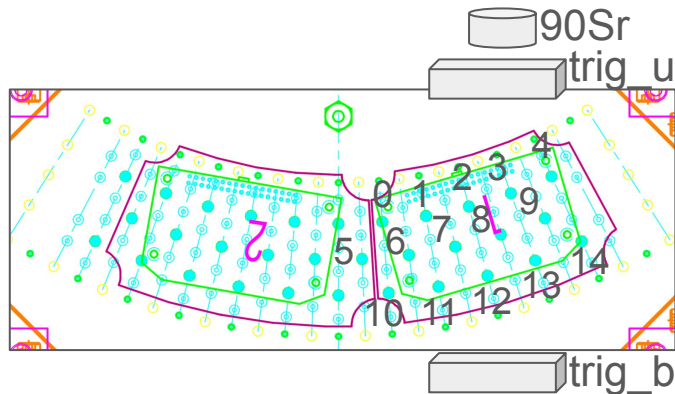
E80-TC (at RIKEN), pos=250cm



E15-TC (at RIKEN), pos=79cm

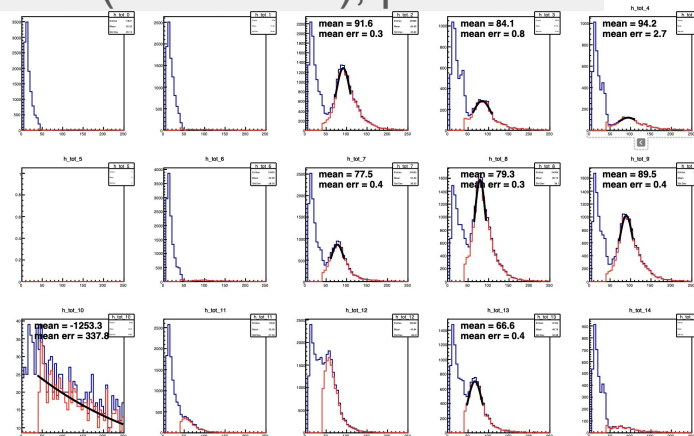


Typical ToT spectra -2700V, Vth=-1.5V, 90Sr, pos=HV-side

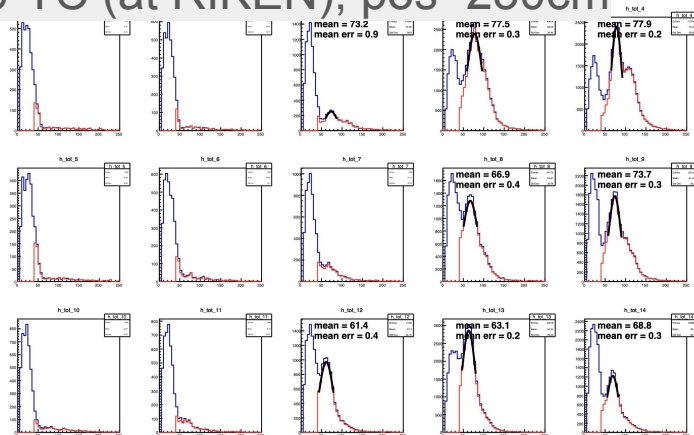


Noise area of E80-TC is broader than E15-TC.

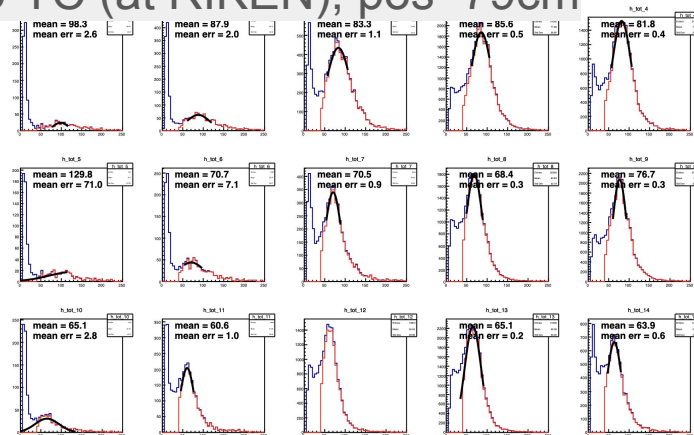
E15-TC (at J-PARC), pos=79cm



E80-TC (at RIKEN), pos=250cm



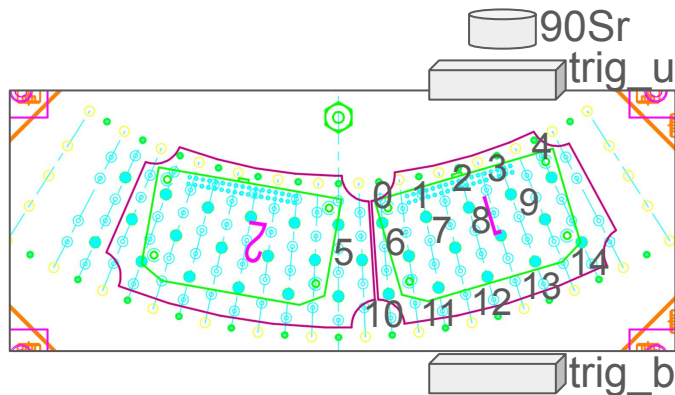
E15-TC (at RIKEN), pos=79cm



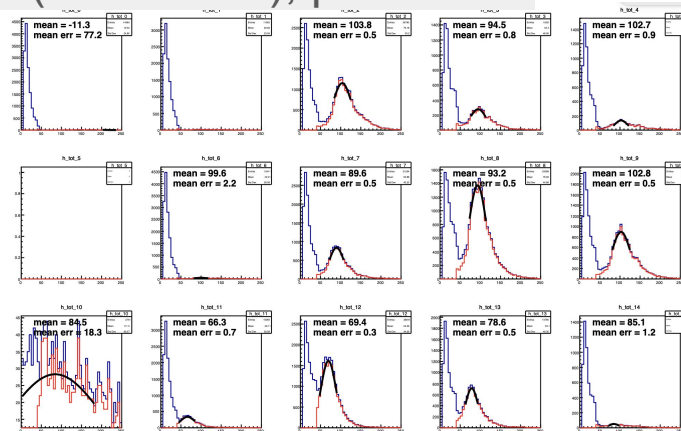
Typical ToT spectra -2800V, Vth=-1.5V, 90Sr, pos=HV-side

— raw

— range & first

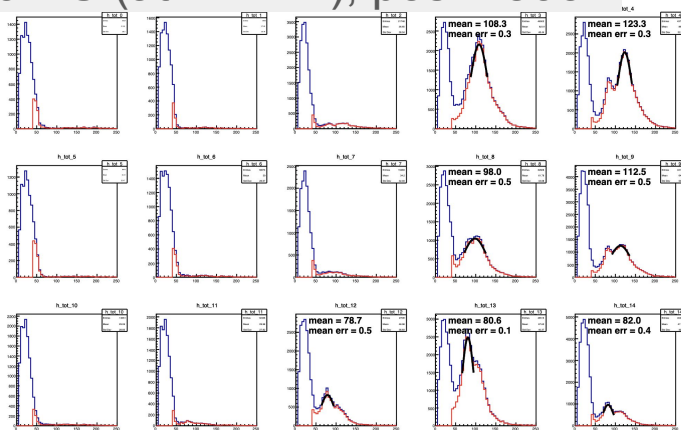


E15-TC (at J-PARC), pos=79cm

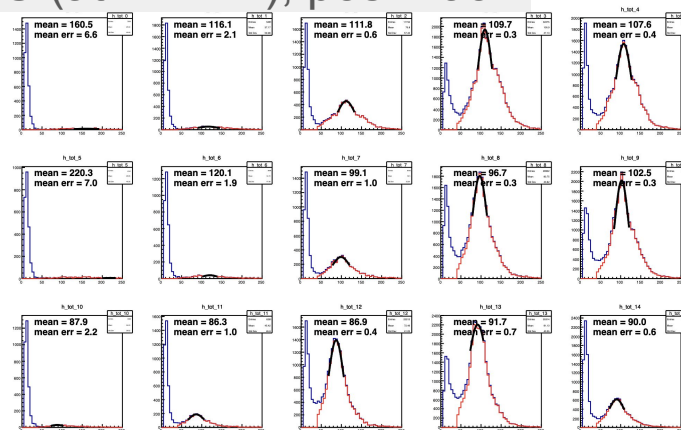


Noise area of E80-TC is broader than E15-TC.
Two peaks appear only in E80-TC.

E80-TC (at RIKEN), pos=250cm



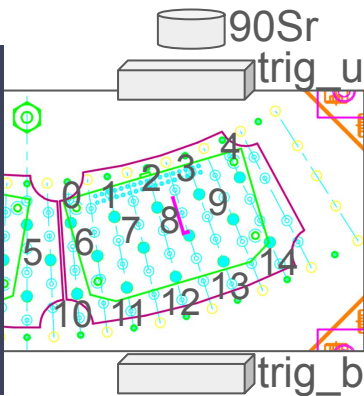
E15-TC (at RIKEN), pos=79cm



ToT Peak and Wire Efficiency

```
// begin wire eff ana
if(hit[0]&&hit[10]&&hit[1]&&!hit[11]){
  denominator++;
  if(hit[5]||hit[6]){
    numerator++;
    track = true;
  }
}

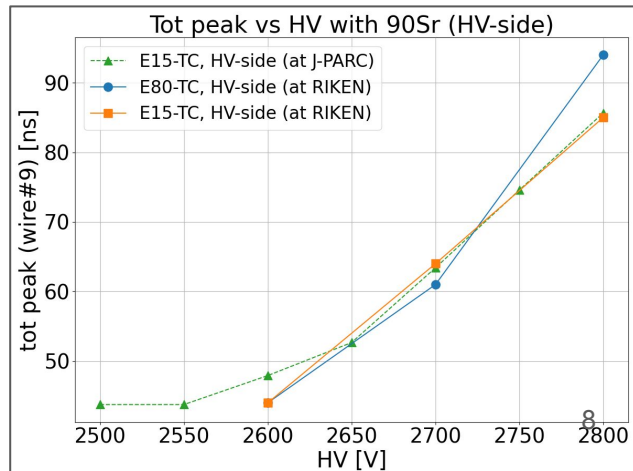
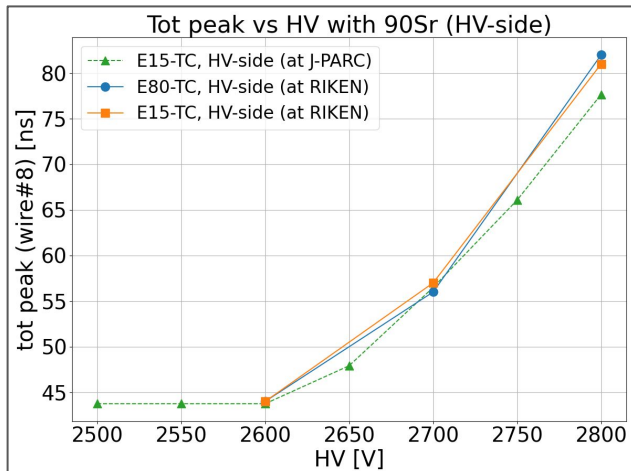
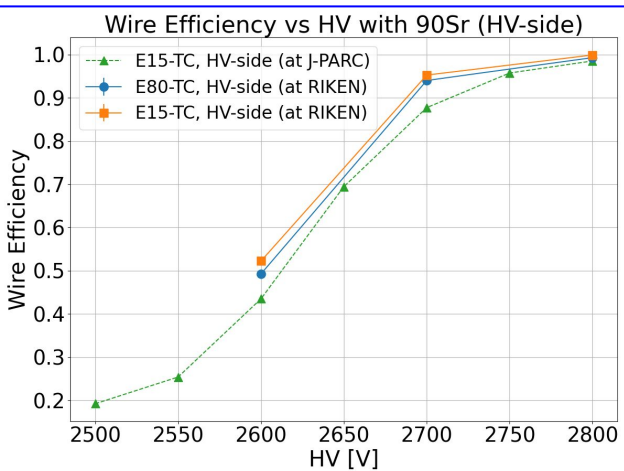
for(int i=1;i<4;++i){
  if(hit[i]&&hit[i+10]&&hit[i-1]&&hit[i+1]&&hit[i+9]&&hit[i+11]){
    denominator++;
    if(hit[i+5]||hit[i+6]){
      numerator++;
      track = true;
    }
  }
}
//end wire eff ana
```



All the error bars are too small to see.
(Efficiency errors are based on binomial distribution. Tot errors are derived from errors of gaussian fits.)

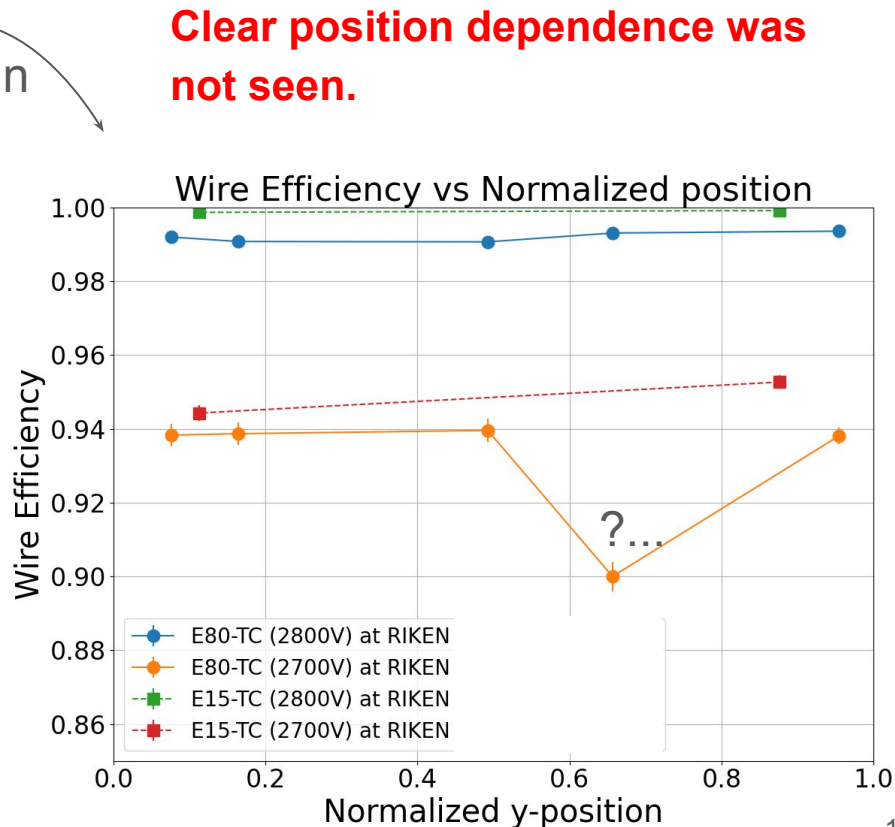
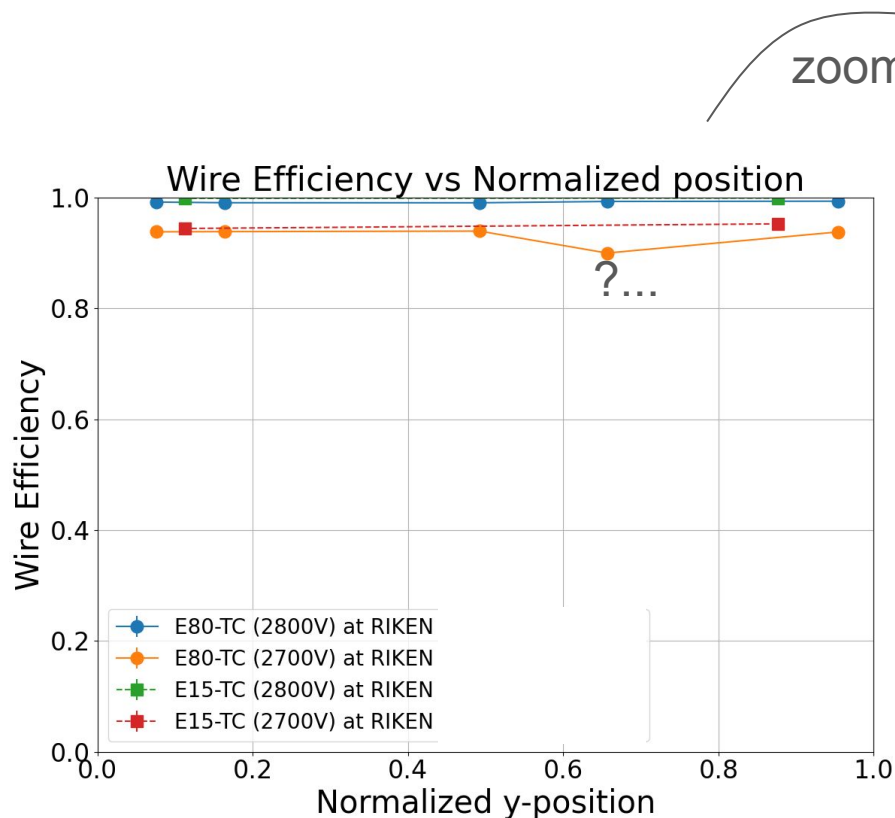
Wire efficiency of E80-TC is a little lower than in case of E15-TC, but it's negligible, I think.

“Hit[i]” means “tot > 40[ch] && 800[ch] < LTDC < 1200[ch].”



Position Dependence
(E80-TC: “total length = 262cm”,
E15-TC: “total length =89cm”)

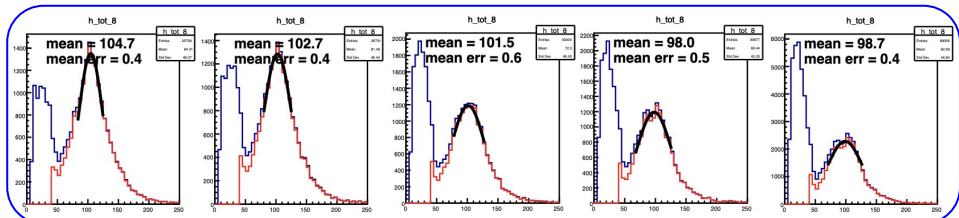
Position Dependence of Wire Efficiency



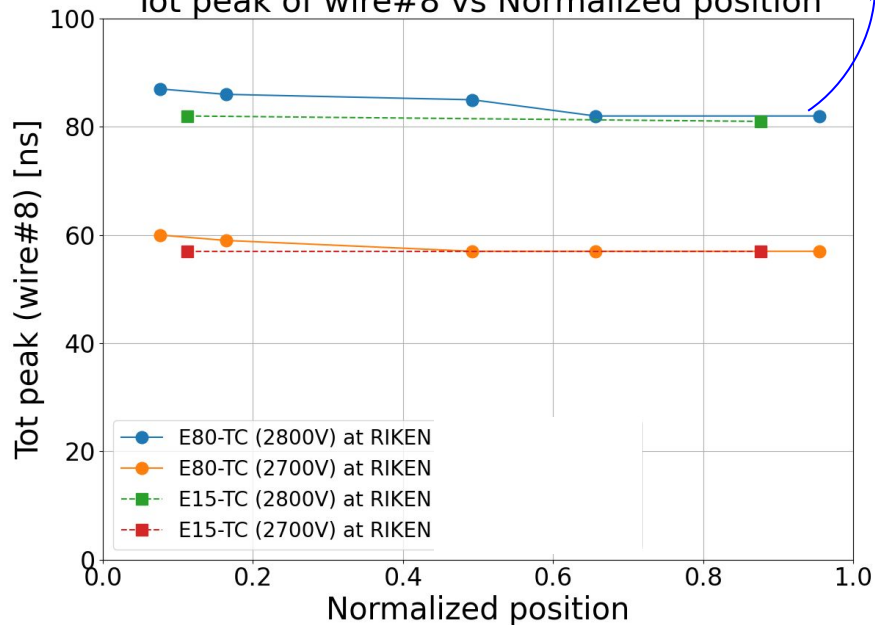
Position Dependence of ToT Peak

While the ToT magnitude is nearly position-independent, a clear position dependence is observed in the signal-to-noise ratio.

Wire#8

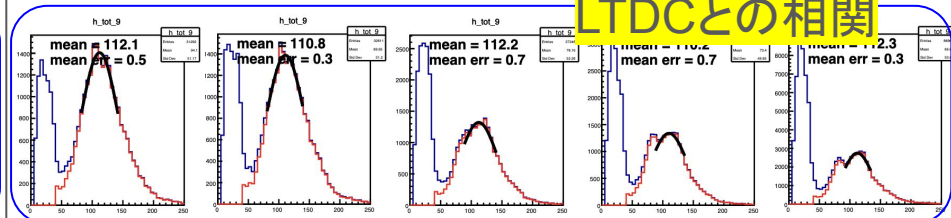


Tot peak of wire#8 vs Normalized position

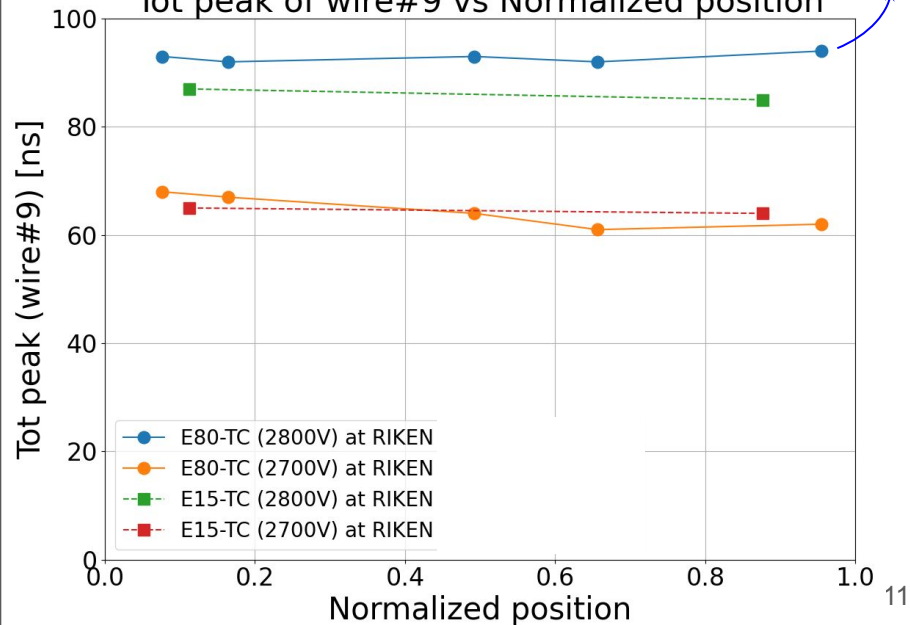


Wire#9

LTDCとの相関

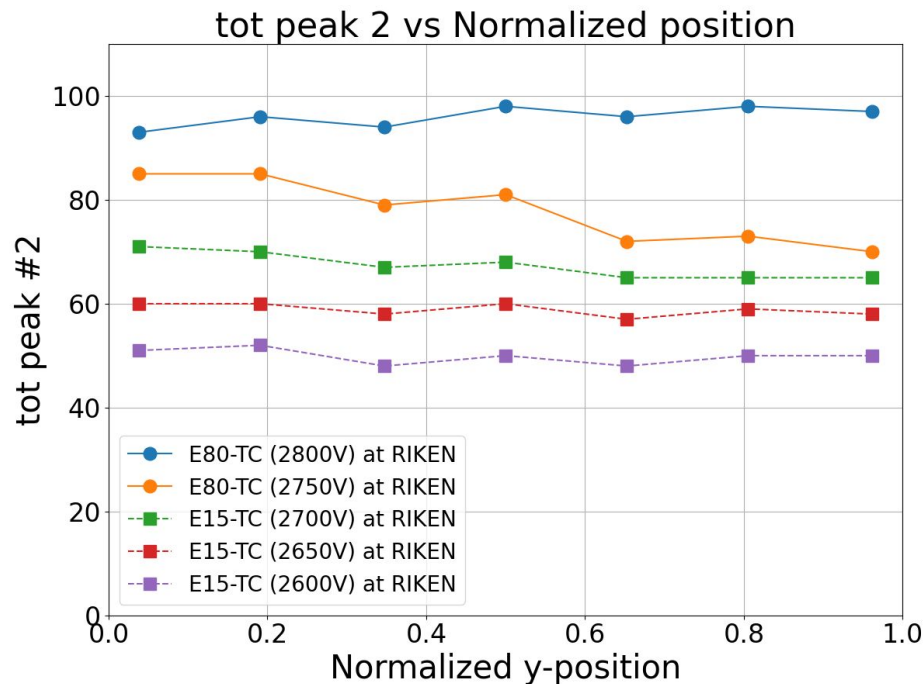
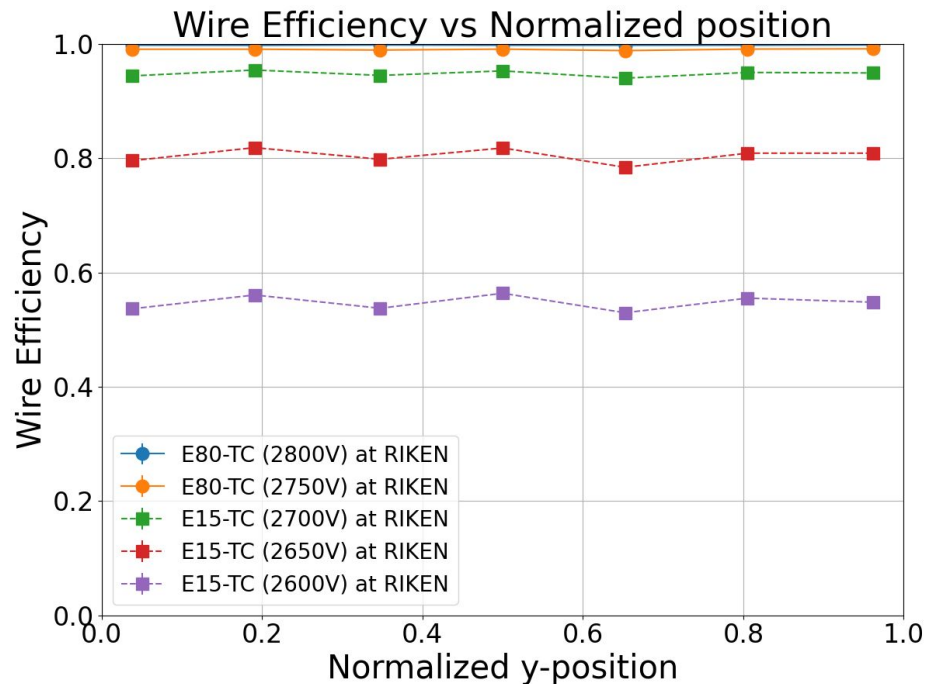


Tot peak of wire#9 vs Normalized position



追加データの解析結果

Track引けたときのToTは位置依存ないはず。要check。



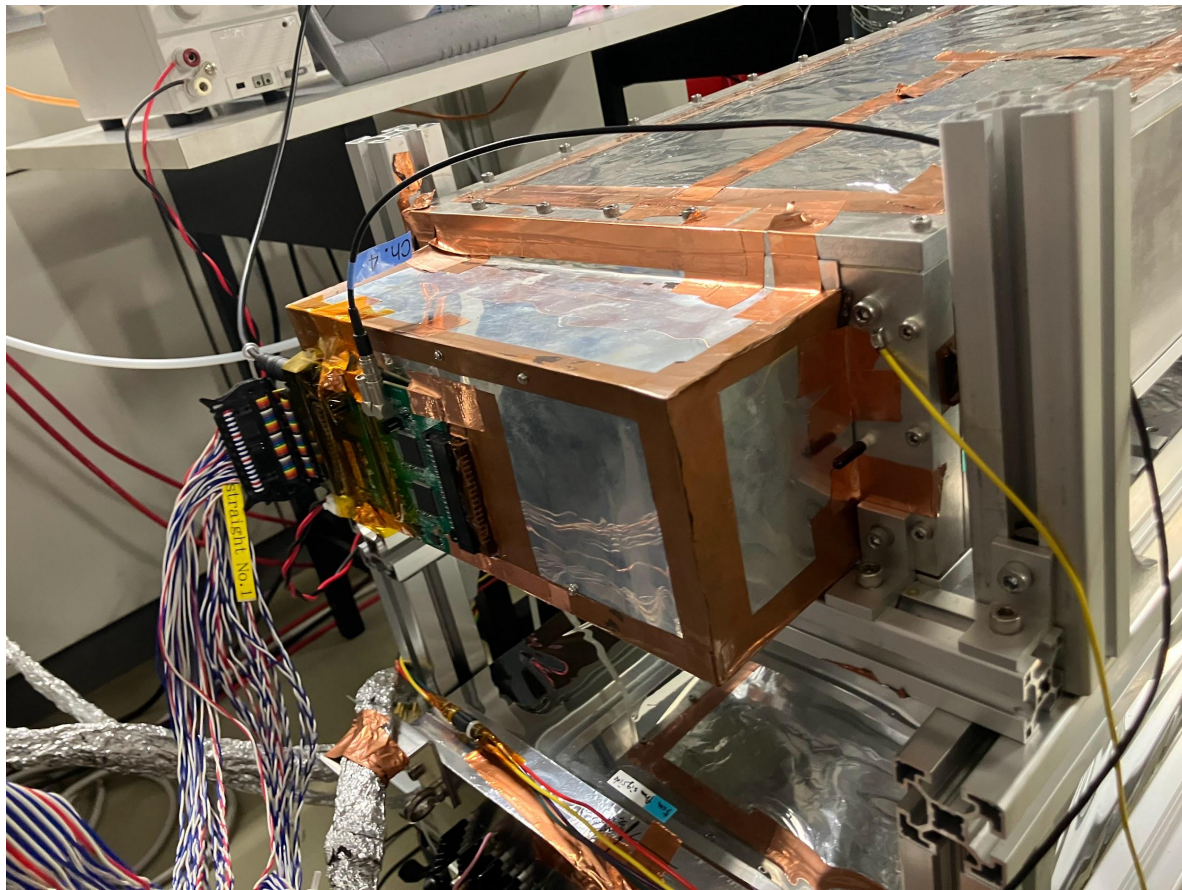
ASAGI v1.5

90Sr x testDC

アナログ信号見てみた

tdc取ってみた

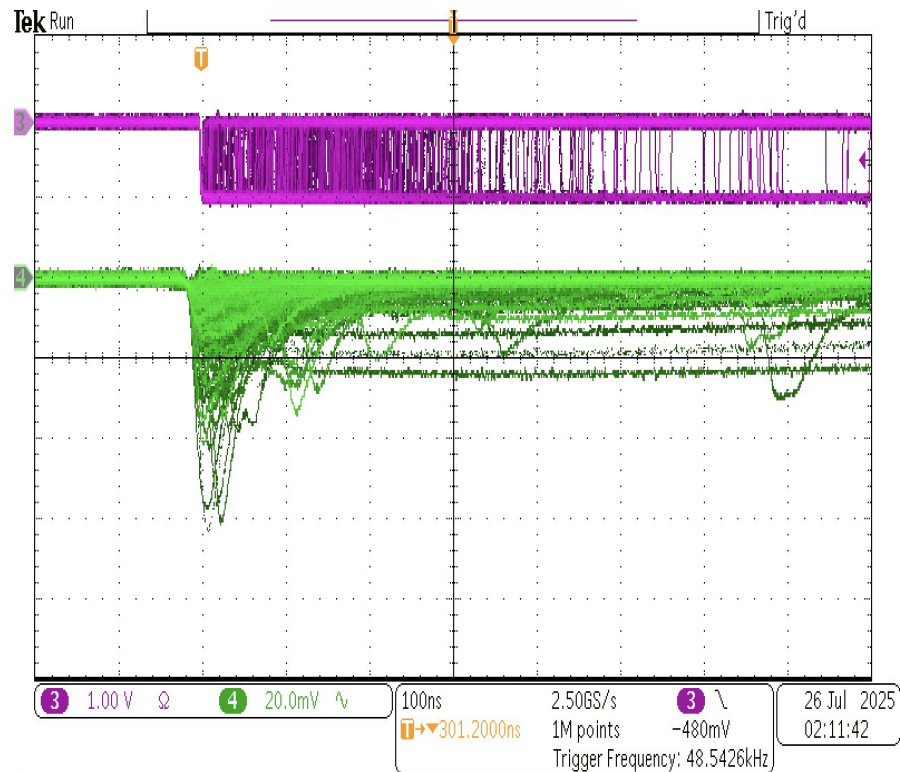
思った通りに制御できているか、1
個ずつ確認している
最中。



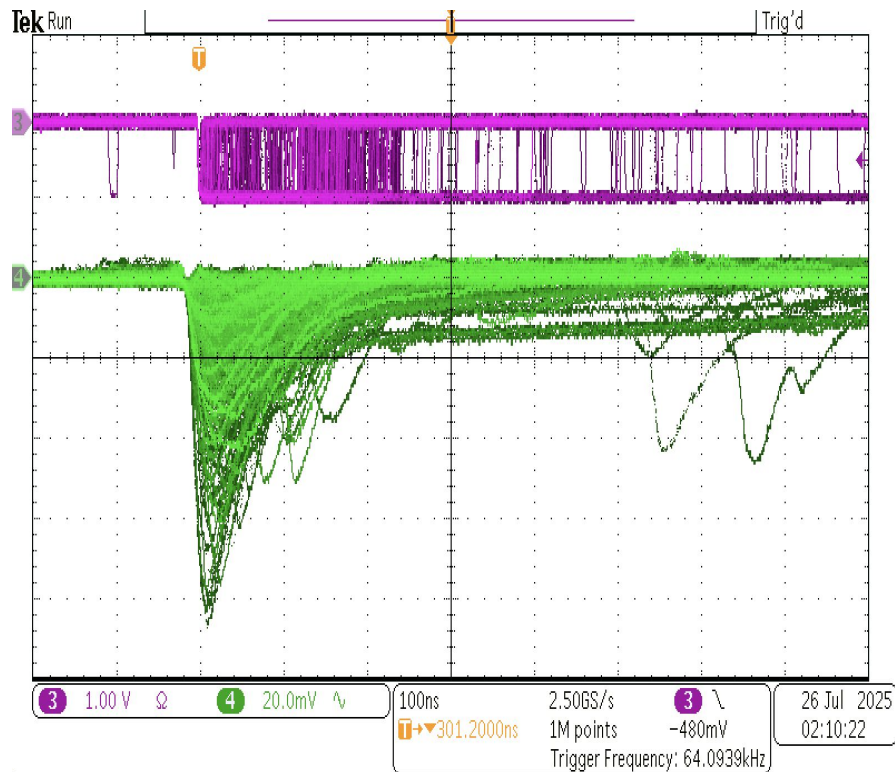
Analog out

90Sr, -2750 V

22:42:18



24:44:14

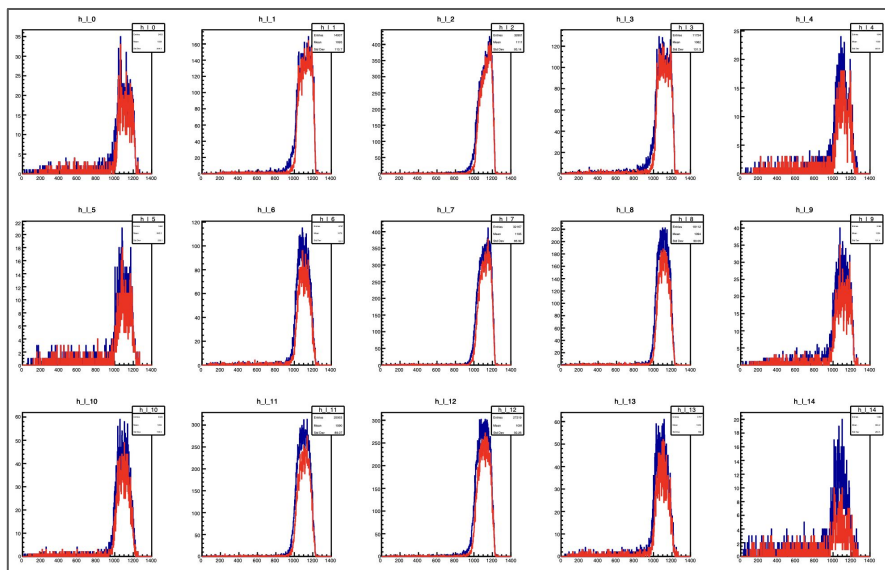


LTDC

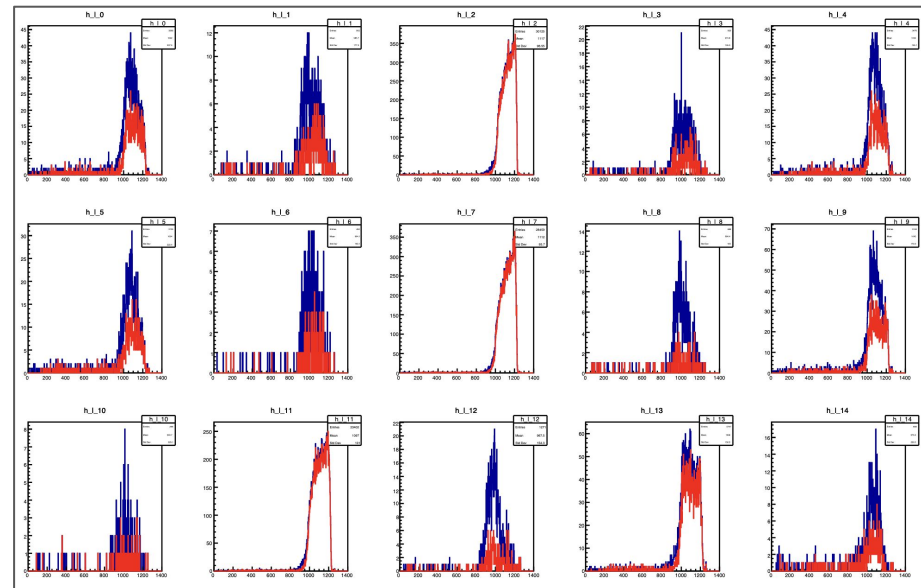
90Sr, -2750 V

— raw
— tot range

22:42:18



24:44:14

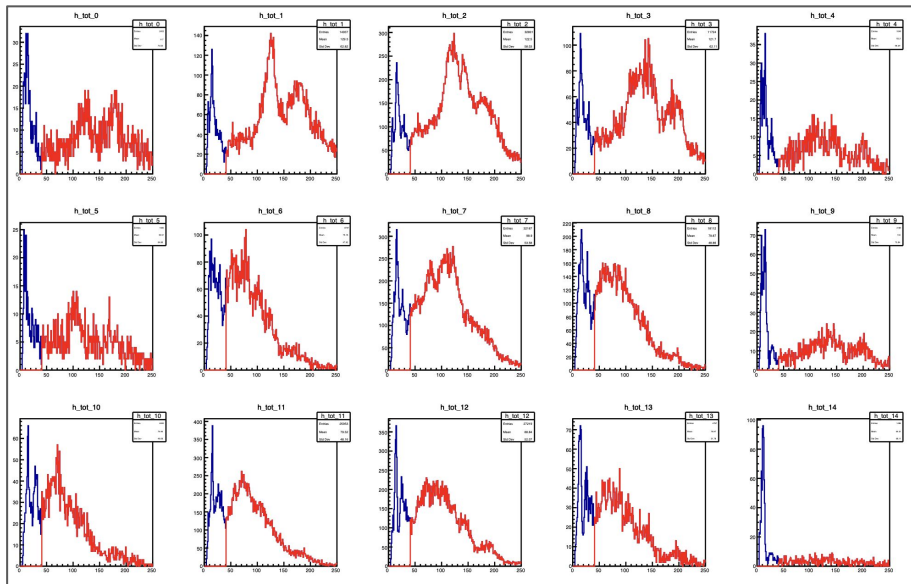


ToT

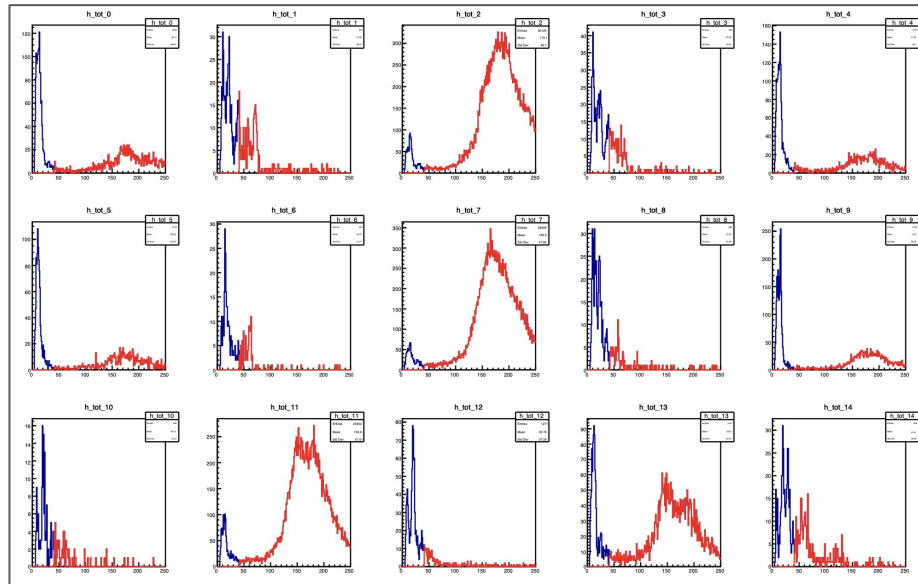
90Sr, -2750 V

Leadingだけあるやつ割合とか
raw
- tot range

22:42:18



24:44:14



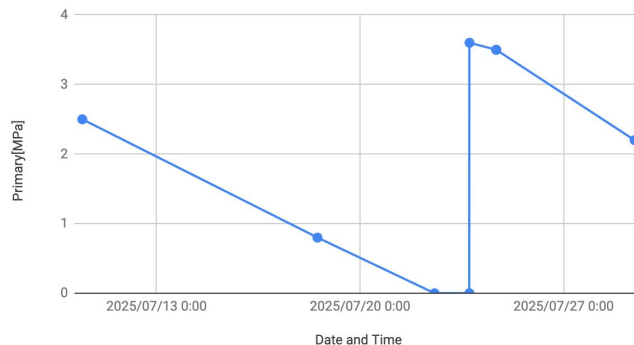
CDC

CDC status

- 現在 pot = -1800 V.
 - 順調。
- そろそろInner -1000 V → -1300 V, Outer -1000 V → -1300 Vに上げてもいいかも。
- 80ml/min, 5 days, -1.3 MPa. 残り2.2 MPa.
 - 8/8まで残り9 days = 2.34 MPa
 - 0 MPaからも数日保つことを考慮すると、流量上げてもいいかも。
→ 100 ml/min?

Date and Time	Primary[MPa]	Secondary[MPa]	FlowMeter[ml/mi	予備ポンベ数
2025/07/10 10:44	2.5	0.092	47	5
2025/07/18 12:50	0.8	0.087	45	5
2025/07/22 13:25	0	0.1	52	5
2025/07/23 18:10	0	0	0	5
2025/07/23 18:17	3.6	0.1	50	4
2025/07/24 16:17	3.5	0.92	46	
2025/07/24 16:21	3.5	0.1	80	
2025/07/29 10:36	2.2	0.1	82	4

Primary[MPa] と Date and Time



- 8/25(木村東海出張日)までに3置換 && -2300 V 目標

To Do and Schedule

- JPS abst : ~Aug.12
- JPS slide ver.0 : ~Aug.8
 - E80 intro
 - CDS : 設計思想。以下status report
 - Solenoid
 - CNC
 - CDC
 - Summary and Prospect
- TC and ASAGI study
 -

ホテルは×新白鳥 → ○広島
東広島、西条付近は空室無Lorz...

-
- Aug. 4 ~ Aug. 8 : 集中講義@Sendai
 - Aug. 25 ~ Sep. 5 : CDC@J-PARC
 - Sep. 16 ~ Sep. 19 : JPS@Hiroshima
 - Sep. 26 ~ Oct. 3 : HDext Town Meeting and HYP2025(oral)@本郷 and RIKEN
 - Oct ~ Nov : E72, Parasite test (new AC etc...) and CDC@J-PARC

Back Up

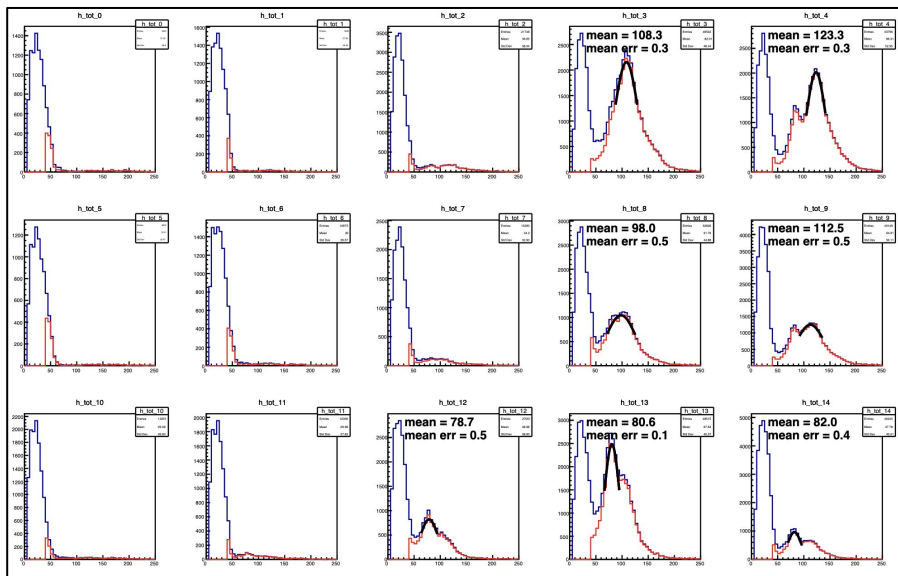
Signal-side
(E80-TC: “pos=20cm”, E15-TC: “pos=10cm”)

Typical LTDC spectra -2800V, Vth=-1.5V, 90Sr, pos=Signal-side

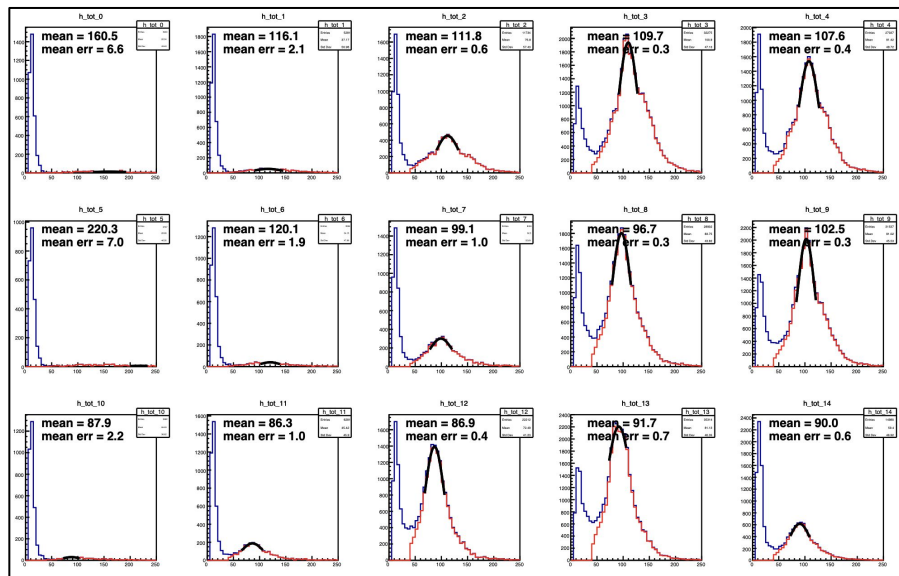
— raw

— range & first

E80-TC (at RIKEN), pos=20cm



E15-TC (at RIKEN), pos=10cm



Typical ToT spectra

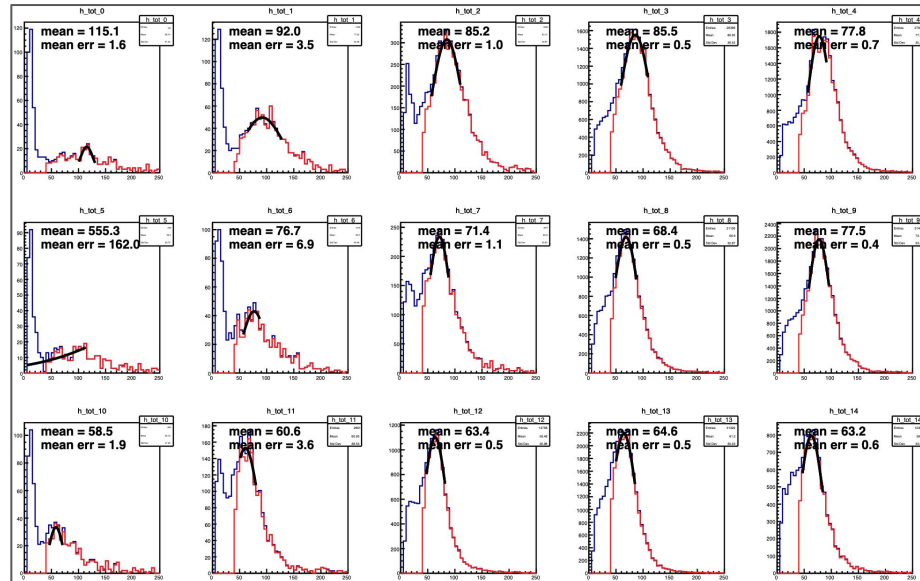
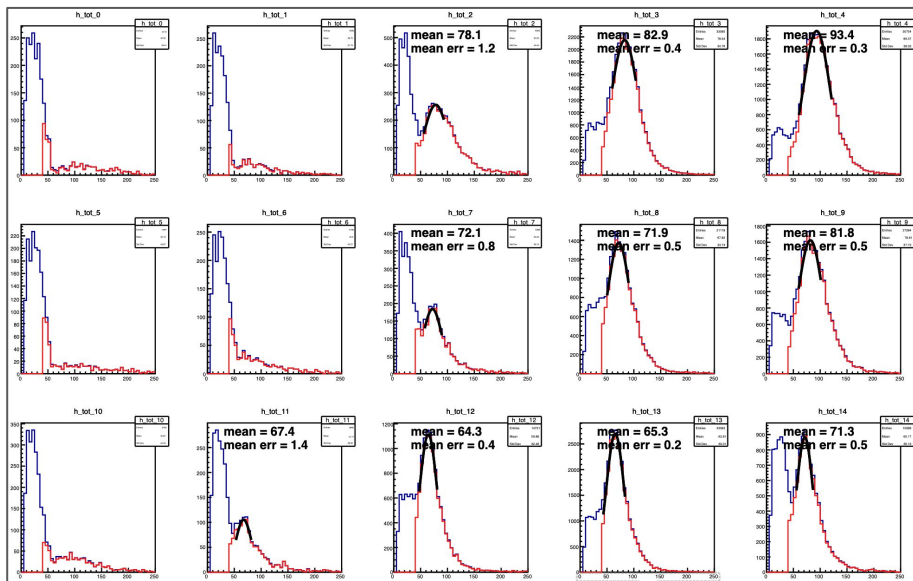
-2700V, $V_{th}=-1.5V$, 90Sr, pos=Signal-side

— raw

— range & first

E80-TC (at RIKEN), pos=20cm

E15-TC (at RIKEN), pos=10cm



Typical ToT spectra

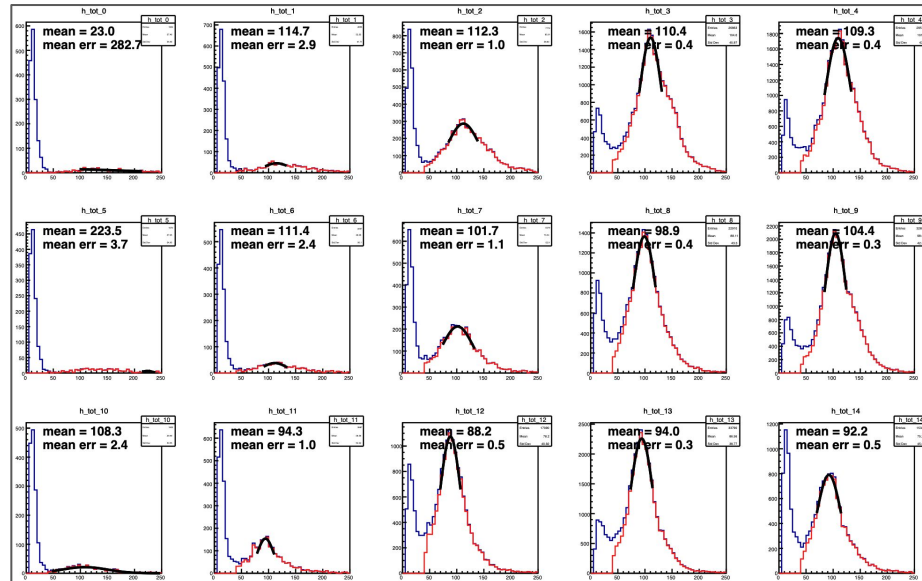
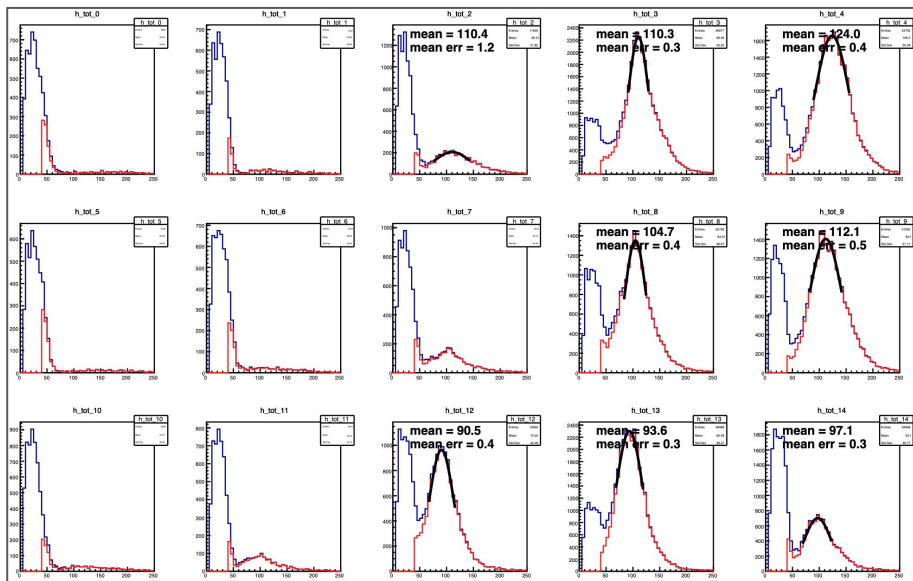
-2800V, $V_{th}=-1.5V$, 90Sr, pos=Signal-side

— raw

— range & first

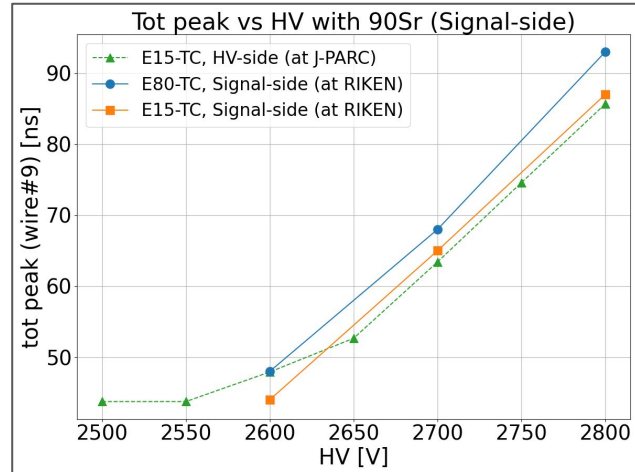
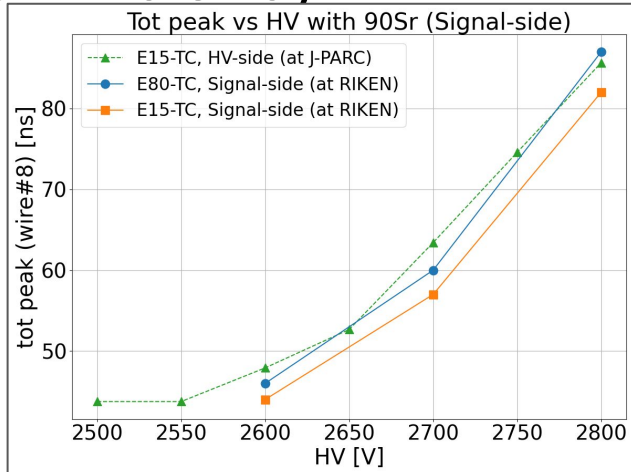
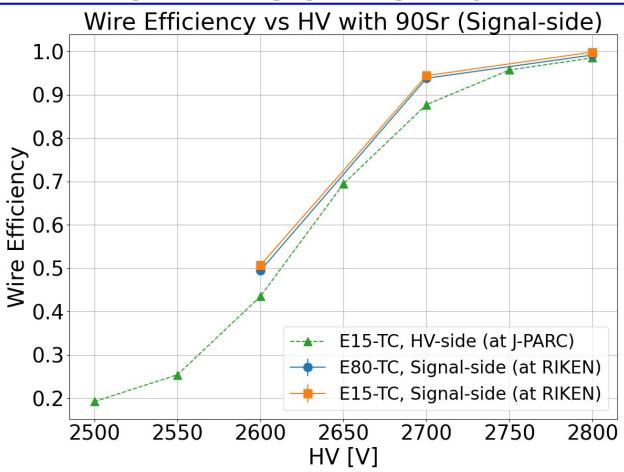
E80-TC (at RIKEN), pos=20cm

E15-TC (at RIKEN), pos=10cm



Two peaks **don't** appear in E80-TC.

ToT Peak and Wire Efficiency



c.f.) Result of HV-side

