

# Weekly Meeting

- TC
  - Rough Efficiency Comparison between ASAGI and SONY-ASD
  - Cosmic Data: TDC spectra etc... and its Reproductivity
  - Status and Prospect about ASAGI
- CDC
  - Status
- ToDo

<https://nulljapan.jp/presen-black-back/>

○ □ [nulljapan.jp/presen-black-back/](https://nulljapan.jp/presen-black-back/)

**PS** これ以上ない資料を  
プレサボ

## 黒背景にするときの注意点

心理学者のコシーマ・ビーベンブロックとスザン・マイヤーが2013年に発表した論文によると、白背景に黒い文字のほうが、正確さもパフォーマンスも高かったといいます。

実験参加者に視力検査と校正作業を行ってもらったところ、白背景に黒い文字のほうが読む速度が速く、見つけた誤字脱字の数も多かったのです。

つまり、黒背景にするのであれば、あまり情報を詰め込んでしまうと、読み手や聞き手にストレスを与えてしまうということになります。

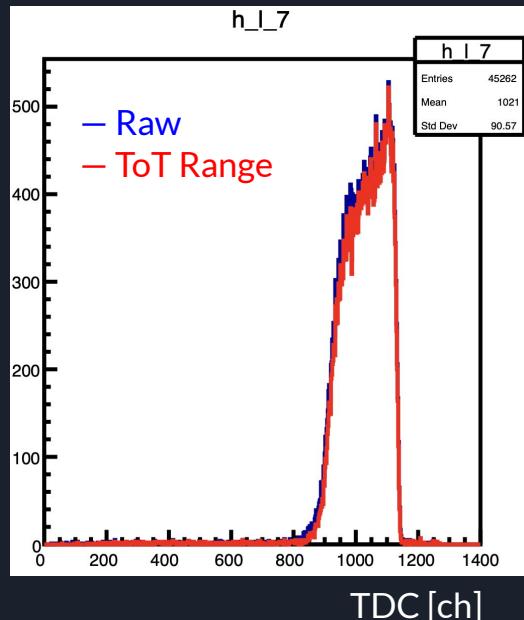
ですので、黒背景を使う場合にはテキストなどの情報量を減らすようにしましょう！

2025.09.10, Y. Kimura (RARiS D1)

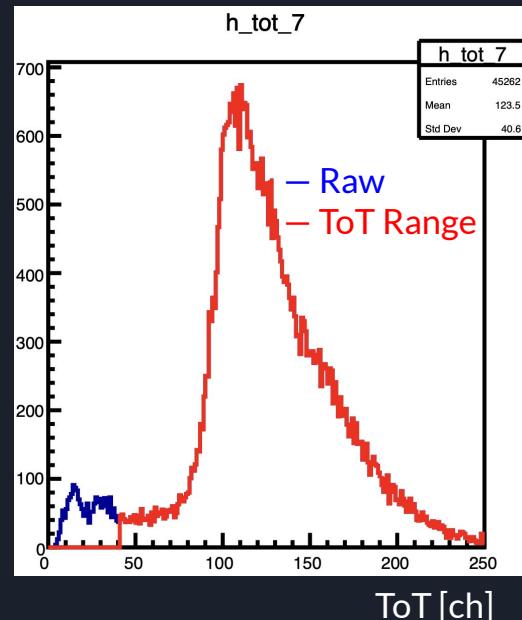
# TC : Typical TDC Spectra

- ❑ GasStudy/tdc\_2025Jul/Run382 (2025.09.07)
  - ❑ 90Sr, -2800 V, pos=24cm
  - ❑ ASAGI "184411, vth=-39.6mV"

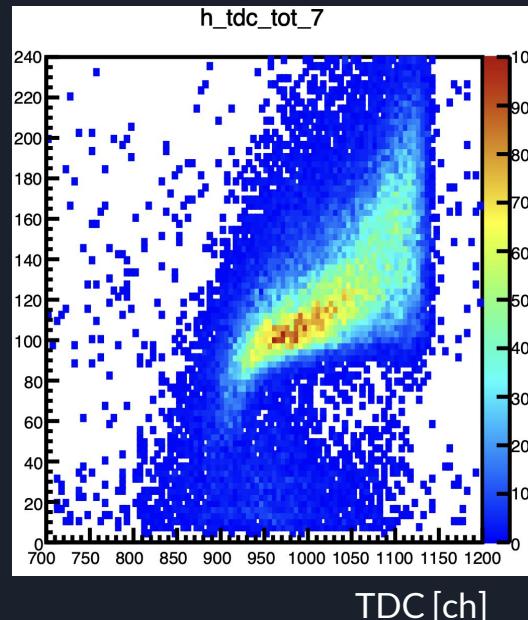
Count



Count



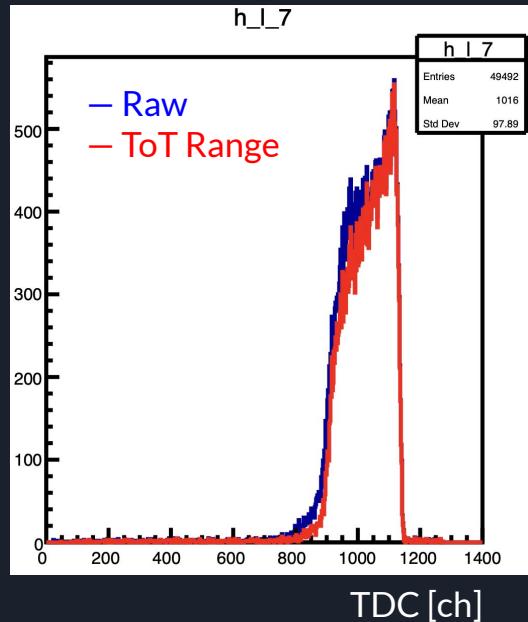
ToT [ch]



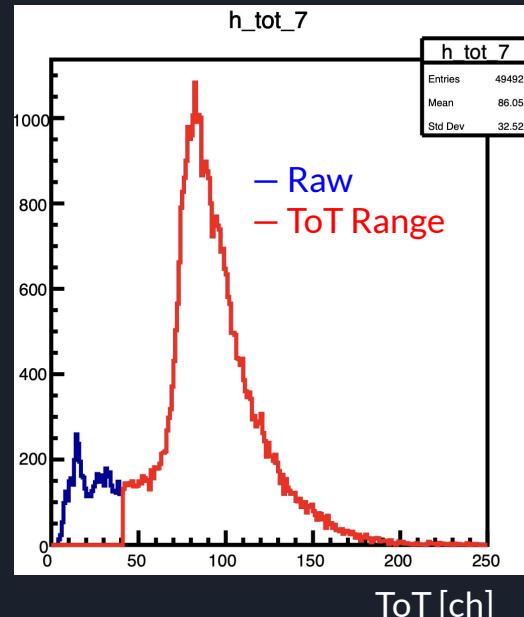
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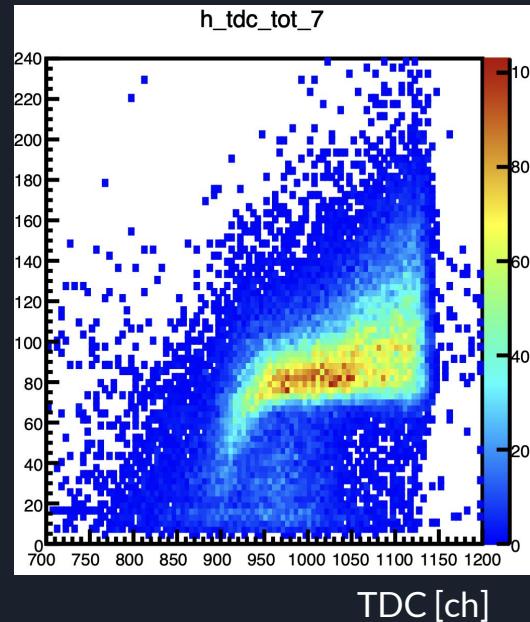
Count



Count



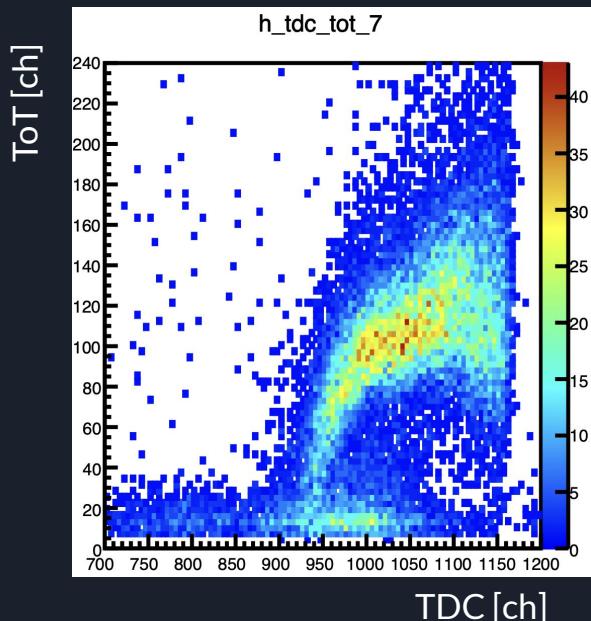
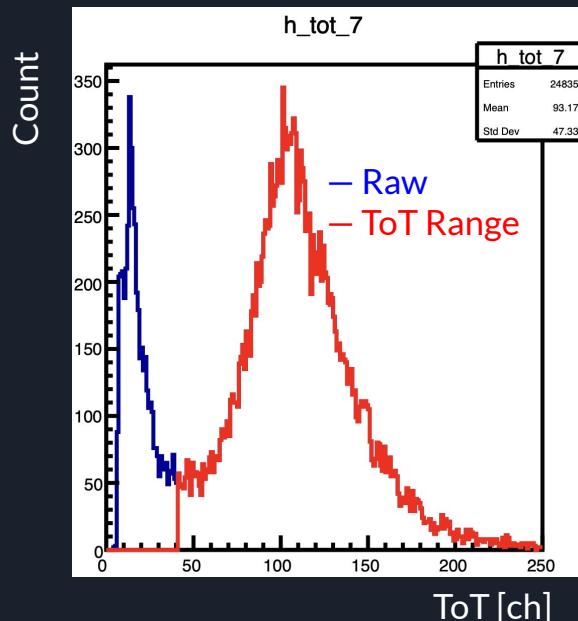
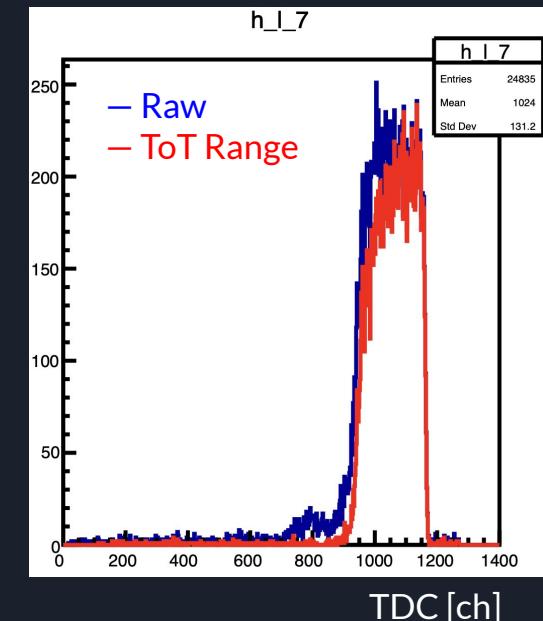
ToT [ch]



# TC : Typical TDC Spectra

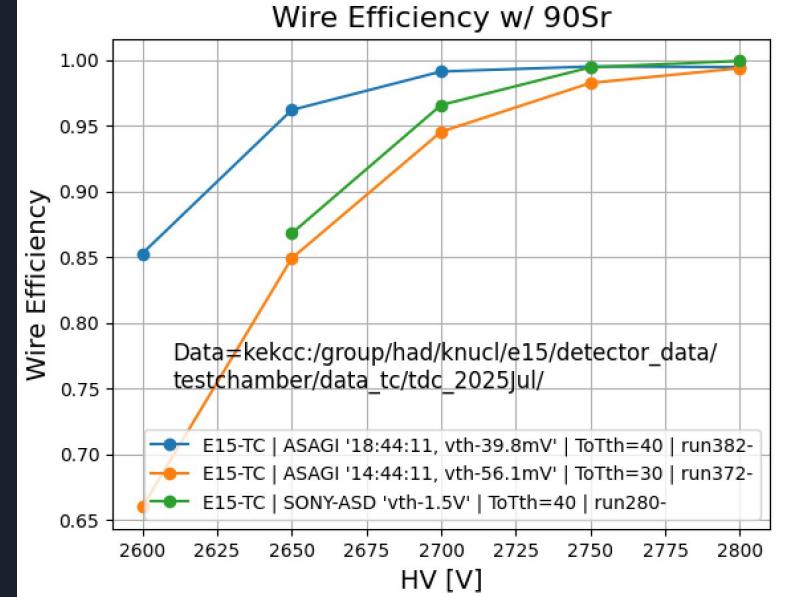
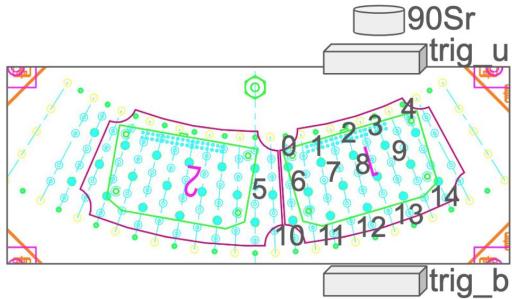
ToTのリニアリティ

- ❑ GasStudy/tdc\_2025Jul/Run280 (2025.08.02)
  - ❑ 90Sr, -2800 V, pos=29cm
  - ❑ SONY-ASD “vth=-1.5V”



# TC : Efficiency (ASAGI vs SONY)

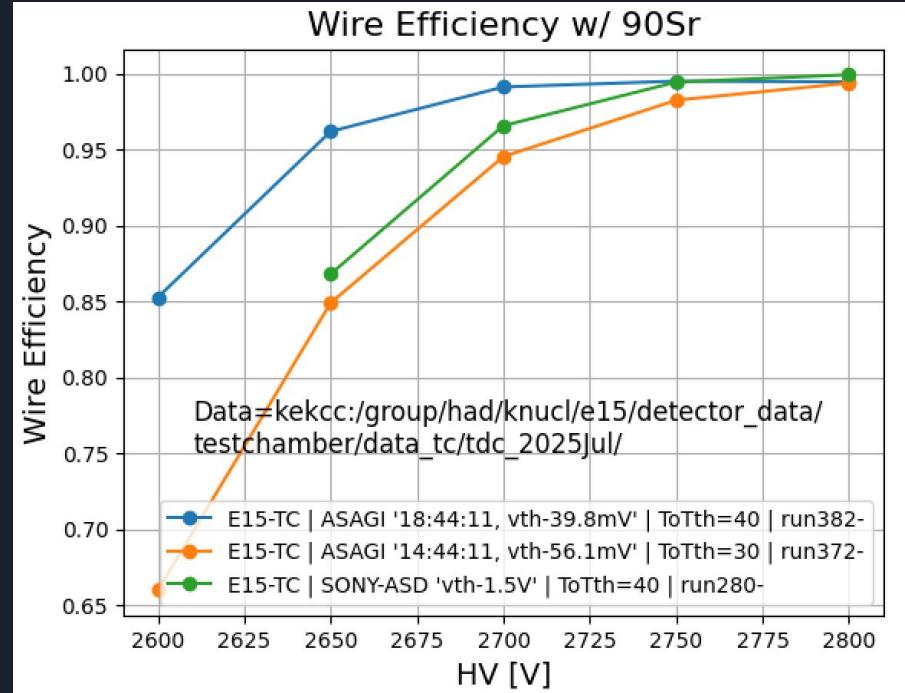
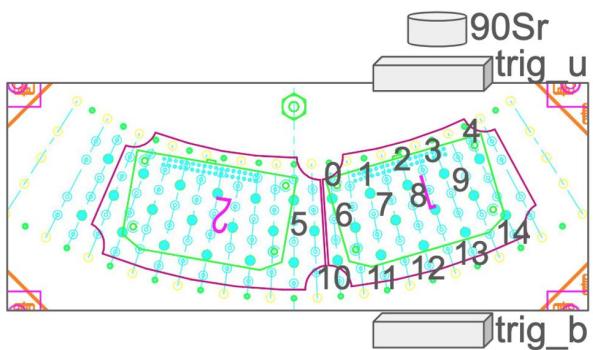
- ✓ 90Sr
- ✓ Ar-C2H6 (50:50)
- ✓ Pre-Amp Card  
(SONY-CXA3653Q,  $\tau = 16$  ns)
- ✓ 検出効率の定義
  - ✓ Layer1 と 3 が鳴ったとき、  
Layer2 の適当な wire が  
鳴った割合(例えば 2, 8, 12 など)



- SONY-ASD seems to approach 100% efficiency.
  - (Hypothesis) The presence of long tails may reduce the detection efficiency of ASAGI.
- ASAGI shows strong dependence of efficiency curves on parameters.
  - Proper choice of parameters and corresponding Vth settings is crucial.

# TC : Efficiency (ASAGI vs SONY)

- ✓ 90Sr
- ✓ Ar-C2H6 (50:50)
- ✓ Pre-Amp Card  
(SONY-CXA3653Q,  $\tau = 16$  ns)
- ✓ 検出効率の定義
  - ✓ Layer1と3が鳴ったとき、Layer2の適当なwireが鳴った割合(例えば2,8,12など)



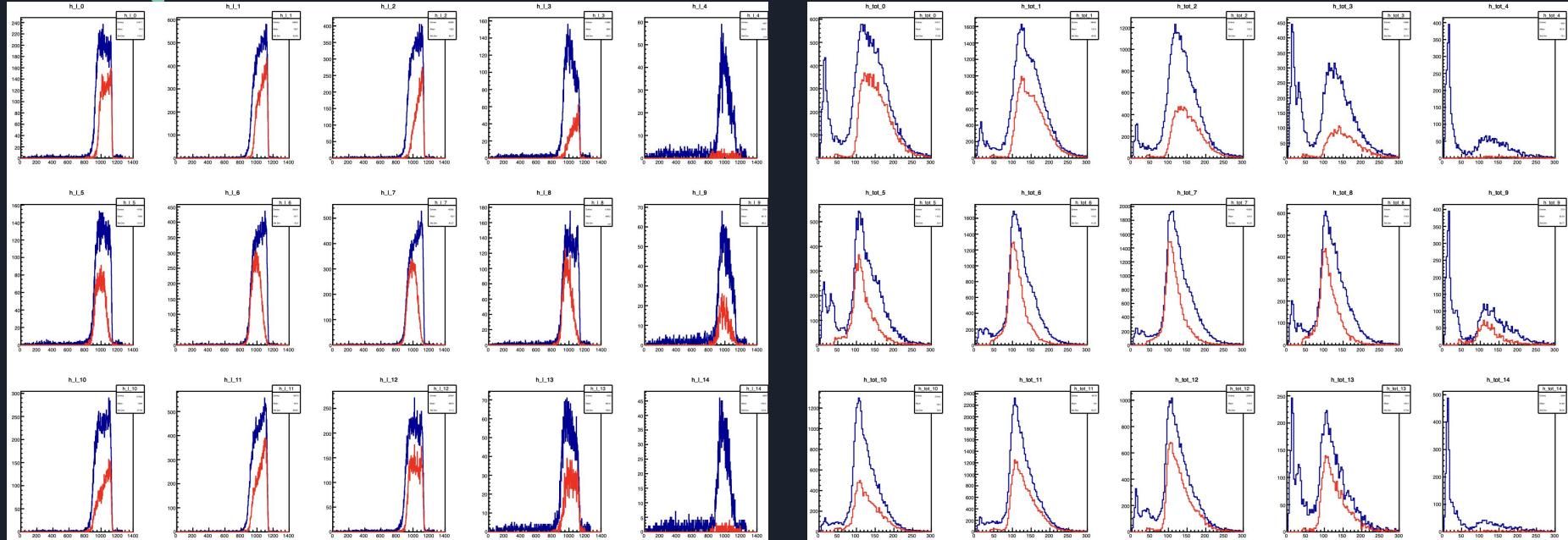
- SONY-ASDの方が100%に近づきそう。
  - (仮説) ロングテールの存在がASAGIの検出効率を低くしてそう。
- ASAGIはパラメータによって検出効率曲線が大きく異なる。
  - パラメータとそれにあったVth設定が非常に重要。

# TC : LTDC and ToT only using tracked events

LTDC of Layer2 looks too strange!!!

— Raw  
— in Tracked events

1,3にヒットの時  
2



My analysis codes may be wrong. So I will fix them and report the results in the next MTG.



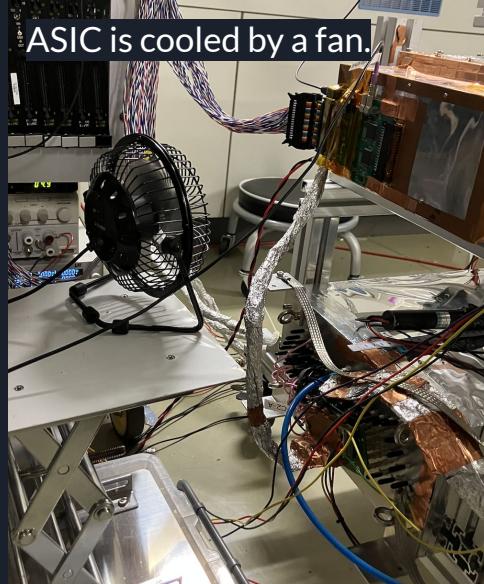
# TC : Cosmic-Ray Data

- ❑ Goal
  - ❑ To evaluate the position resolution with two test chamber
    - ❑ Comparison
      - ❑ E80-TC vs E15-TC
      - ❑ SONY-ASD vs ASAGI
- ❑ in This Report
  - ❑ Reproductivity check with using two cosmic-ray data

# TC : Cosmic-Ray Data

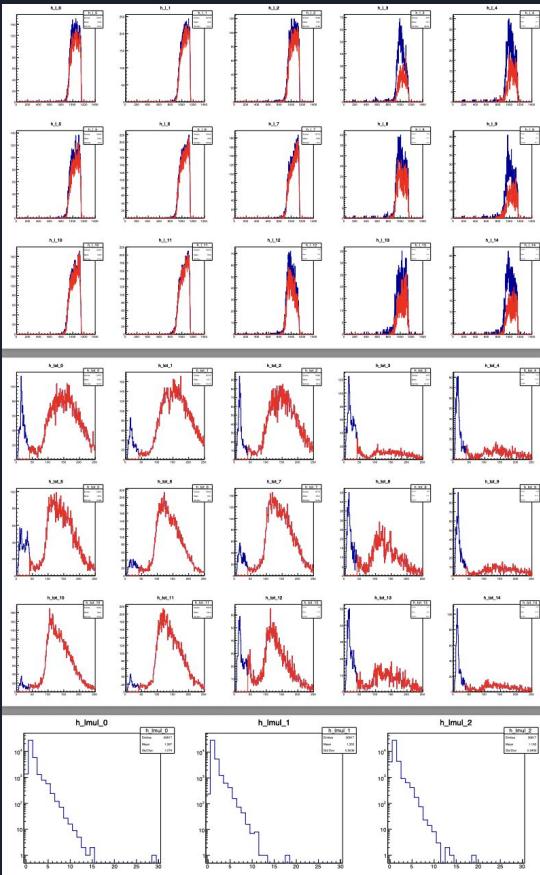
- ❑ GasStudy/tdc\_2025Jul/Run381 (2025.08.27 - 2025.09.07)
- ❑ GasStudy/tdc\_2025Jul/Run388 (2025.09.07 - 2025.09.11)
  - ❑ Cosmic, -2800 V, pos=24cm
  - ❑ E15-TC
    - ❑ ASAGI "184411, vth=-39.6mV"
  - ❑ E80-TC
    - ❑ SONY "vth=-3.0V"
- ❑ HV-Current right before the end of run388
- ❑ This values was kept throughout the period of data taking

test1pot	10.00 uA	2800.0 V	0.32 uA	2799.8 V	On
test1gua	10.00 uA	1500.0 V	0.02 uA	1499.8 V	On
test2pot	10.00 uA	2800.0 V	0.00 uA	2799.5 V	On
test2gua	10.00 uA	1500.0 V	0.00 uA	1499.8 V	On

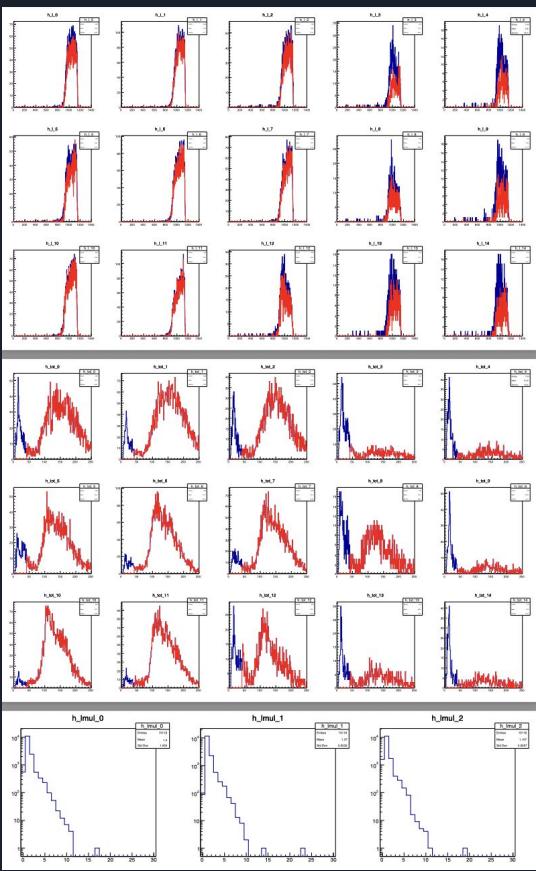


# TC : Cosmic Data, LTDC, ToT, Multiplicity (Layer)

Run381 (2025.08.27 - 2025.09.07)



Run388 (2025.09.07 - 2025.09.11)



At first glance,  
the reproducibility looks great.

# TC : Cosmic Data, Rough Efficiency

The way to calc. the eff. is the same as the previous page.

```
Processing tc_eff.C(381)...  
Info in <TCanvas::Print>: pdf file pic/tc_eff_  
Info in <TCanvas::Print>: Current canvas added  
##### Efficiency #####  
=====  
denominator : 16588  
Wire Efficiency : 0.994876  
Error : 0.000552949  
=====  
l_bunbo[0] : 32248  
layer_Efficiency[0] : 0.977704  
Error : 0.00081296  
=====  
l_bunbo[1] : 31757  
layer_Efficiency[1] : 0.992821  
Error : 0.000472061  
=====  
l_bunbo[2] : 34370  
layer_Efficiency[2] : 0.917341  
Error : 0.00142261  
=====
```

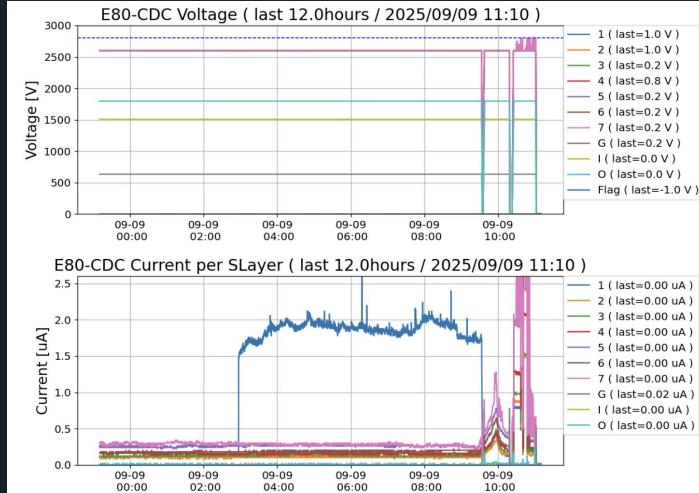
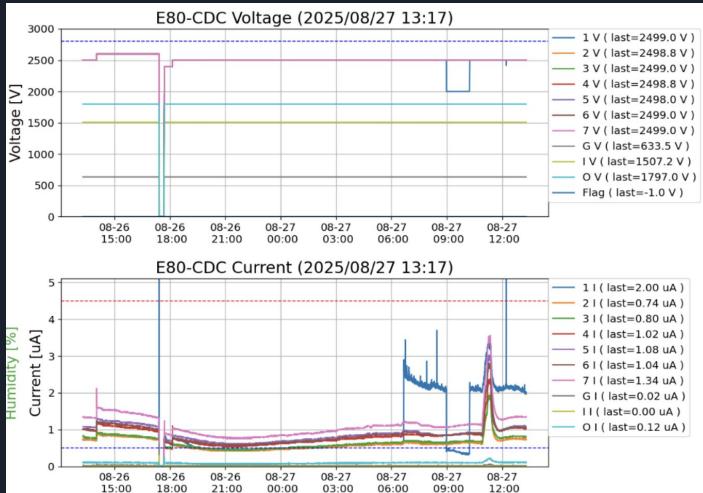
```
Processing tc_eff.C(388)...  
Info in <TCanvas::Print>: pdf file pic/tc_eff_  
Info in <TCanvas::Print>: Current canvas added  
##### Efficiency #####  
=====  
denominator : 6879  
Wire Efficiency : 0.994621  
Error : 0.000879493  
=====  
l_bunbo[0] : 13269  
layer_Efficiency[0] : 0.977617  
Error : 0.00126972  
=====  
l_bunbo[1] : 13043  
layer_Efficiency[1] : 0.994556  
Error : 0.000642511  
=====  
l_bunbo[2] : 14152  
layer_Efficiency[2] : 0.91662  
Error : 0.00222491  
=====
```

- 再現性ok。
- 今後
  - トラッキング(with 6 Layers)に挑戦してみる。
  - Test Chamberで位置分解能評価できるか?

# TC : Status of ASAGI

- ❑ Goal
  - ❑ Efficiency, Resolution and Noise Level of ASAGI ver.2.0 (16ch) are better than (or as good as )SONY's ASD  
→ Use for E80-CDC
- ❑ What I've done ( What I can do )
  - ❑ With using ASAGI ver.1.5 (32ch) attached on E15-TC,
    - ❑ To control the all parameters freely
    - ❑ To check the analog out of test pulse and real signal from wires
      - ❑ 90Sr: Done
      - ❑ 55Fe: Not yet
    - ❑ To reduce the noise by Cu tape
    - ❑ To find the good combination of RCparam and Vth (e.g. "18:44:11, -39.1mV")
      - ❑ Not to oscilate
      - ❑ One peak ToT (peak pos = 100 ~ 150 [ch])
    - ❑ To derive the rough efficiency with 90Sr and cosmic-ray
      - ❑ SONY's ASD has better Max performance ?(see p.5 in this slide)
  - ❑ Suggestion
    - ❑ We may need to deal with the long tail.
- ❑ What I will after getting the ASAGI ver.2.0 (16ch)
  - ❑ To find the best parameter set
  - ❑ To compare it with SONY's ASD
  - ❑ If it looks good → with E80-CDC

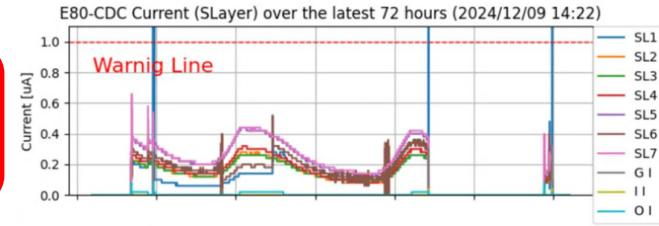
# CDC : Status



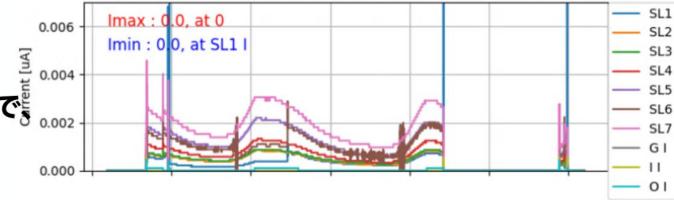
- ❑ All caps was shortened.
  - ❑ Current was calm down.
- ❑ But SLayer1 is in the trouble. Current in SL1 often rises at ~2.5 uA.
  - ❑ Before the cap shortening work, SL1's Itrip is easy to happen.
  - ❑ In next business trip to Tokai,
    - ❑ To look for wrong parts
    - ❑ To check the condition of caps, Al plates etc... (GND is no problem.)

# DOLAMI CDC Status

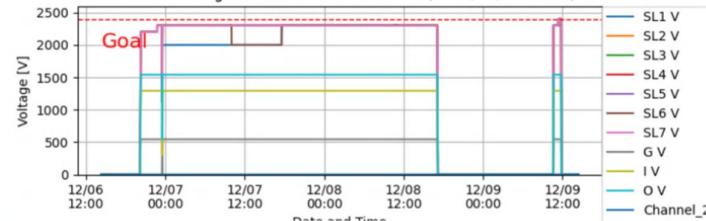
E80-CDC HV aging transition



E80-CDC Current (Wire) over the latest 72 hours (2024/12/09 14:22)



E80-CDC Voltage over the latest 72 hours (2024/12/09 14:22)





# To Do (2025.09.11時点)

- To modify my JPS slide (10 minutes talk)
  - To take pictures of wave form on E80-TC and E15-TC
    - 55Fe and 90Sr
- HYP2025 slide (10 minutes talk)
  - How change ?
  - I will share ver.0 by this week.
- RARiS WS (X minutes talk)
  - Contents (physics)



# To Do (2025.09.22時点)

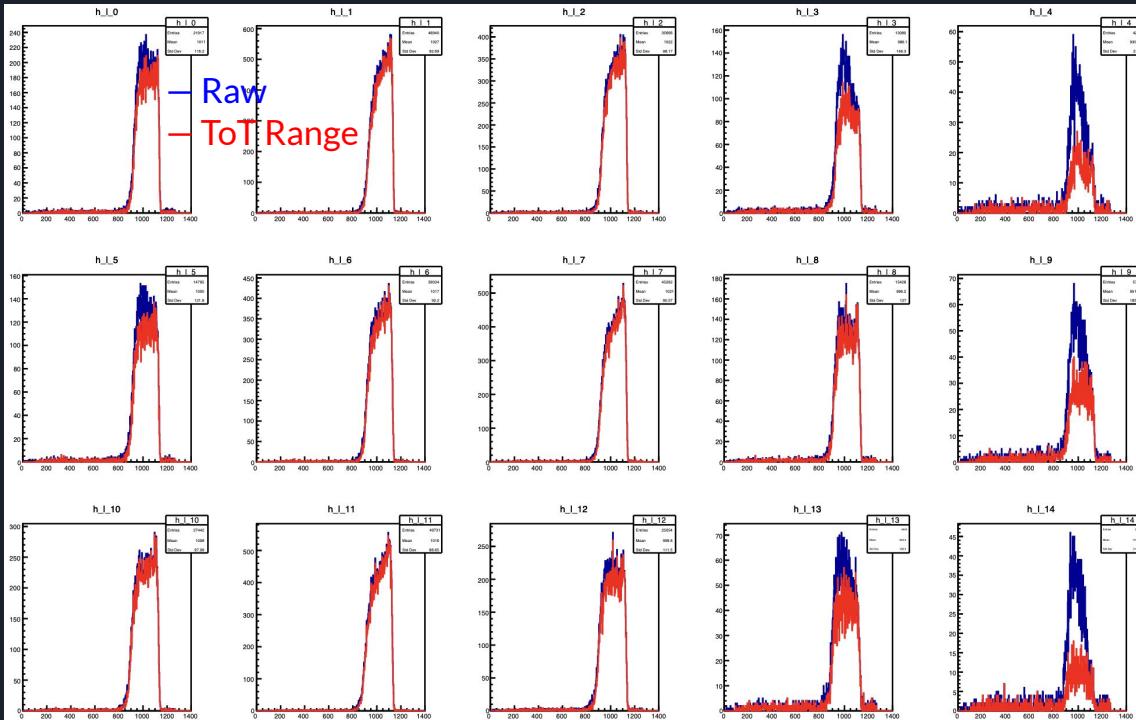
- ❑ Tracking w/ E15-TC and E80-TC
- ❑ HYP2025 slide (10 minutes talk)
  - ❑ I will share ver.-1 now.
- ❑ RARiS WS (X minutes talk)
  - ❑ Contents (physics)



# Back Up

# TC : LTDC Spectra

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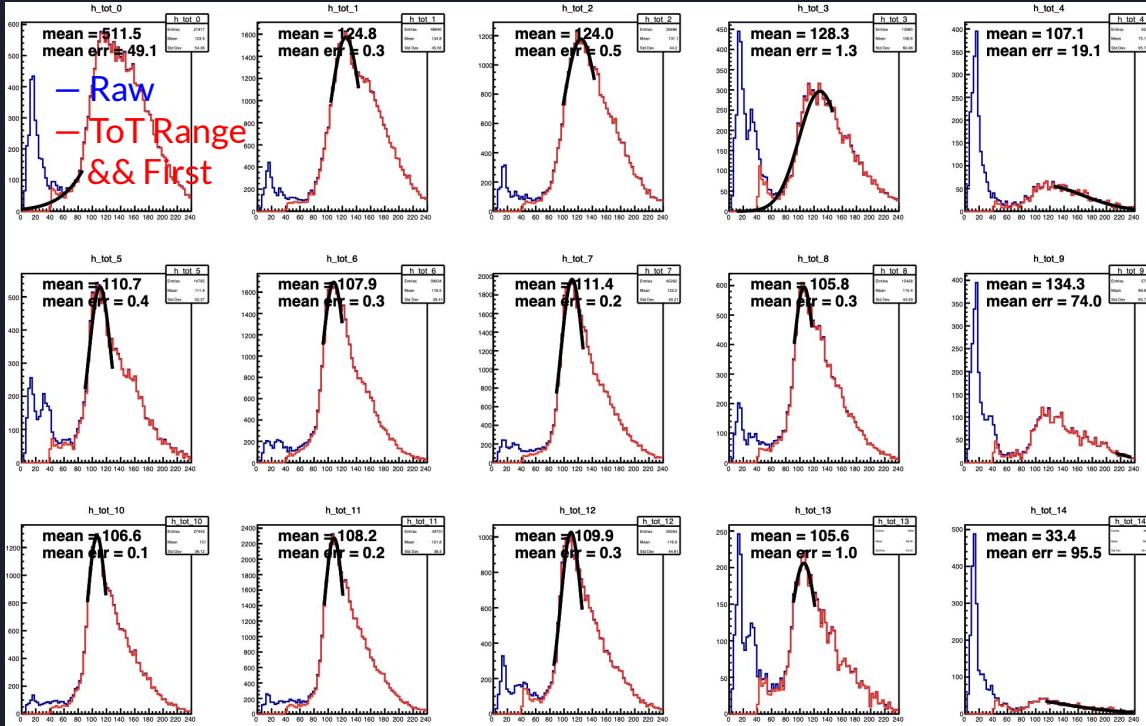
# TC : ToT Spectra

- GasStudy/tdc\_2025Jul/Run280 (2025.08.02)
  - 90Sr, -2800 V, pos=24cm
  - SONY-ASD "vth=-1.5V"

Inner  
Bigger ToT

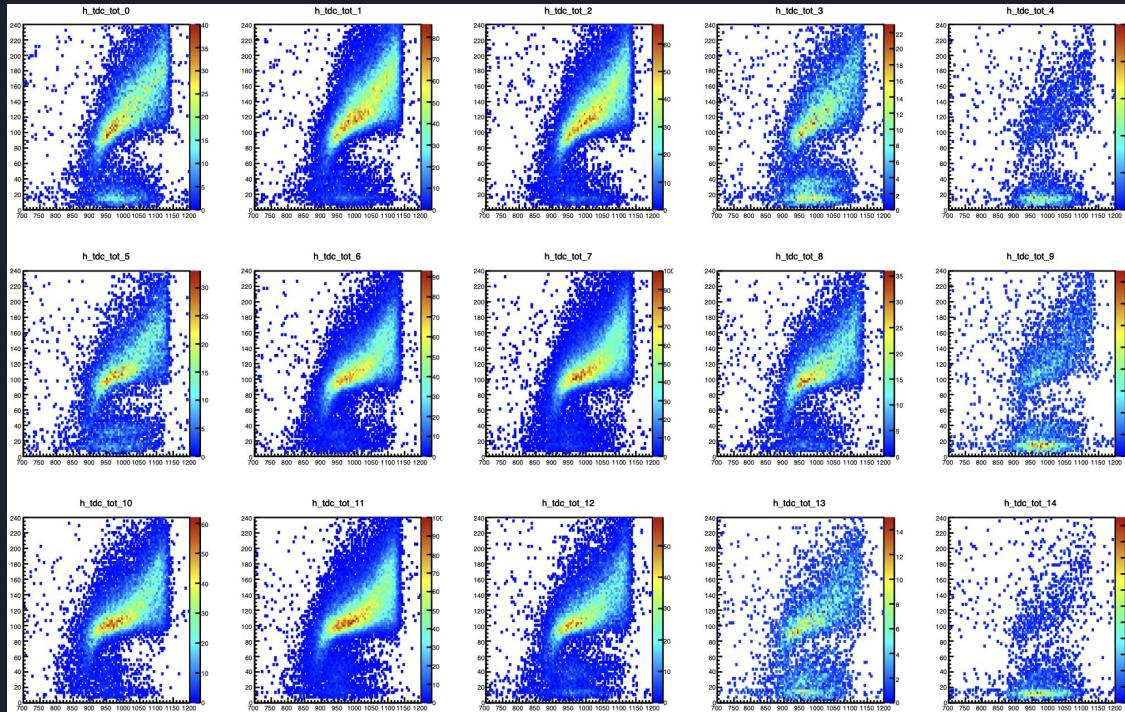


Outer  
Smaller ToT



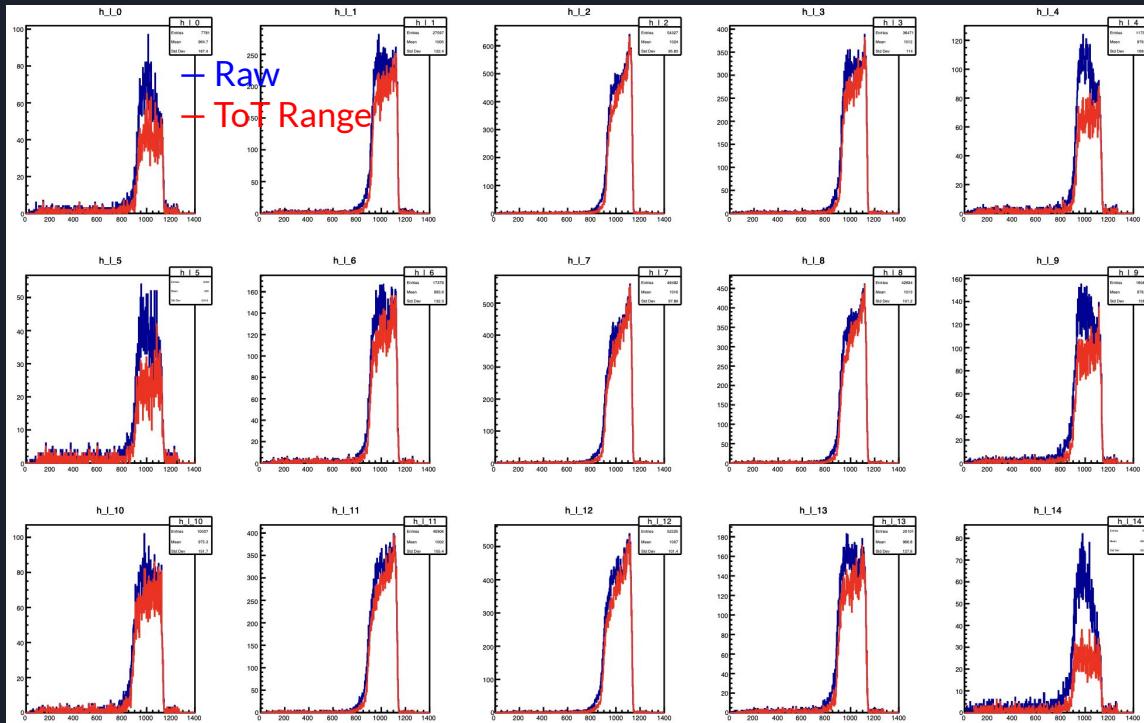
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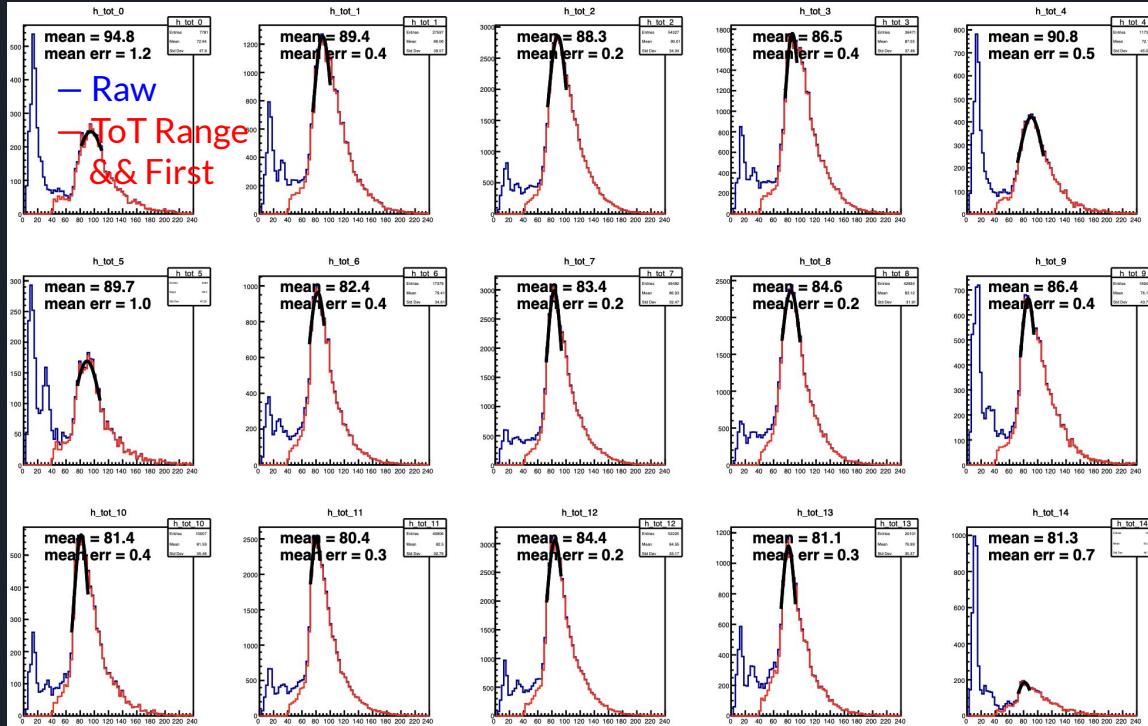
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Bigger ToT

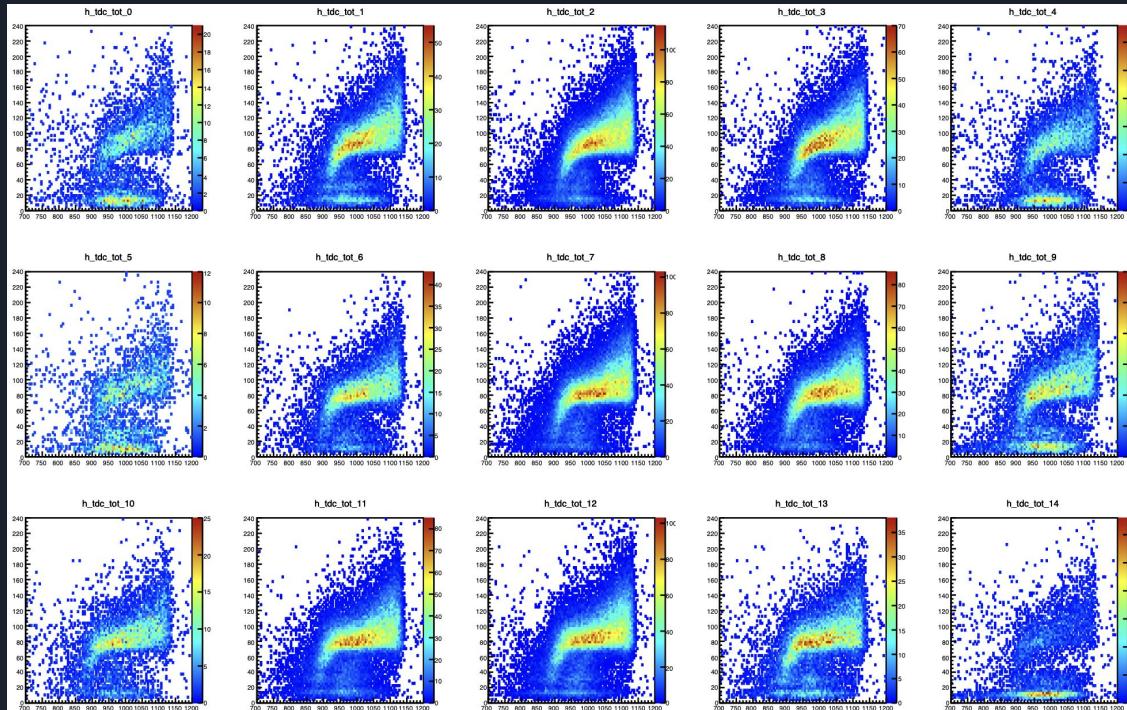


Outer  
Smaller ToT



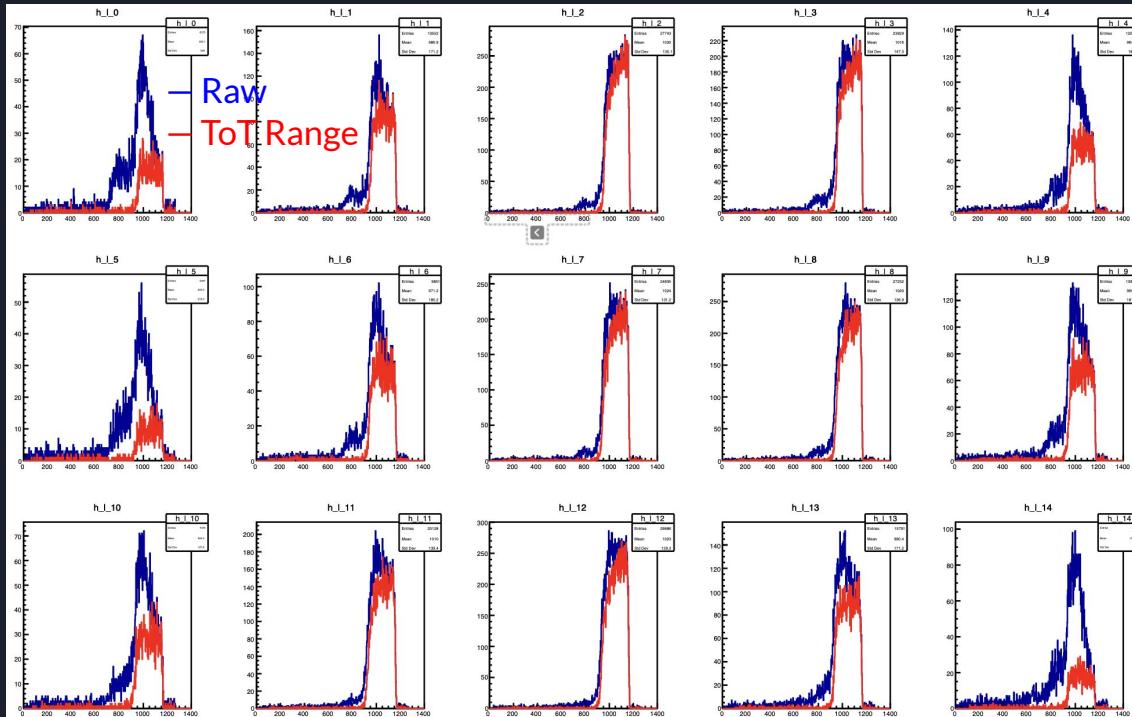
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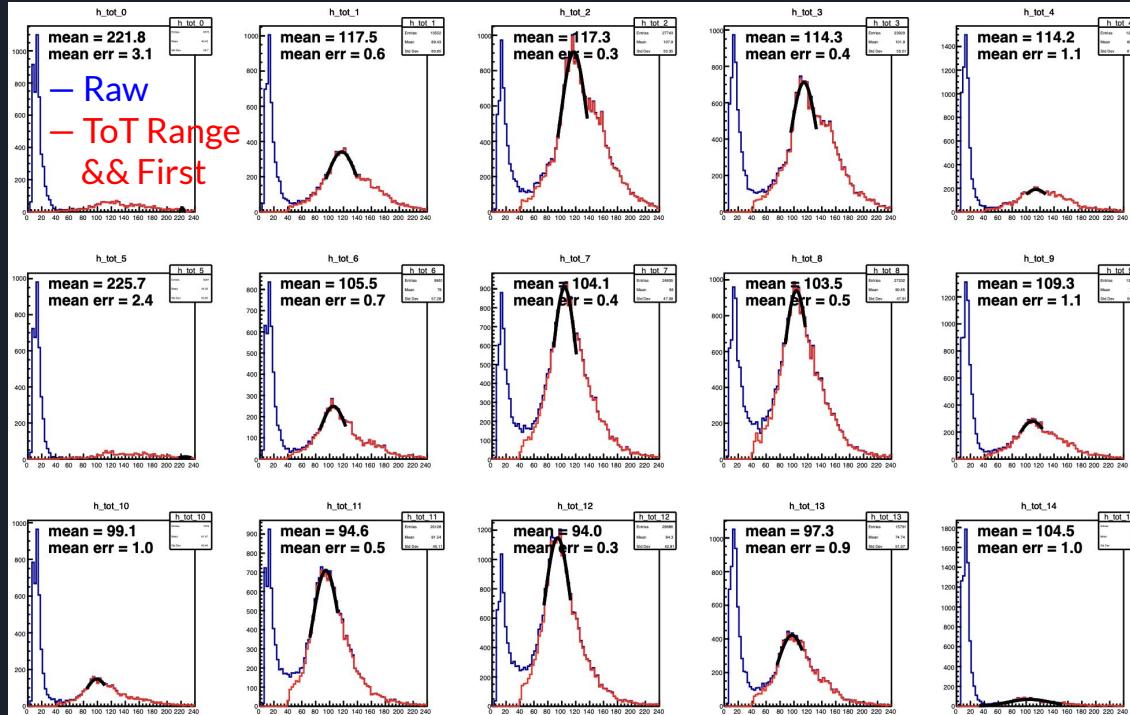
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Inner  
Bigger ToT



Outer  
Smaller ToT



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