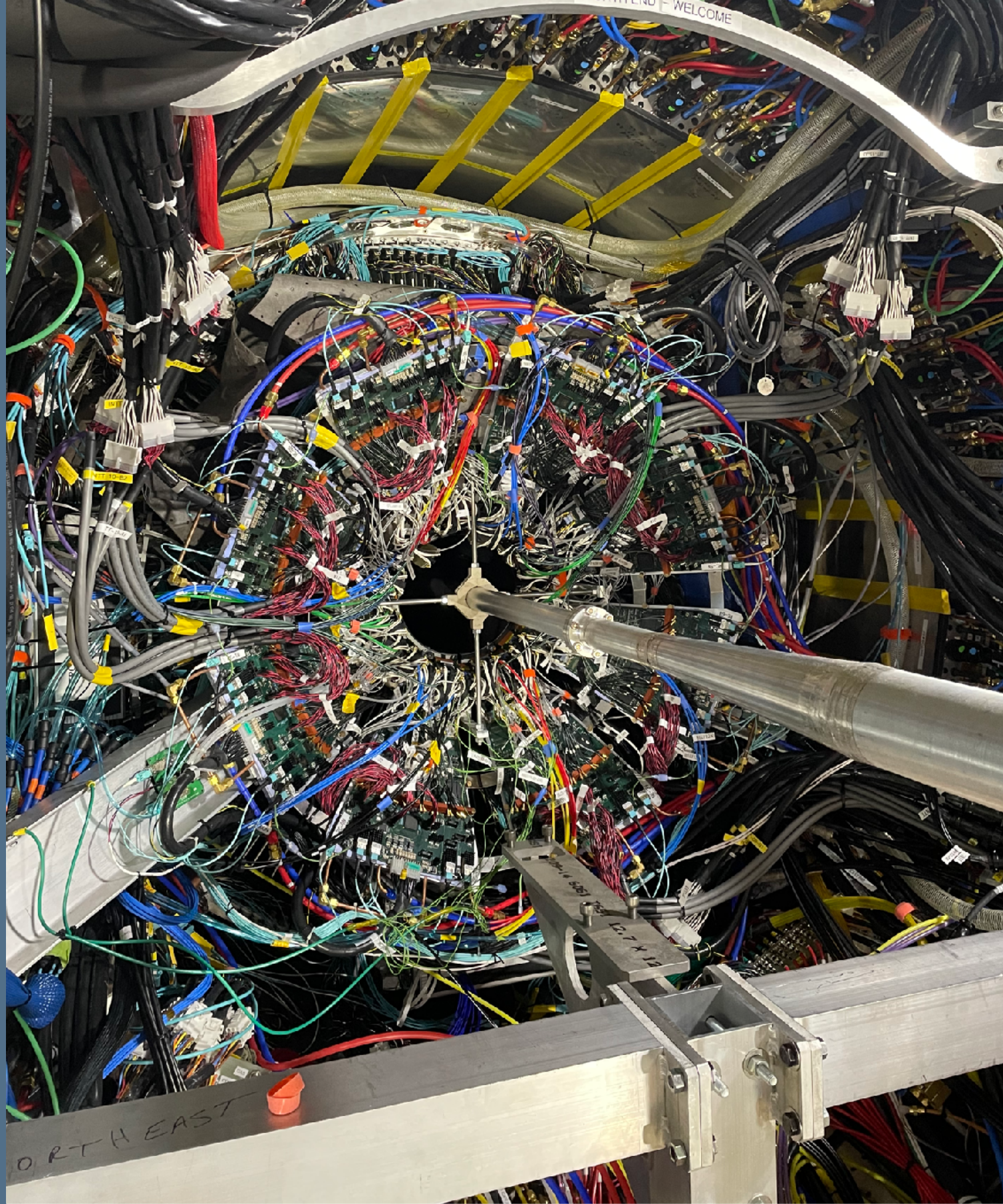


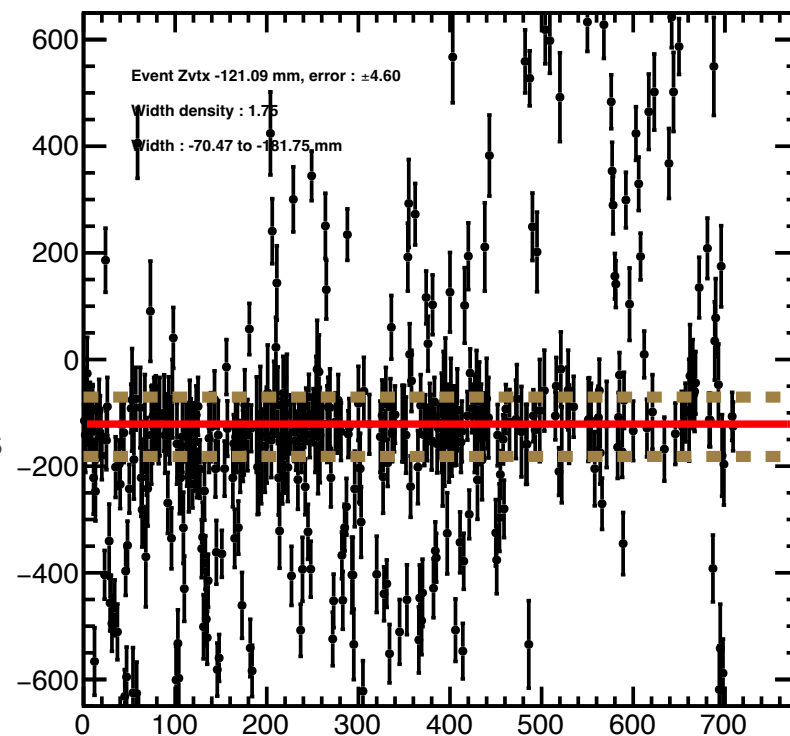
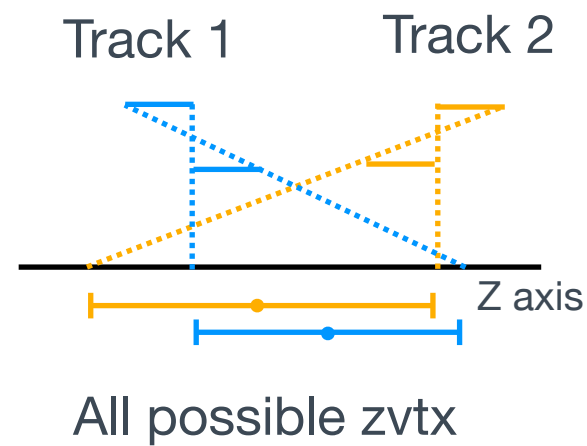
sPEHNIX INTT - $dN/d\eta$

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



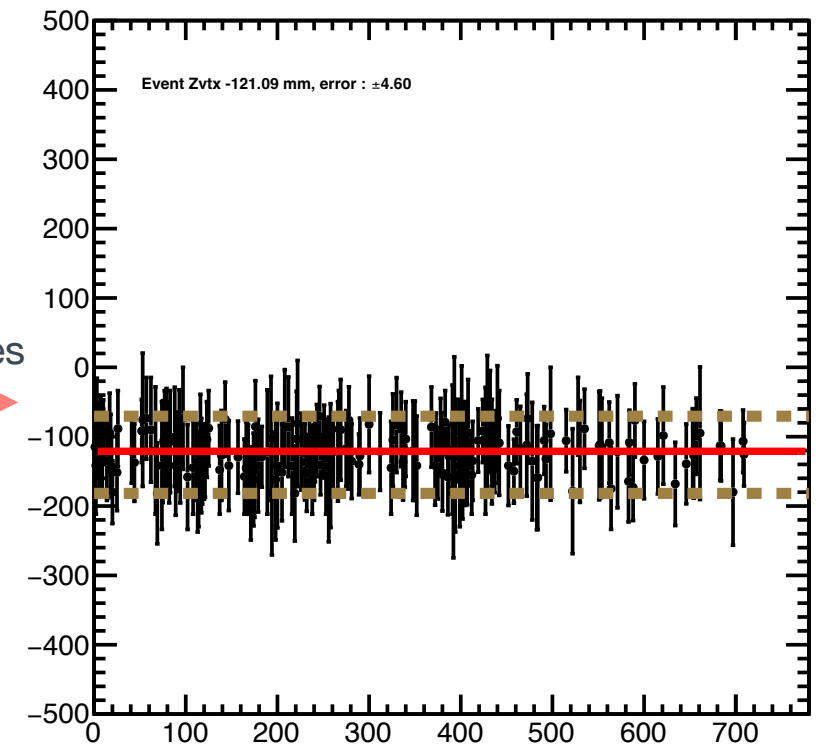
VTX_z by INTT (Zero field)

After track finder in XY plane

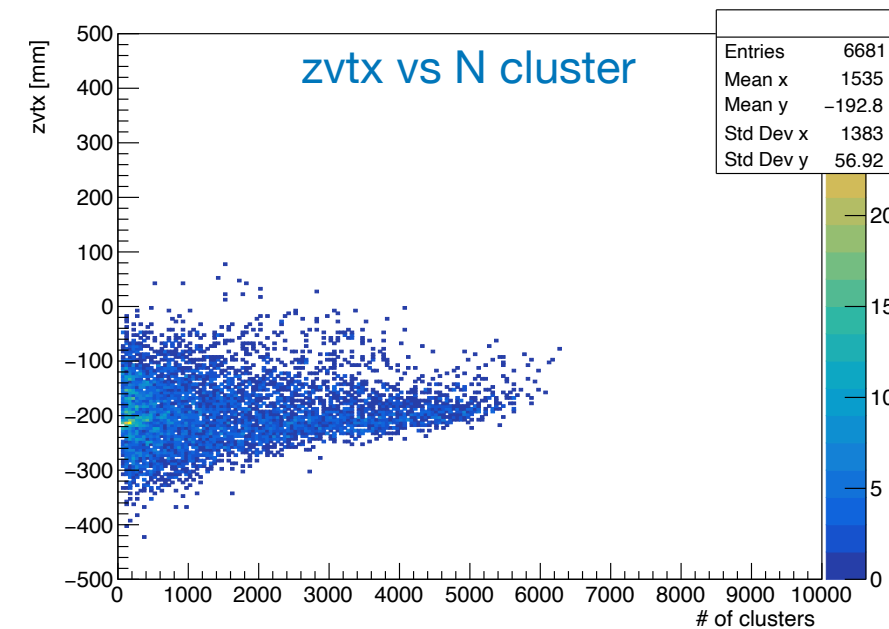
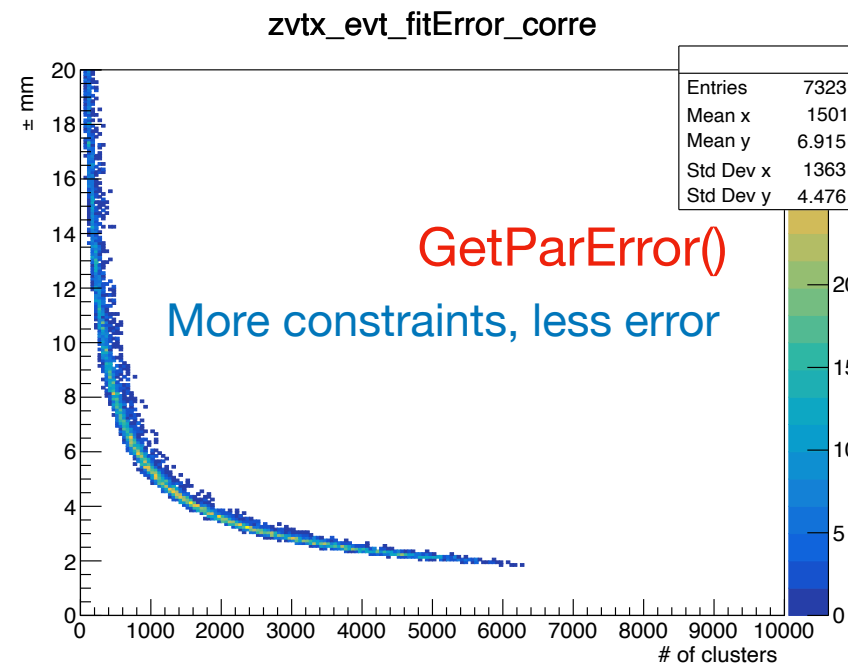
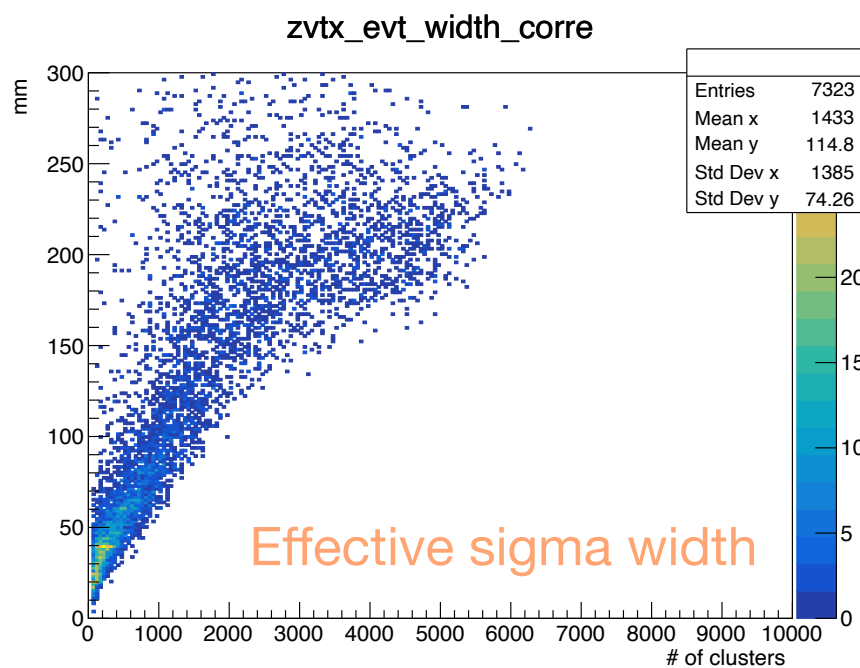


All the possible combinations

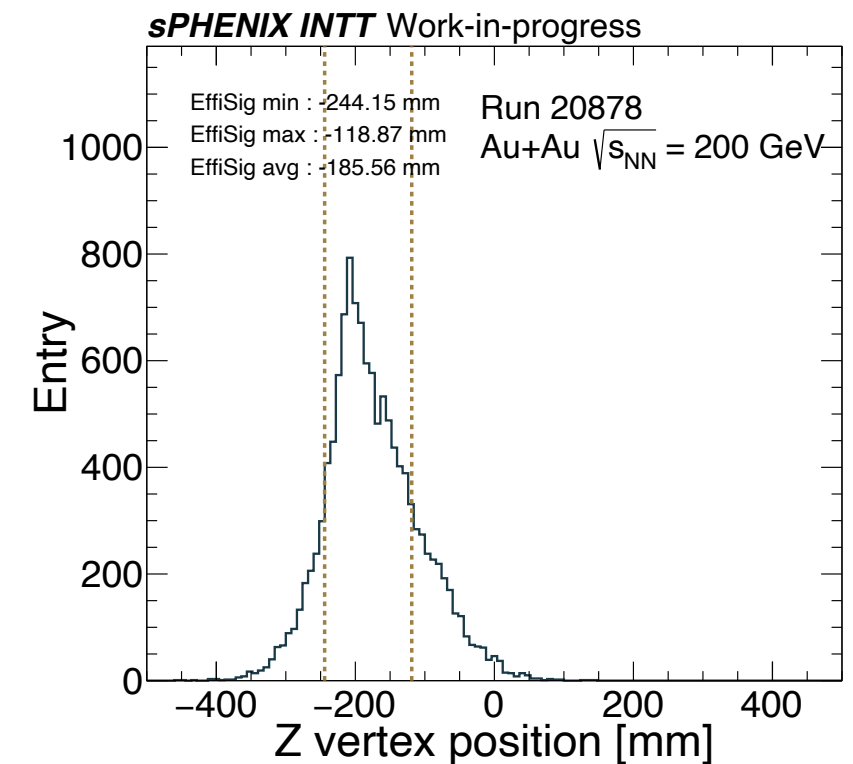
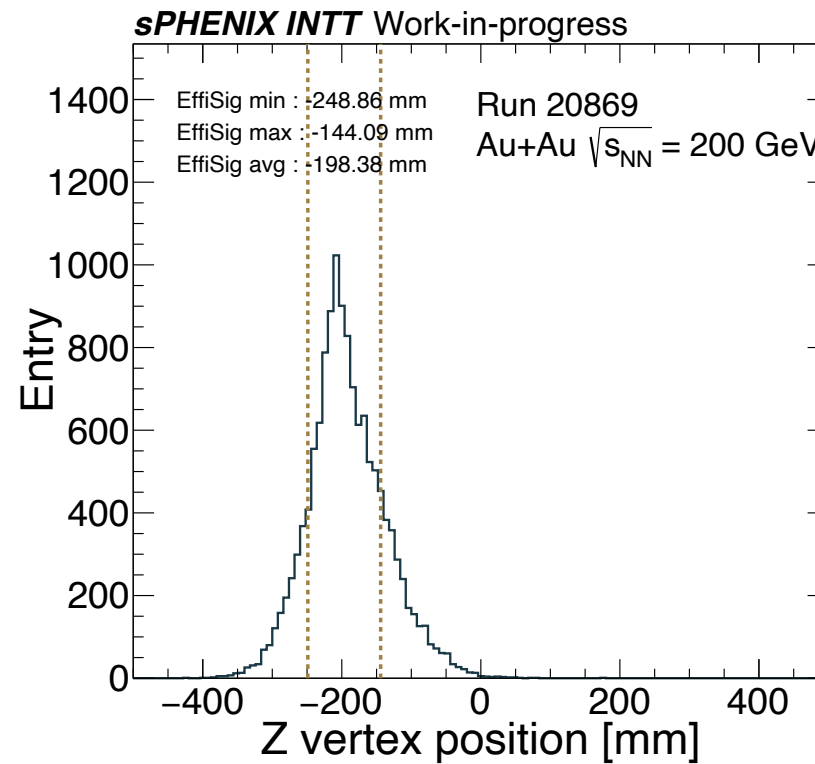
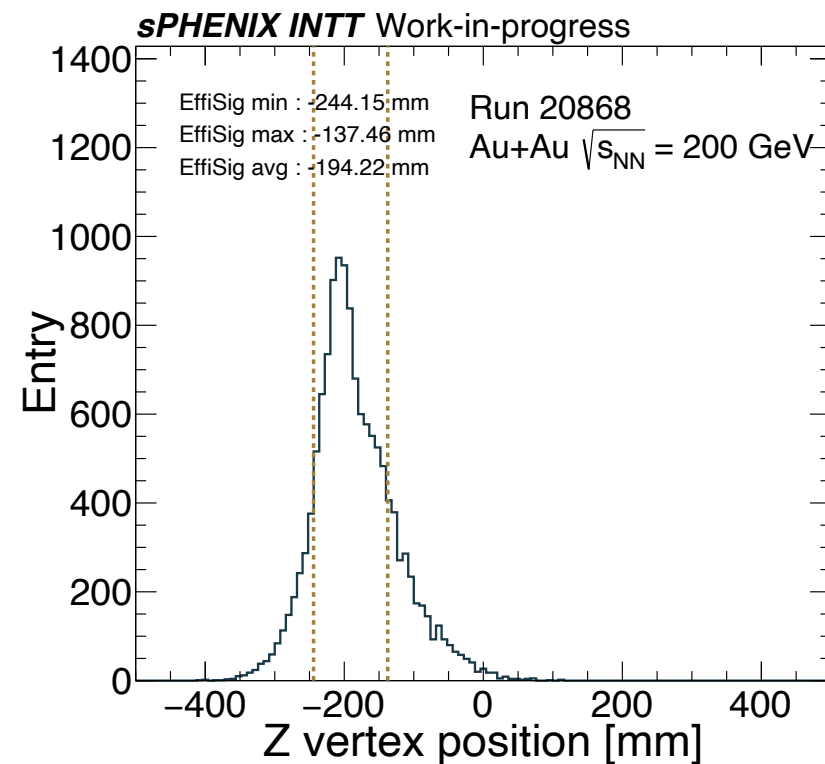
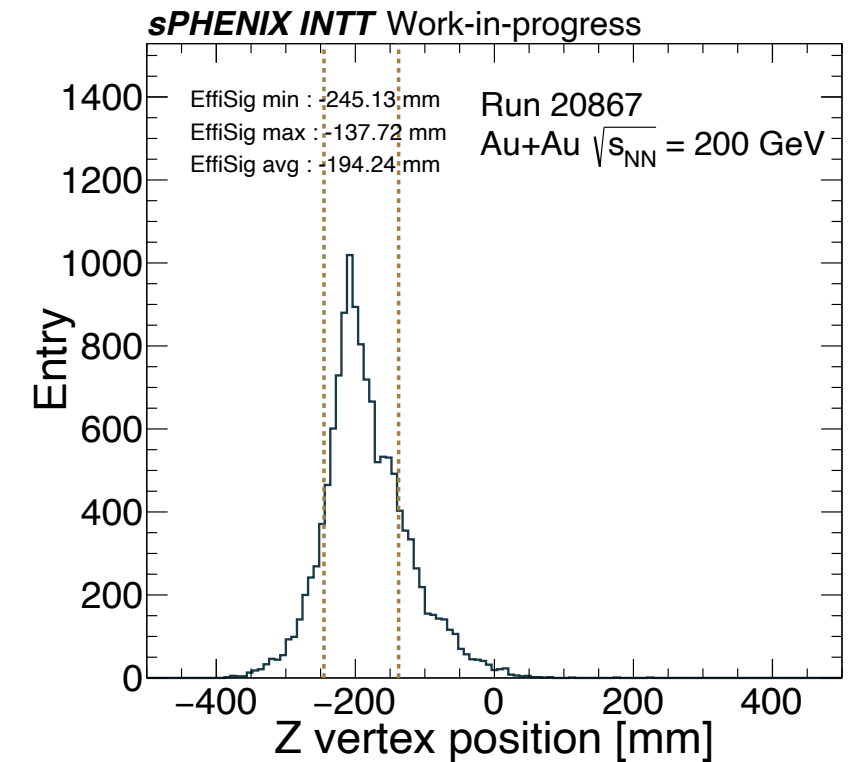
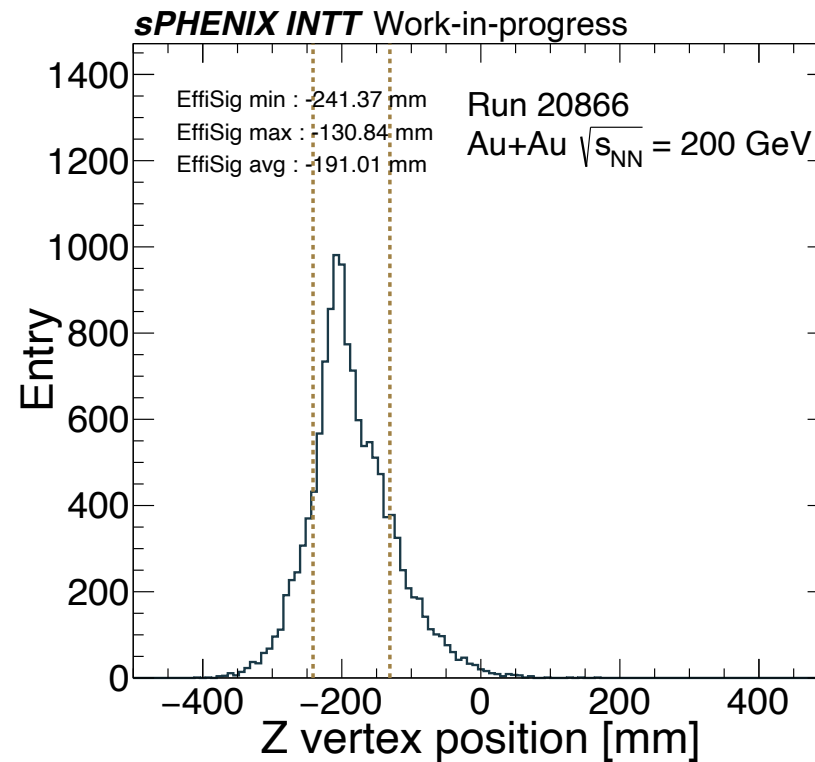
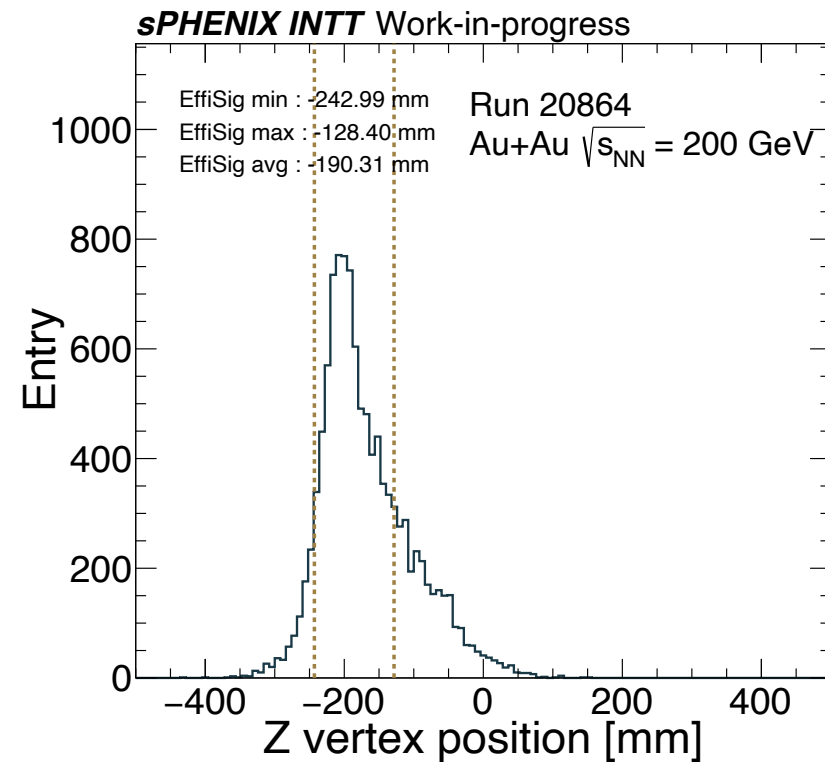
Find the effi. range including 40% of entries



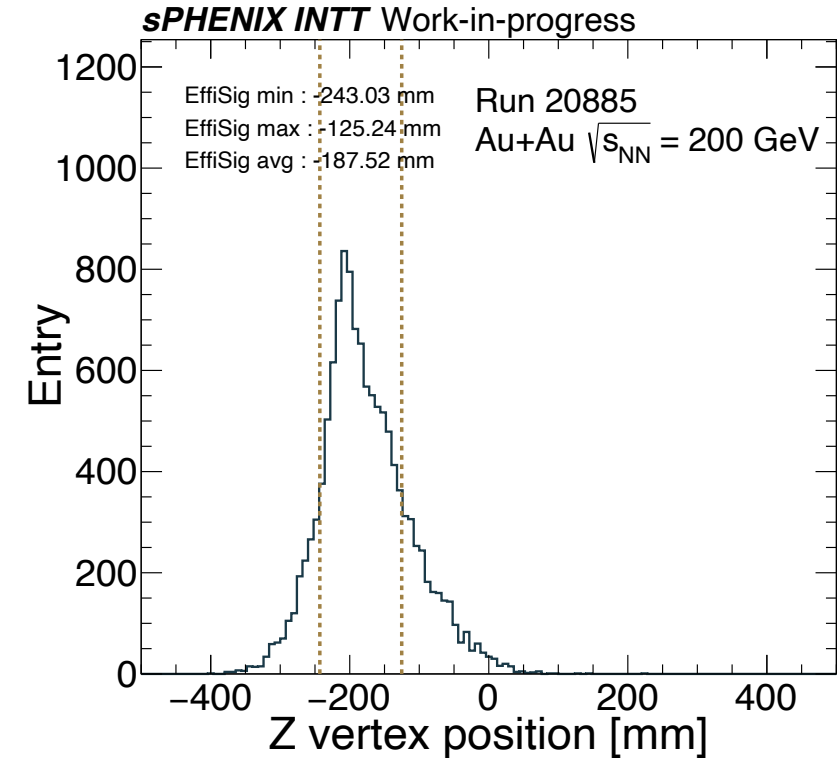
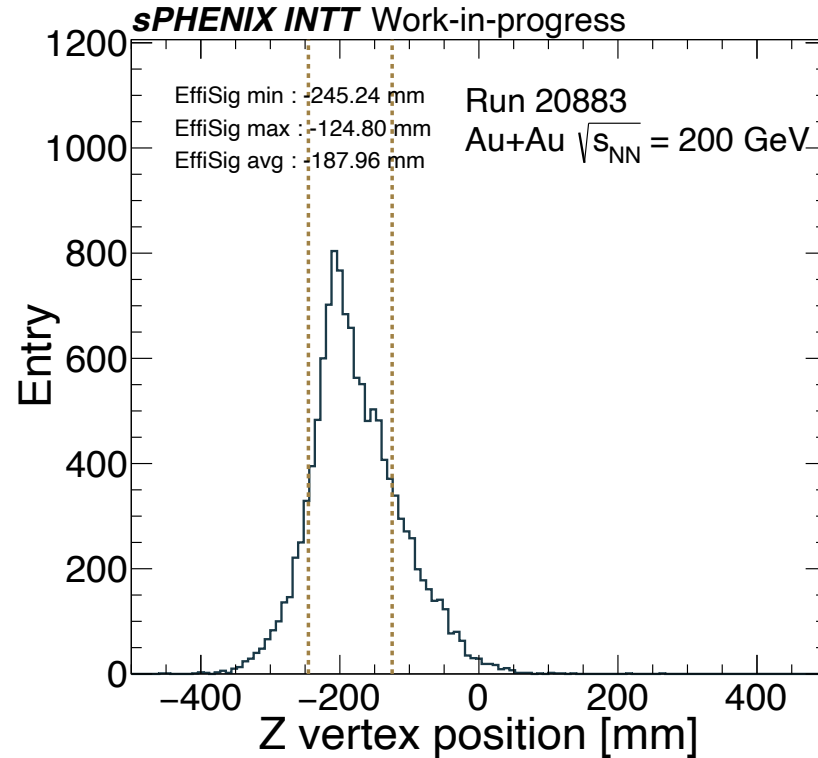
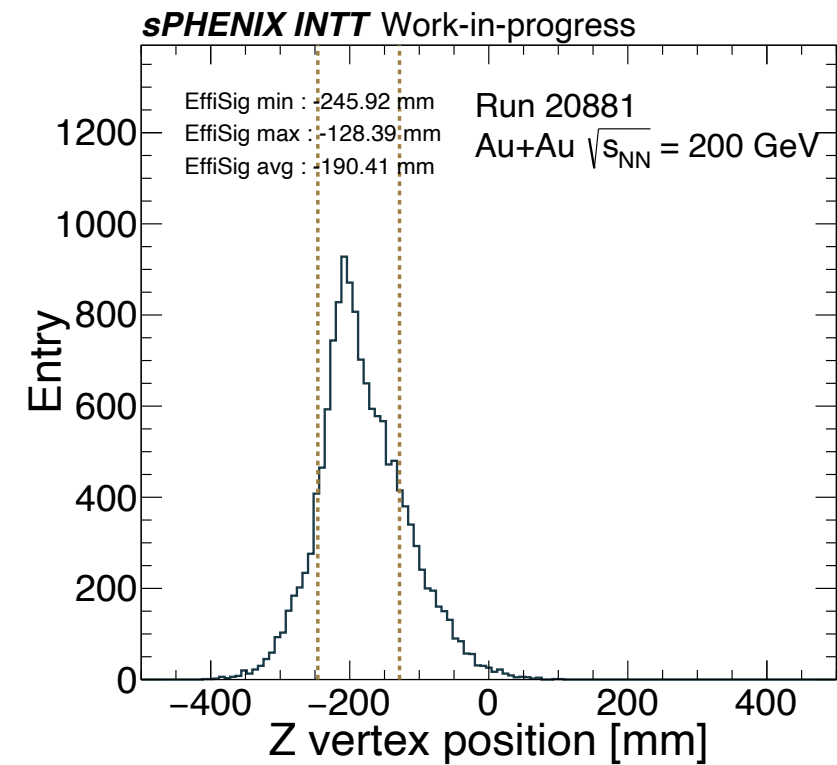
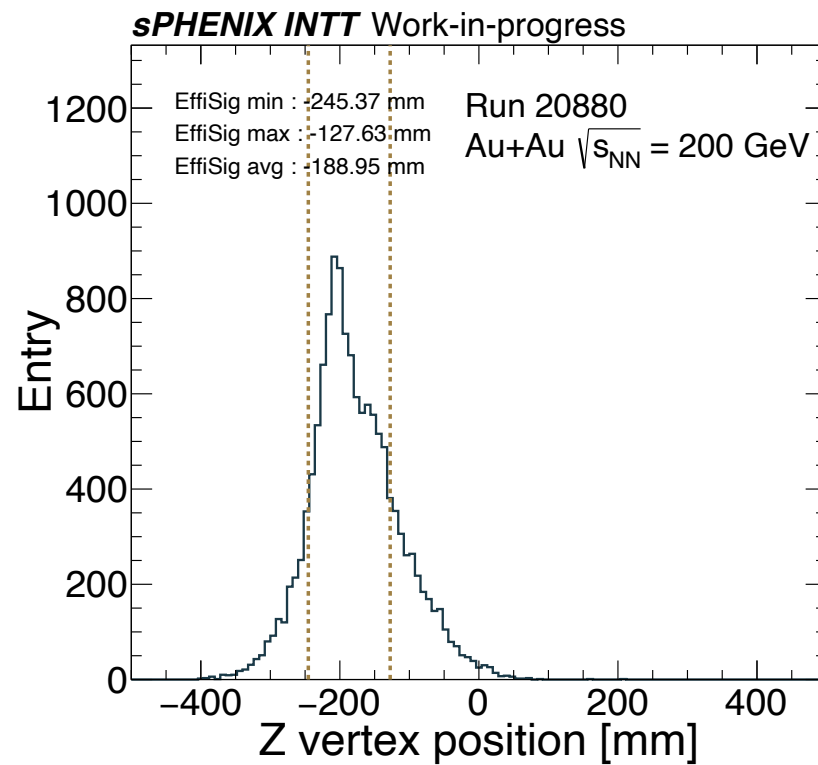
The combinations within the range



Z vertex by INTT (10 ZF runs)



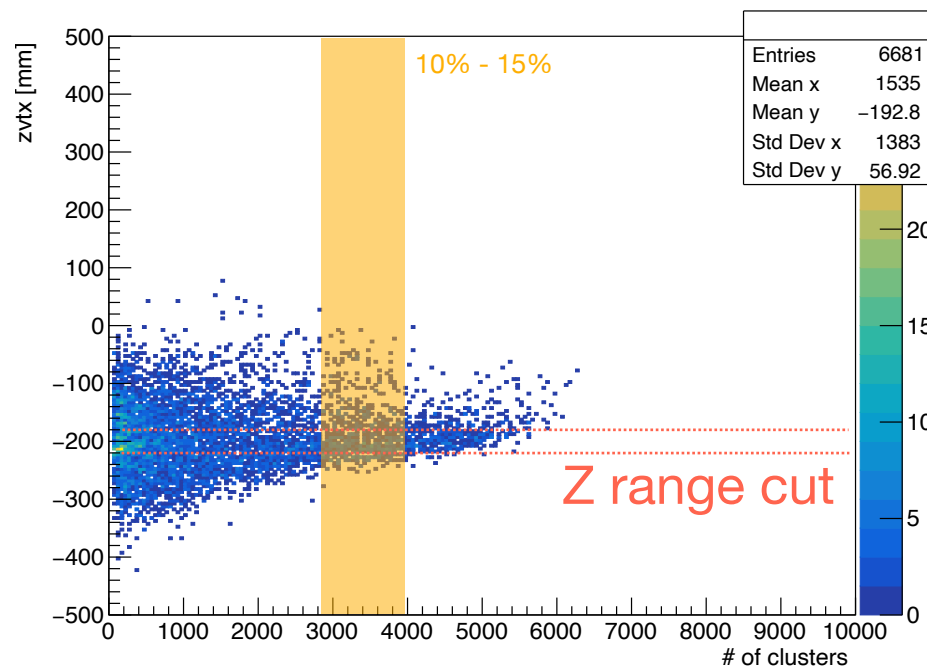
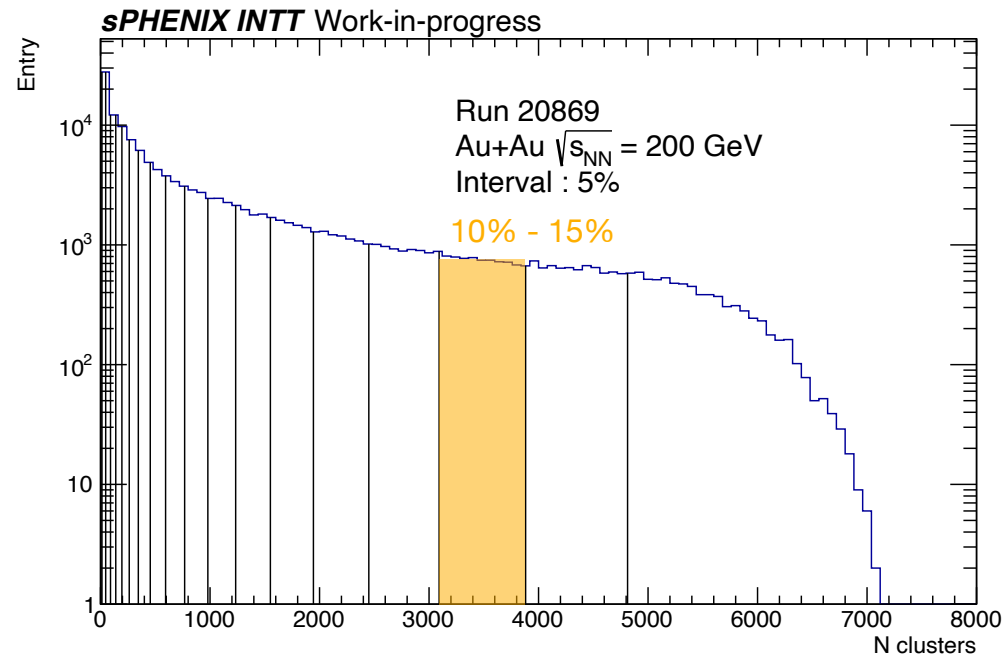
Z vertex by INTT (10 ZF runs)



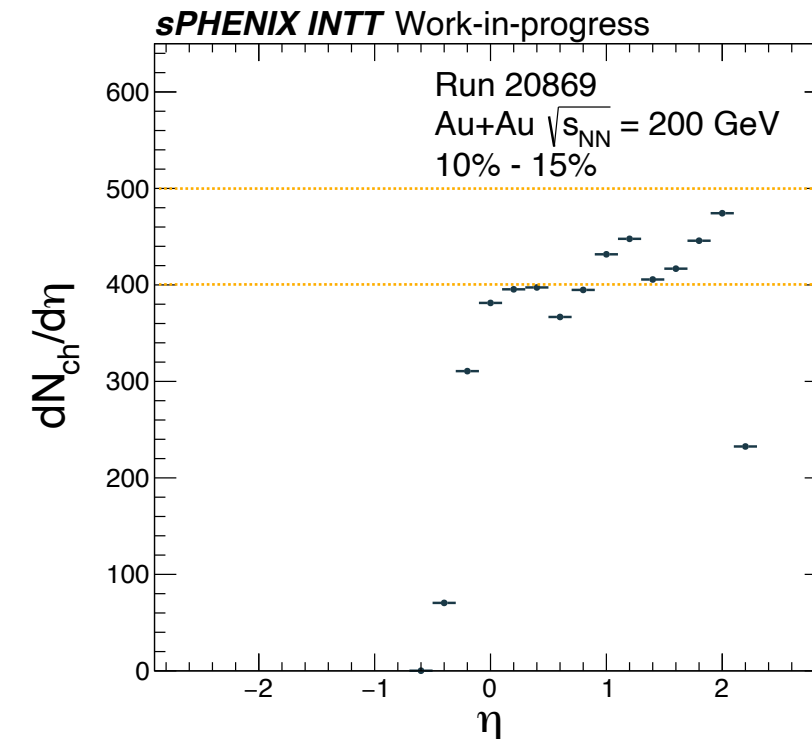
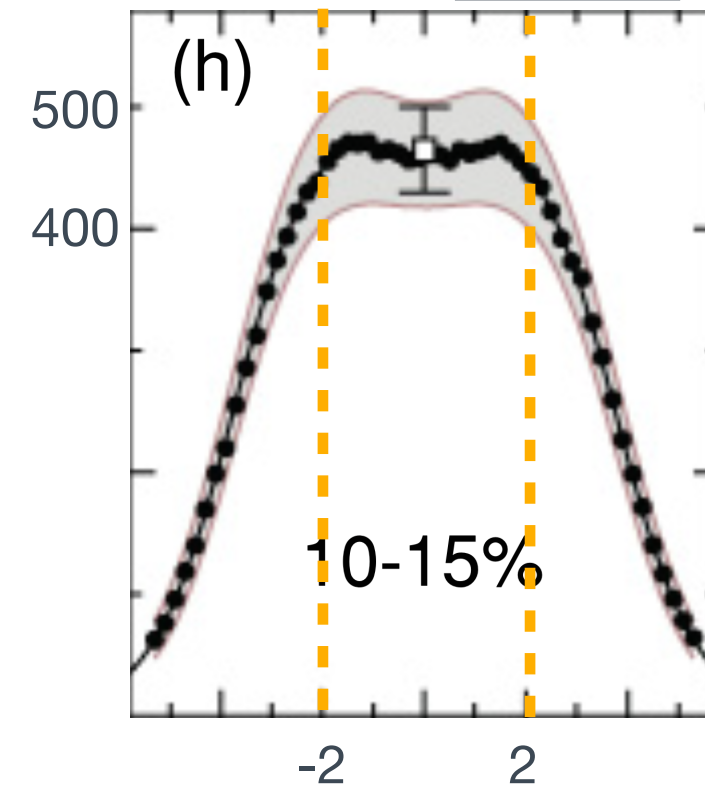
All 10 zero-field runs have the zvtx ~ -200 mm

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

Main purpose : check the η coverage with ZF-run data



Results from PHOBOS

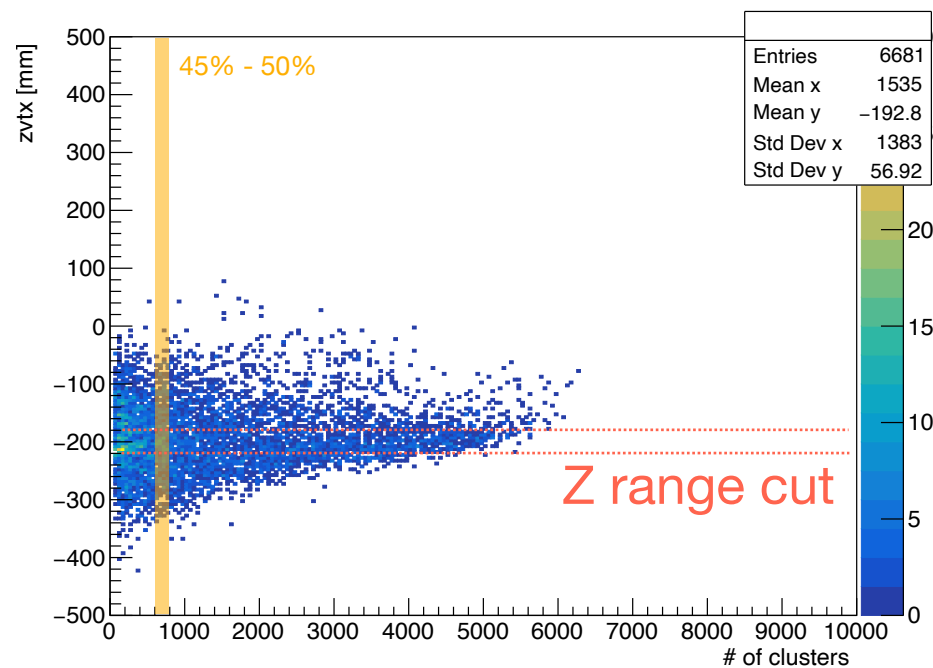
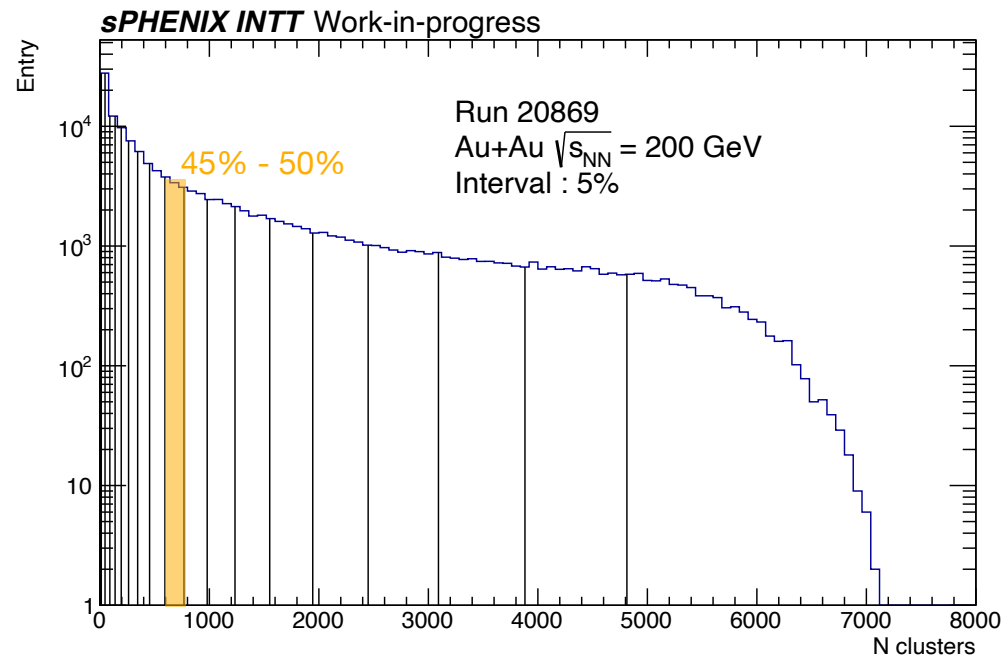


Zero correction

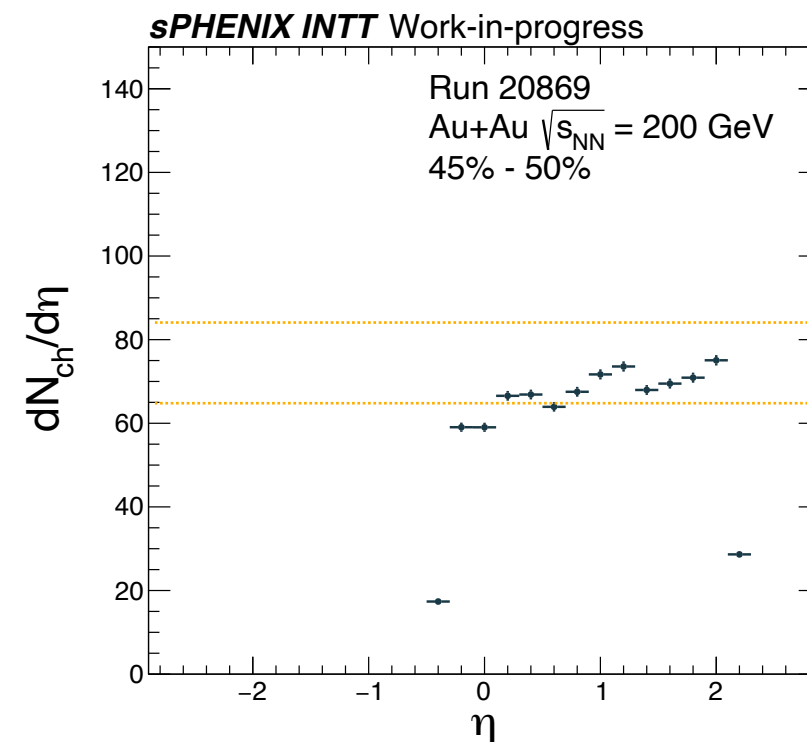
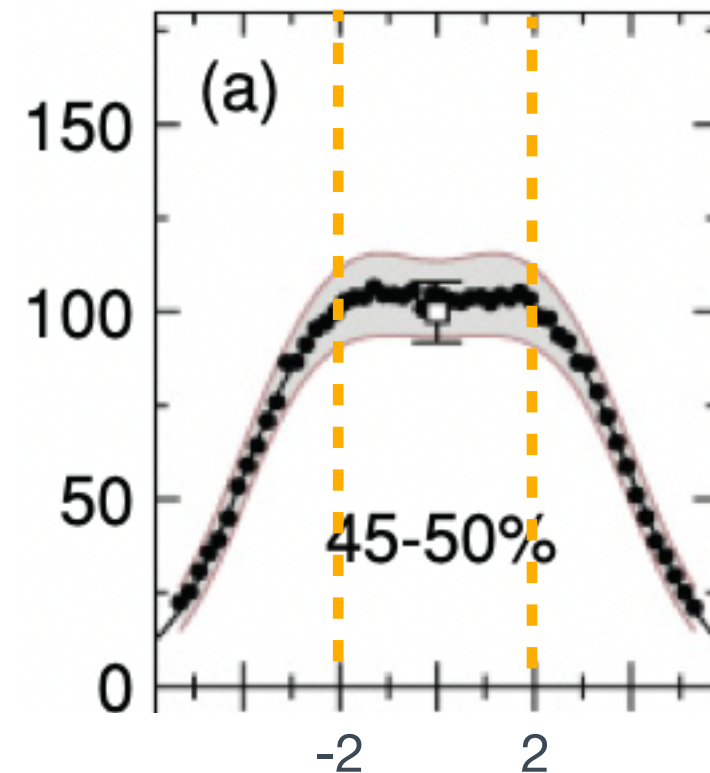
Distribution **asymmetrical**, not all the bins are meaningful

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

Main purpose : check the η coverage with ZF-run data



Results from PHOBOS



Zero correction

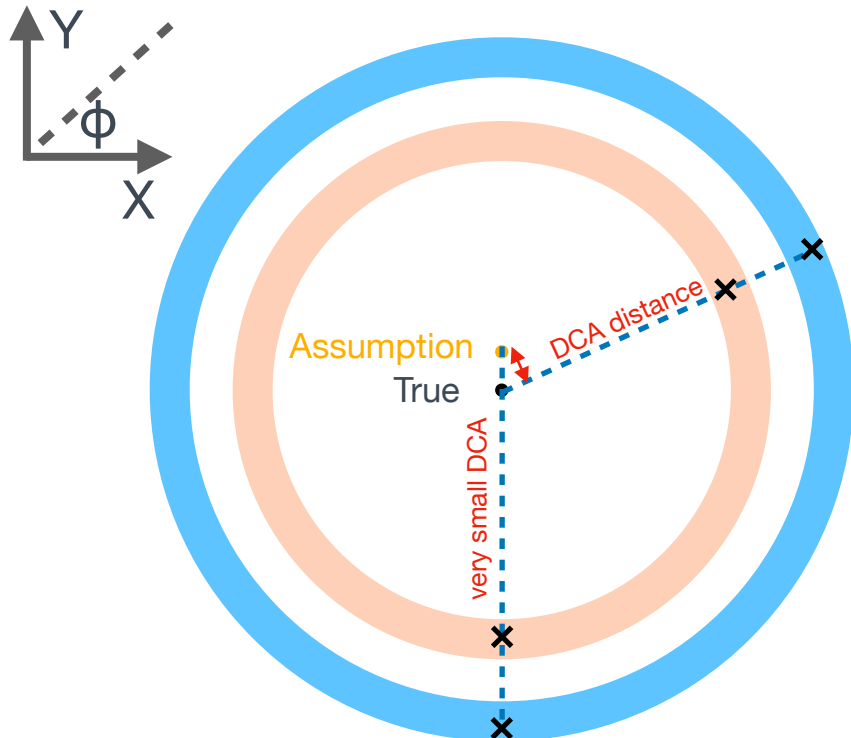
Distribution **asymmetrical**, not all the bins are meaningful

- All INTT zero field runs in Run23 have the z vertex off by -200 mm.
 - Result in asymmetrical $dN/d\eta$ distribution
- The current status was reported in the sPHENIX Bulk TG meeting
 - People are ok with the condition of INTT ZF runs

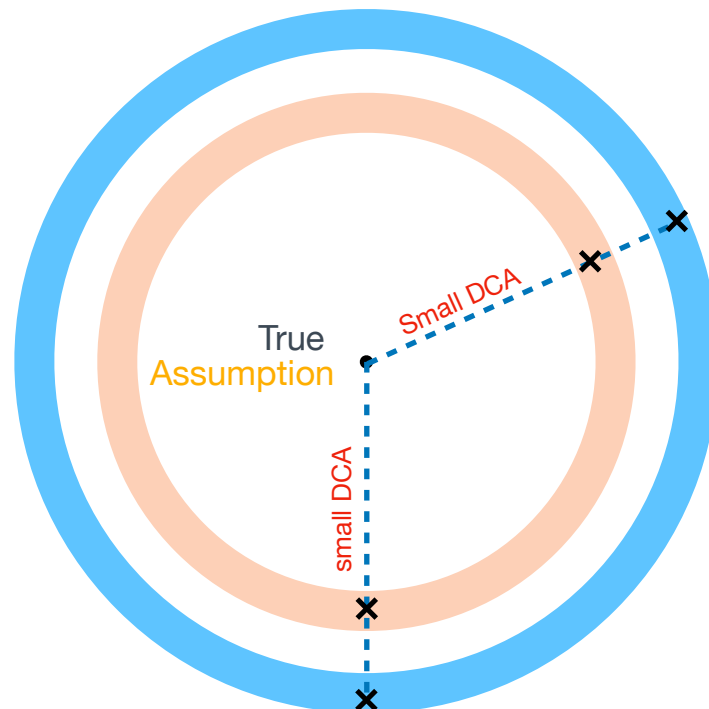
Backup

RunNumber (ZF)	Nevents
20864	417,729
20866	26,404
20867	317,047
20868	288,481
20869	550,123
20878	89,238
20880	171,760
20881	31,736
20883	94,249
20885	357,343
Sum	2,344,110

VTX_{xy} by INTT (Zero field)

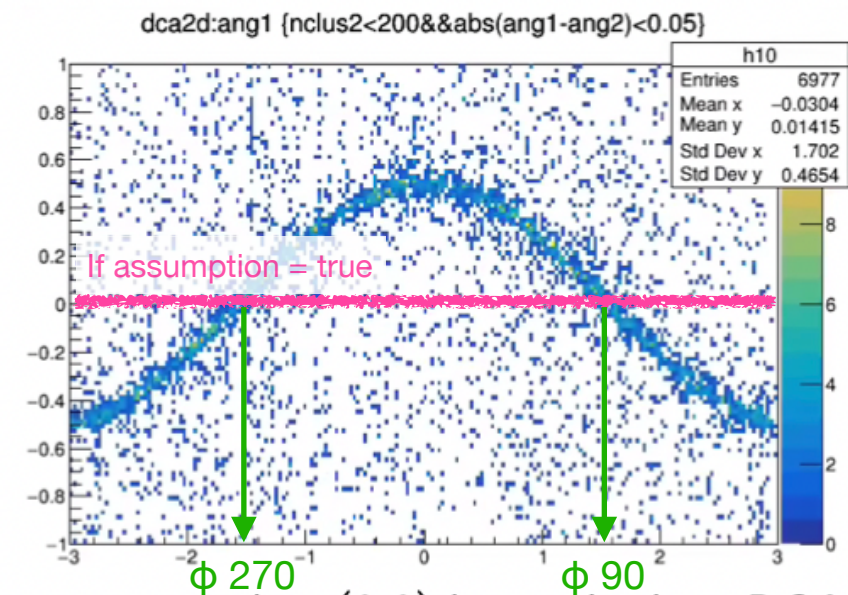


Assumed vertex $\neq$ true vertex
DCA varies along with track ϕ

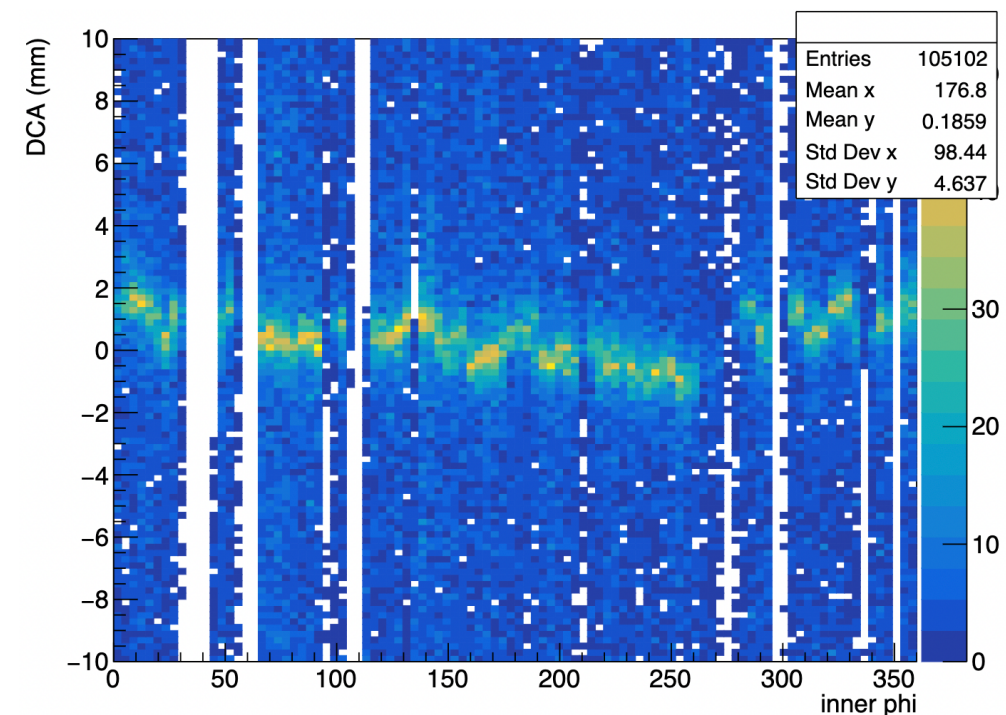


Assumed vertex = true vertex

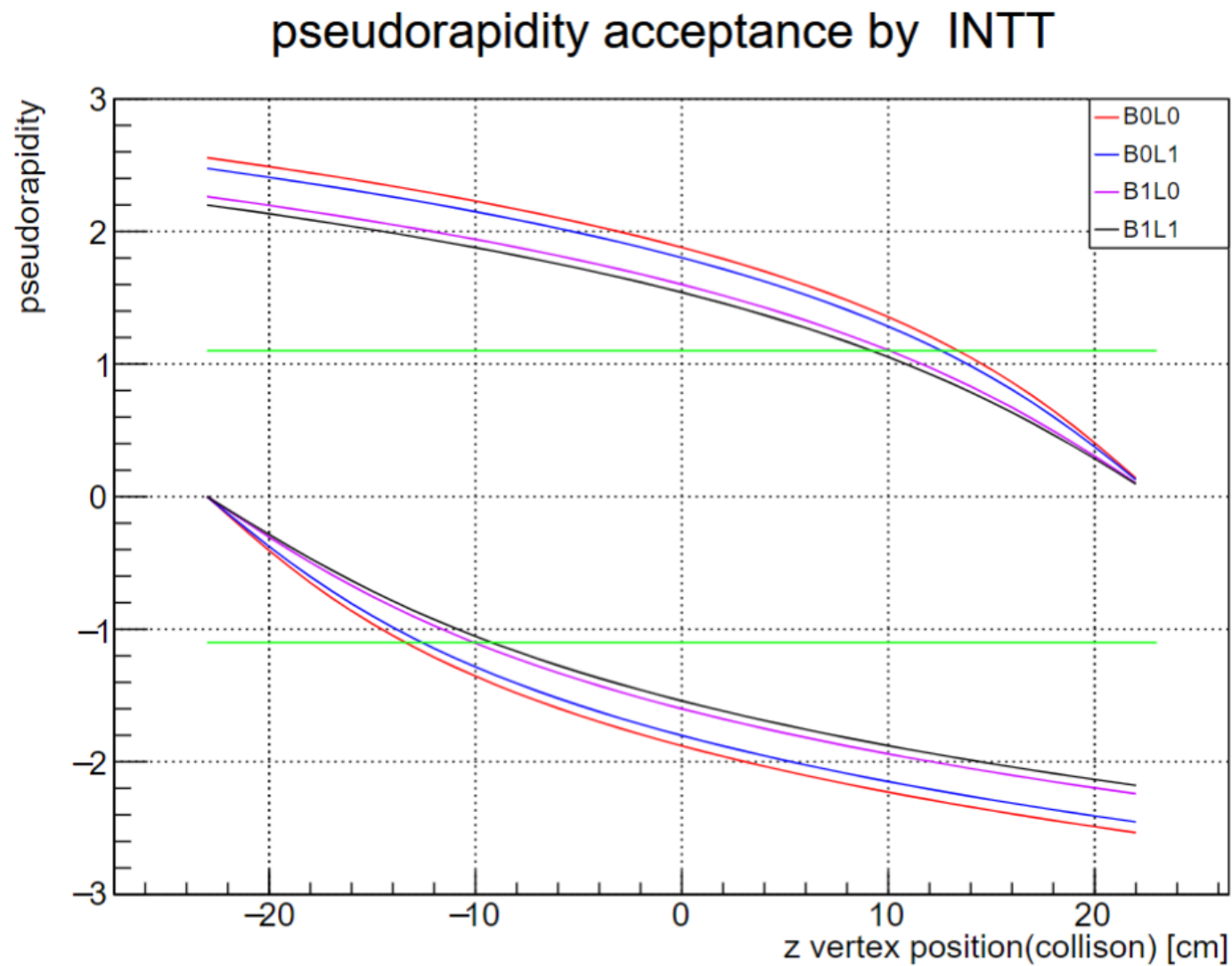
SIM(PYTHIA + Zerofield) @ BeamSpot (0, -5mm)



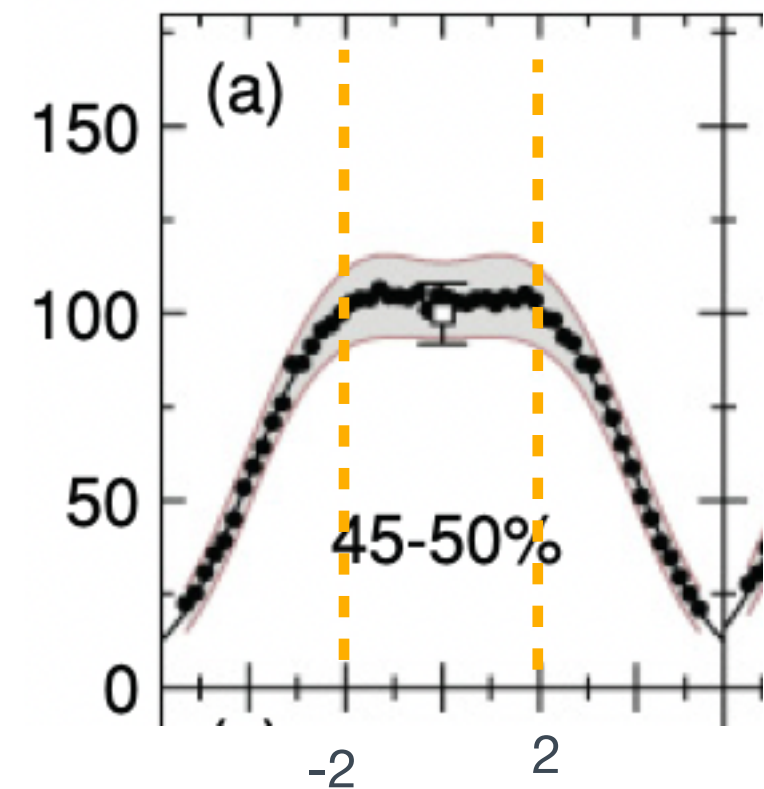
Sim is generated at (0,0) but calculate DCA (0, -5mm)
Plot made by Takashi



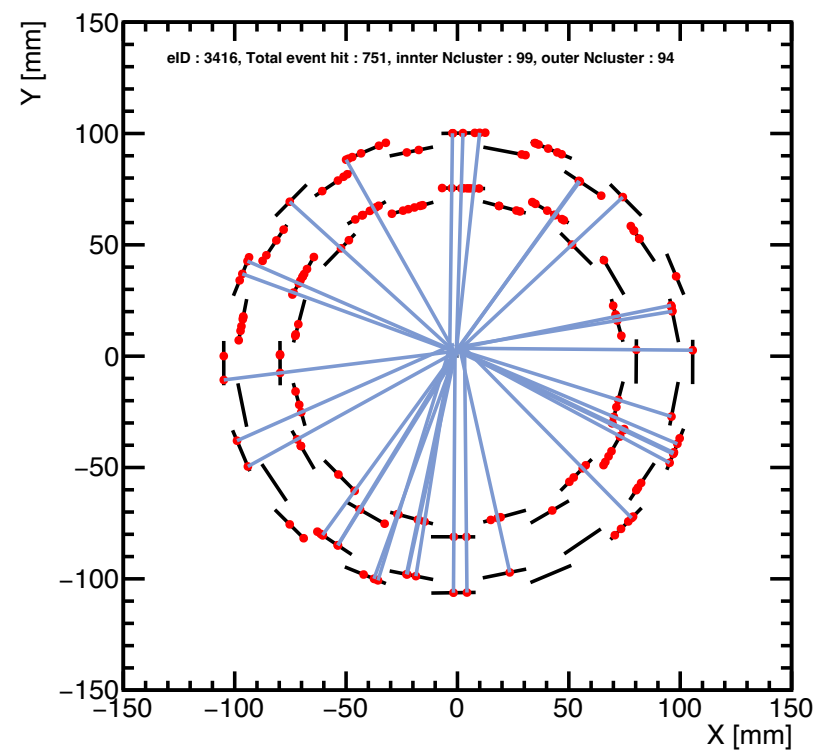
Assumed VTX $\approx$ true vertex
More and less flat



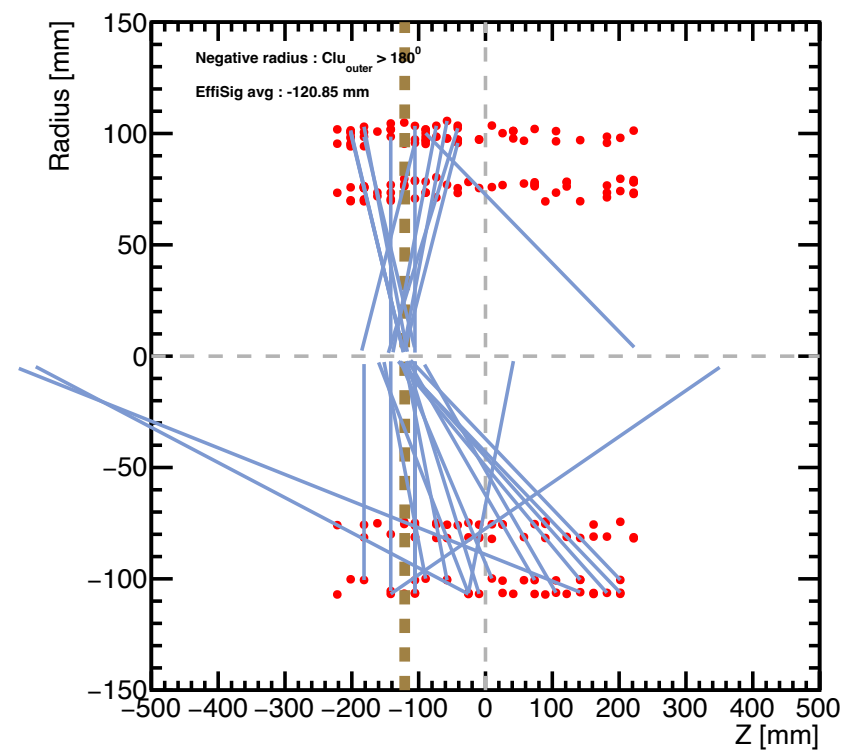
Plot made by Tomoya



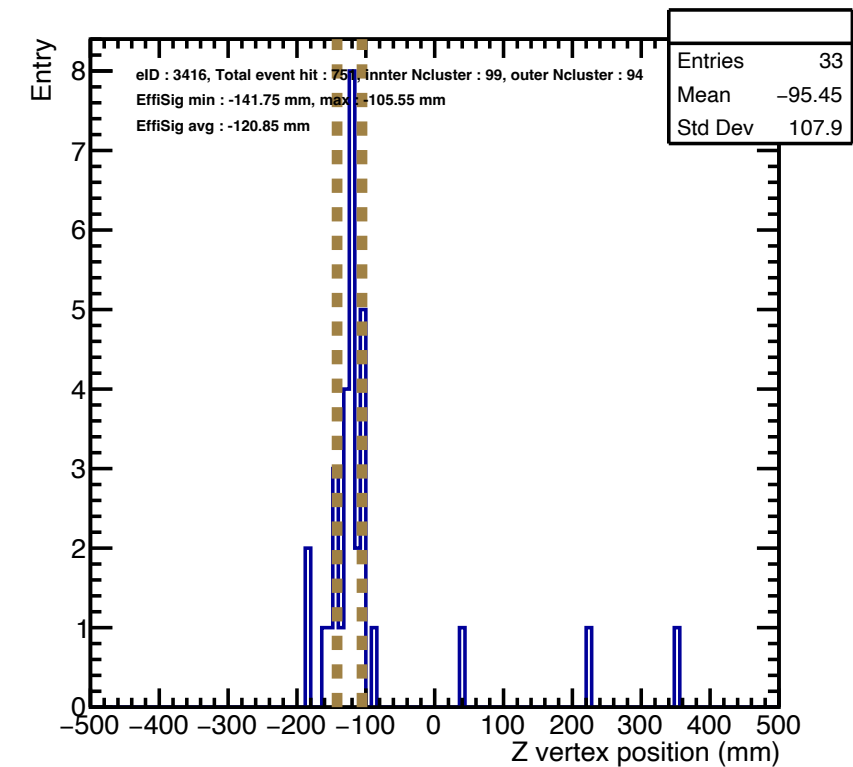
INTT event display X-Y plane



INTT event display r-Z plane



Z vertex dist

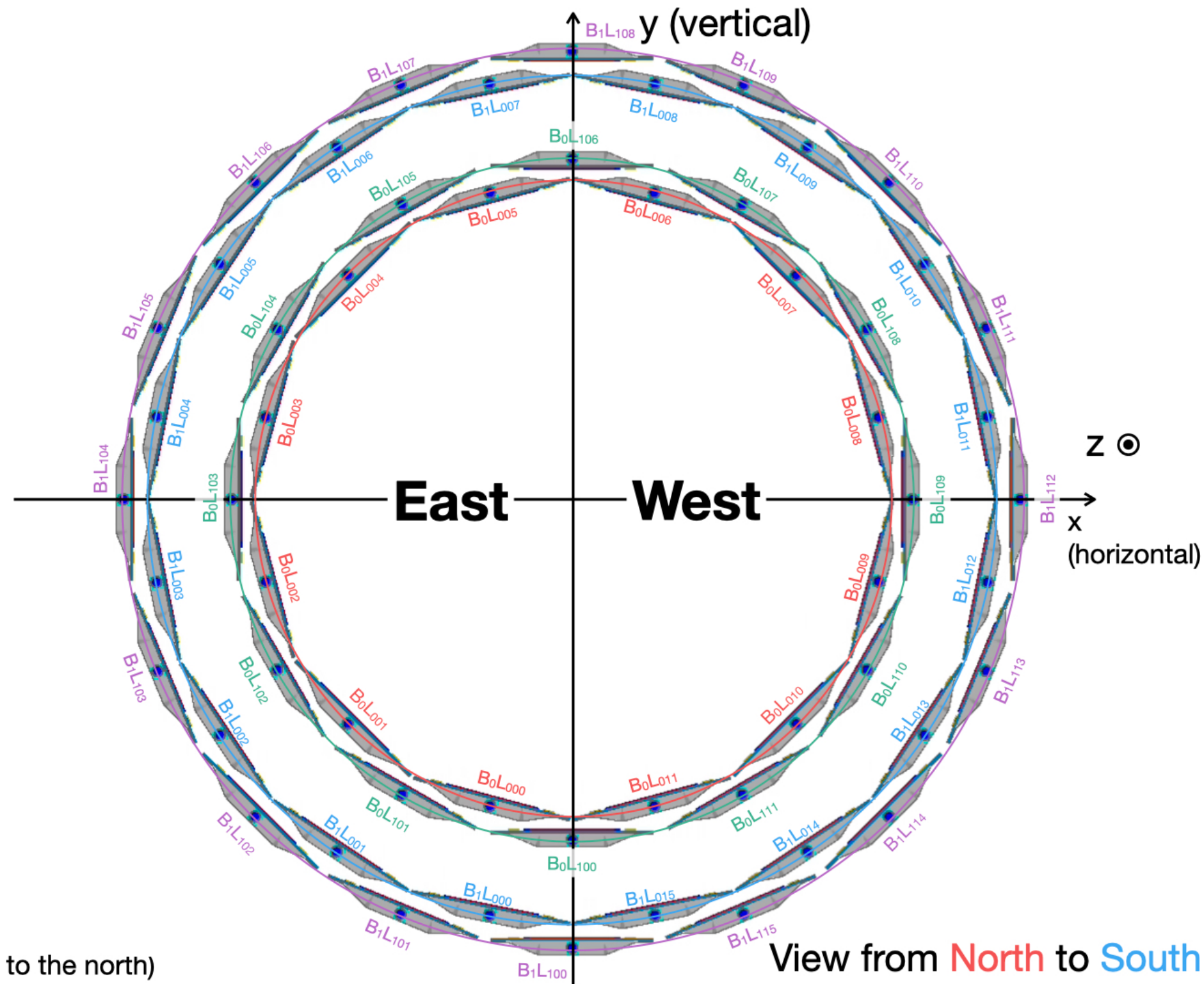


Notation: $B_x L_{yzz}$

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

Centrality given by INTT

centrality line : 5 %, 7423 entry_line : 4813
centrality line : 10 %, 14847 entry_line : 3882
centrality line : 15 %, 22270 entry_line : 3092
centrality line : 20 %, 29694 entry_line : 2450
centrality line : 25 %, 37117 entry_line : 1944
centrality line : 30 %, 44541 entry_line : 1551
centrality line : 35 %, 51964 entry_line : 1234
centrality line : 40 %, 59388 entry_line : 980
centrality line : 45 %, 66811 entry_line : 768
centrality line : 50 %, 74235 entry_line : 594
centrality line : 55 %, 81658 entry_line : 454
centrality line : 60 %, 89082 entry_line : 345
centrality line : 65 %, 96505 entry_line : 262
centrality line : 70 %, 103929 entry_line : 195
centrality line : 75 %, 111352 entry_line : 139
centrality line : 80 %, 118776 entry_line : 91
centrality line : 85 %, 126199 entry_line : 47
centrality line : 90 %, 133623 entry_line : 13
centrality line : 95 %, 141046 entry_line : 3