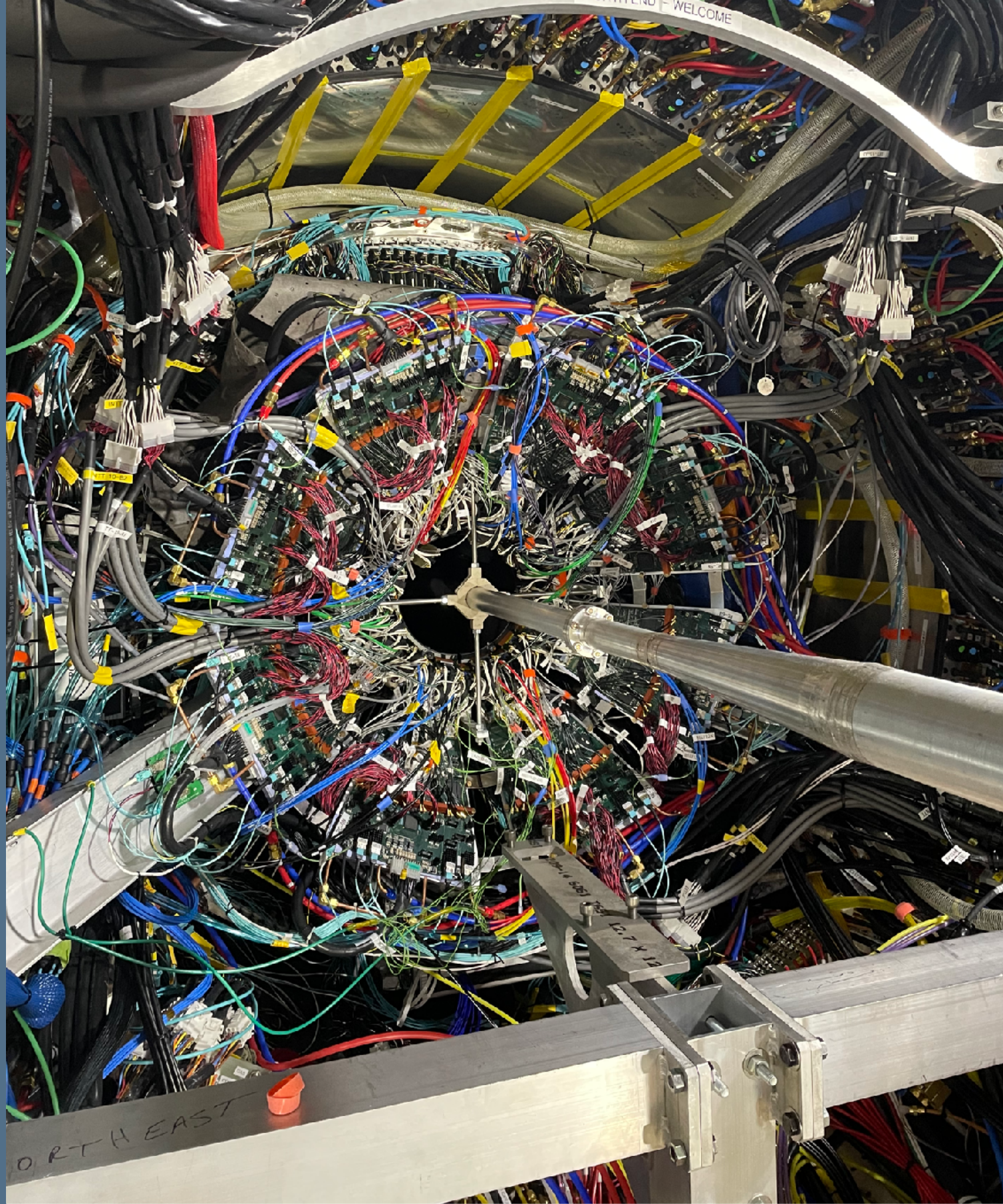


sPEHNIX INTT - $dN/d\eta$

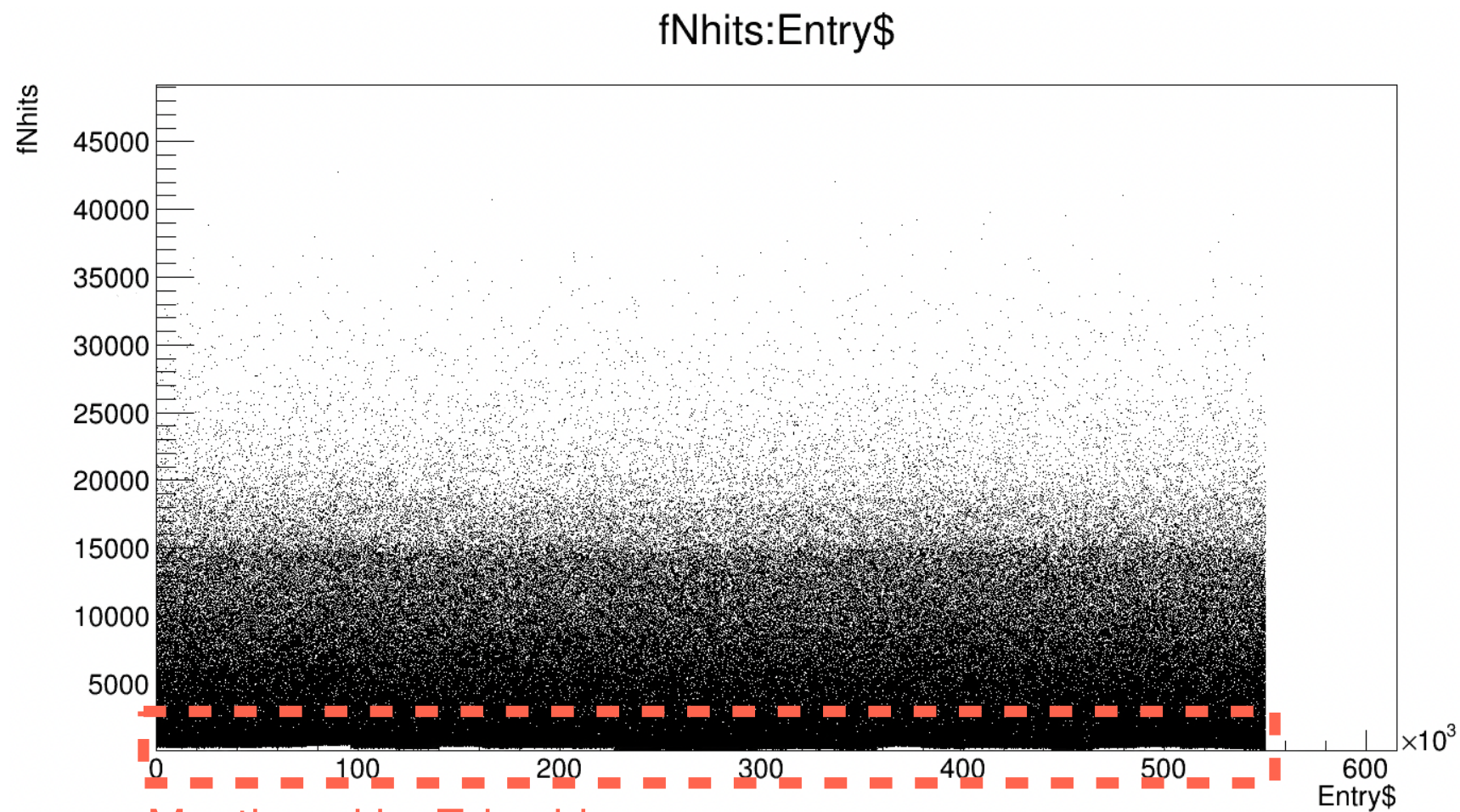
Cheng-Wei Shih, Chia-Ming Kuo
National Central University



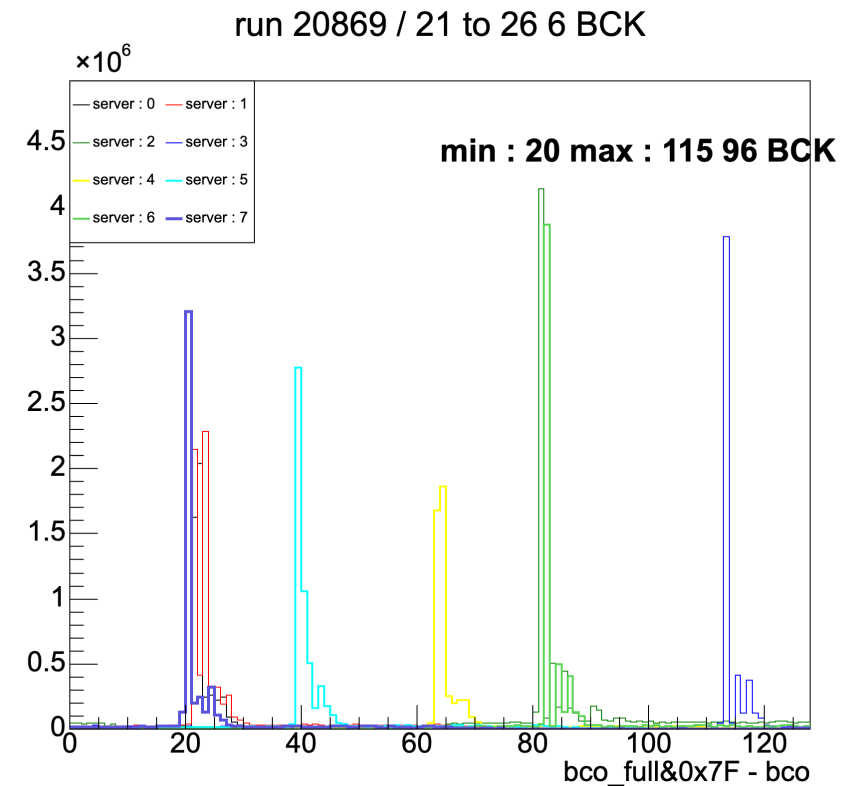
Sanity check of run 20869

- N event : 550123

BCO diff, plot made by Jaein



Mentioned by Takashi
Might be the clone hits ?



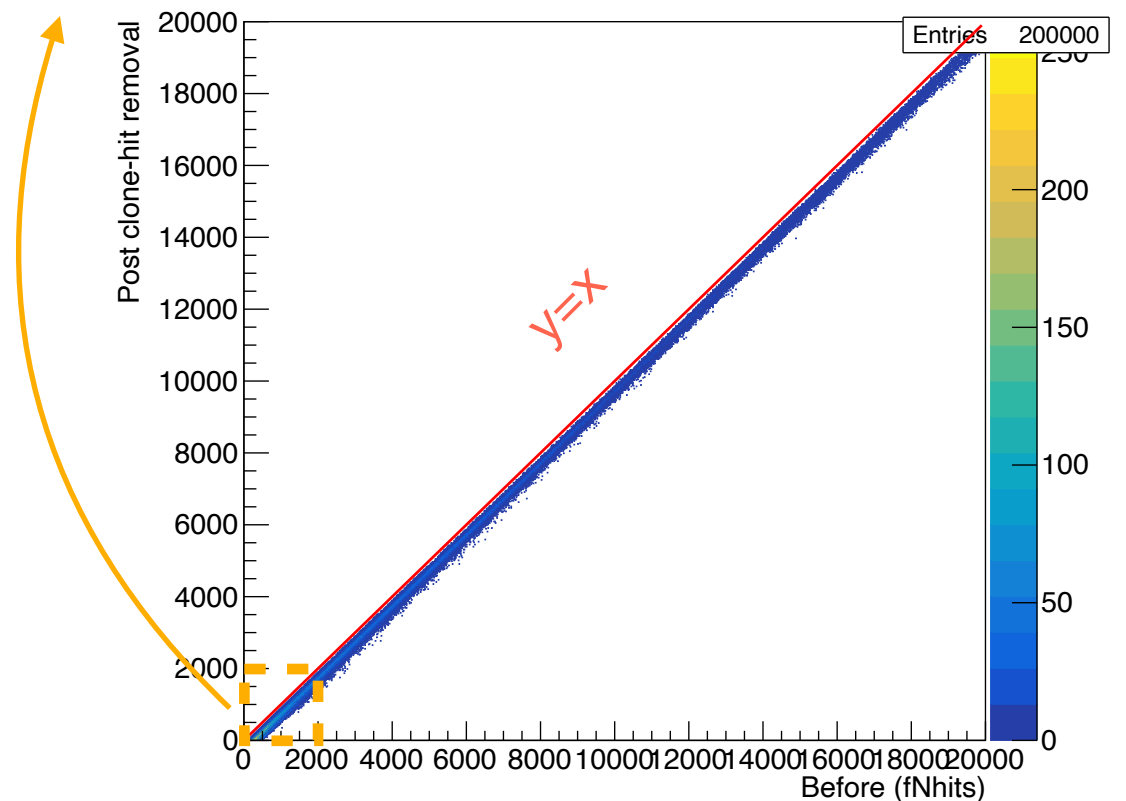
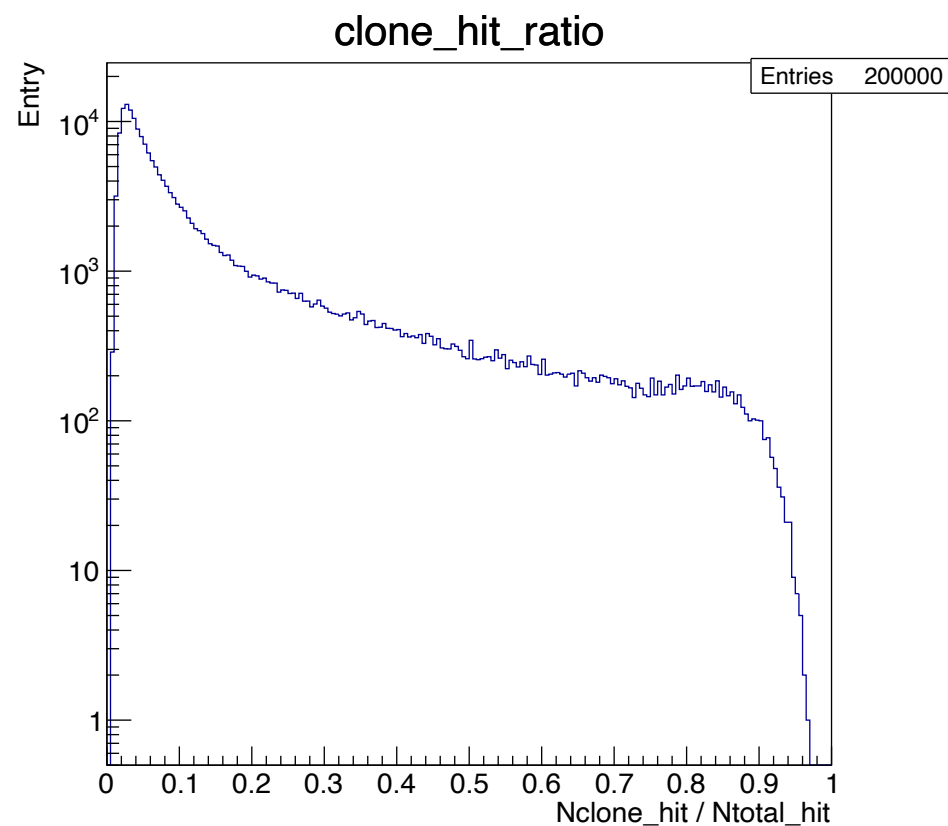
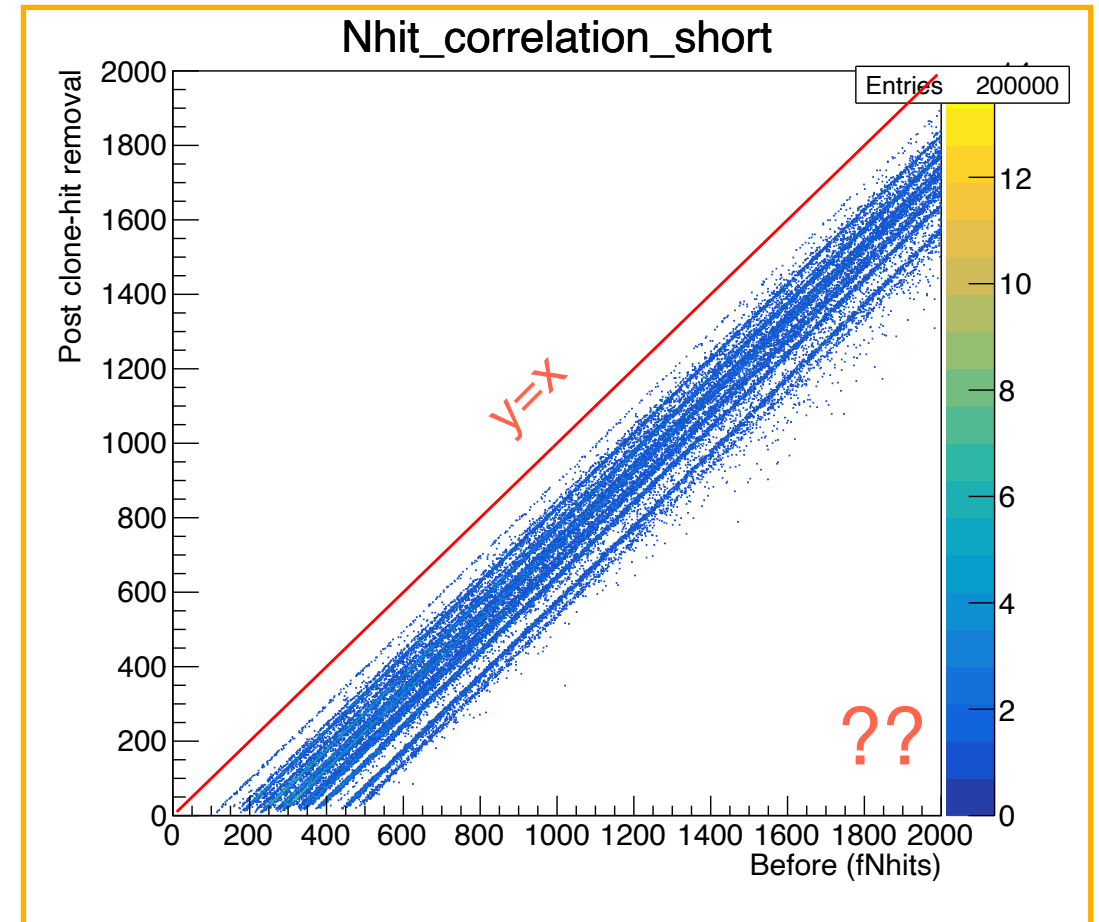
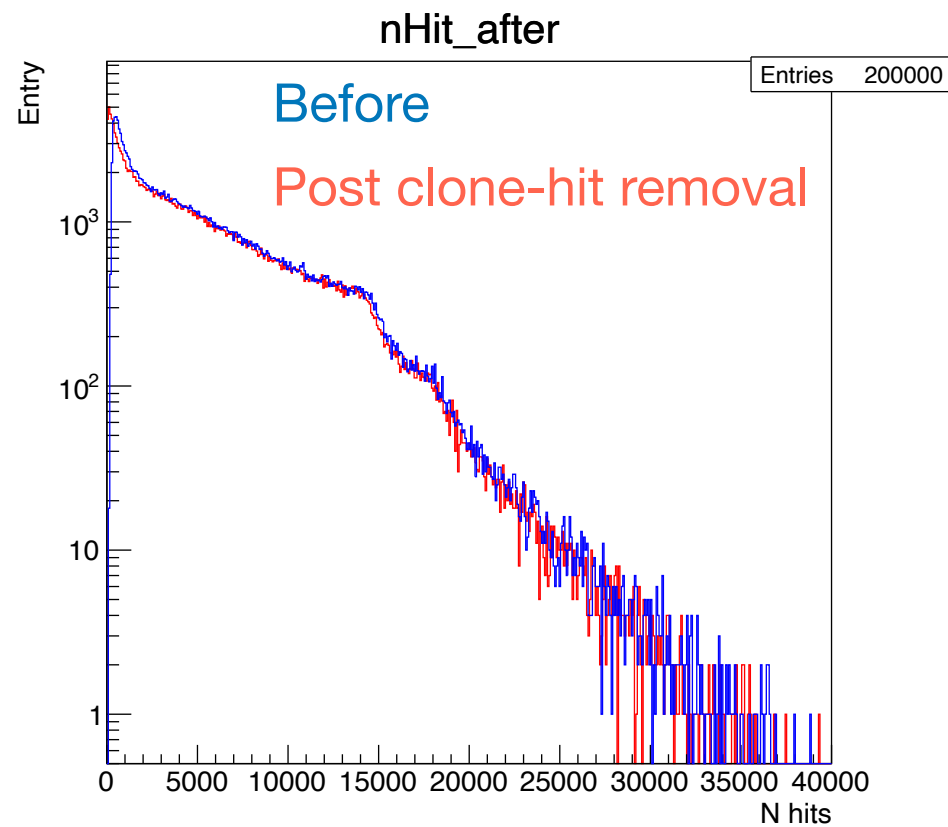
Peak bco_diff

INTT0	21 & 22
INTT1	21 & 22 & 23
INTT2	81
INTT3	113
INTT4	63 & 64
INTT5	39 & 40
INTT6	82
INTT7	20

Sanity check of run 20869 - clone hit remove

Clone hit

First 200k events were checked

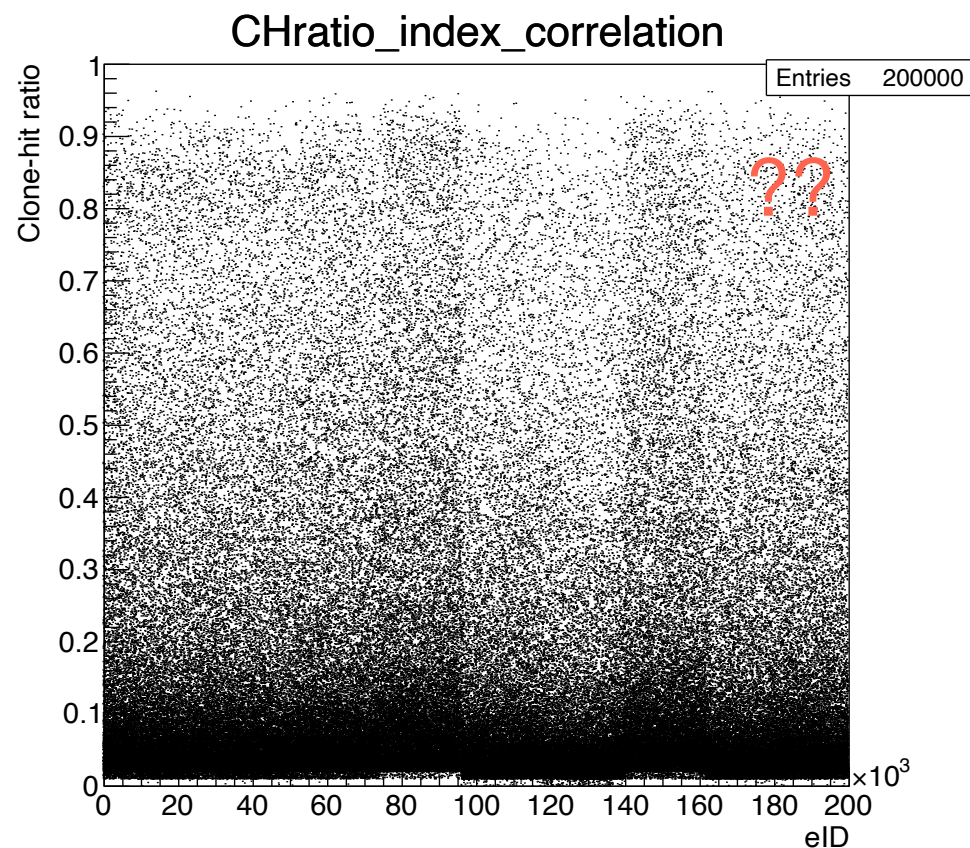
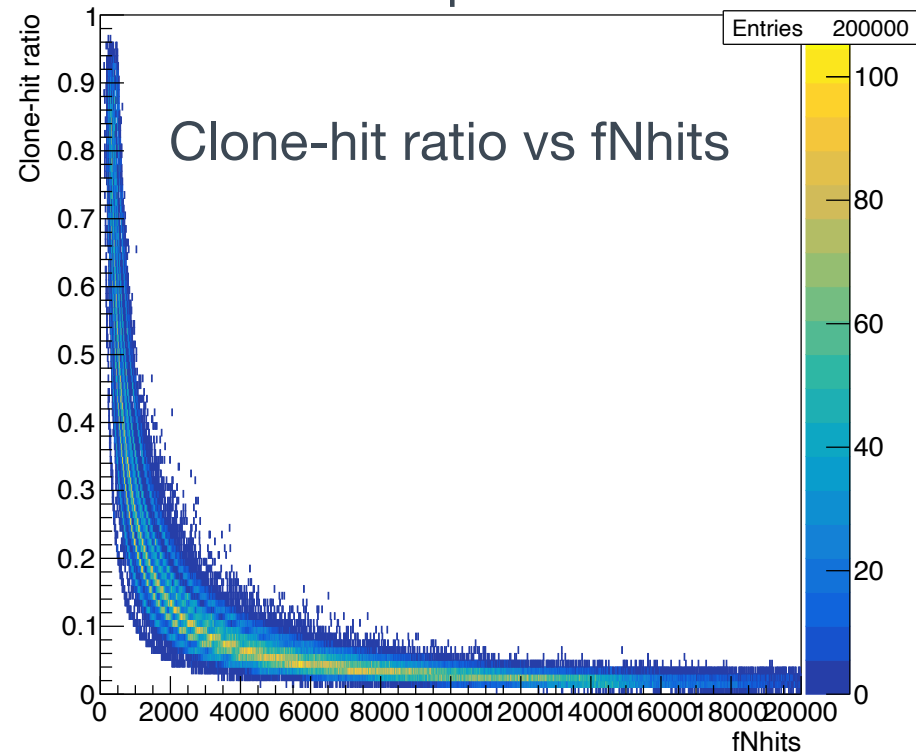


Sanity check of run 20869 - clone hit remove

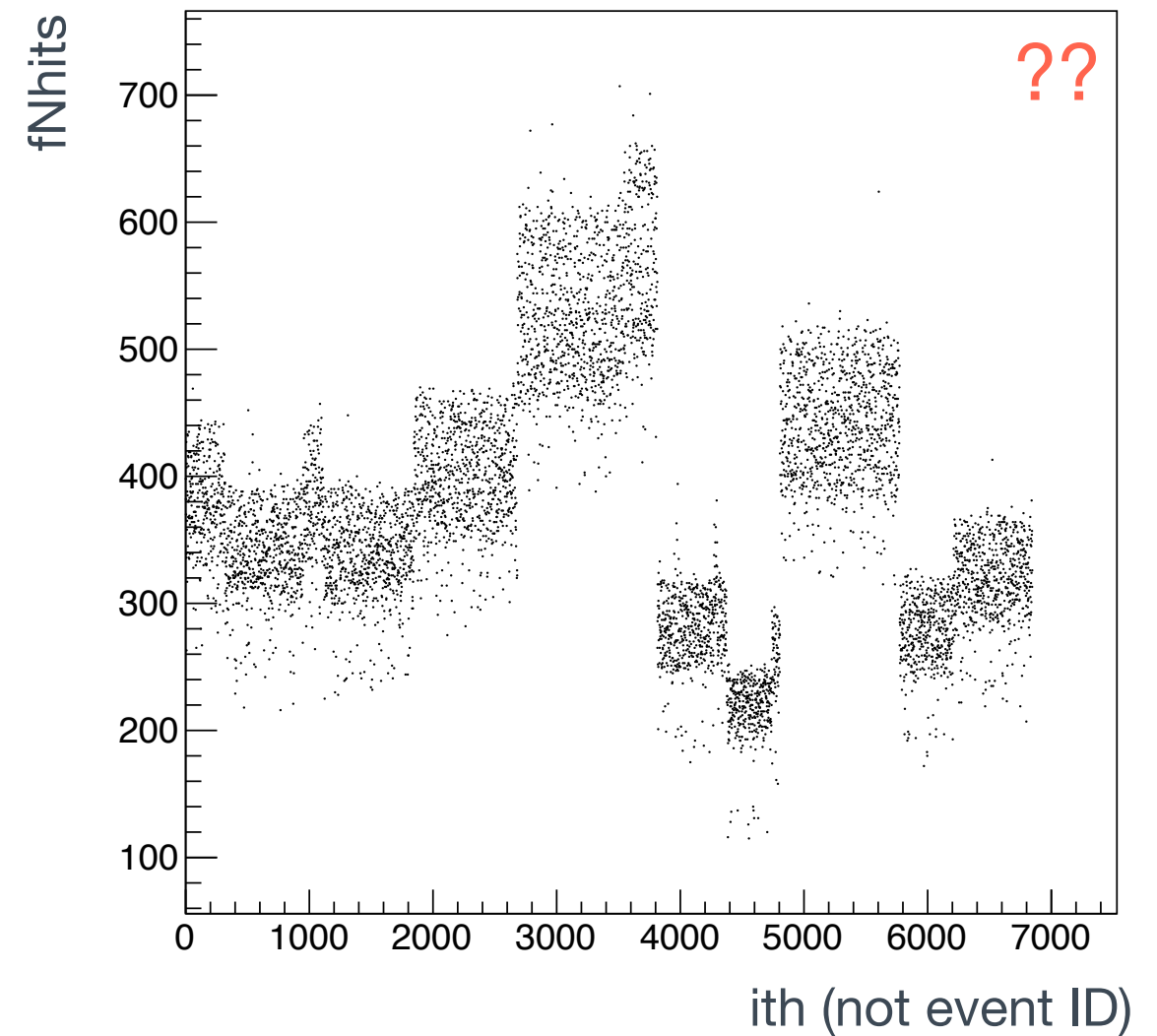
Clone hit

Clone-hit ratio : $N \text{ clone hits} / \text{total hits (fNhits)}$

Example : Two identical hits in one event $\rightarrow$ 1 clone hit $\rightarrow$ ratio : 50%



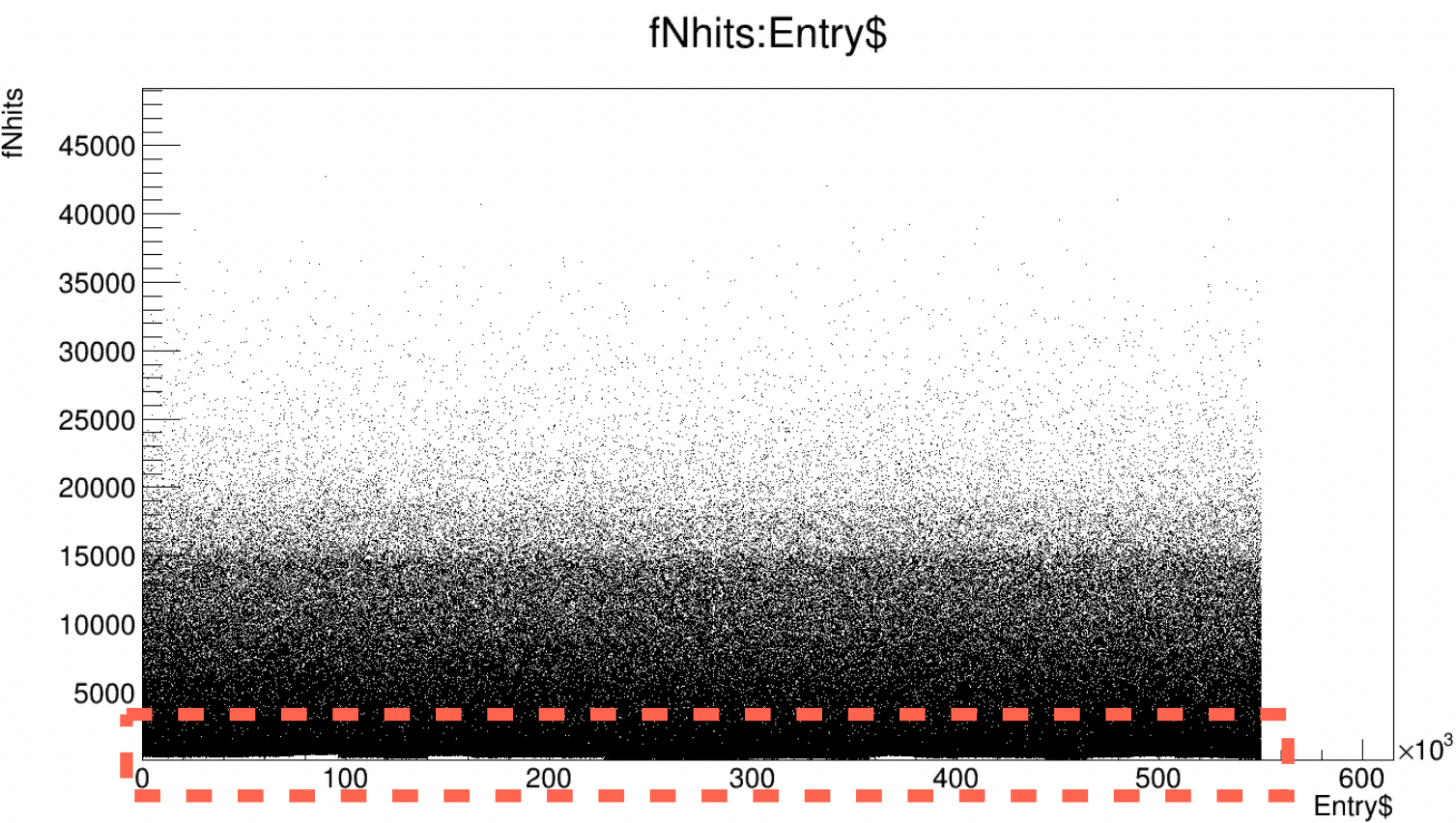
The ith event with clone-hit ratio greater than 70%



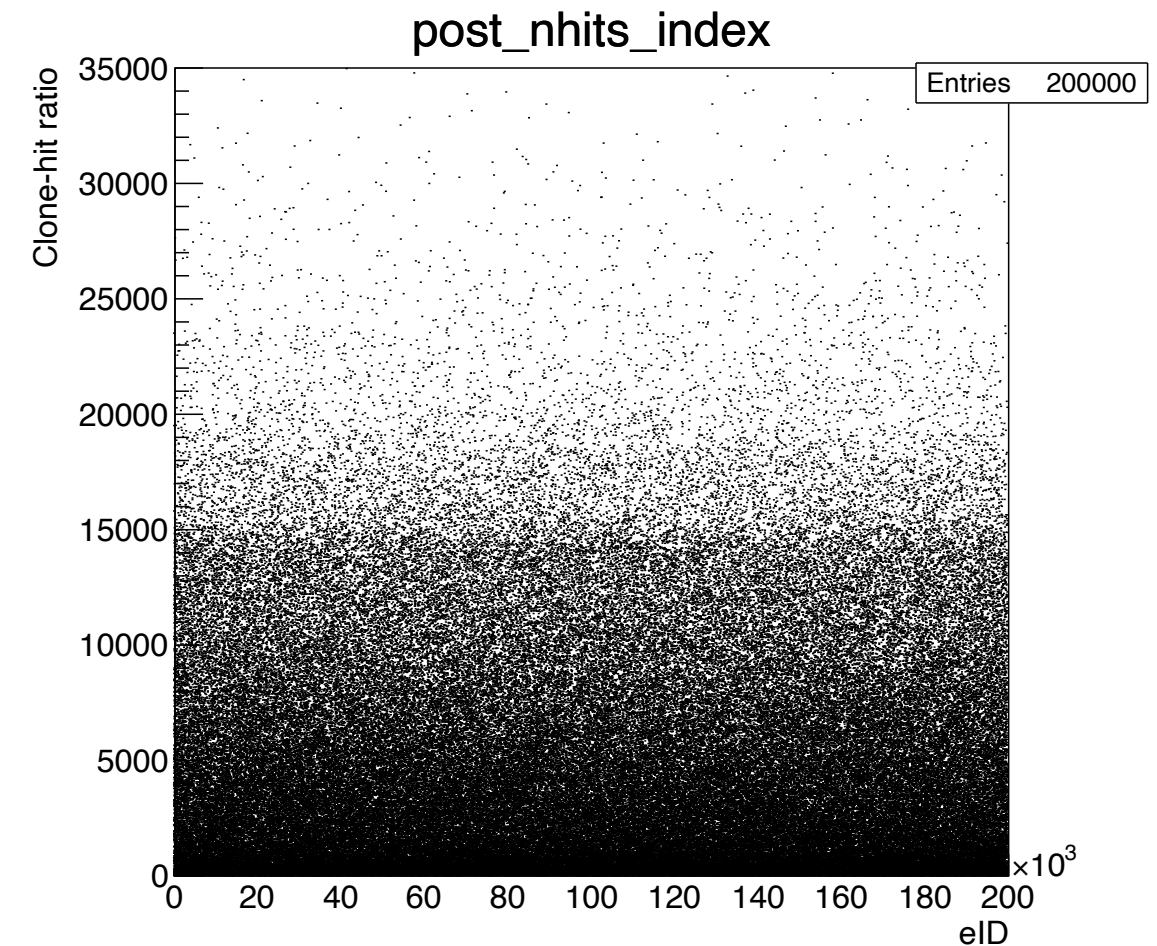
Sanity check of run 20869

N hits in the event vs eID

Before clone-hit removal

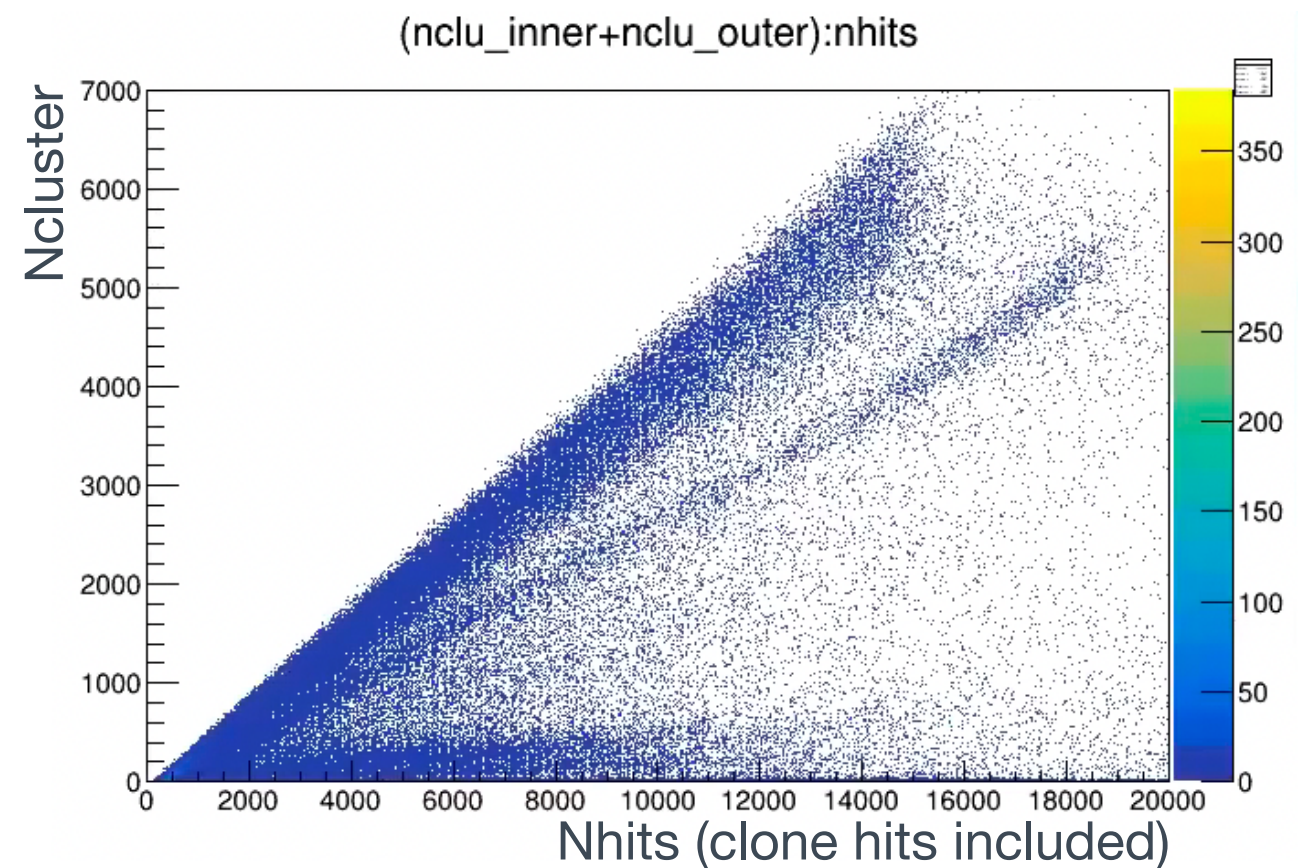
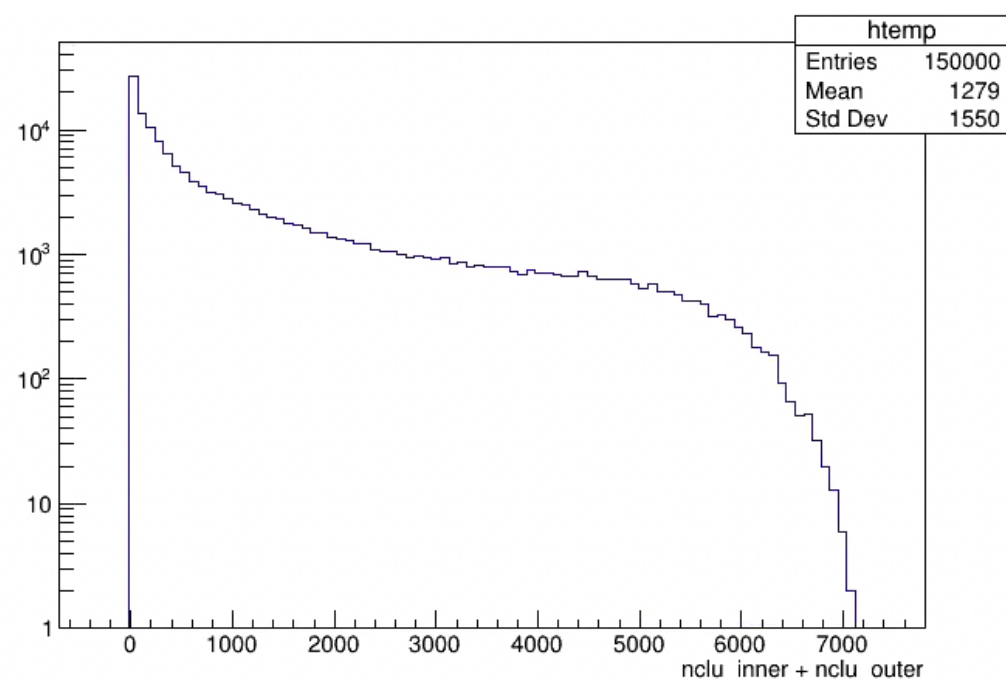
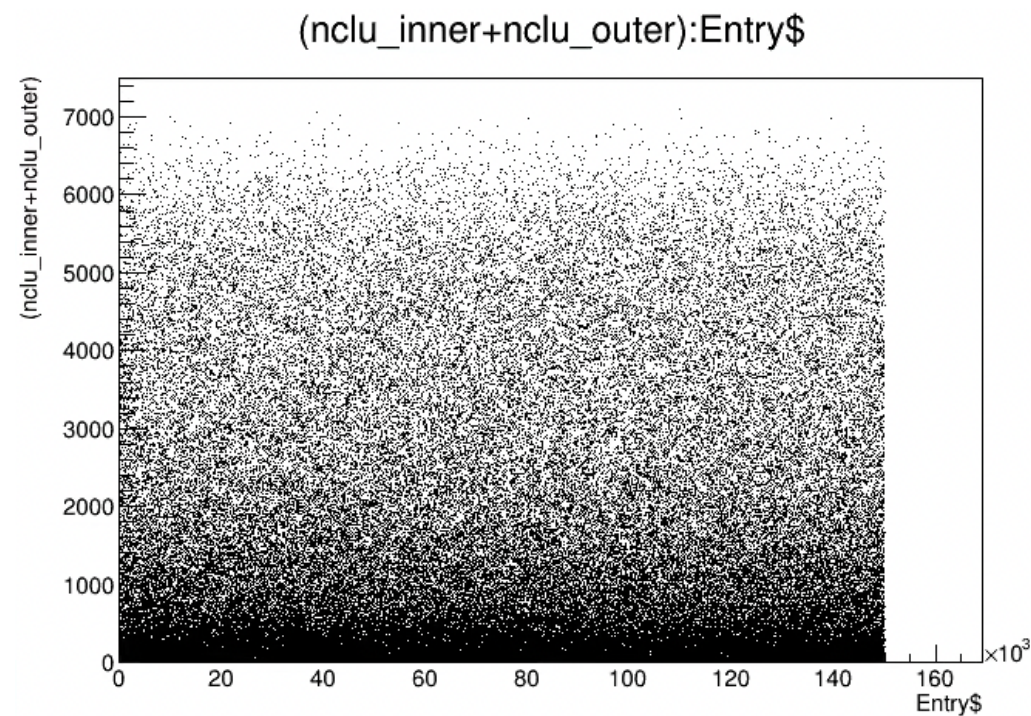


Post clone-hit removal



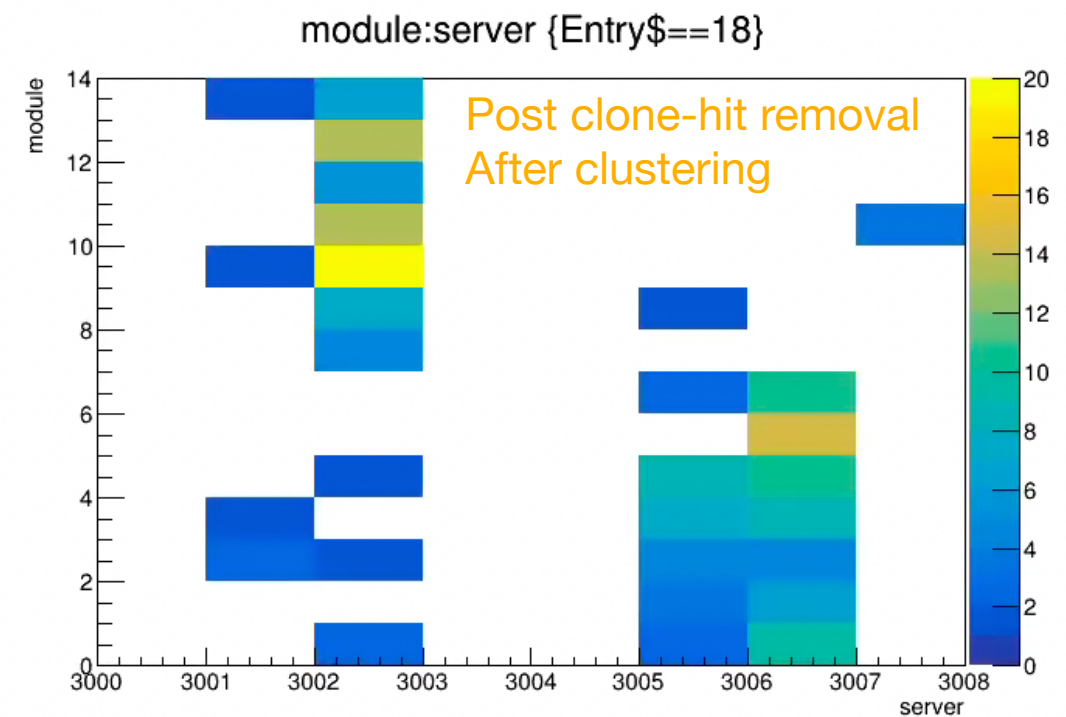
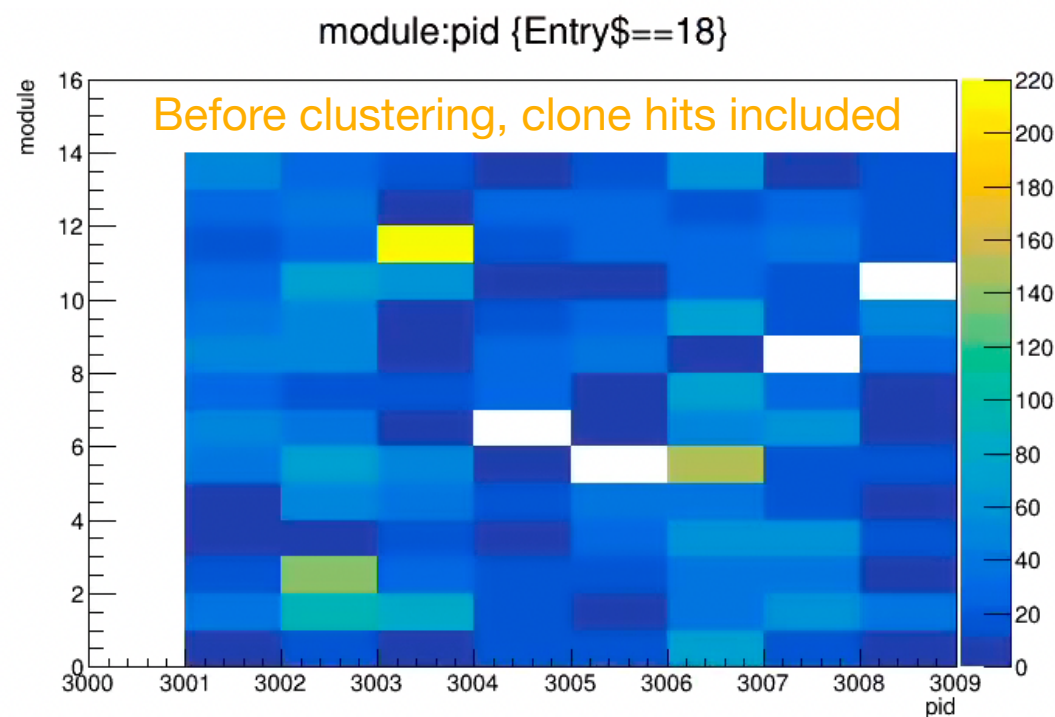
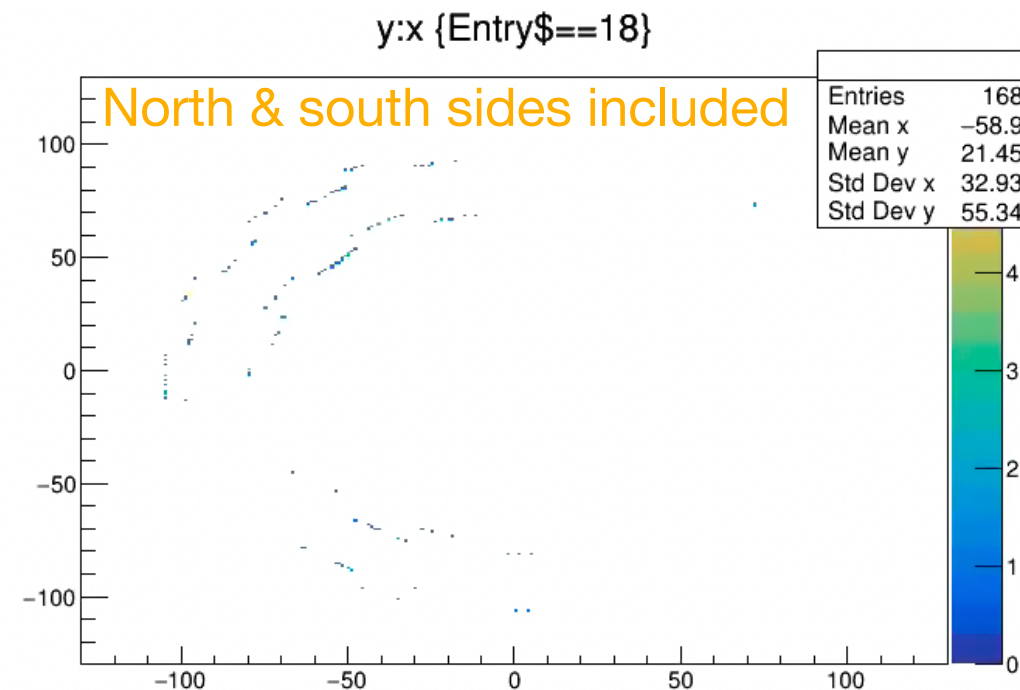
Sanity check of run 20869

- After clustering and conversion (Only check the first 150k events)
- bco_diff cut was applied
- Two HLs & some hot channels were masked

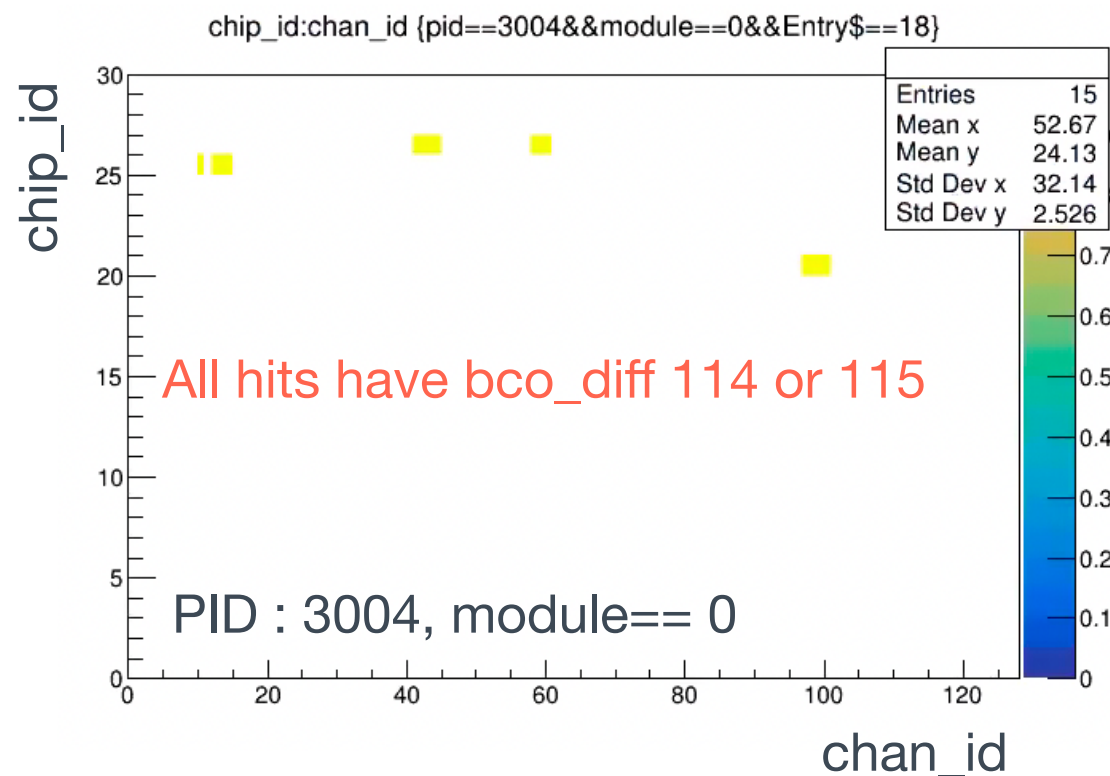


Sanity check of run 20869

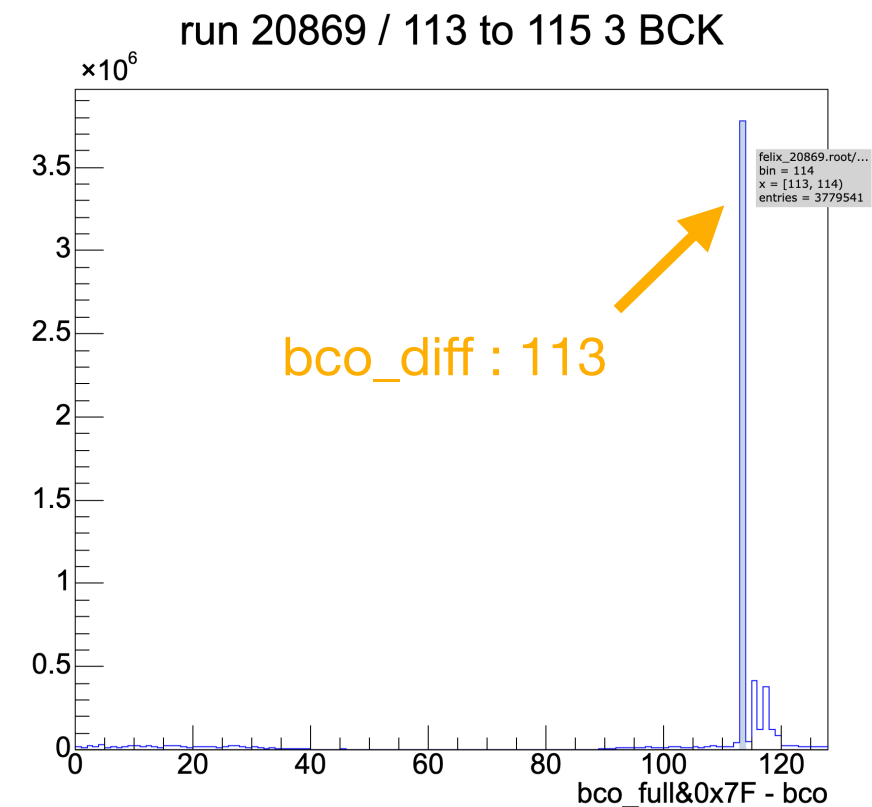
- Some weird events that some INTT quarters got no data after clustering.
- Example : eID 18



- Some weird events that some INTT quarters got no data after clustering.
- Example : eID 18
- For INTT3, $\text{bco_diff} == 113$ was applied



Peak of INTT3 (pid : 3004) : 113

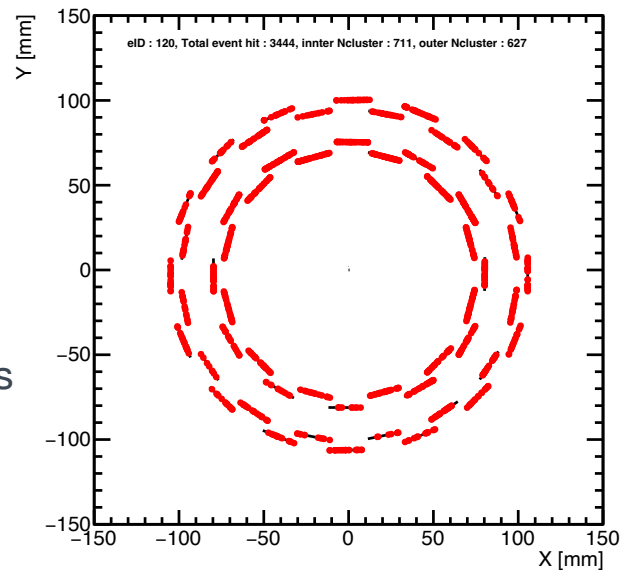


Z vertex by INTT

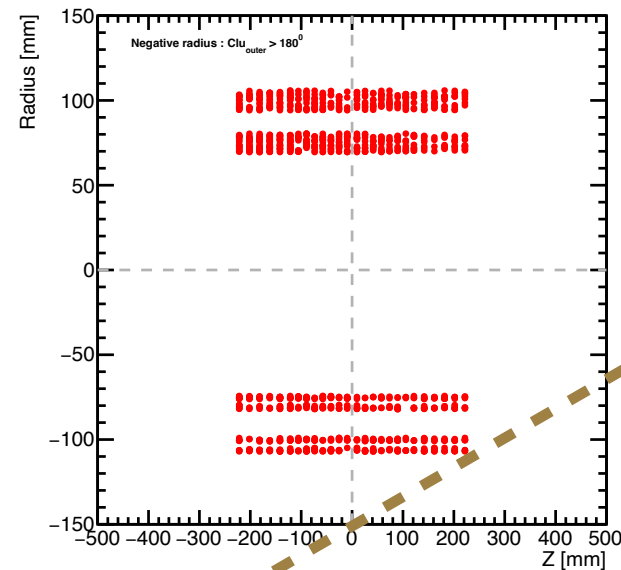
Track 1 Track 2

All possible zvtx

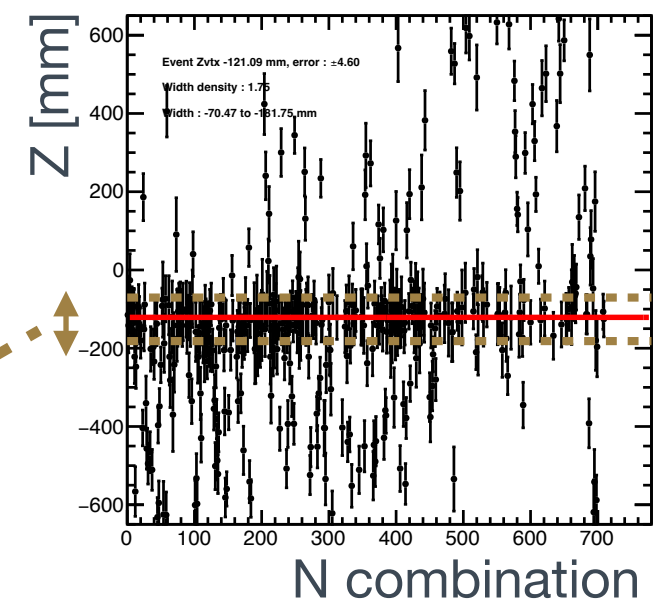
INTT event display X-Y plane



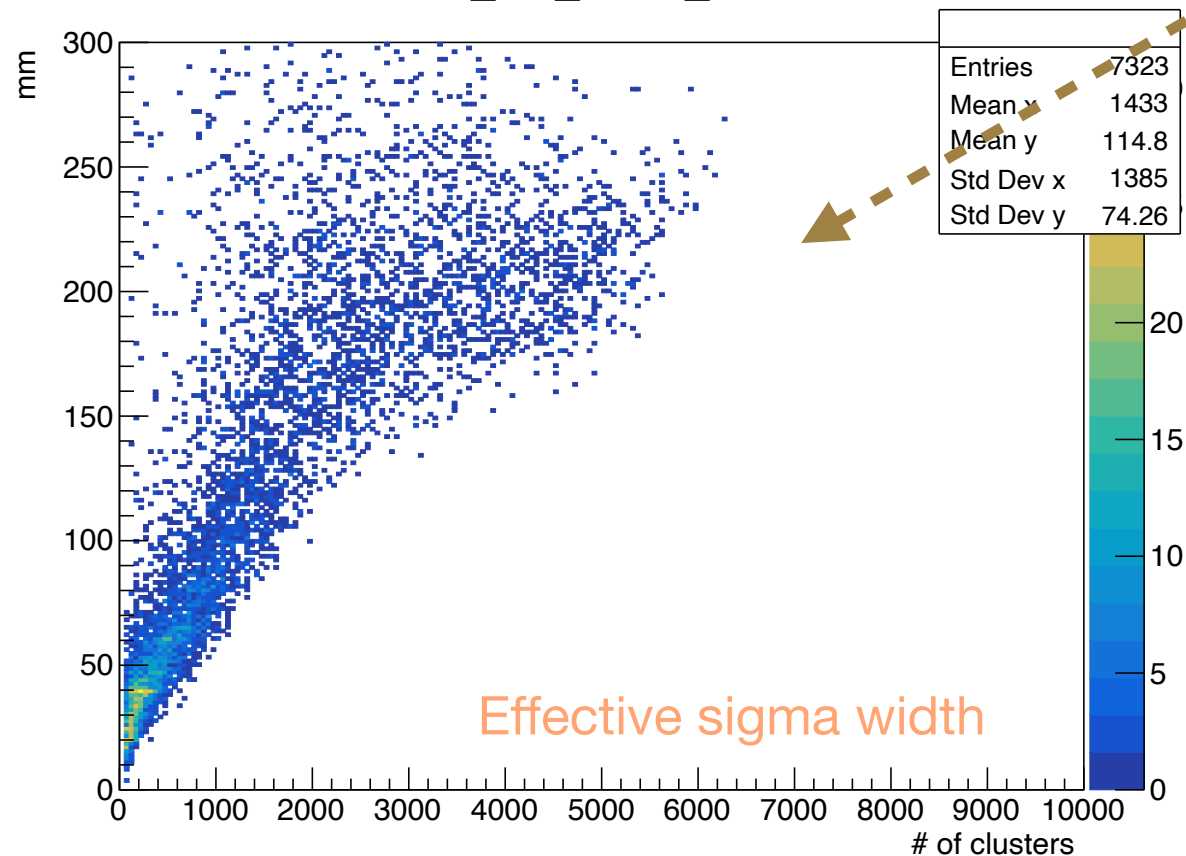
INTT event display r-Z plane



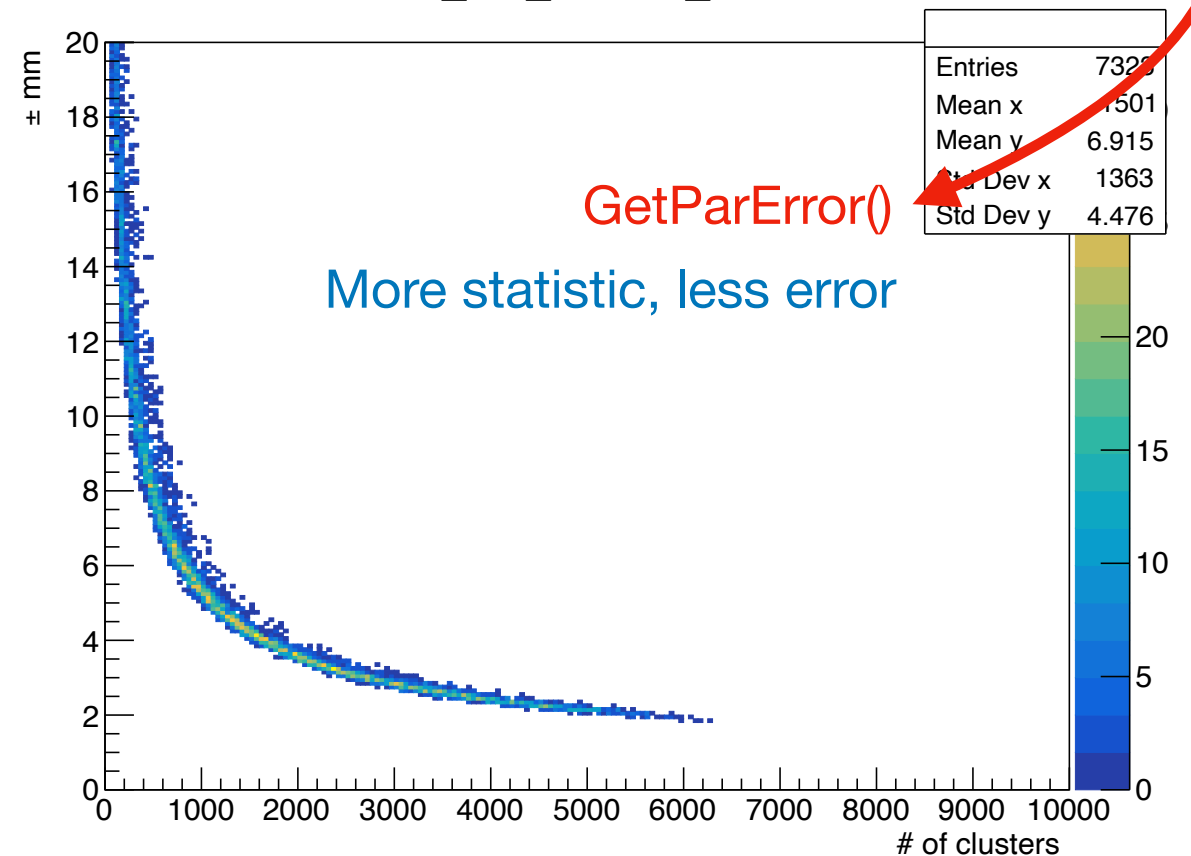
Graph



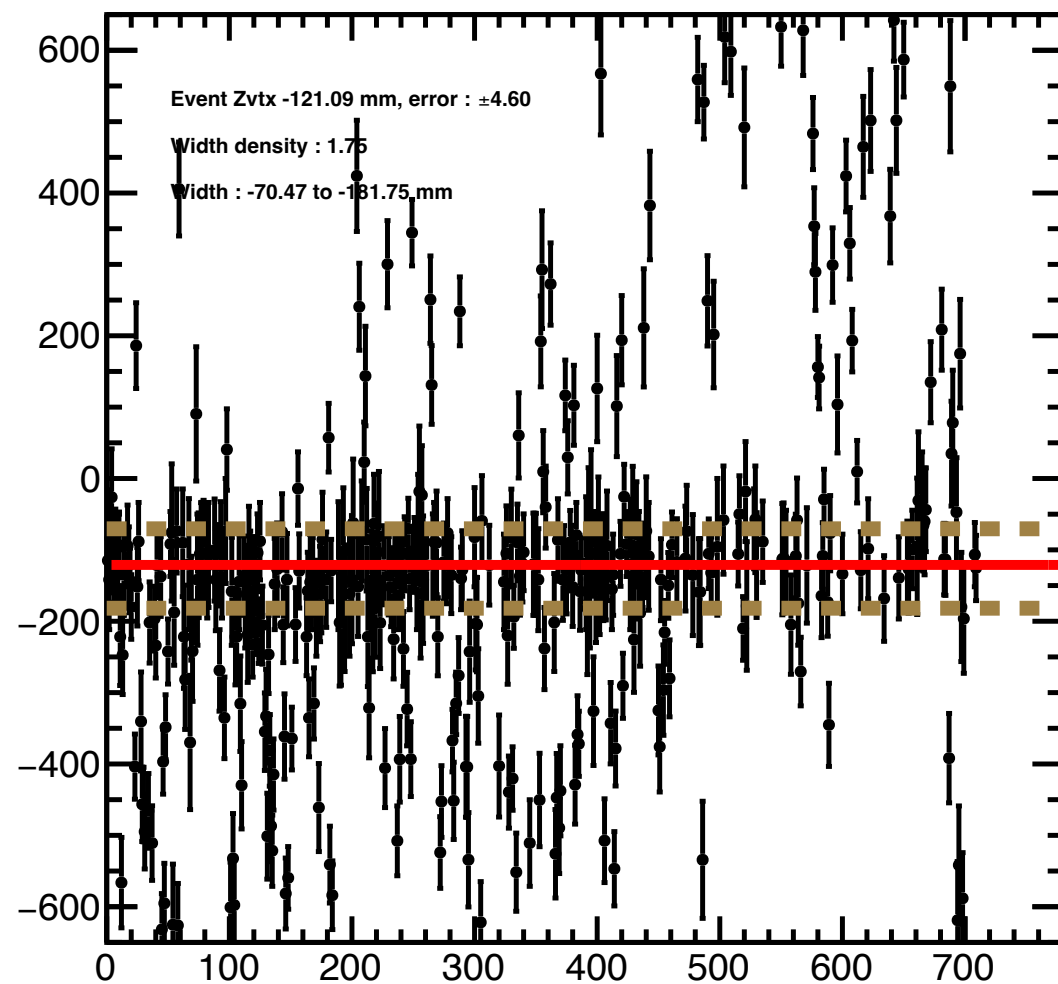
zvtx_evt_width_corre



zvtx_evt_fitError_corre



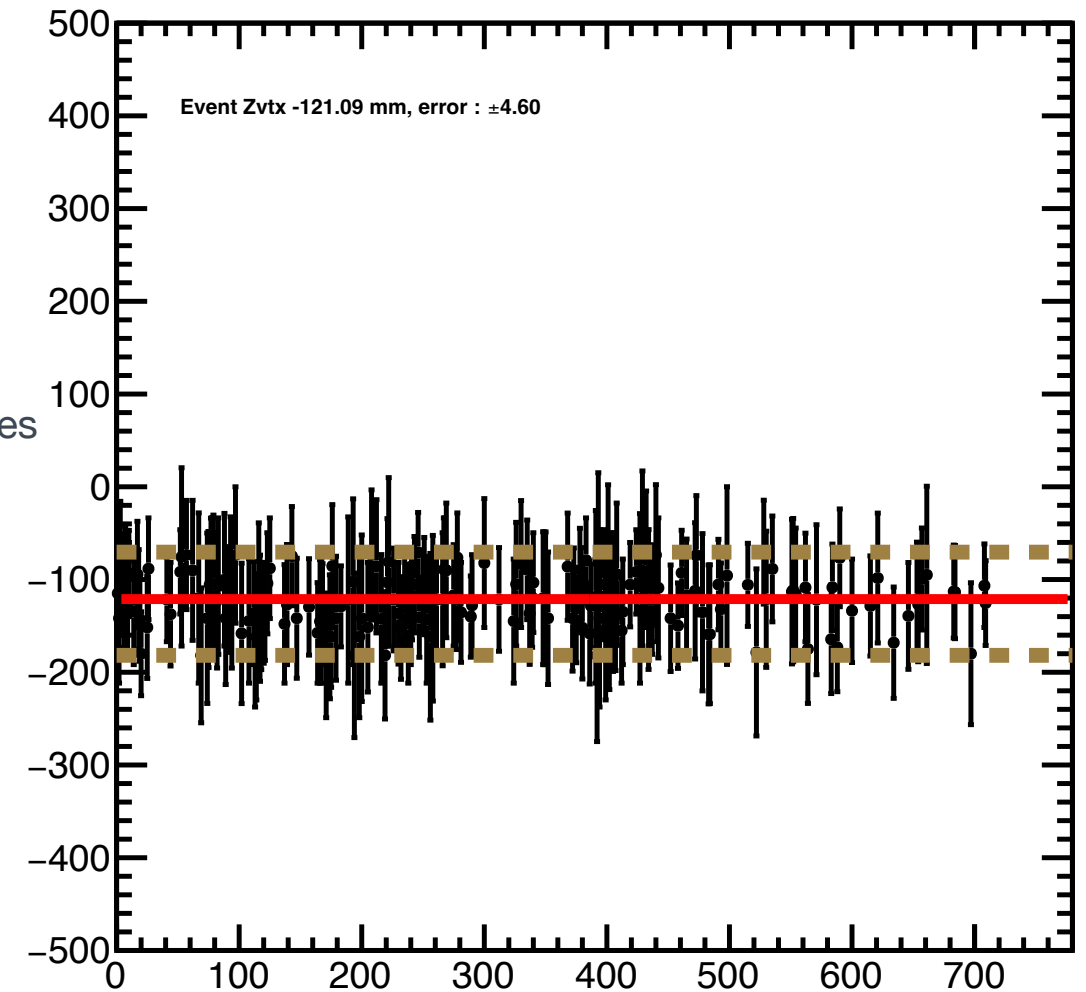
All the possible combinations



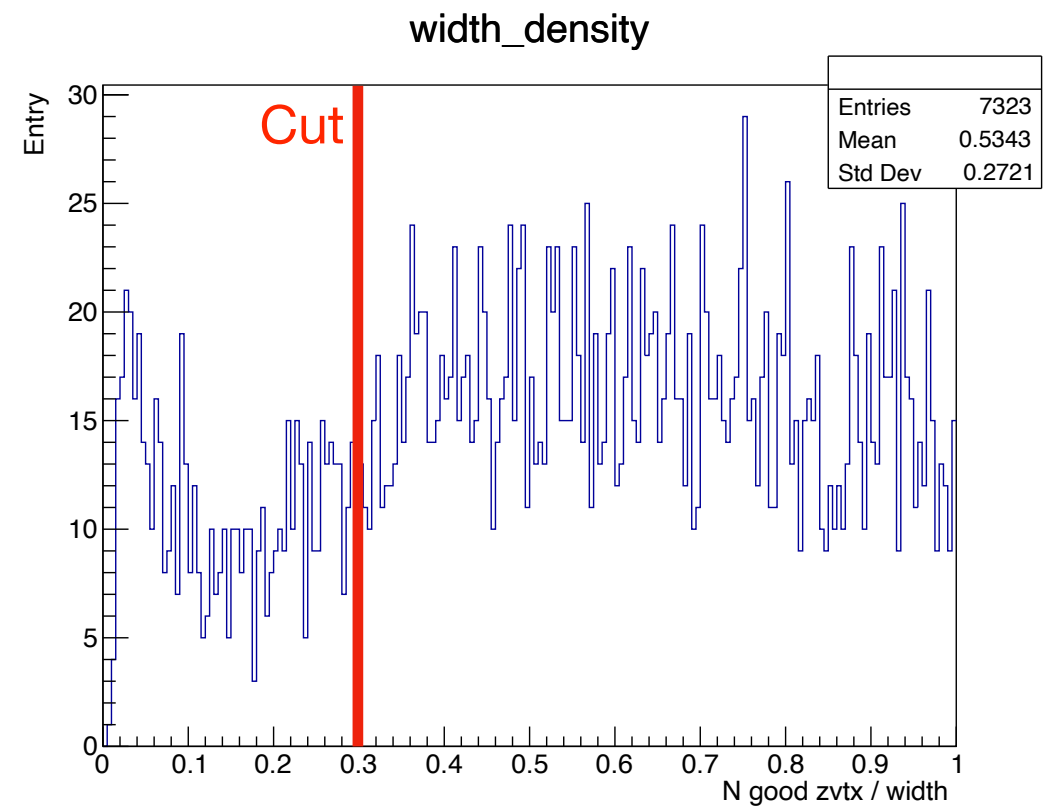
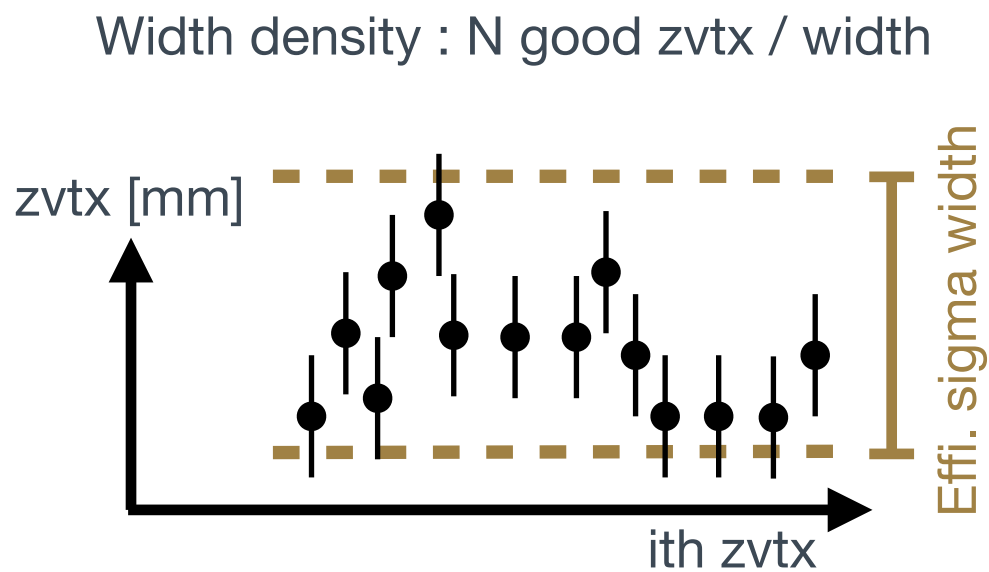
Find the effi. range
including 40% of entries



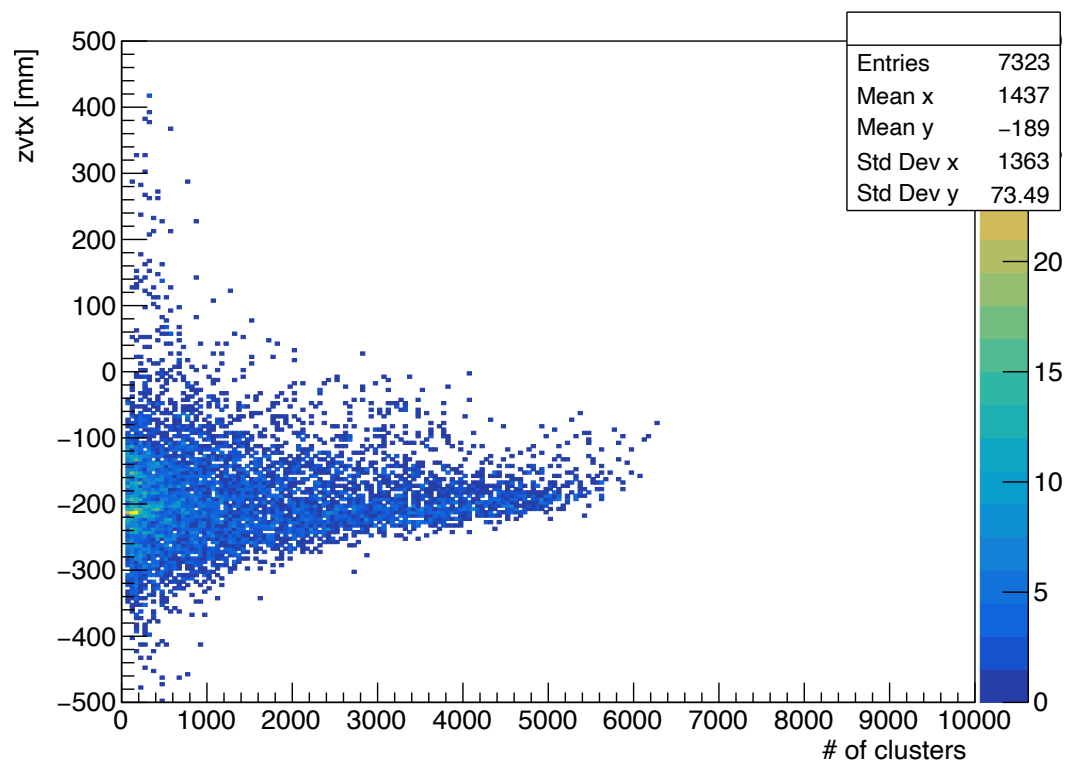
The combinations within the range



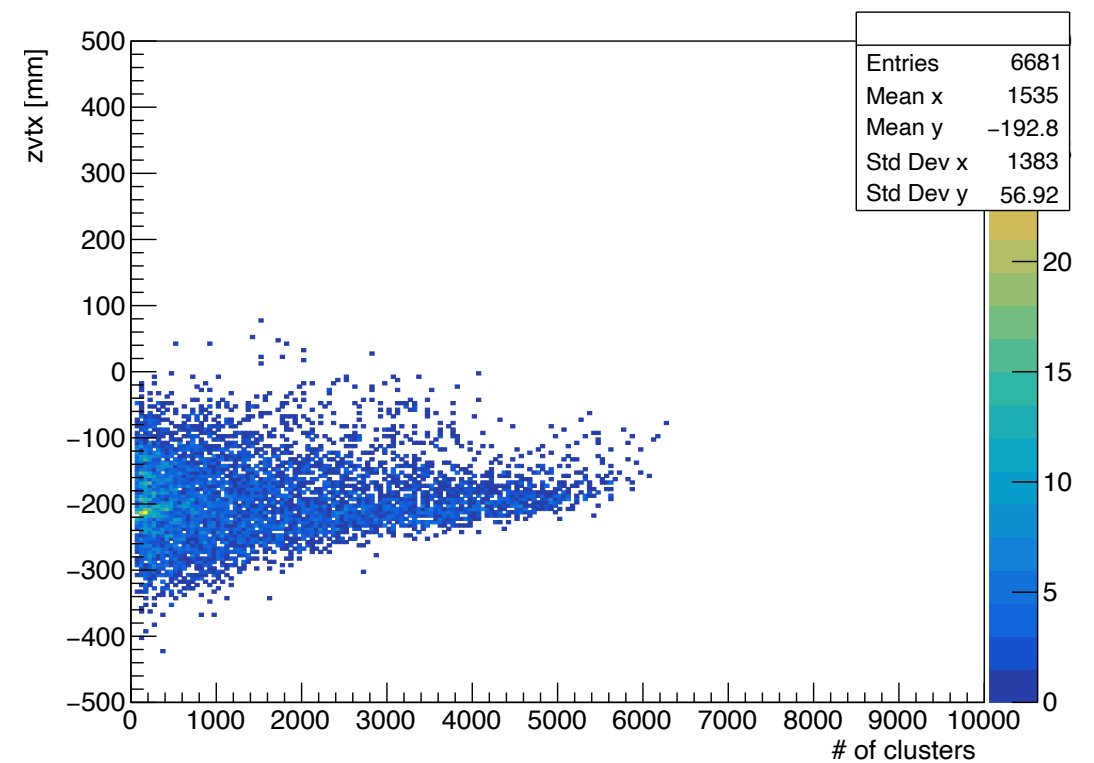
Only the combinations within the range were included in the fitting
Error bars were included in the fitting



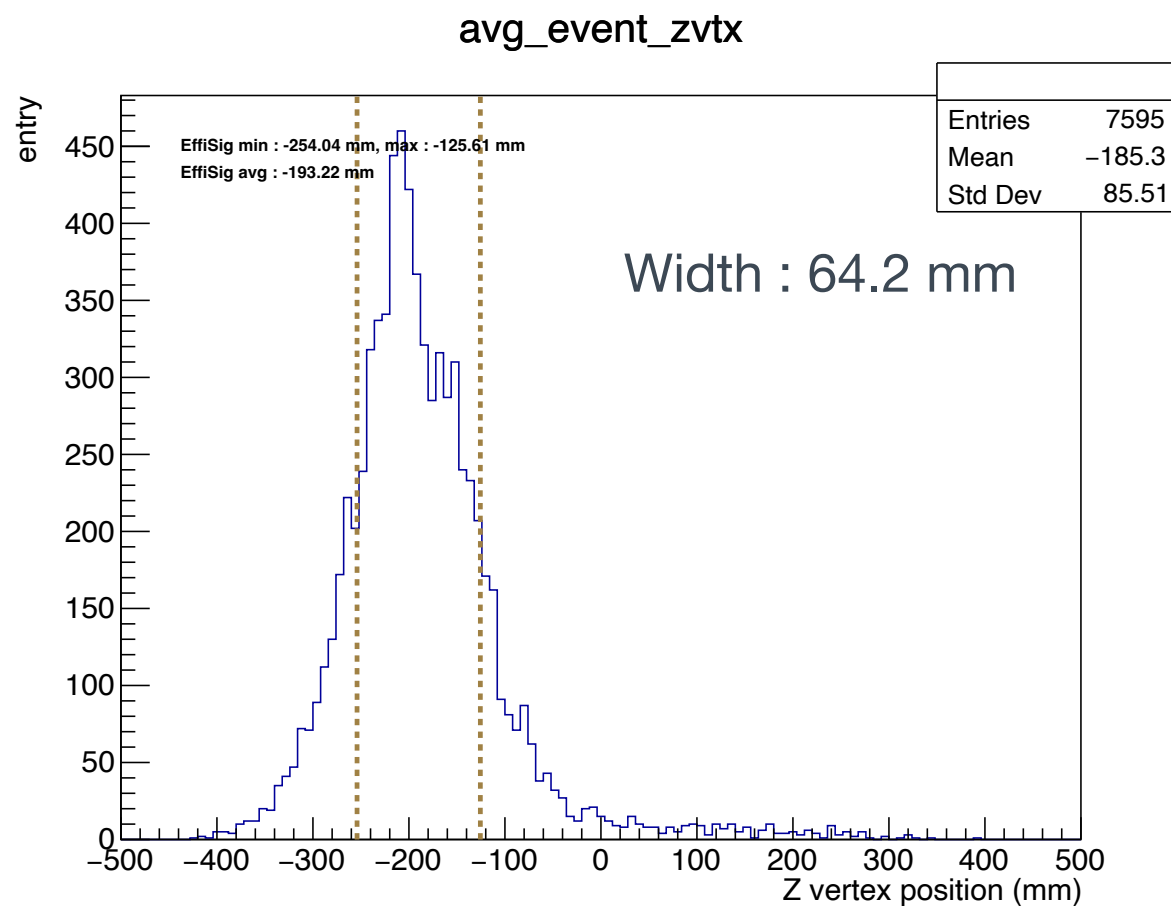
Without width_density cut



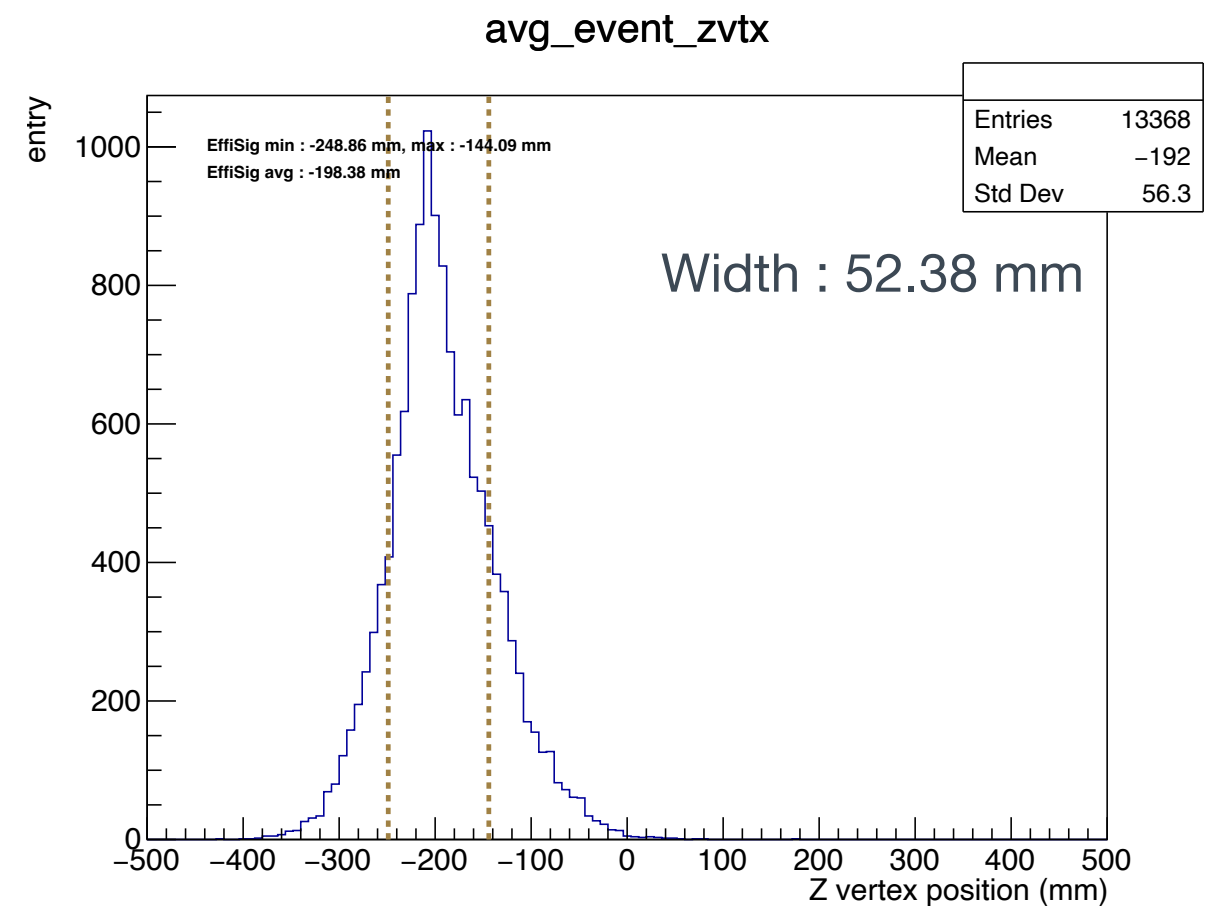
With width_density cut



Z histogram filled with Zpos @ DCA point

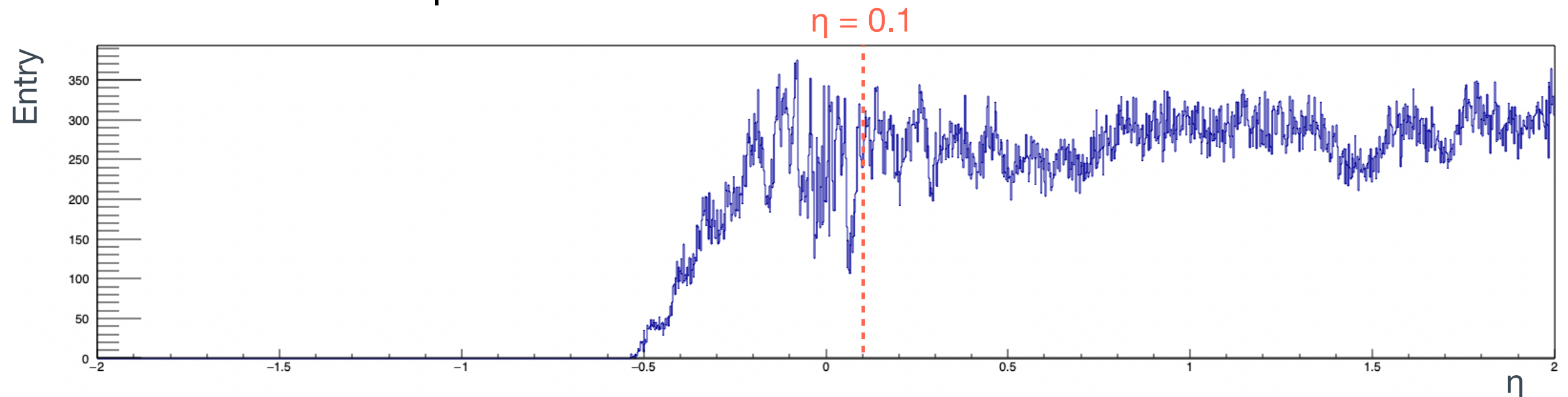
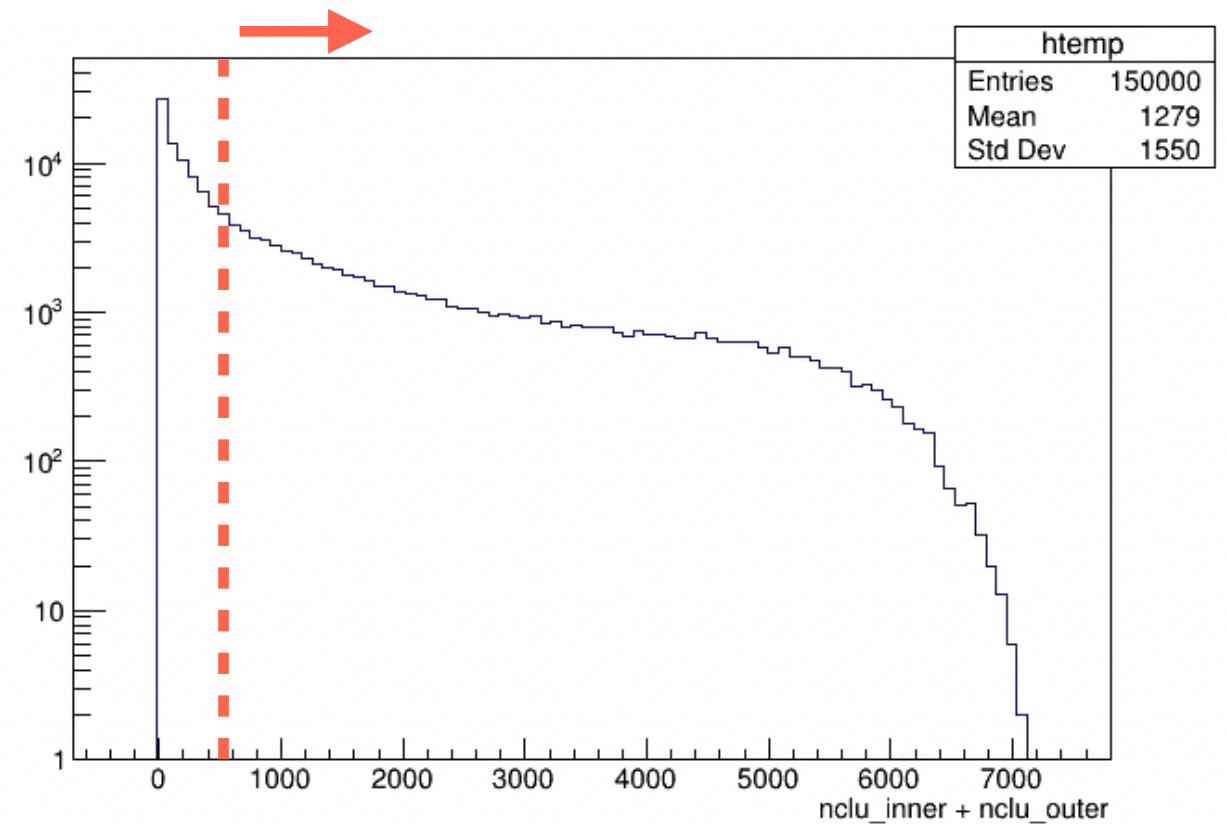
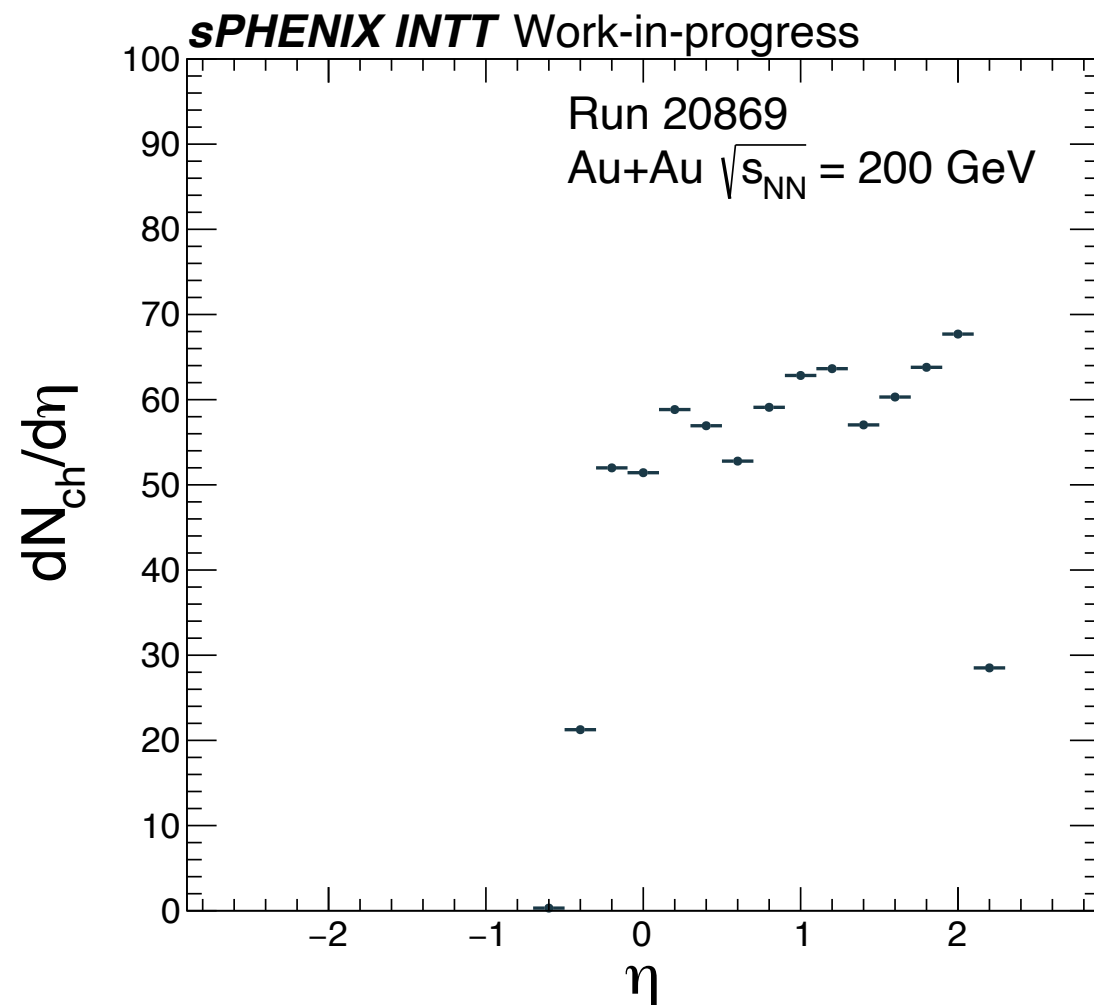


New method :
All possible Z vtx considered (width density cut 0.3)

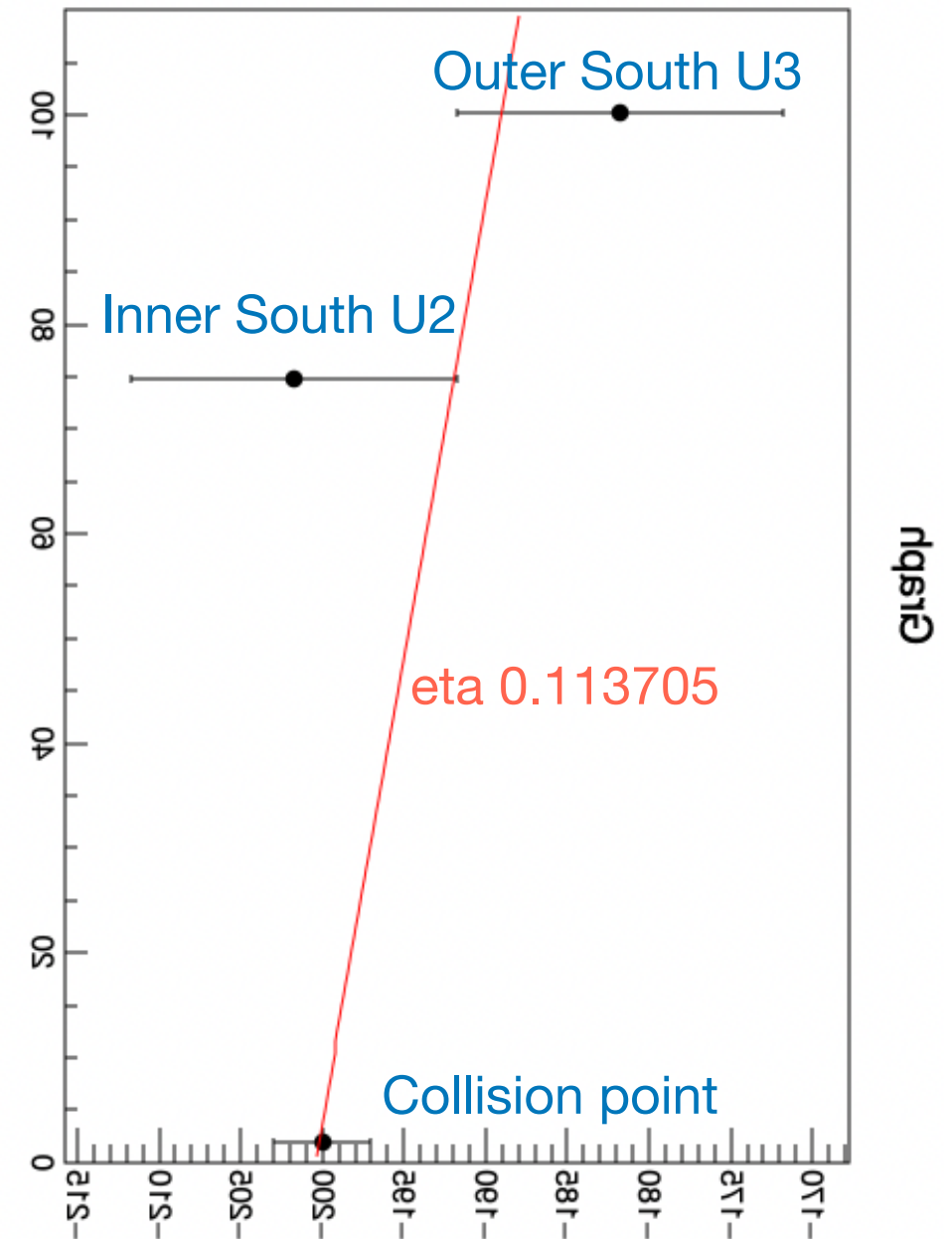
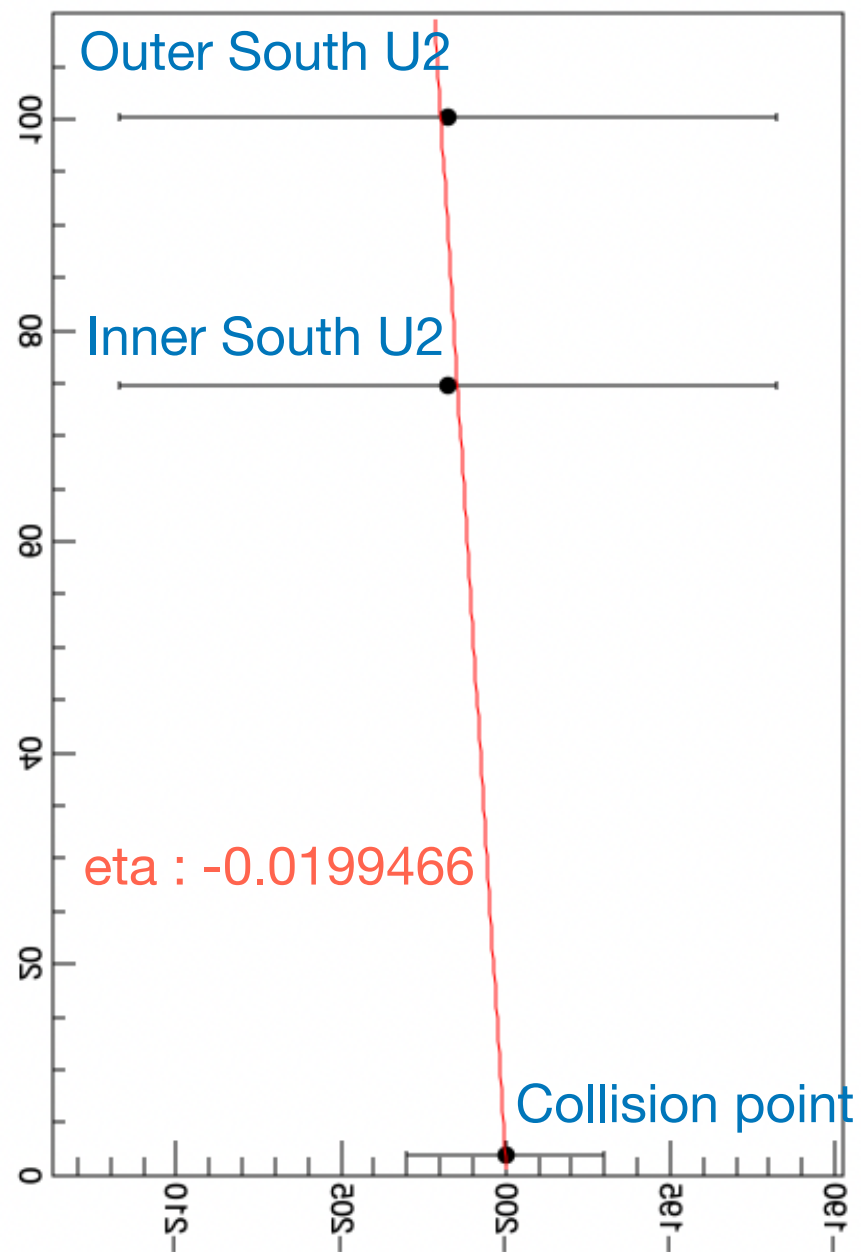
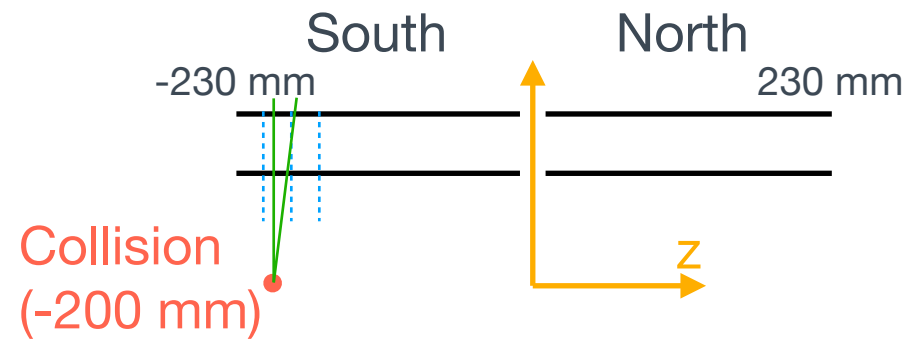


INTT $dN/d\eta$ (z given by INTT)

Full ϕ included. N total clusters > 500

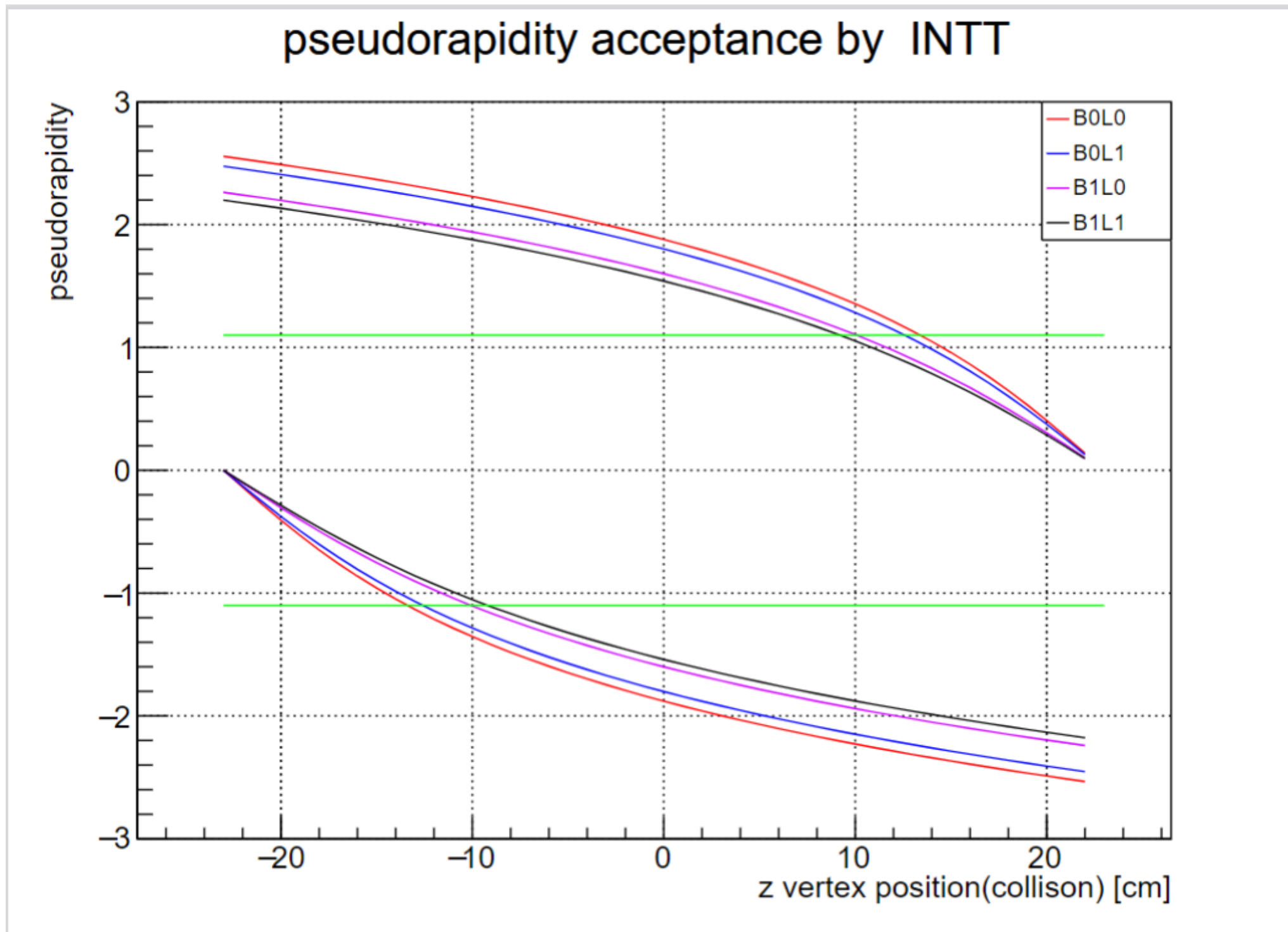


INTT $dN/d\eta$ (z given by INTT)



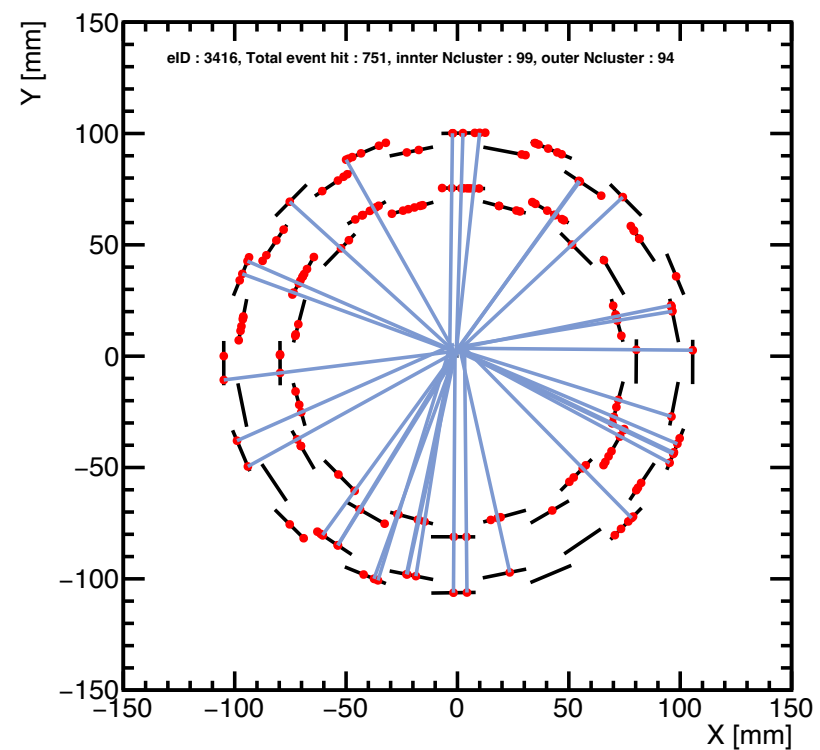
- After clone-hit removal, the N-hits distribution seems to be more reasonable
- Weird clone-hit behavior may need more investigation
- New algorithm was introduced to measure the INTT z vertex
 - Resolution : ± 5.23 cm
- Without the consideration of geometry correction, the $dN/d\eta$ is not smooth
- To do :
 - INTT Z vertex correlation with MBD Z
 - Study INTT MC, and apply the geometry correction provided by MC

Backup

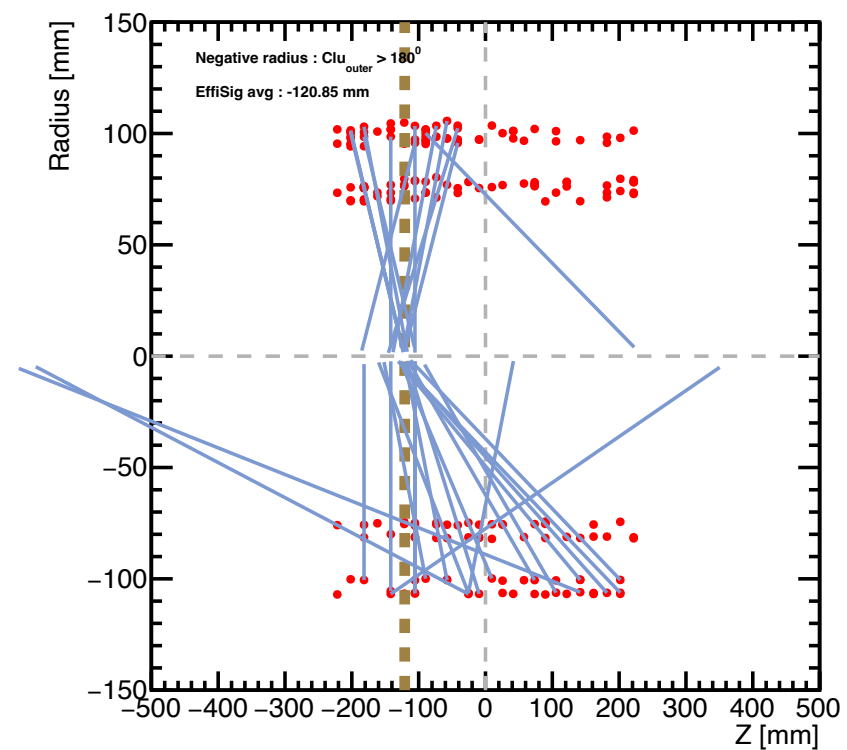


Plot made by Tomoya

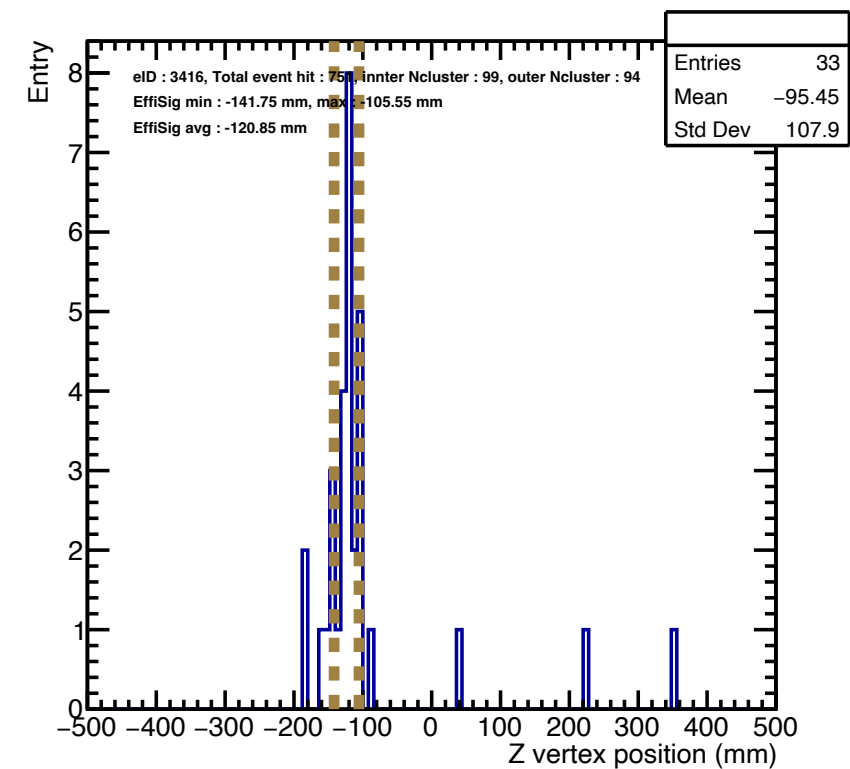
INTT event display X-Y plane



INTT event display r-Z plane



Z vertex dist

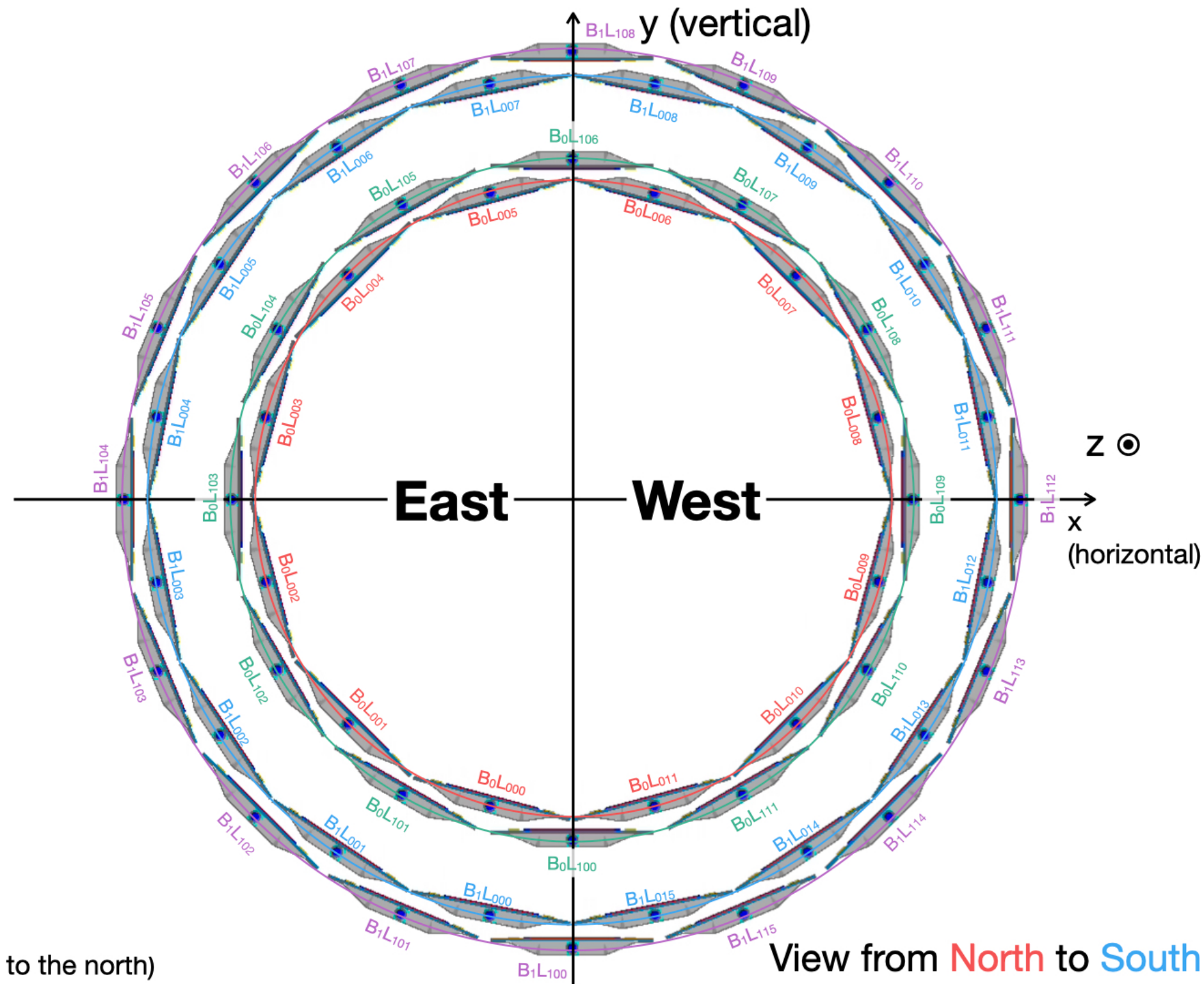


Notation: $B_x L_{yzz}$

x: Barrel ID (0 for inner or 1 for outer)

y: Layer ID (0 for inner or 1 for outer)

zz: Ladder ID (from 0 to 15)



Axis (Right-handed coordinate)

x-axis: $\vec{y} \times \vec{z}$

y-axis: Vertically upward direction

z-axis: The blue beam direction (pointing to the north)

View from North to South

beam_inttall-00020869-0000_event_base_ana.root
Run 20869, event 18, pid 3004, module 0

```
root [5] tree->Scan("pid:module:chip_id:chan_id:adc:bco_full:fhitArray.bco","Entry$ == 18 && pid == 3004 && module == 0","colsize=30",1000)
```

Row	Instance	pid	module	chip_id	chan_id	adc	bco_full	fhitArray.bco
18	1600	3004	0	20	97	0	727878316840	54
18	1601	3004	0	20	98	1	727878316840	54
18	1602	3004	0	20	99	0	727878316840	53
18	1603	3004	0	20	100	0	727878316840	54
18	1604	3004	0	25	10	0	727878316840	54
18	1605	3004	0	25	12	0	727878316840	54
18	1606	3004	0	25	13	1	727878316840	53
18	1607	3004	0	25	14	3	727878316840	53
18	1608	3004	0	26	41	1	727878316840	53
18	1609	3004	0	26	42	4	727878316840	53
18	1610	3004	0	26	43	1	727878316840	53
18	1611	3004	0	26	44	1	727878316840	53
18	1612	3004	0	26	58	1	727878316840	54
18	1613	3004	0	26	59	1	727878316840	53
18	1614	3004	0	26	60	2	727878316840	53

=> 15 selected entries
(long long) 15