INTT tracklet study part 2

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Status

- I reproduced Hinako's event display.
- Since the DAC configuration this year is different from last year's, we have to set it properly. I tried, but it didn't work…

DAC config 2023

DAC	Value
0	15
1	30
2	60
3	90
4	120
5	150
6	180
7	210

DAC config 2024

DAC	Value
0	30
1	45
2	60
3	90
4	120
5	150
6	180
7	210

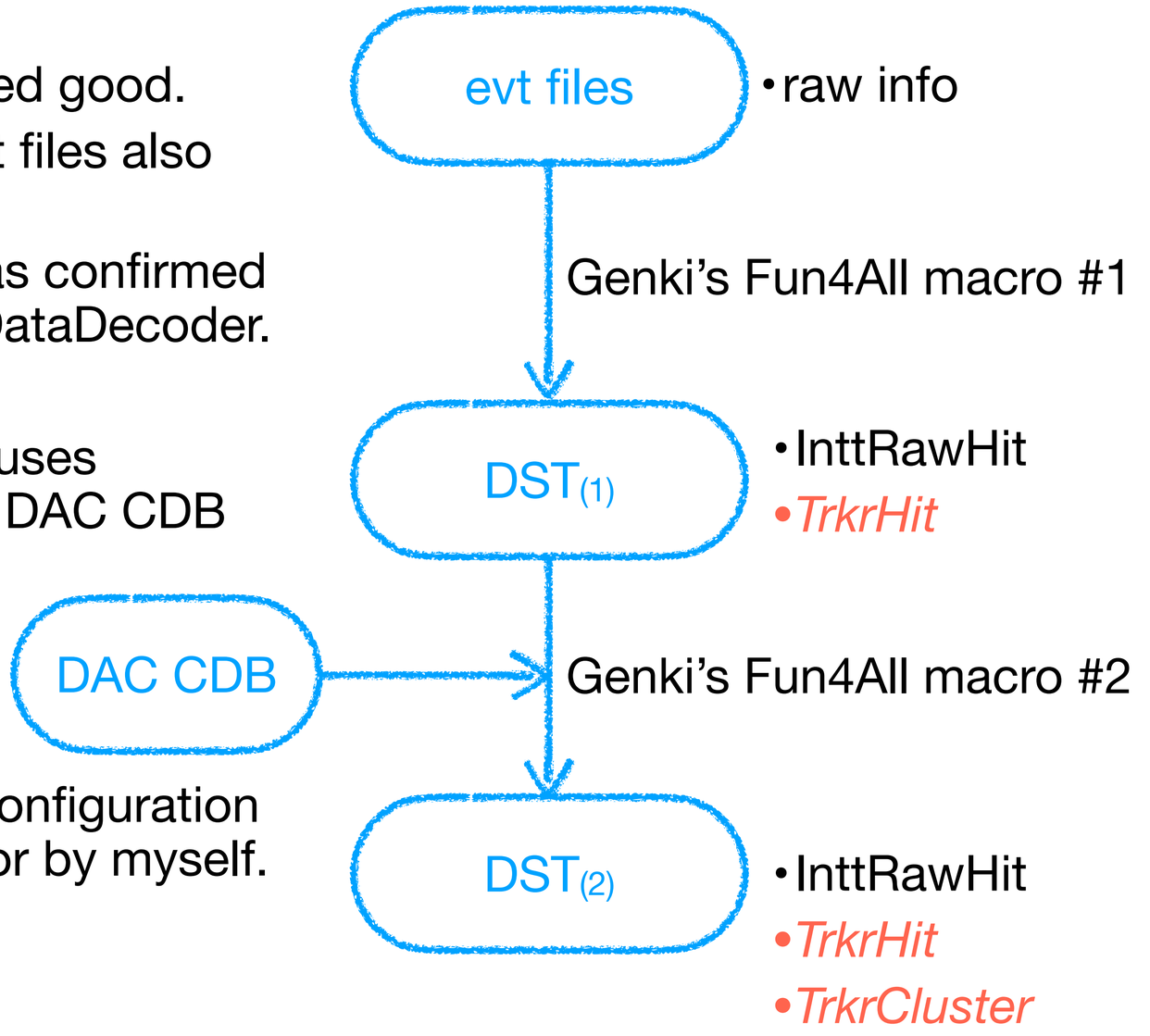
DAC config 2024

DAC	Value
0	35
1	45
2	60
3	90
4	120
5	150
6	180
7	210

for streaming mode

DAC configuration

- I checked InttCombinedRawDataDecoder. It looked good.
- The reason was that the $DST_{(1)}$ produced from evt files also contains TrkrHit. It's not necessary to be honest.
- DAC configuration can be changed by CDB. It was confirmed by `cout` in the source code of InttCombinedRawDataDecoder.
- The change was not seen in $DST_{(2)}$.
- I guess the clustering module (or output module) uses TrkrHit written in $DST_{(1)}$. The change made by the DAC CDB was not there.
- After removing TrkrHit in $DST_{(1)}$, TrkrHit and TrkrCluster in $DST_{(2)}$ have the right DAC configuration.
- Conclusion: no change is needed to apply DAC configuration other than the default. I made the strange behavior by myself.



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```
root [3] ntp_clus->Scan( "adc" )
************************
*    Row   *       adc *
************************
*        0 *        90 *
*        1 *        60 *
*        2 *        90 *
*        3 *       180 *
*        4 *        75 *
*        5 *        60 *
*        6 *       120 *
*        7 *        75 *
*        8 *       120 *
*        9 *       210 *
*       10 *        60 *
*       11 *        30 *
*       12 *        30 *
*       13 *        75 *
*       14 *        30 *
*       15 *        60 *
*       16 *       120 *
*       17 *       210 *
*       18 *        90 *
*       19 *        30 *
*       20 *        60 *
*       21 *        60 *
*       22 *        60 *
*       23 *        30 *
*       24 *        30 *
Type <CR> to continue or q to quit ==> q
************************
(long long) 25
root [4] ntp_clus->Scan( "adc", "adc<30" )
************************
*    Row   *       adc *
************************
************************
==> 0 selected entries
(long long) 0
```

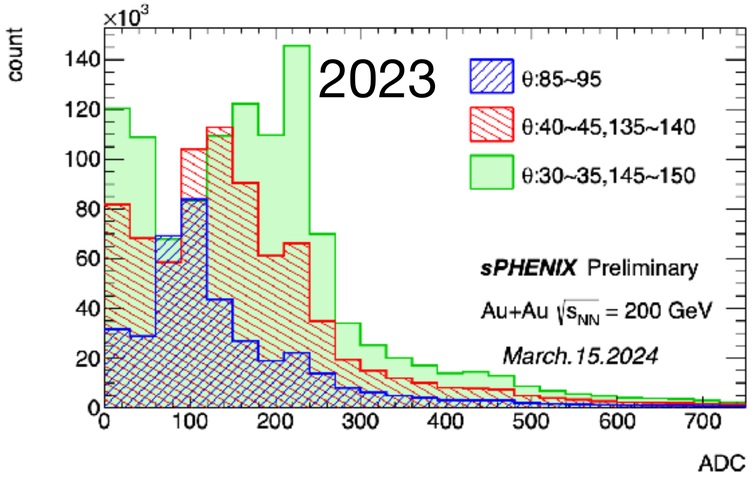
There is no cluster with DAC 15 after the modification.

Analysis: MIP: Does the DAC modification affect?

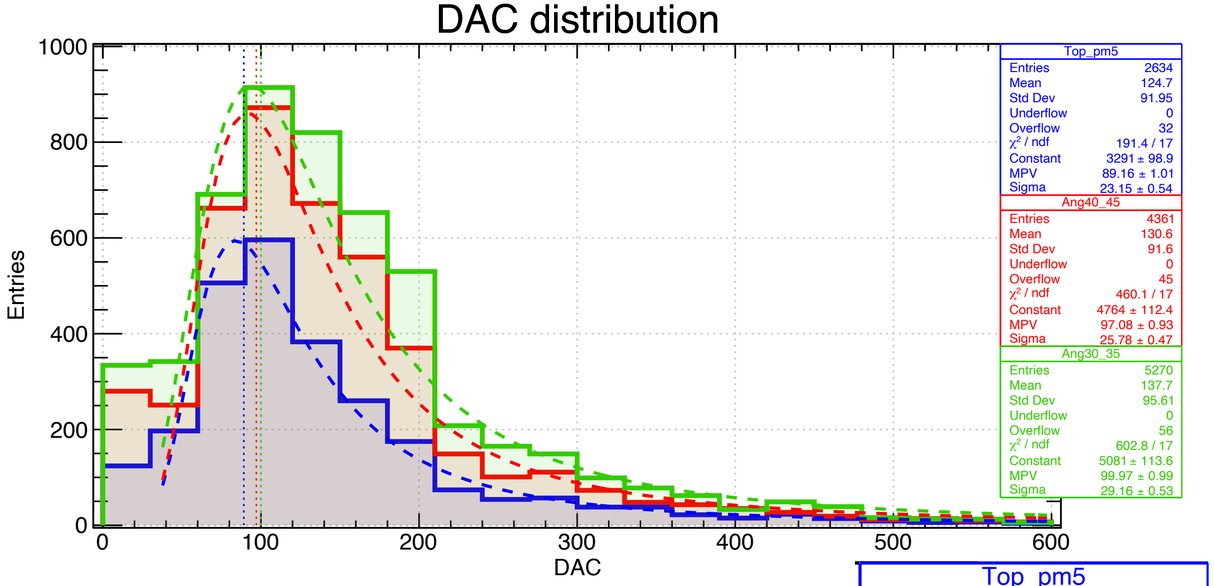
Condition

- Run: 41981
- #event: 13050 events (all events in this run. It was10k events).
- Cut
  - Noisy channel rejection
  - BCO difference cut: Only the peak in the BCO diff distribution
  - Clusters only on the inner barrel were used (meaningless but I didn’t have time)
  - $| z_{vtx} | < 23$ cm
  - clusters with (DAC=210 AND cluster size =1) are not used. They are overflow bin entries.
  - Clusters associated with Hinako’s tracklets are used

Analysis: MIP: W/O DAC modification



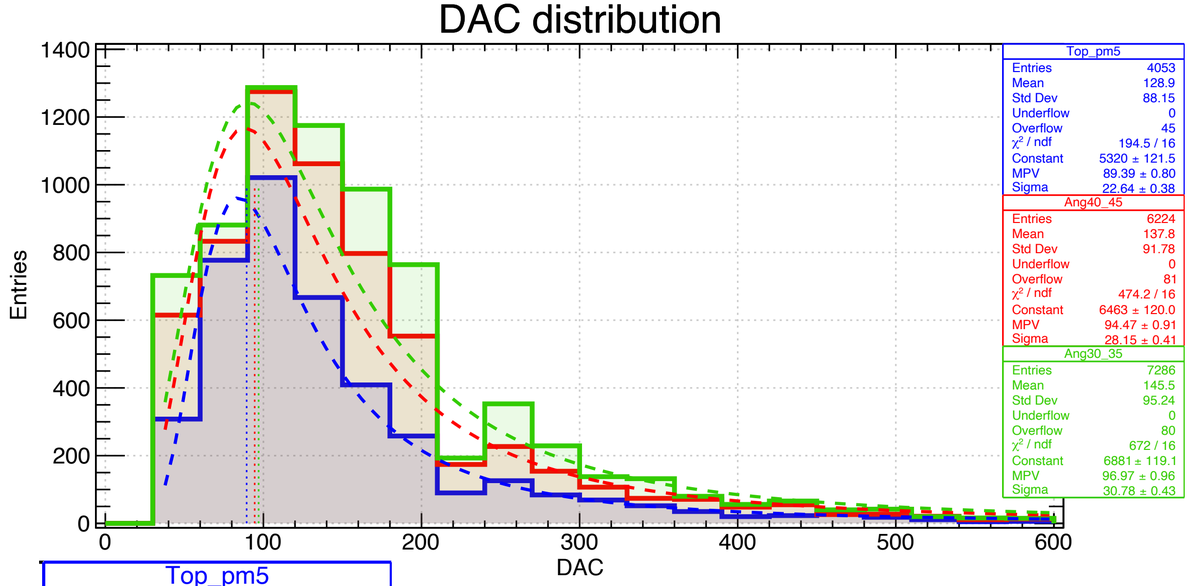
Before DAC modification



- $85^\circ < |\theta| < 90^\circ$
- $40^\circ < |\theta| < 45^\circ$
- $30^\circ < |\theta| < 35^\circ$

Top_pm5	
Entries	2634
Mean	124.7
Std Dev	91.95
Underflow	0
Overflow	32
χ^2 / ndf	191.4 / 17
Constant	3291 ± 98.9
MPV	89.16 ± 1.01
Sigma	23.15 ± 0.54

After DAC modification



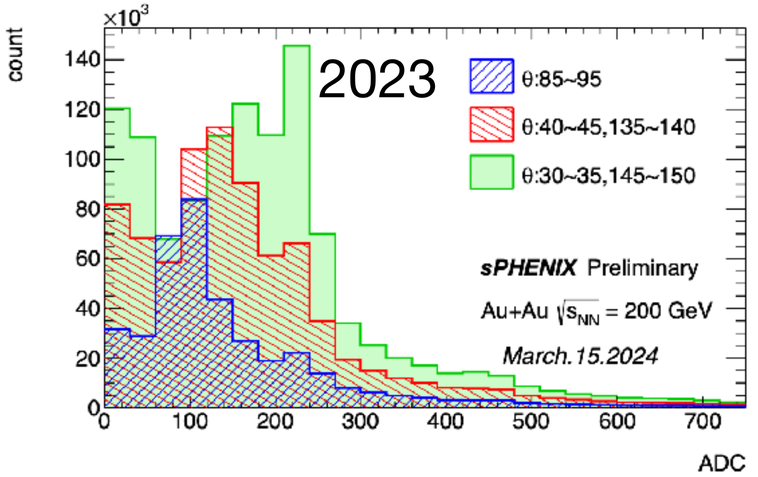
Top_pm5	
Entries	4053
Mean	128.9
Std Dev	88.15
Underflow	0
Overflow	45
χ^2 / ndf	194.5 / 16
Constant	5320 ± 121.5
MPV	89.39 ± 0.80
Sigma	22.64 ± 0.38

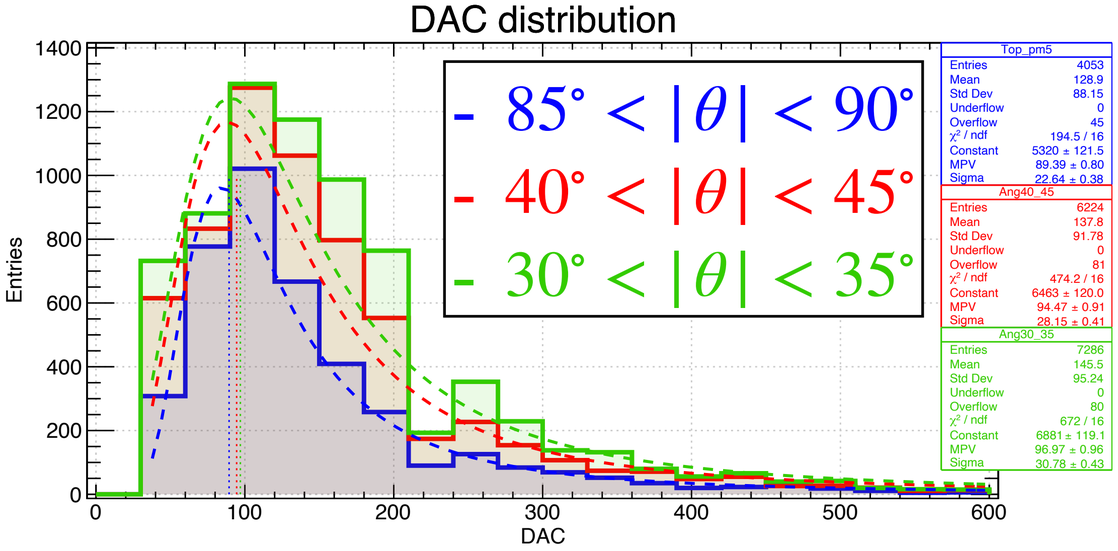
The peaks get slightly sharper but probably within uncertainty.

No major difference can be seen.

Analysis: MIP: What need to be done?

- I didn’t check how vertex position is determined. Hard-coded values are used for x-y. They must be fine for this run. I’m not sure about z_{vtx}…
- any idea?





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