

A first look at the test beam data

- Dark noise
- Run 56 ?
- LED

Practical considerations

Beam type	Runs
Electron	25-32
Pion	35 - 58
Muon	33,34 and 59,60

GRAiNITA type	Runs
Troll1 + Water	11- 51
Troll1 + Heavy Liquid	56 – 62
Troll2 + Heavy Liquid	52- 55

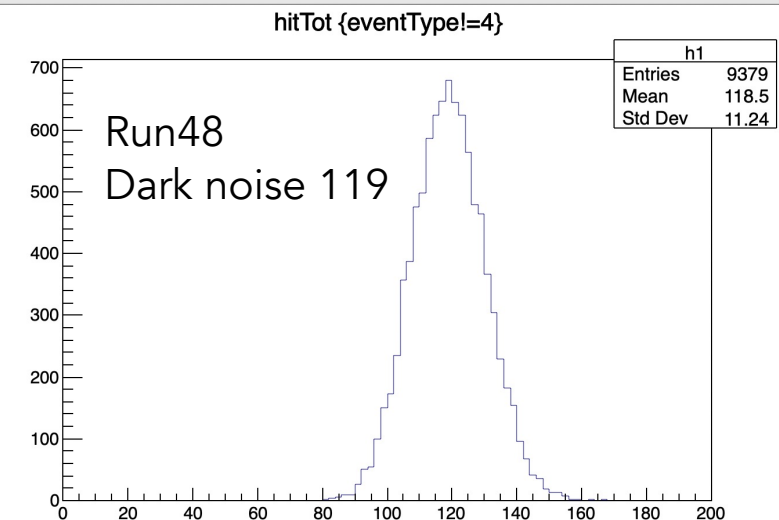
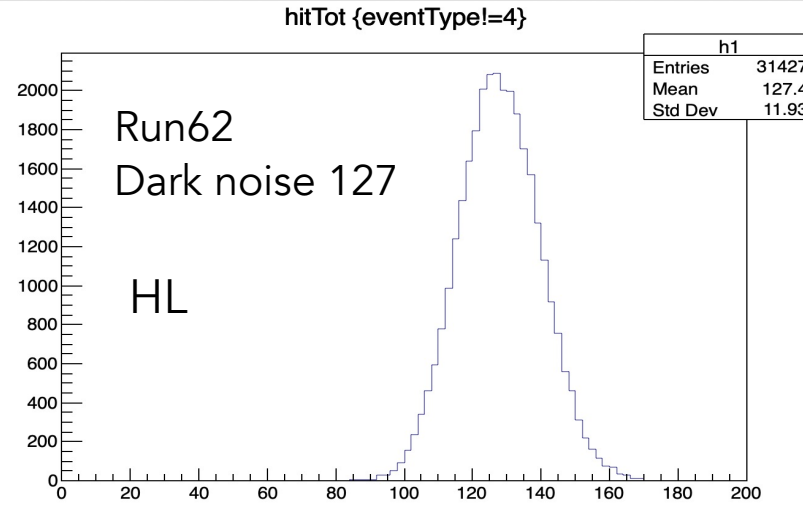
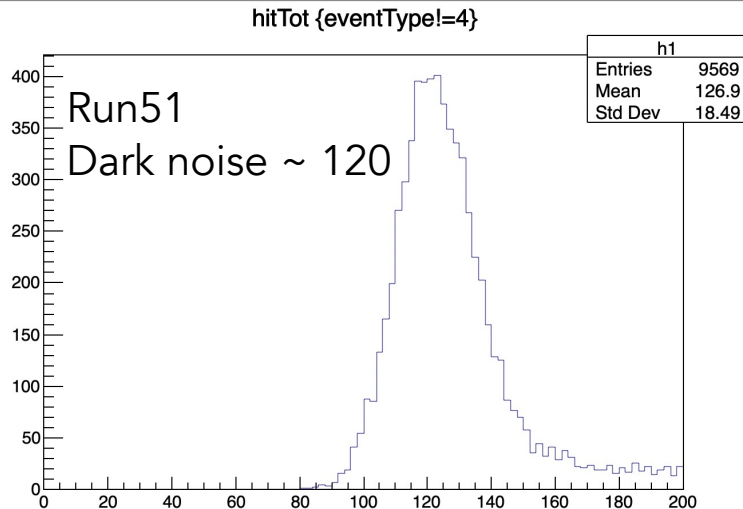
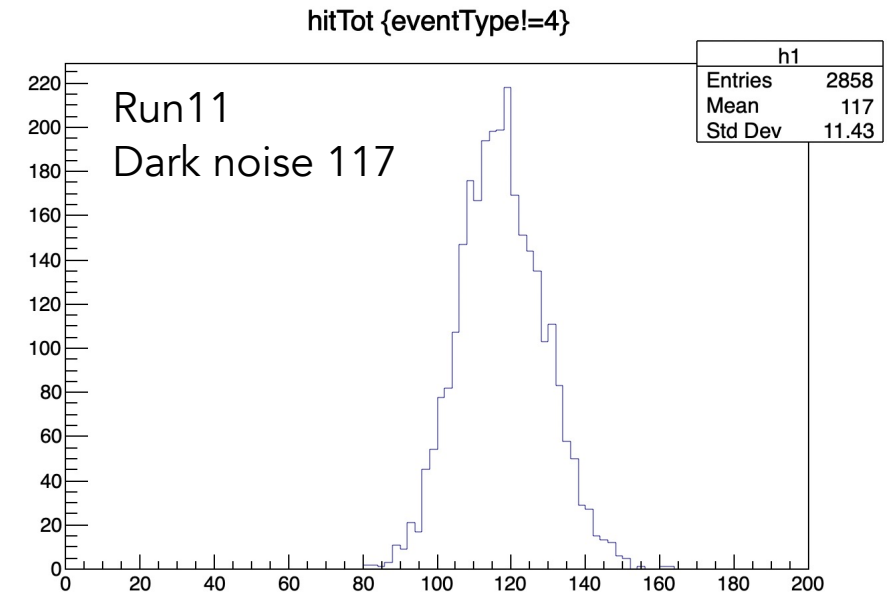
SiBB configuration	Runs
OK	11- 51 and 62
Degraded	52 – 61

More info in the [logbook](#)

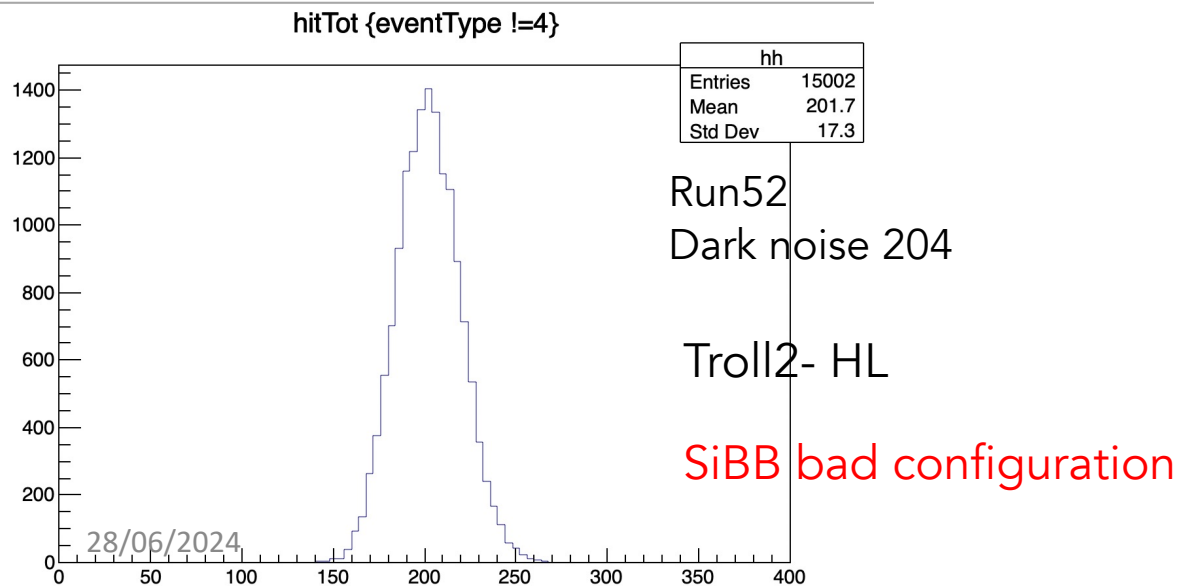
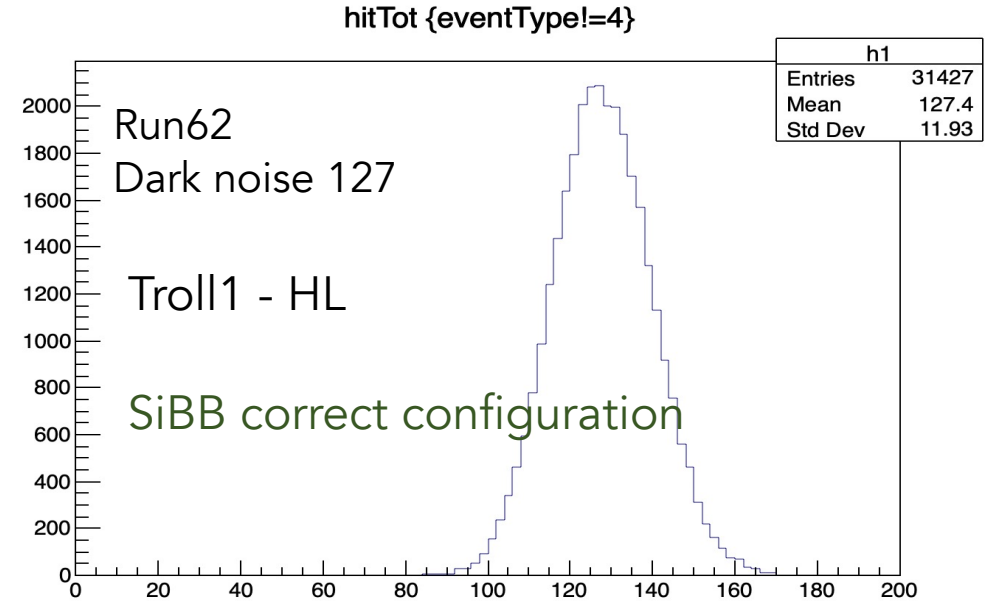
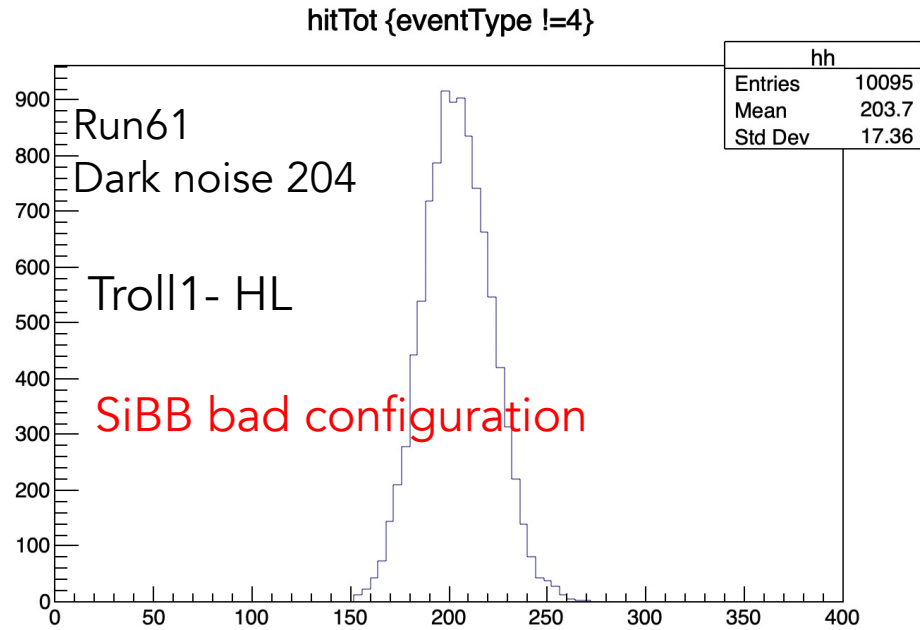
Dark noise studies - 1

Troll1 – Water except Run62 (HL) – SiBB correct configuration

For the SiBB correct configuration
Dark noise ~ stable (small increase at the end ?)

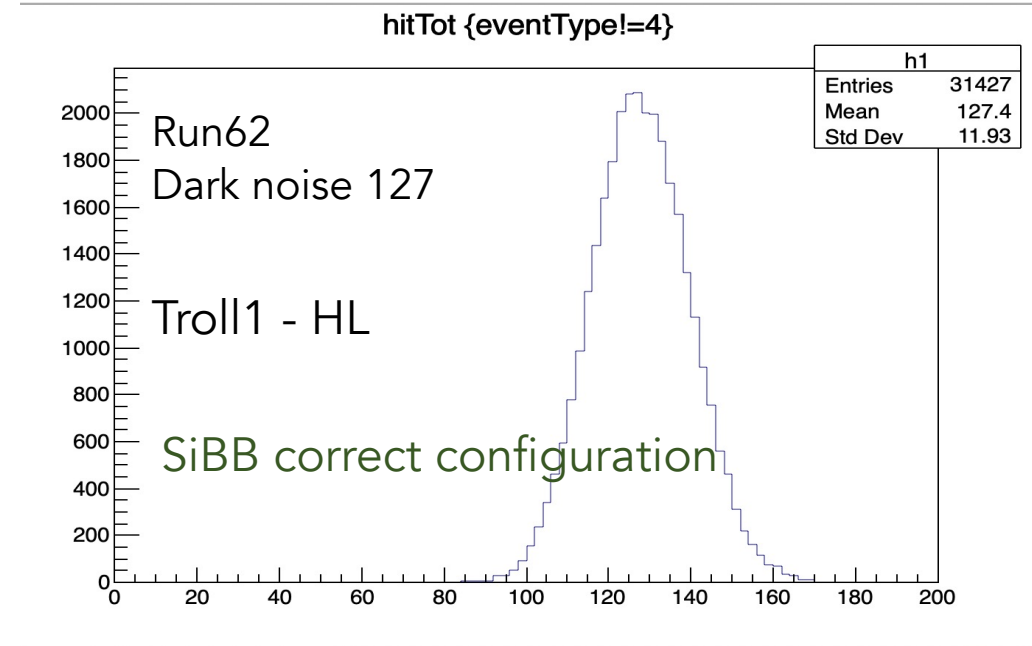
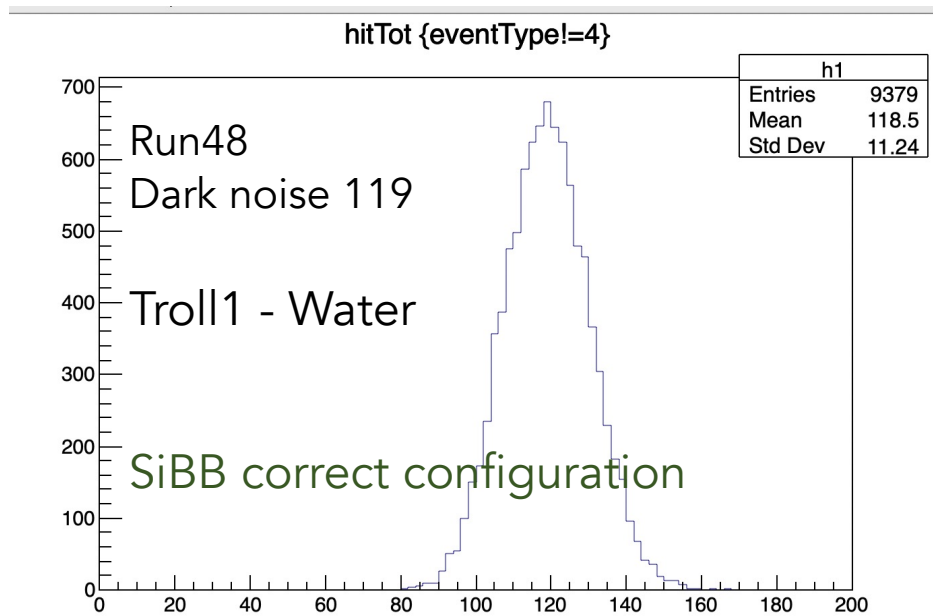


Dark noise studies – 2: SiBB config



Clear effect of the configuration
As expected Troll1 & Troll2 identical

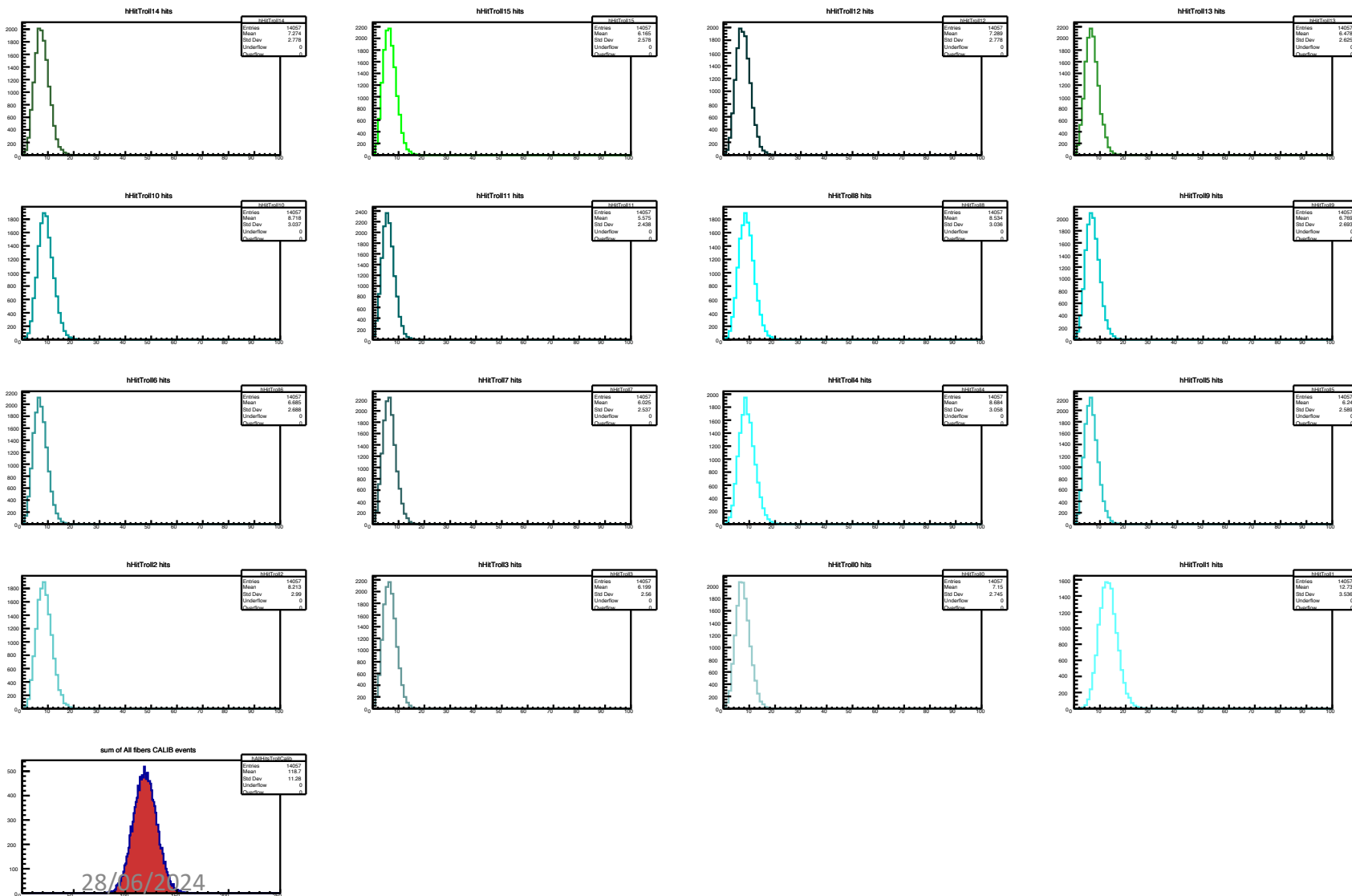
Dark noise studies – 3: HL vs water



In principle we should measure the same for HL and water
~ 10 counts difference .. Temperature effect ?

Dark noise studies – 4: maps

Correct SiBB – Run 47 & 48



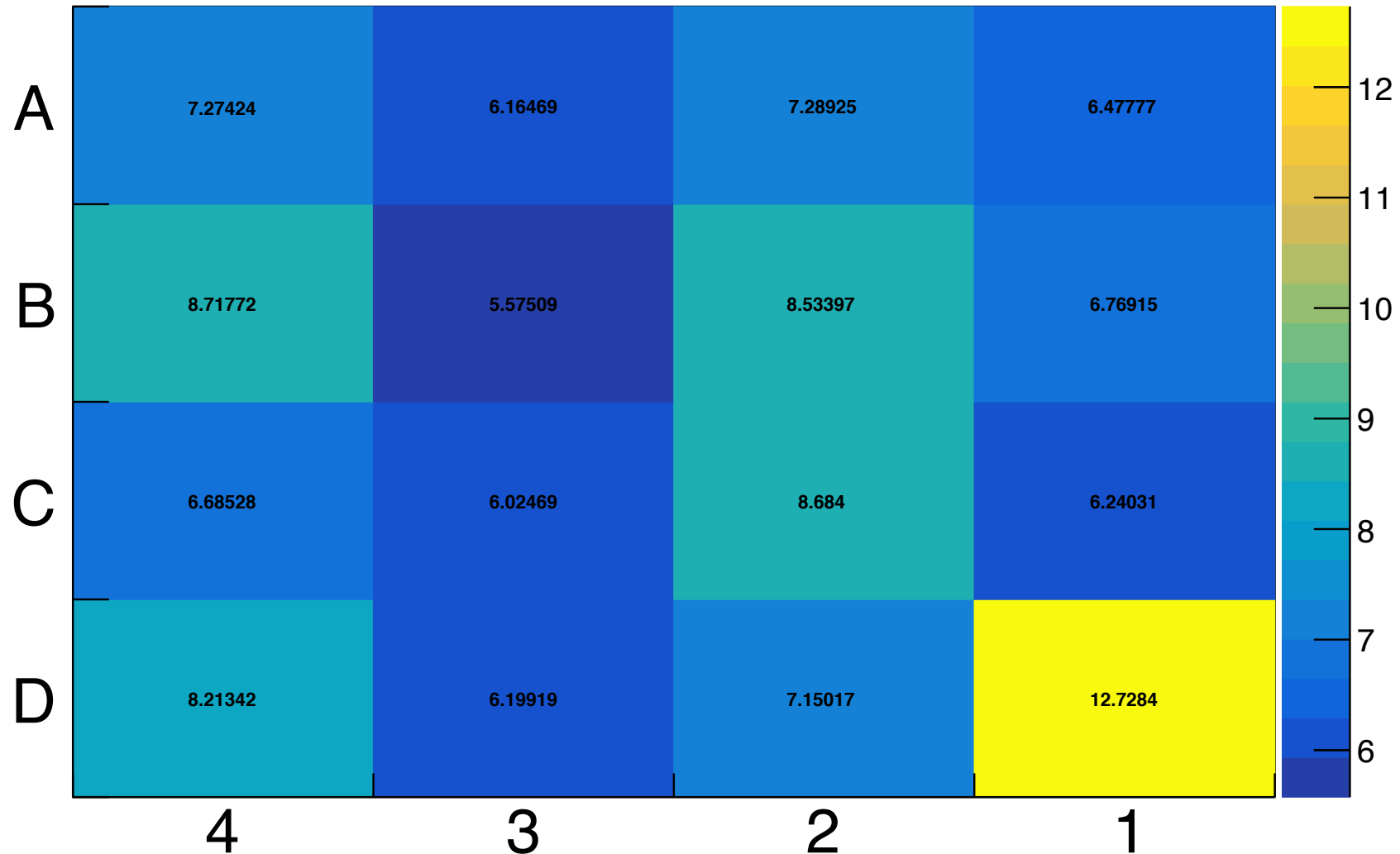
Run 47 & 48

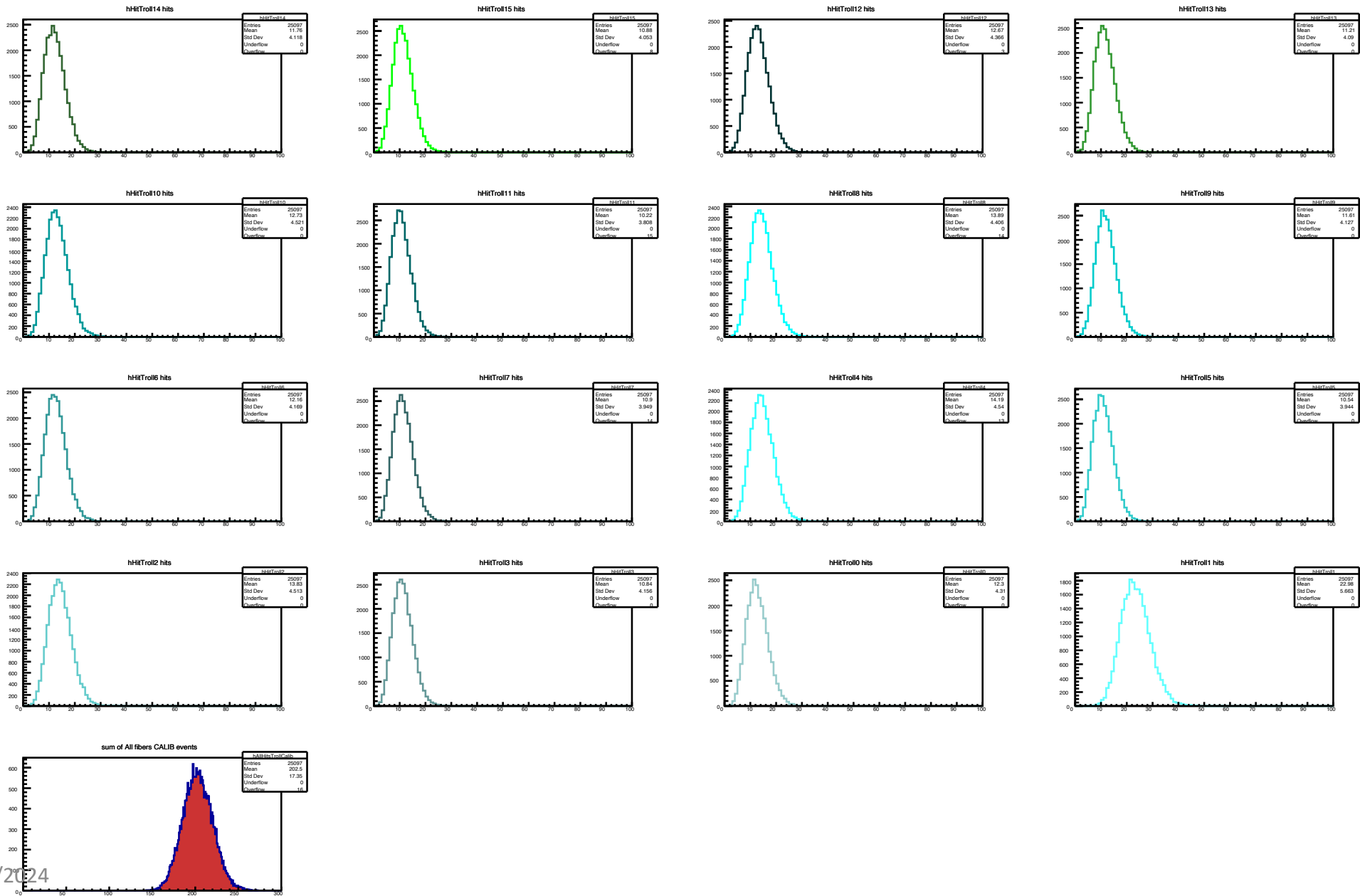
Channel 0 average noise= 7.15017
Channel 1 average noise= 12.7284
Channel 2 average noise= 8.21342
Channel 3 average noise= 6.19919
Channel 4 average noise= 8.684
Channel 5 average noise= 6.24031
Channel 6 average noise= 6.68528
Channel 7 average noise= 6.02469
Channel 8 average noise= 8.53397
Channel 9 average noise= 6.76915
Channel 10 average noise= 8.71772
Channel 11 average noise= 5.57509
Channel 12 average noise= 7.28925
Channel 13 average noise= 6.47777
Channel 14 average noise= 7.27424
Channel 15 average noise= 6.16469

Dark noise studies – 4: maps

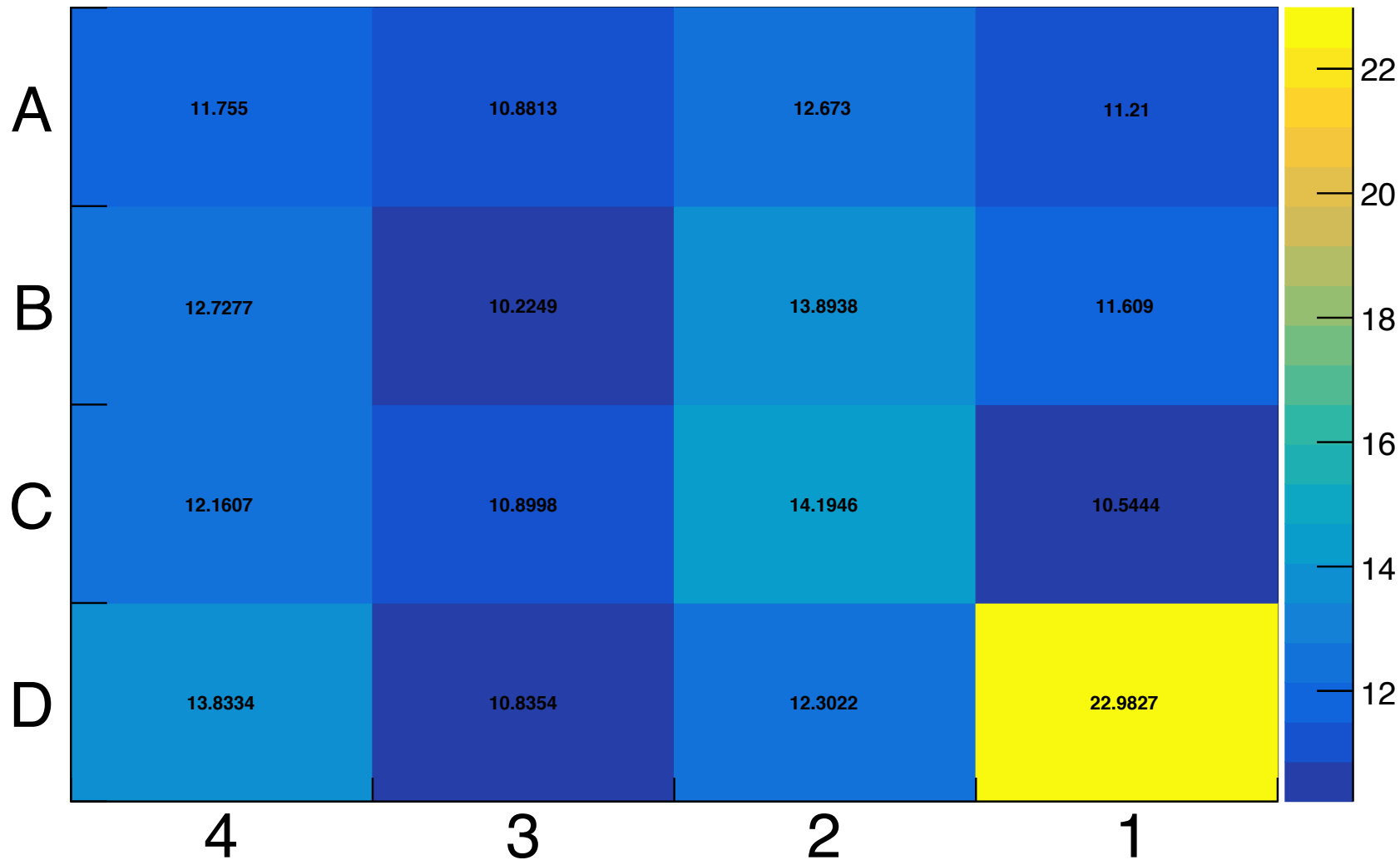
Correct SiBB – Run 47 & 48

16 fibers intensity map





16 fibers intensity map

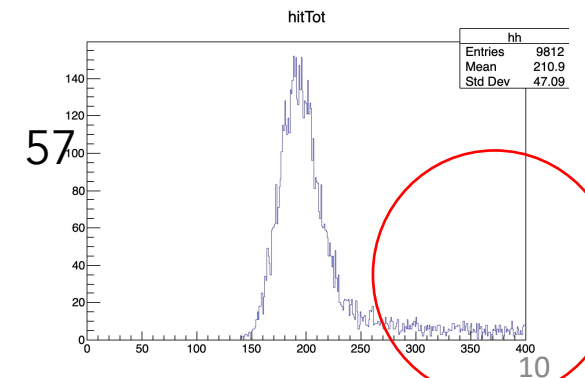
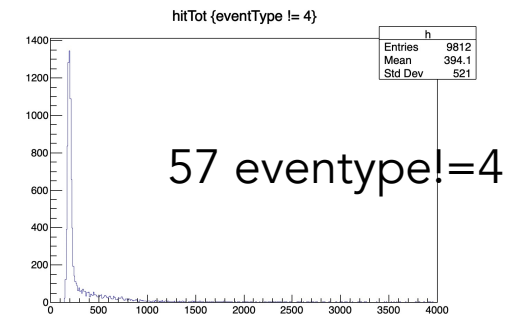
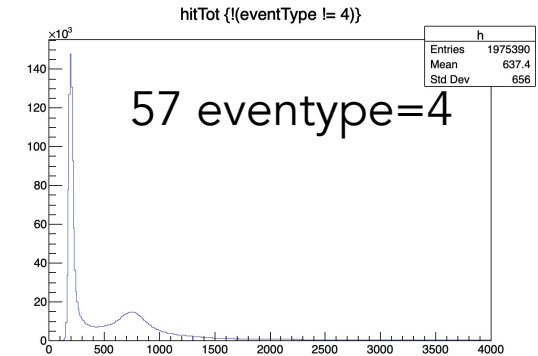


Similar pattern

Channel 0	average noise= 12.3022
Channel 1	average noise= 22.9827
Channel 2	average noise= 13.8334
Channel 3	average noise= 10.8354
Channel 4	average noise= 14.1946
Channel 5	average noise= 10.5444
Channel 6	average noise= 12.1607
Channel 7	average noise= 10.8998
Channel 8	average noise= 13.8938
Channel 9	average noise= 11.609
Channel 10	average noise= 12.7277
Channel 11	average noise= 10.2249
Channel 12	average noise= 12.673
Channel 13	average noise= 11.21
Channel 14	average noise= 11.755
Channel 15	average noise= 10.8813

Dark noise - first conclusions

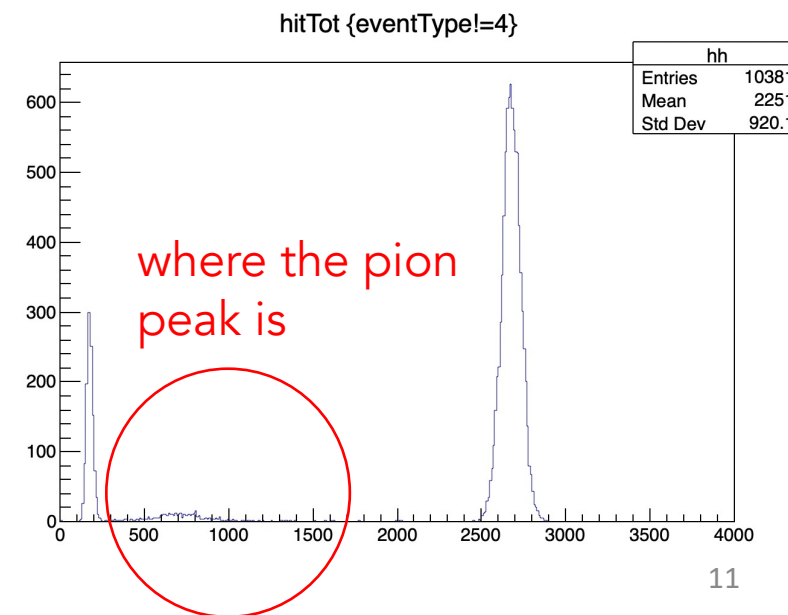
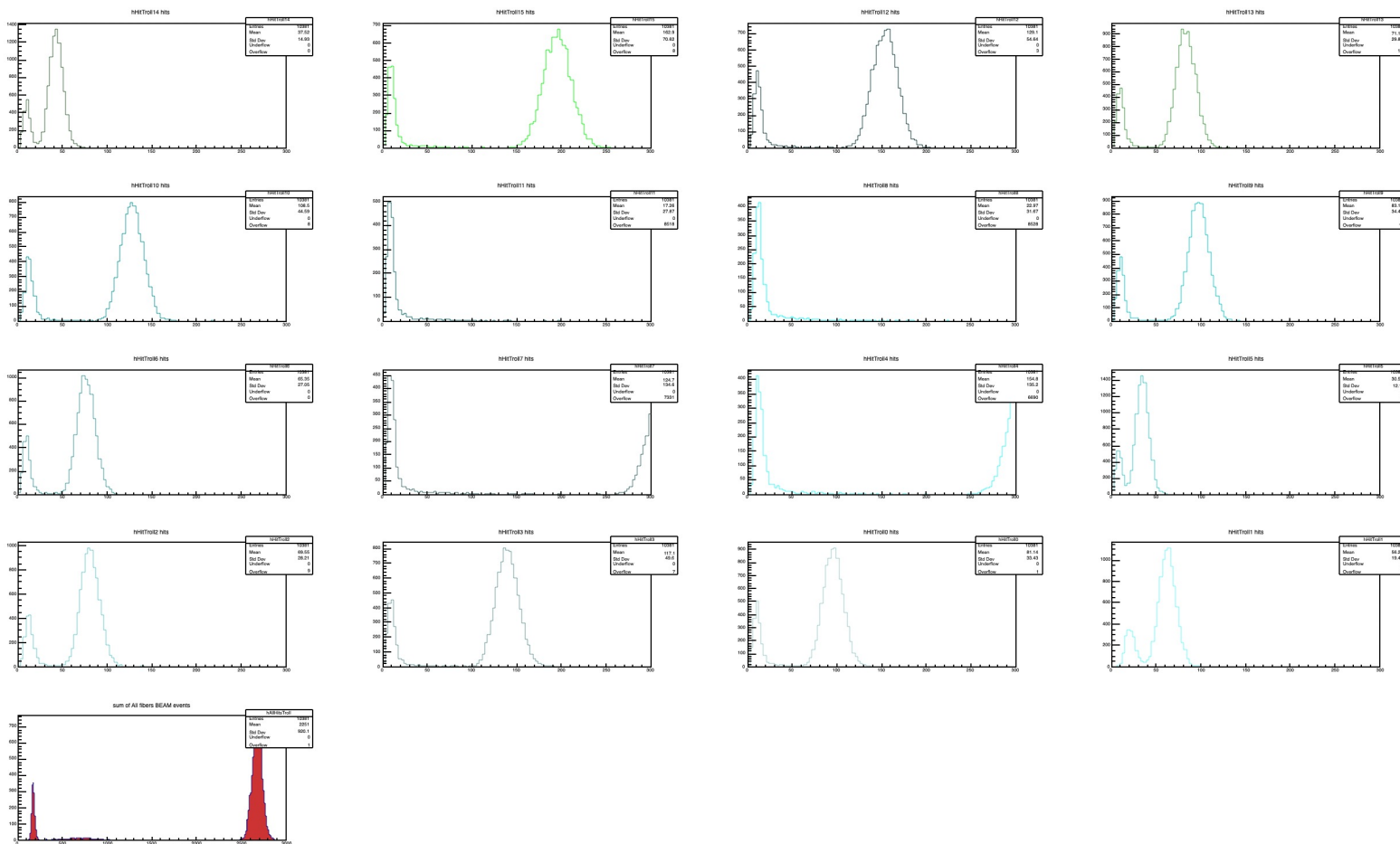
- Troll1 vs Troll2 : can use the same
 - Can use the same for HL & water
 - Dark noise is changing for the two SiBB configurations but seems rather stable for a given SiBB config.
- Can create 2 txt files (one for each SiBB configuration) containing the Dark noise to be subtracted channel by channel
- Some Beam runs are taken with Pedestal trigger (event Type !=4) in (eg 57) but not obvious to use



Run 56 is weird (issues with trigger ?)

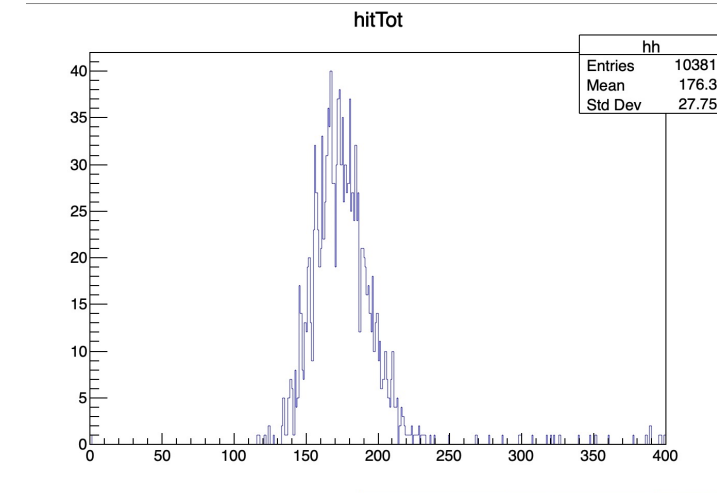
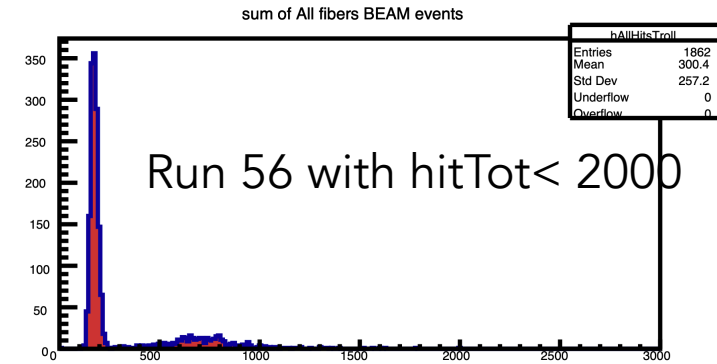
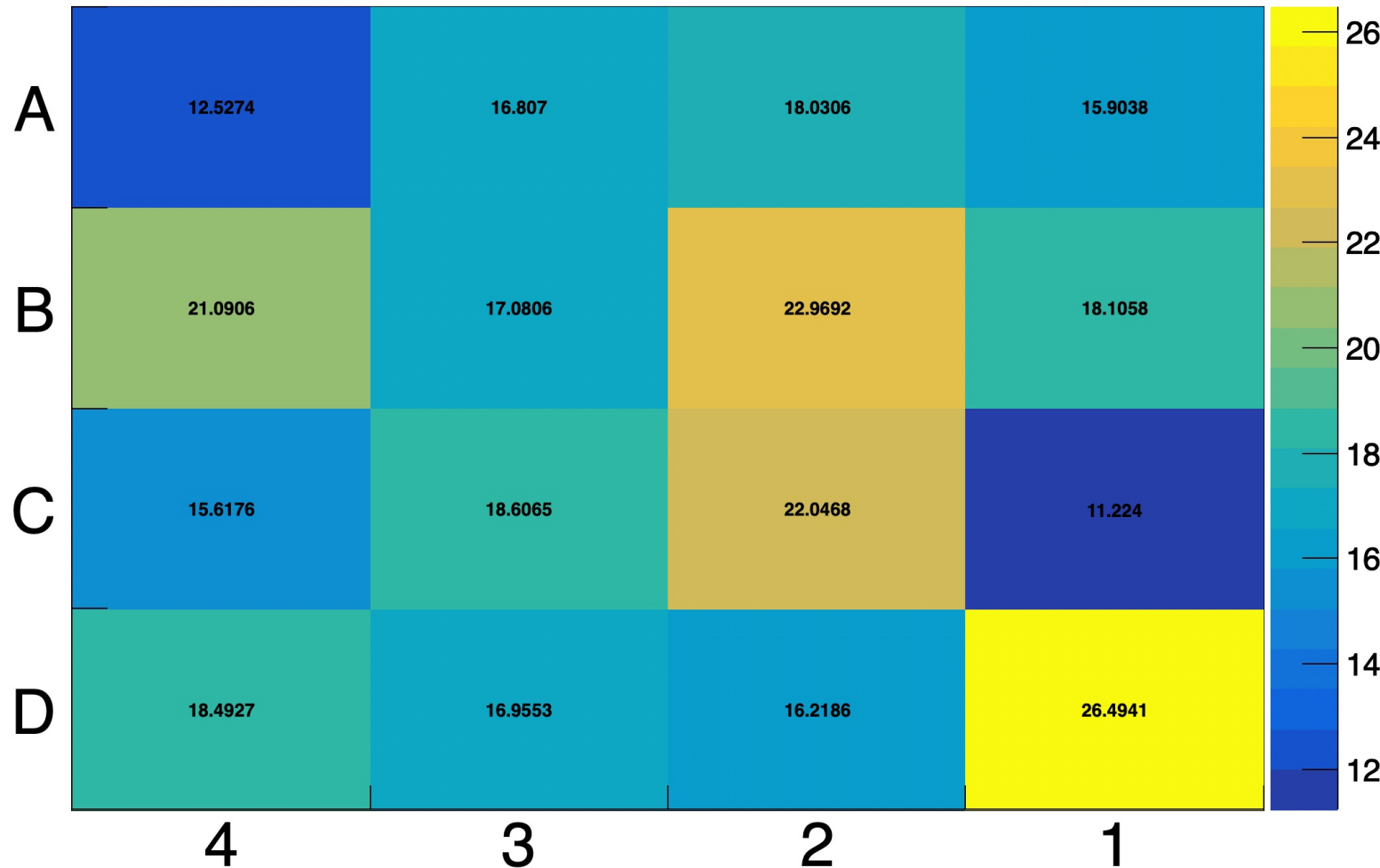
Wrong SiBB

eventType != 4



Run 56 with hitTot < 2000

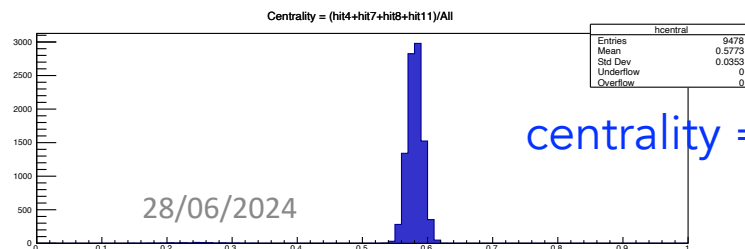
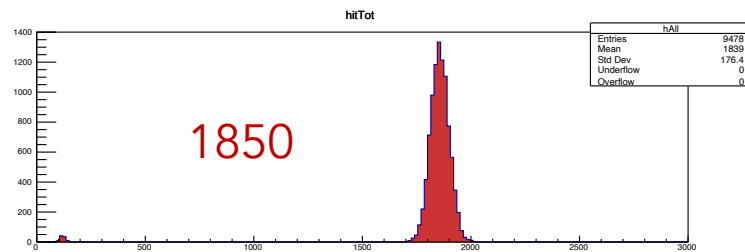
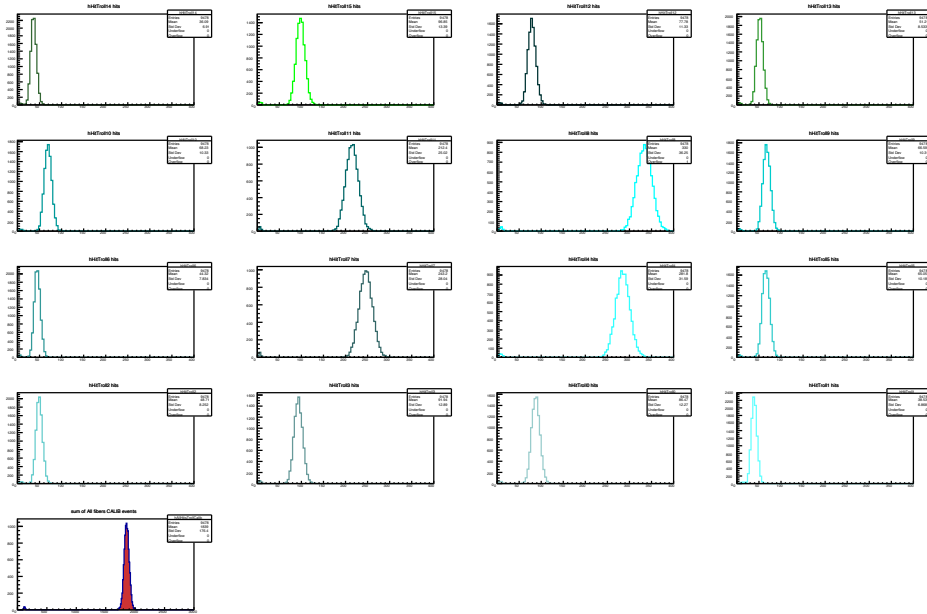
16 fibers intensity map



About 4 more hits / channel
Remanent beam activity ????

LED studies – 1

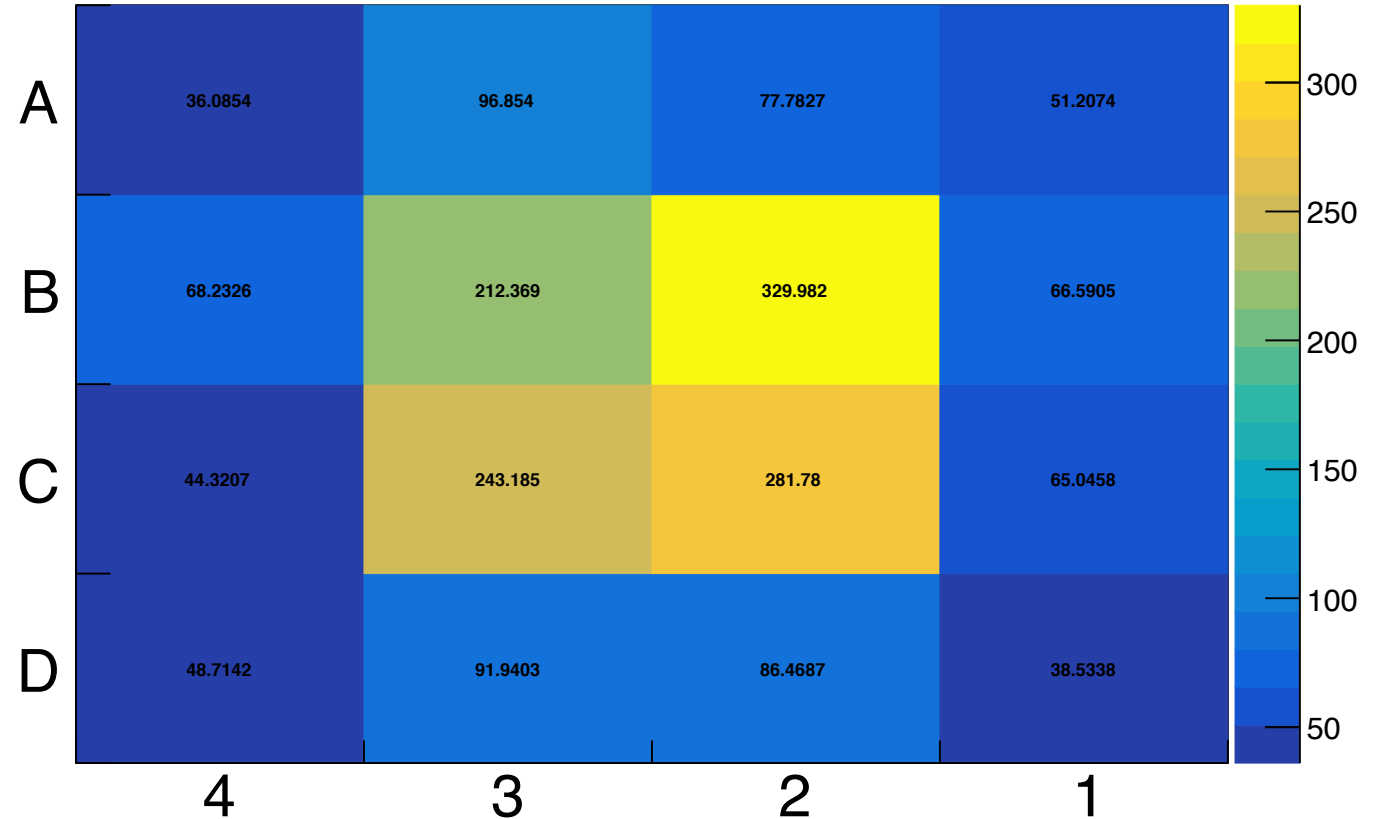
Run48 Troll1-Water-
good SiBB



centrality = .58

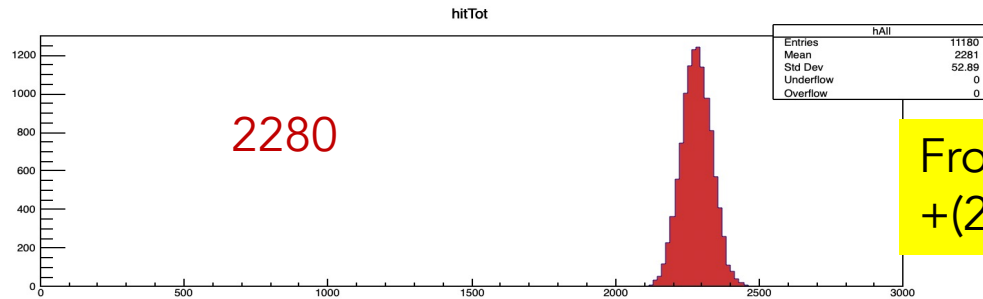
Publication : 0.5886 ± 0.0005

16 fibers intensity map



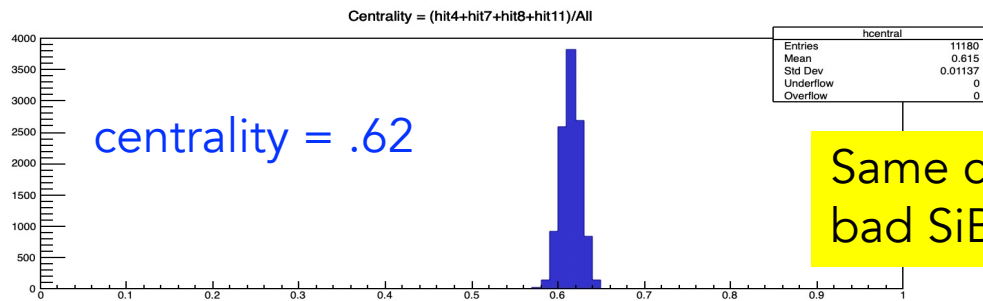
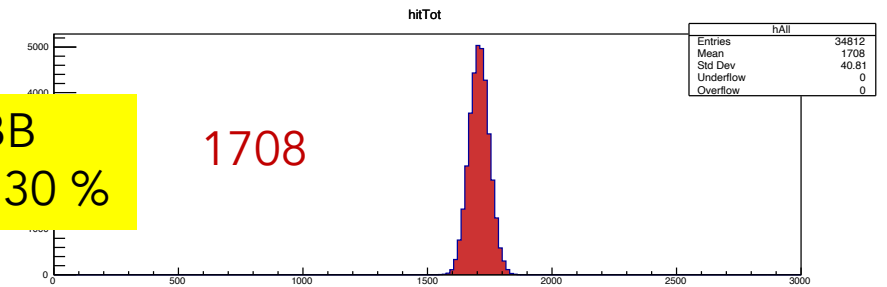
LED studies – 2

Troll1-HL – Run61- Bad SiBB

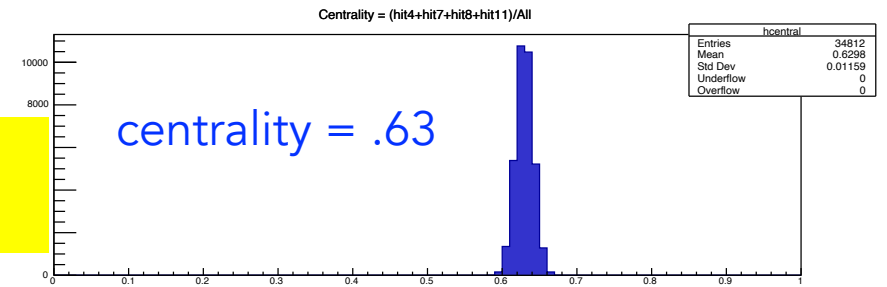


From Good SiBB to Bad SiBB
 $+(2280-205)/(1710-120) \sim +30\%$

Run62 Troll1-HL- good SiBB

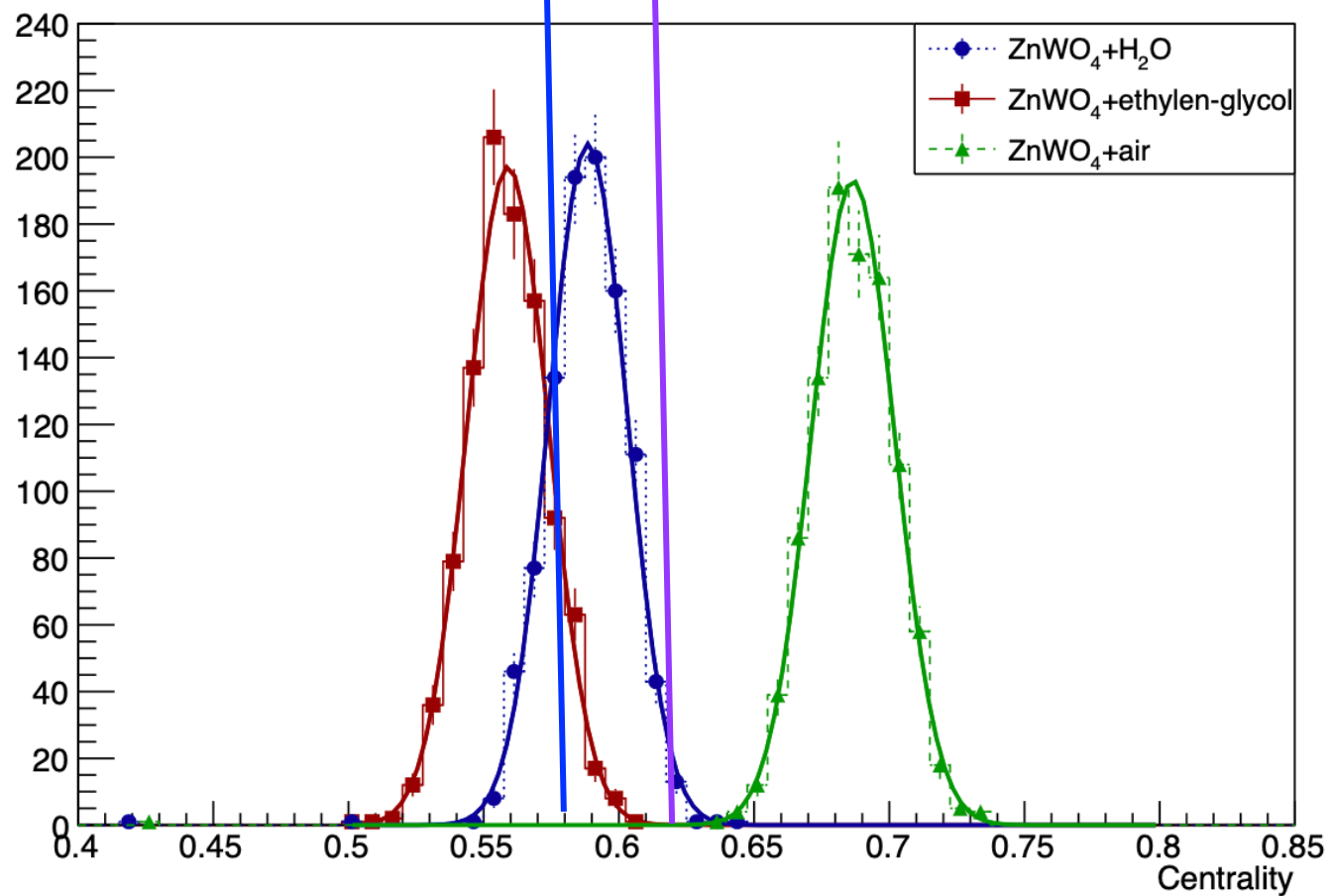


Same centrality for good and bad SiBB (expected)



Test beam (run 48 – Troll 1 Water)

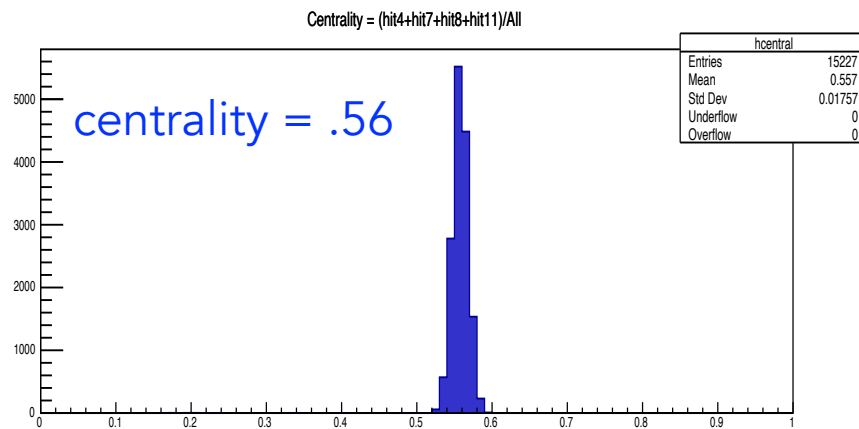
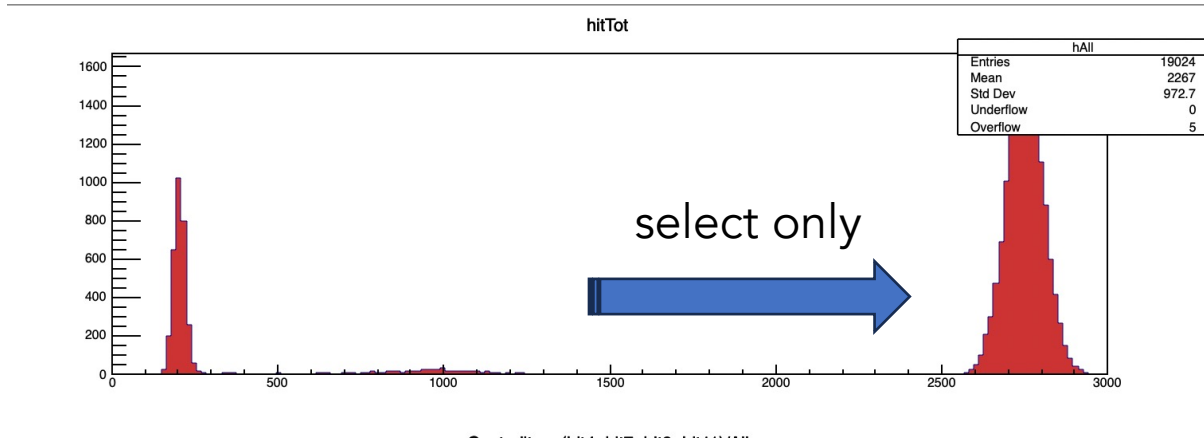
Test beam (run 61 or 62 – Troll 1 HL)
???



Publication

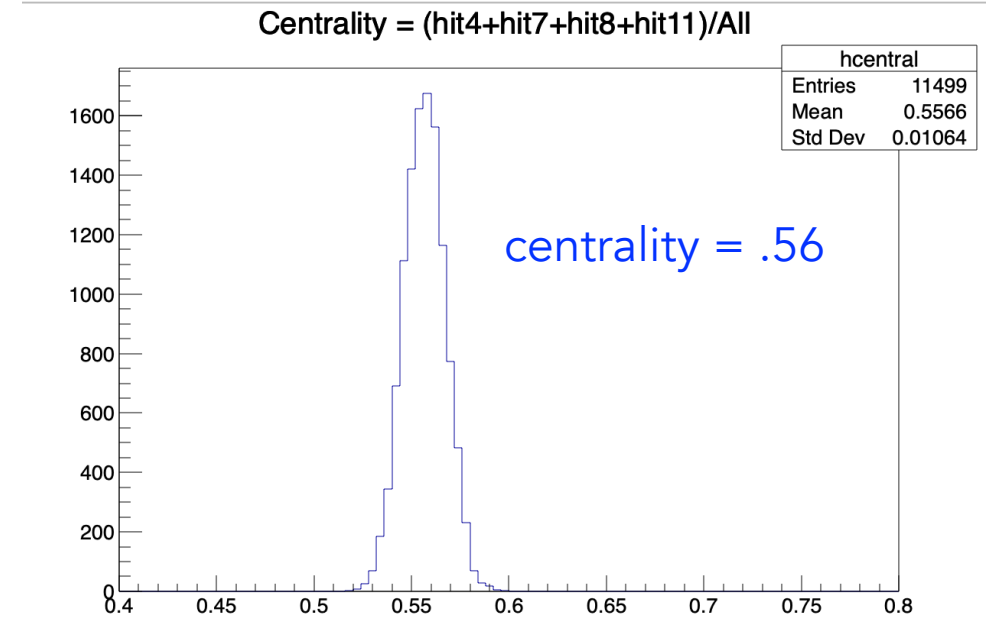
LED studies – 3

Troll2-HL – Run52 – Bad SiBB



20/00/2024

Troll1-HL – Run56 – Bad SiBB



Troll1 - Troll 2 in agreement

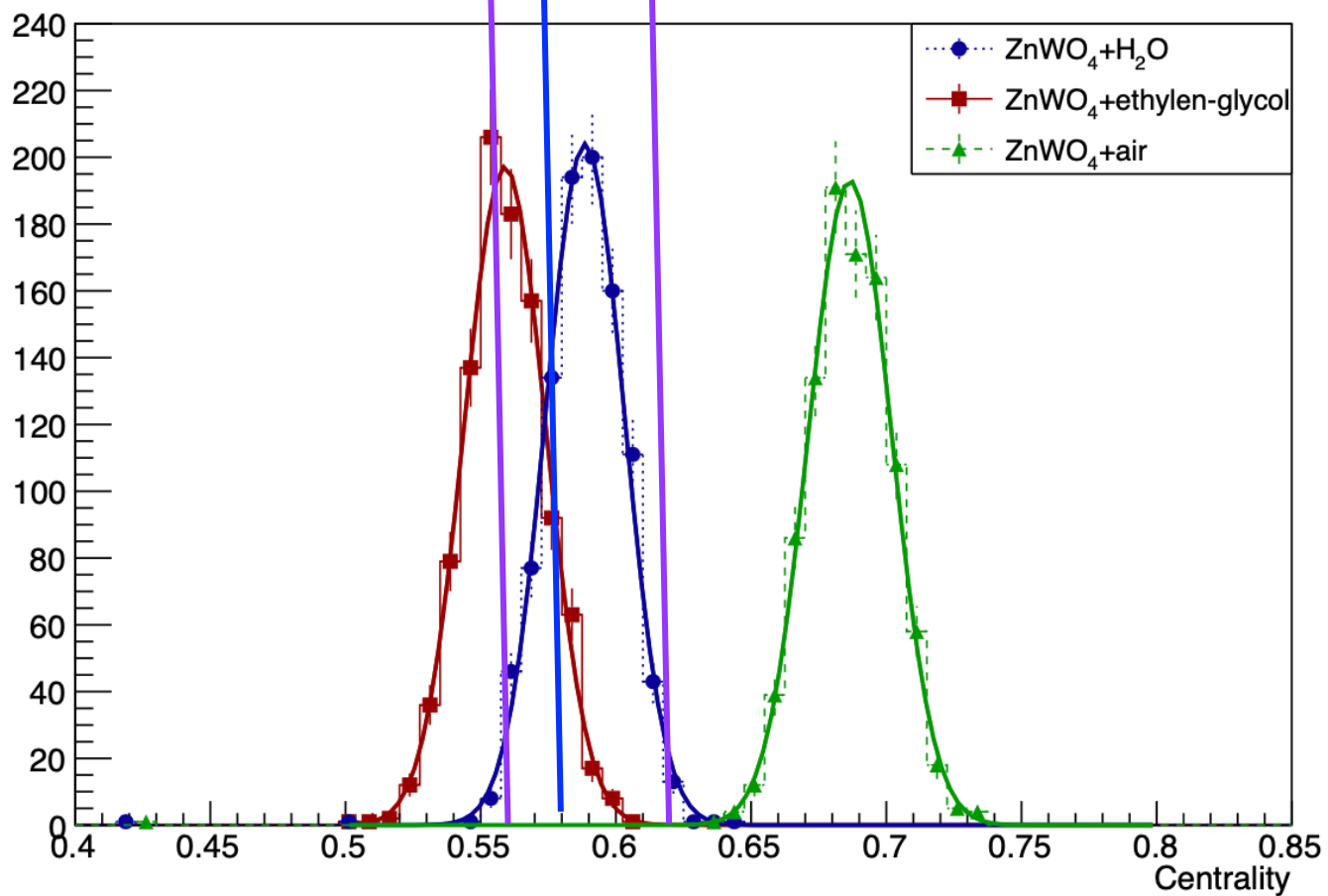
Test beam (run 48 – Troll 1 Water)

Test beam (run 62 – Troll 1 HL)

Test beam (run 52 – Troll 2 HL)

going towards dry ????

Test beam (run 56 – Troll 1 HL)

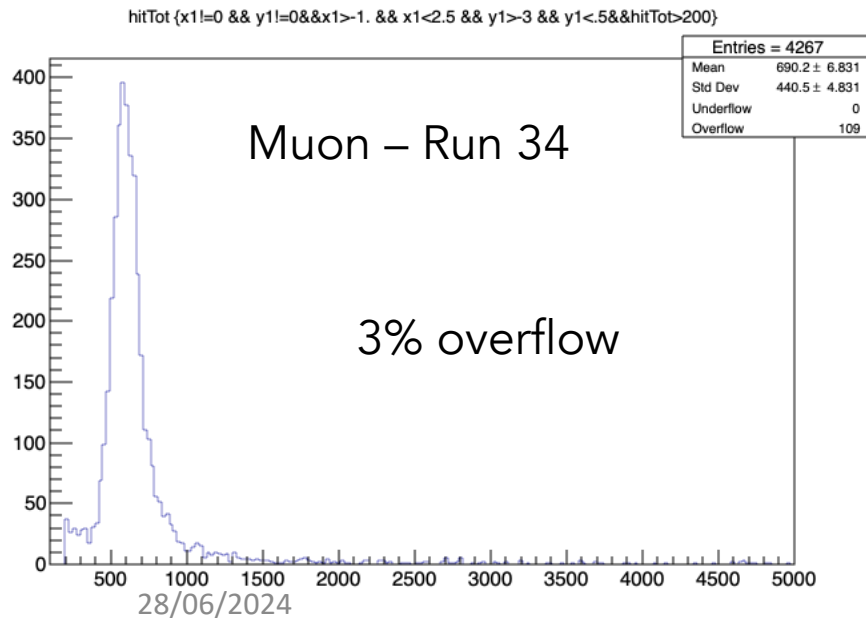
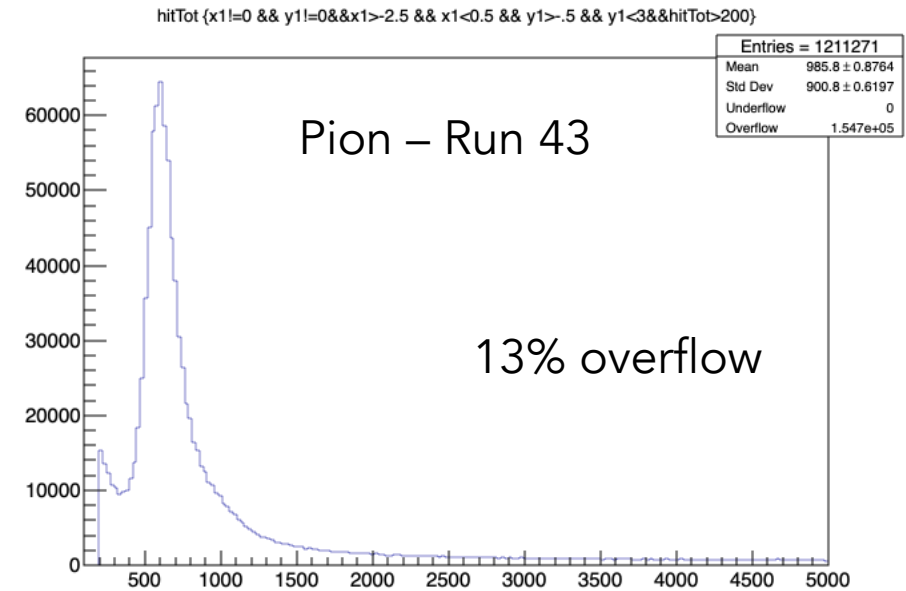
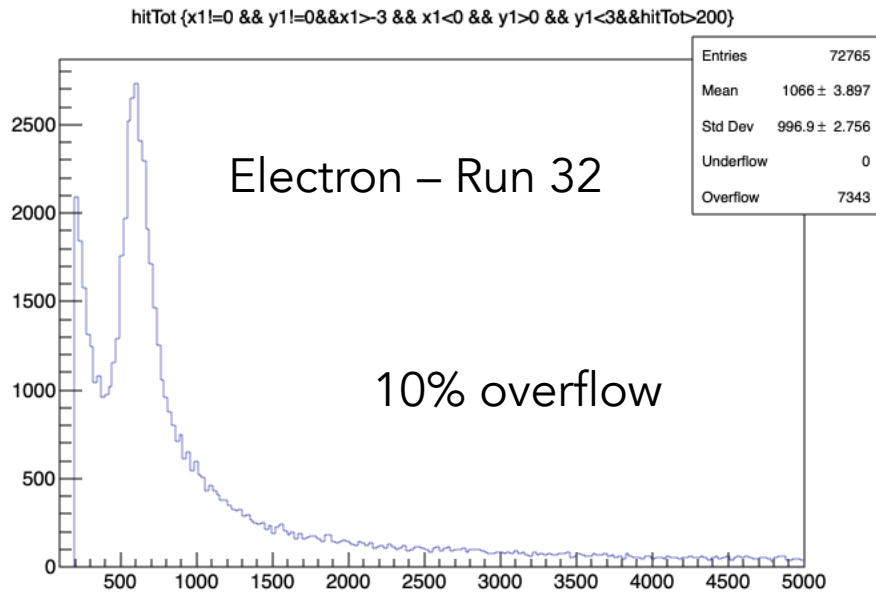


Publication

LED - first conclusions

- With water (Troll1) we reproduce the published results for the centrality
- With Troll 2 – HL we have the same centrality as the published results with EGL .
Troll2 – HL was leaking. The LED run was first (so not too much HL lost ?)
- With Troll 1 – HL at the beginning we have the same centrality
- With Troll1 – HL at the end of the run centrality is off ... significant leak ?

Different beam types (just for fun)



No Dark noise correction

EventType = 4 && x1 !=0 & y1 !=0

Select (x1 – y1) in front of Troll region (by eye (!))

Summary

- Dark noise files produced
- LED results for centrality makes sense
- Do we see the leak(s) ?



To be added (next processing) :

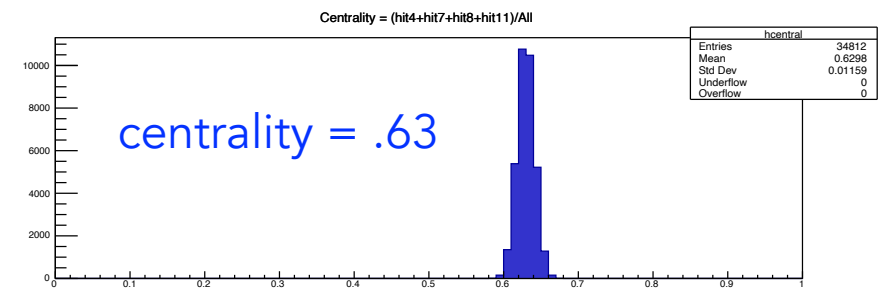
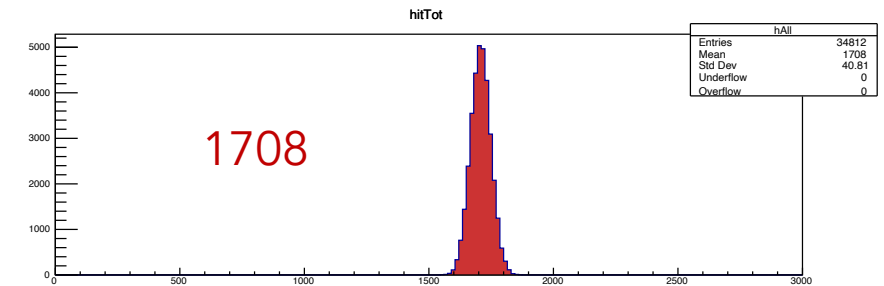
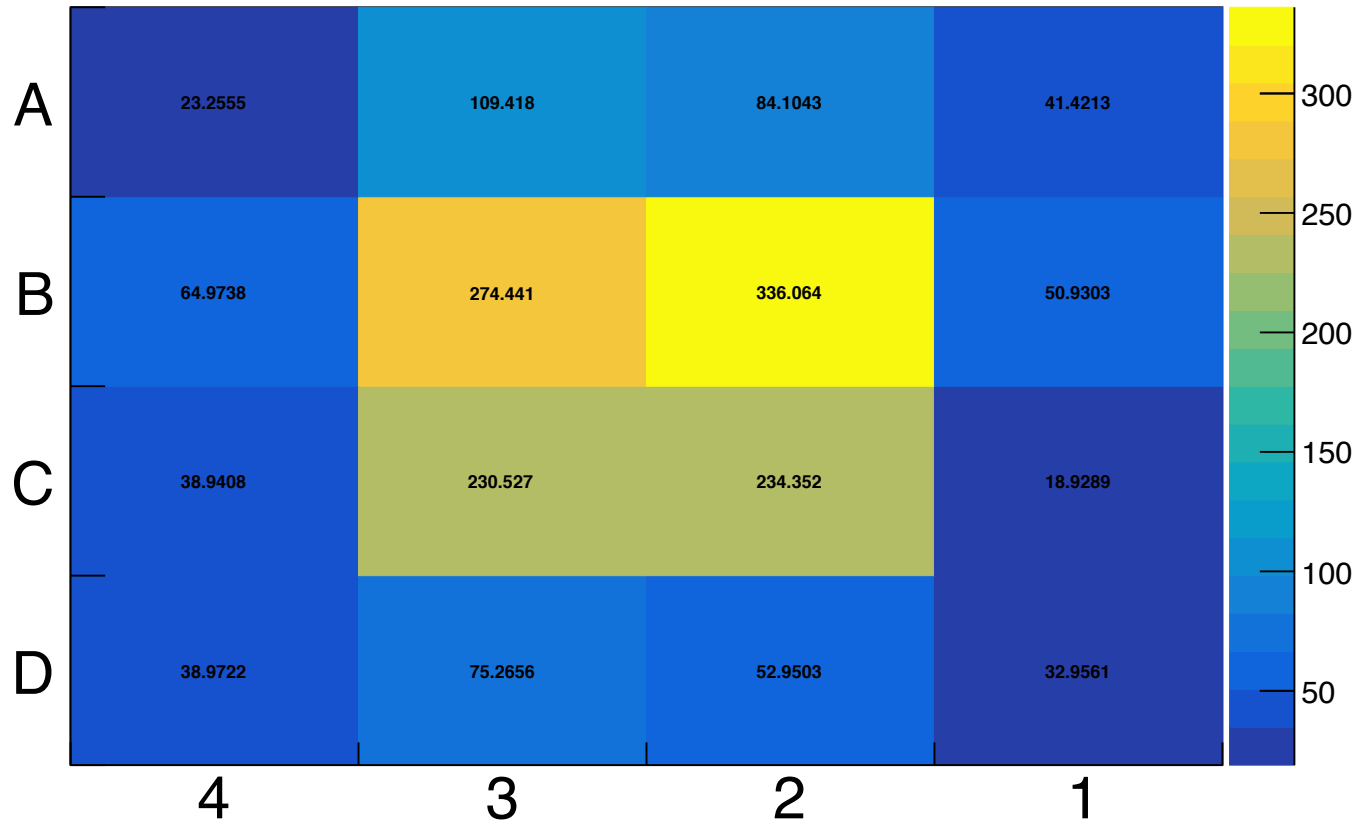
- hitCorr for each channel using the correction for each SiBB configuration
- hitTotCor
- Max (hit)
- Max (hitCor)

Back-up slides

LED studies – 2

Run62 Troll1-HL- good
SiBB

16 fibers intensity map



Run#	Troll Type	Data type	Comment	Dark
11	Troll1 Water	LED + pedestal ?		118 – Event Type = 4 LED reste pedestal ?
24	Troll1 Water	LED-only		Event Type = 4 LED
25,30,31,32	Troll1 Water	Electron		~120 – 130
33,34	Troll1 Water	Muon		~130
35,36,37,38,39,40	Troll1 Water	Pion.	changes in position of GRAiNITA ... Beam changes	~130
41,42,43	Troll1 Water	Pion	With 3x3 in the trigger (Samedi soir S, MH)	~140
44,45	Troll1 Water	Pion	No 3x3 in trigger. Dimanche matin... (Giulia & co)	~130
47	Troll1 Water	Pedestal		~ 119
48	Troll1 Water	LED		118 .
50,51	Troll1 Water	Pion	Trigger 5x5	~130
52	Troll2 Heavy L	LED		203. SiBB pb from here
53,54,55	Troll2 Heavy L	Pion	Trigger 5x5	210
56	Troll1 Heavy L	LED+pedestal		Bizarre du beam ???
57,58	Troll1 Heavy L	Pion	Trigger 5x5	180 ?
59,60	Troll1 Heavy L	Muon		211
61	Troll1 Heavy L	LED	Degraded SiBB	204 eventType = 4 = LED
62 28/06/2024	Troll1 Heavy L	LED	Normal SiBB	125 eventType = 4 = LED 23