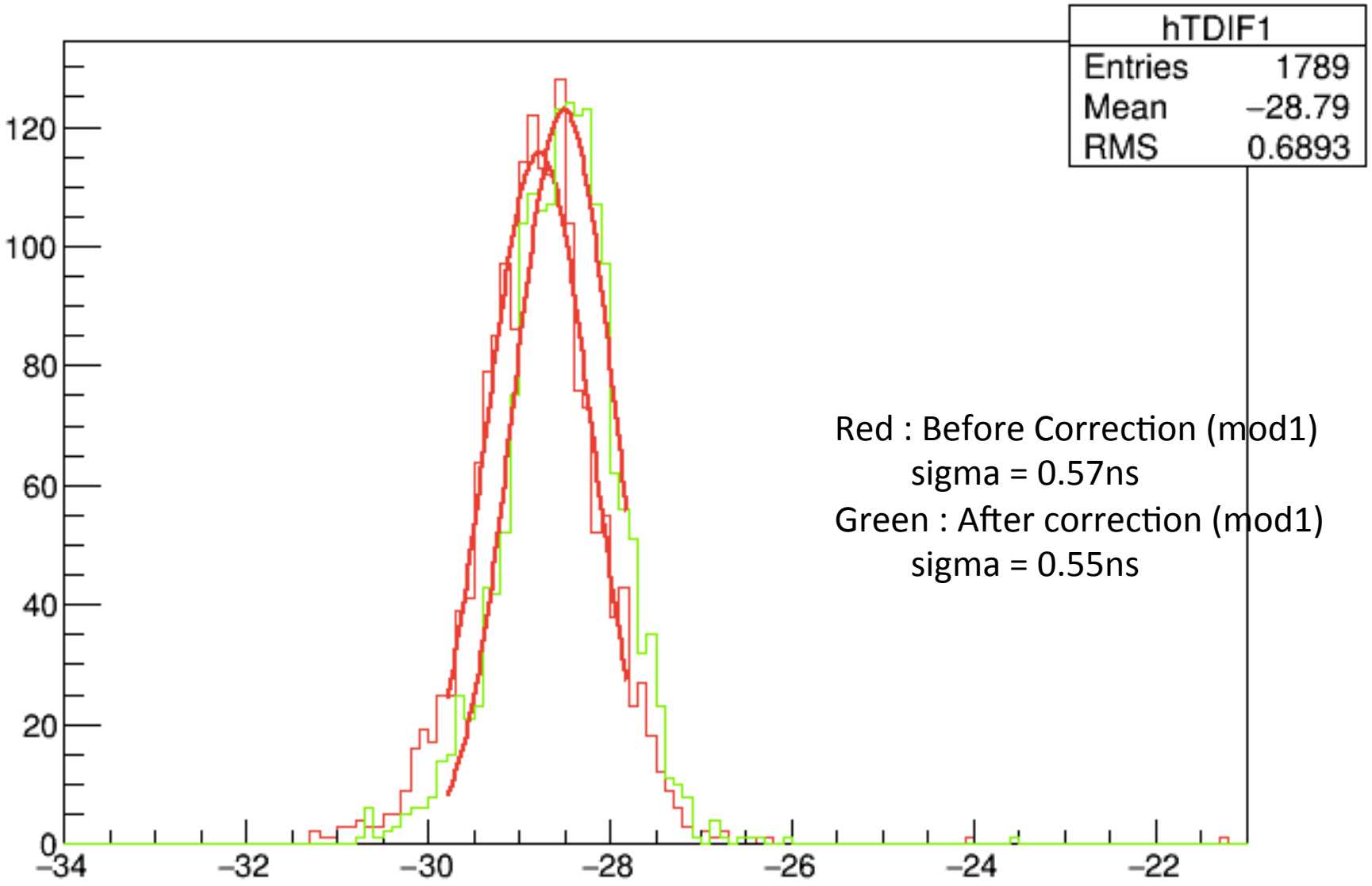
Time Correction

- Run Correction
  - All modules are integrated
- Module Correction
  - After Run Correction
- Determination of correction constants
  - Mean of gaussian

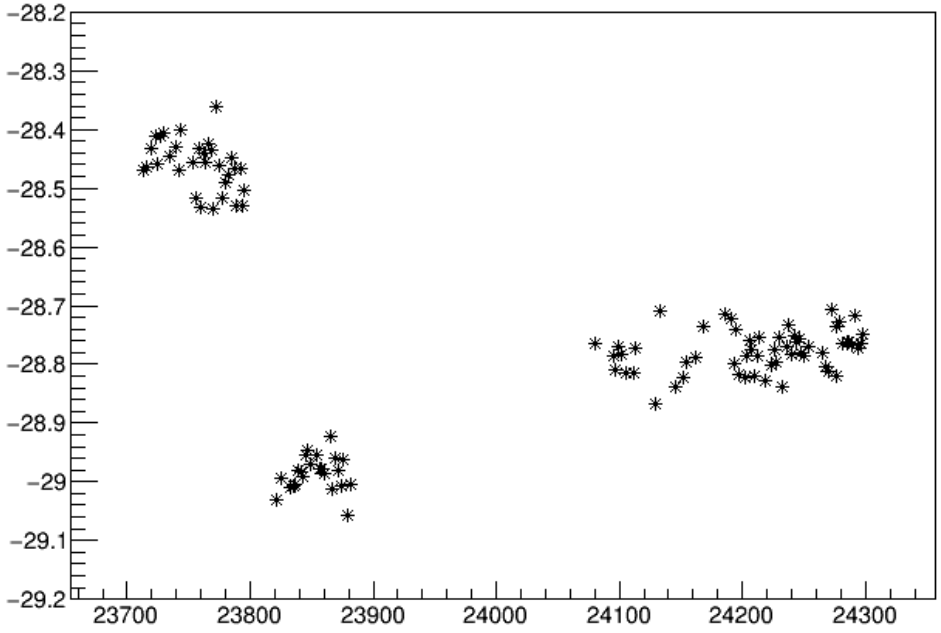
Run Correction



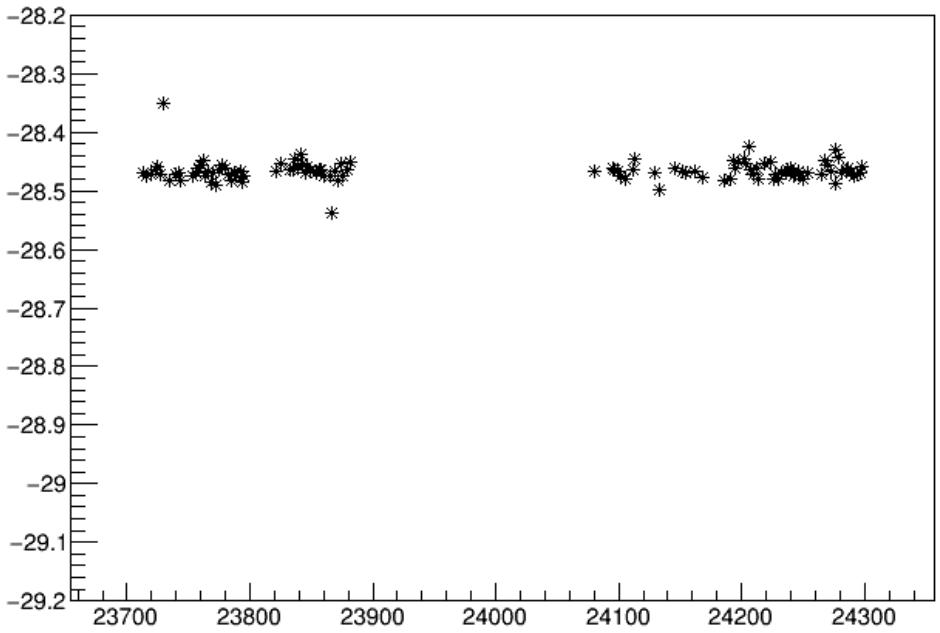
Red : Before Correction (mod1)
sigma = 0.57ns
Green : After correction (mod1)
sigma = 0.55ns

Run Correction Check

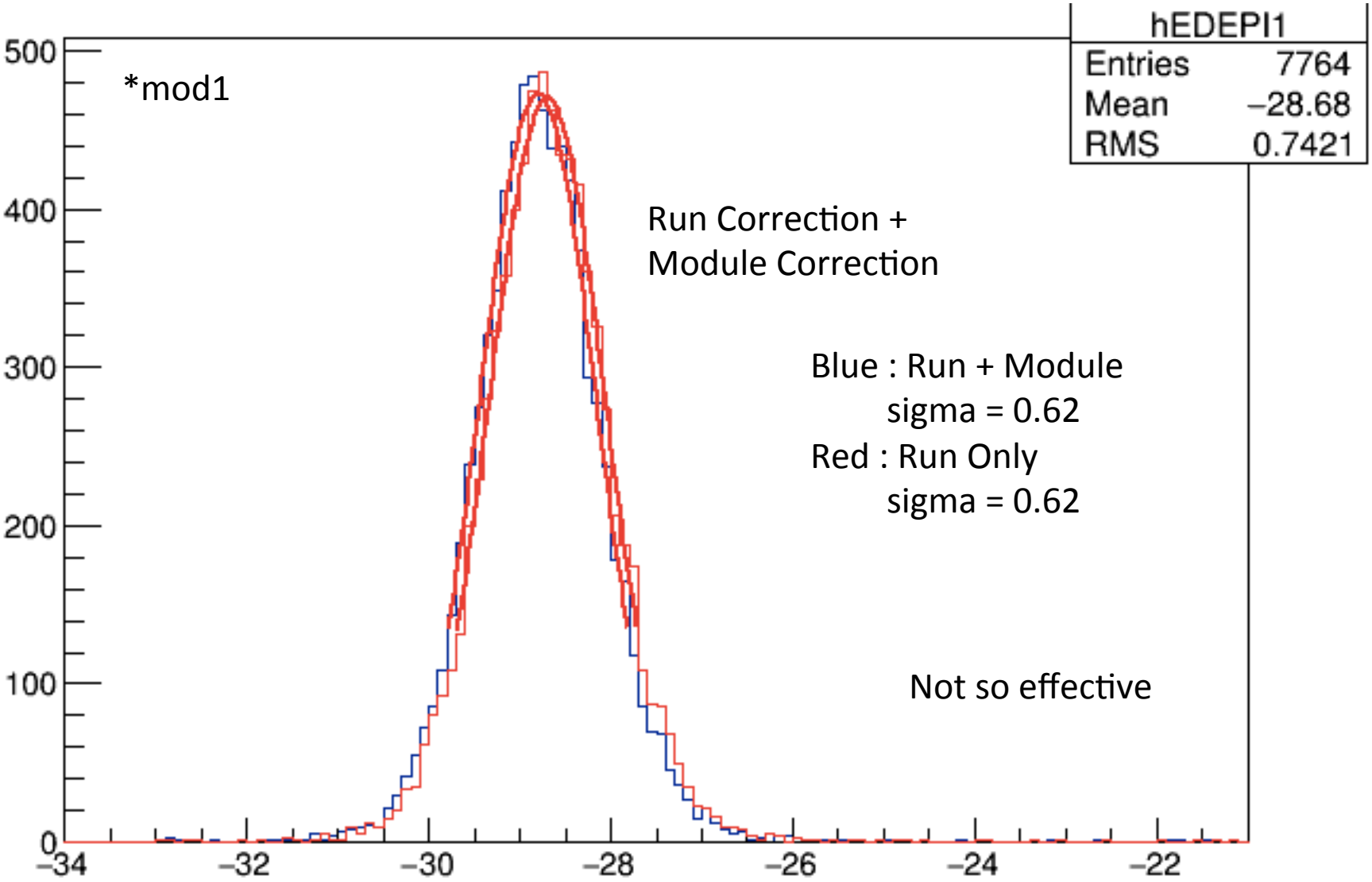
Before



After

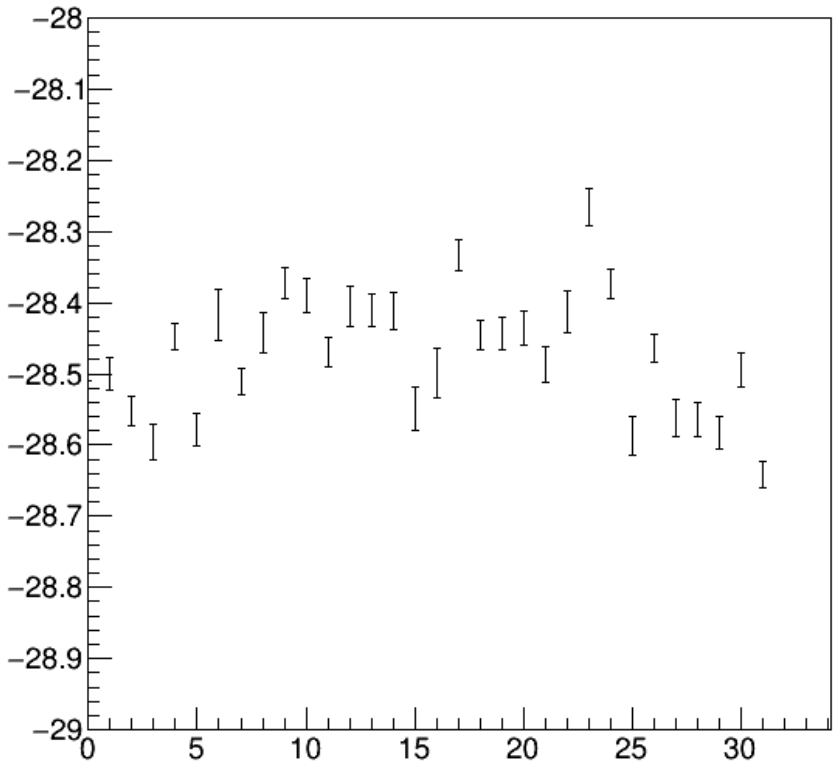


Module Correction

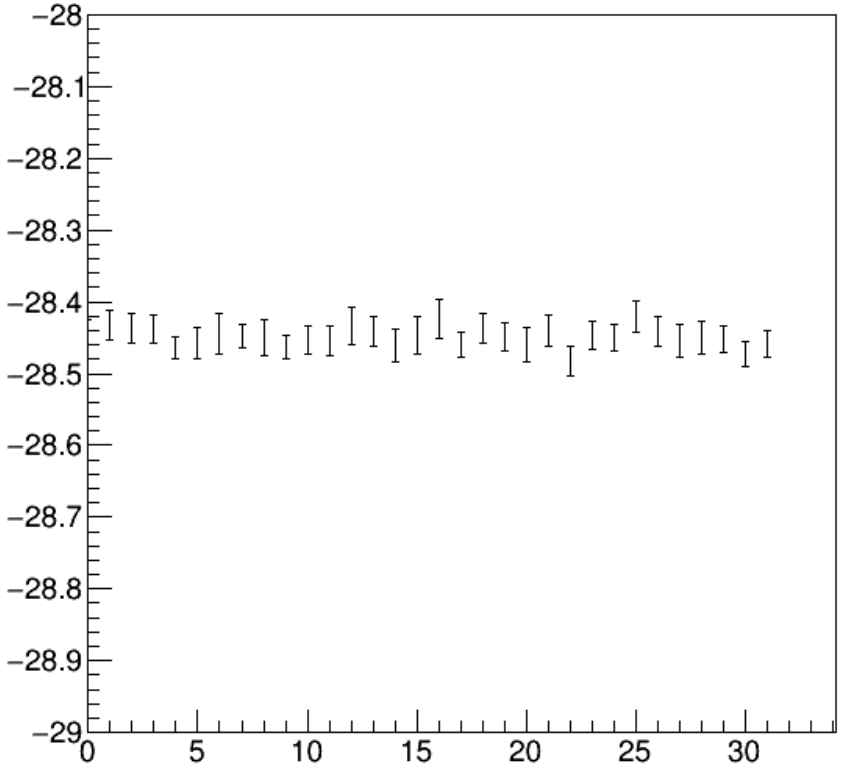


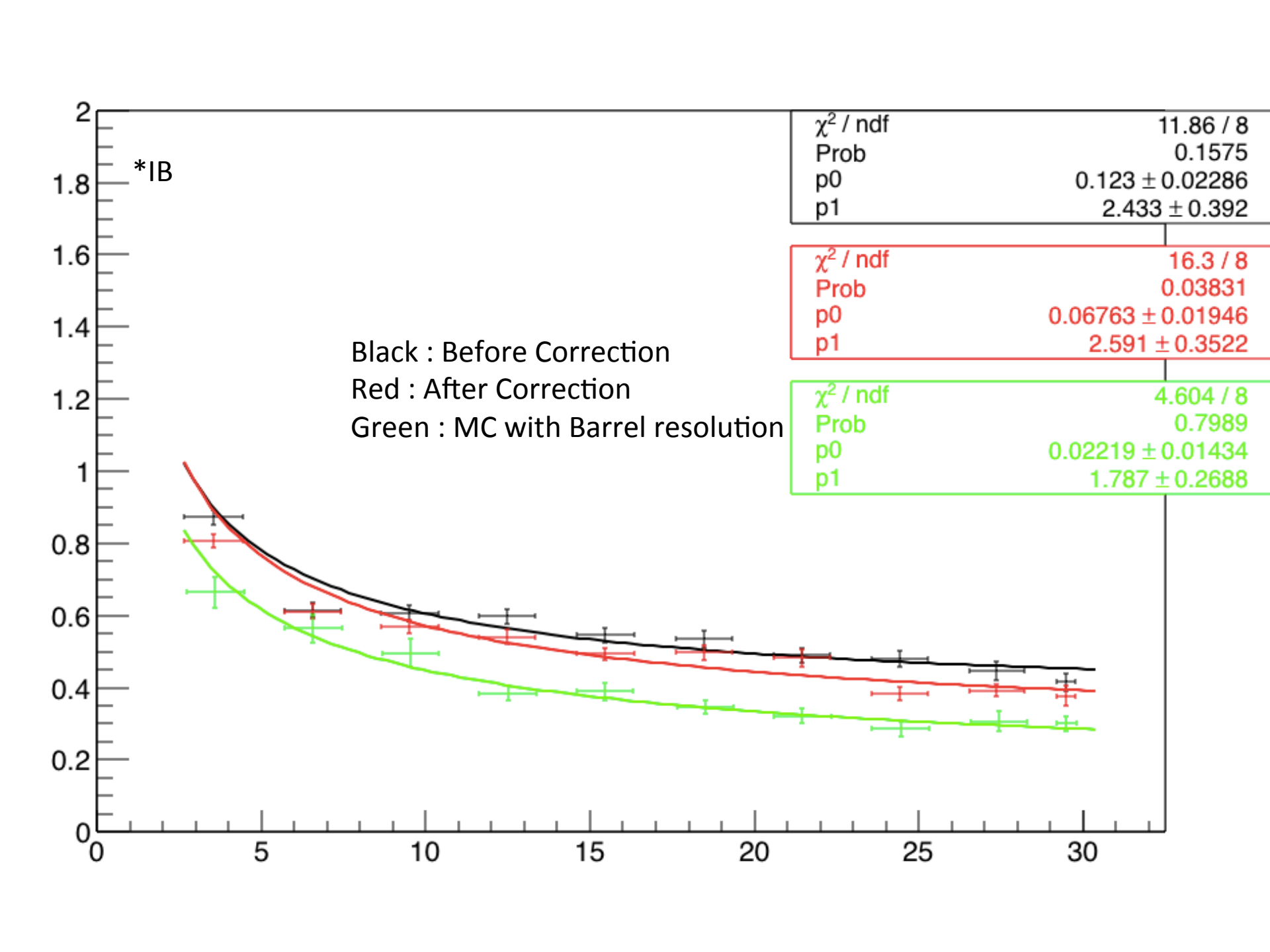
Module Correction Check

Before

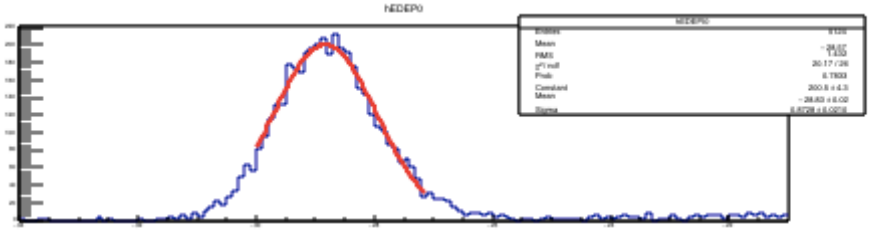


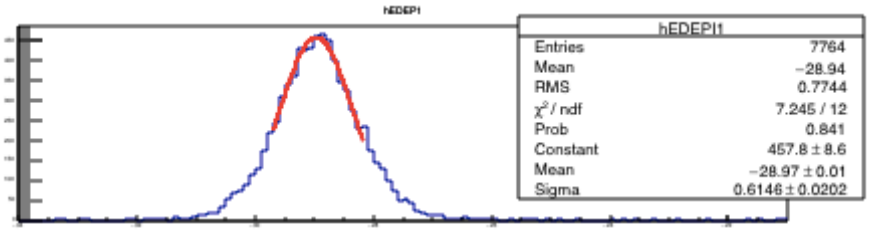
After

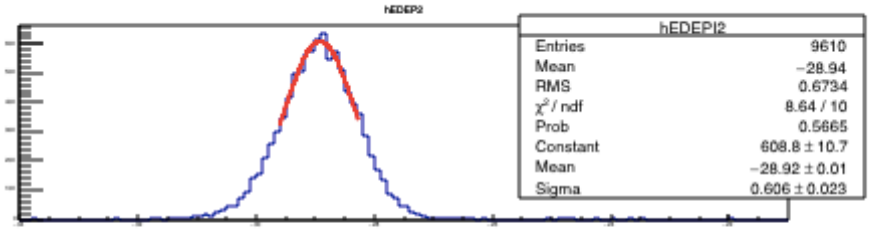


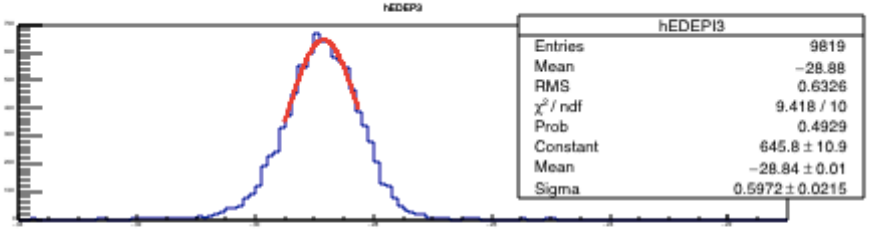

*IB
Black : Before Correction
Red : After Correction
Green : MC with Barrel resolution
χ² / ndf 11.86 / 8
Prob 0.1575
p0 0.123 ± 0.02286
p1 2.433 ± 0.392
χ² / ndf 16.3 / 8
Prob 0.03831
p0 0.06763 ± 0.01946
p1 2.591 ± 0.3522
χ² / ndf 4.604 / 8
Prob 0.7989
p0 0.02219 ± 0.01434
p1 1.787 ± 0.2688
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0
5
10
15
20
25
30

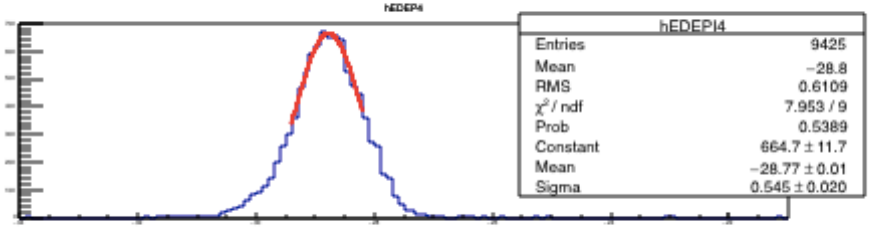
Before Correction

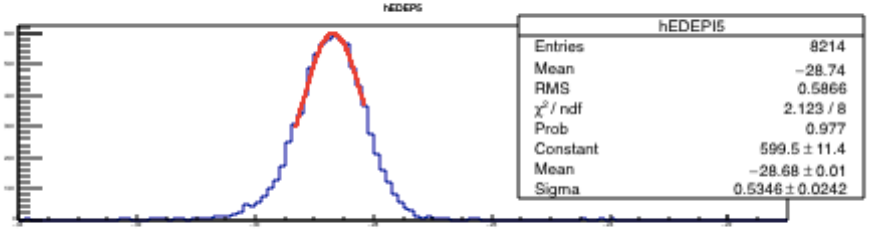


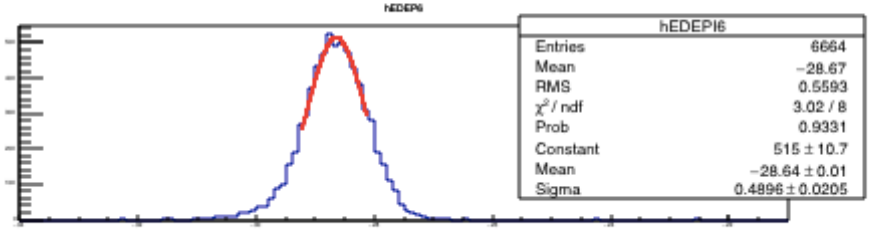


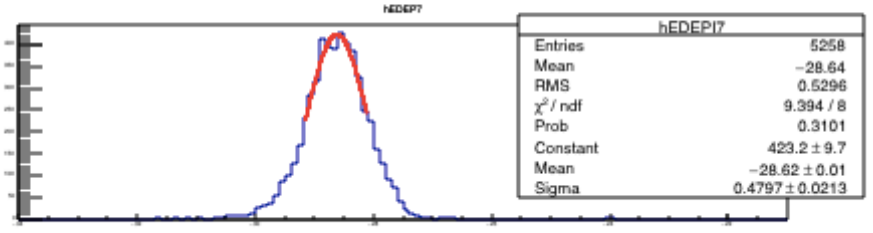


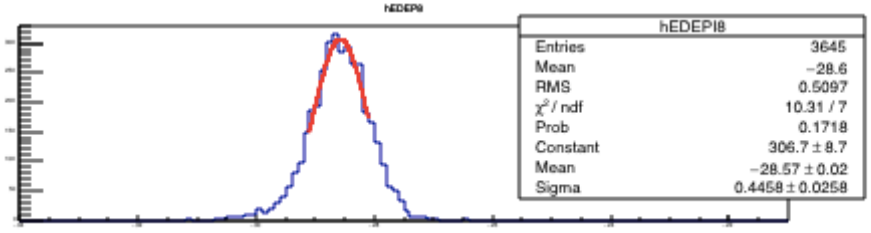


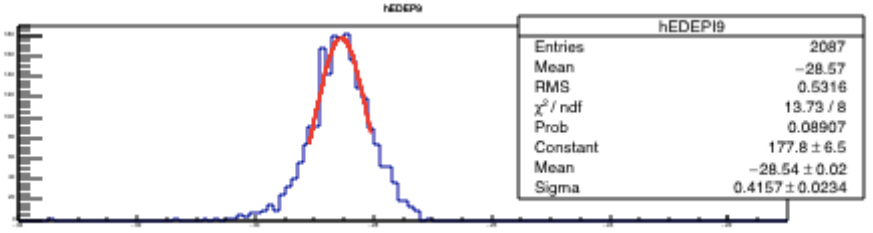




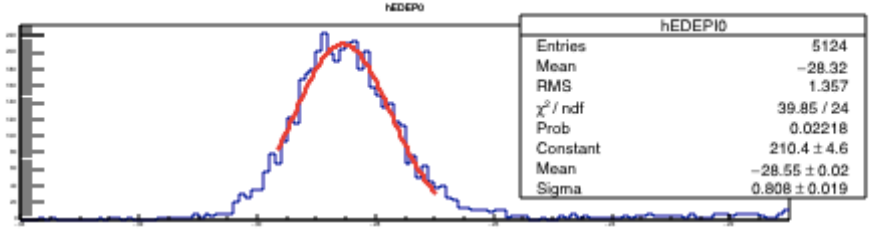


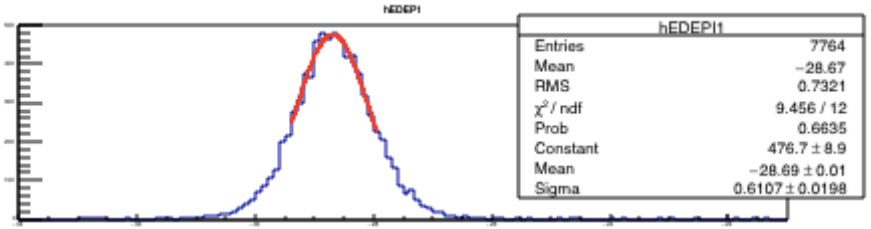


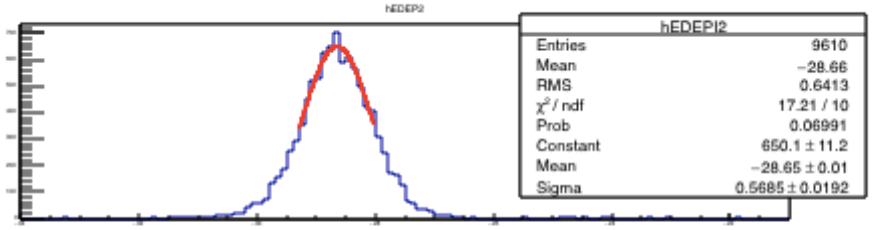


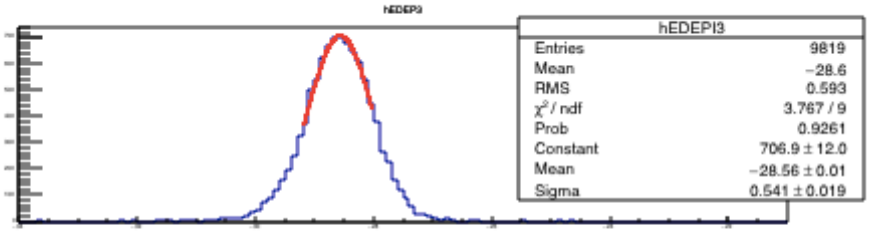


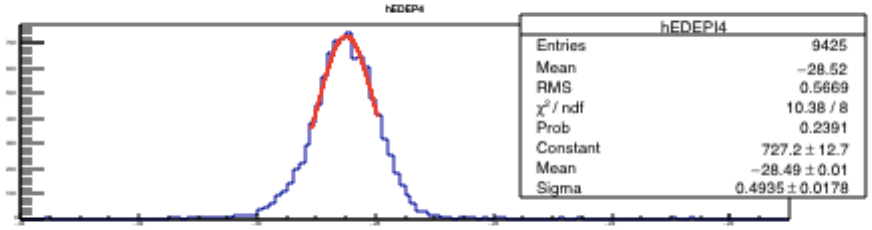
After Correction

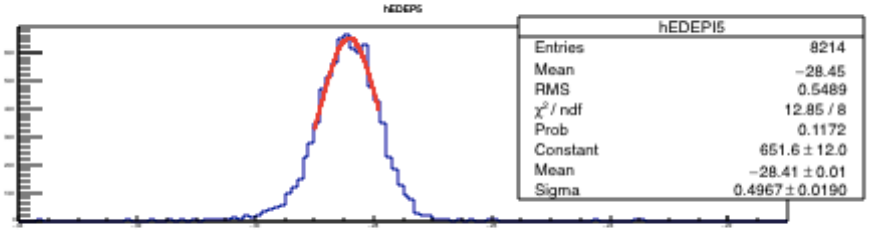


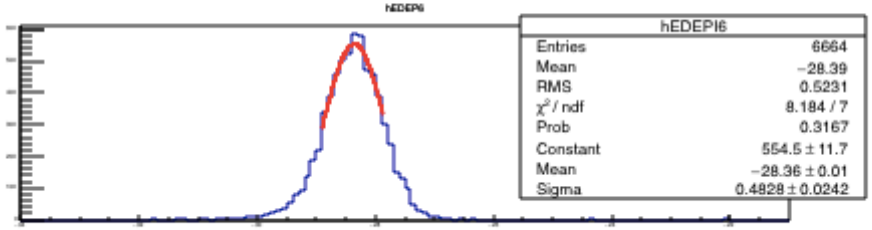


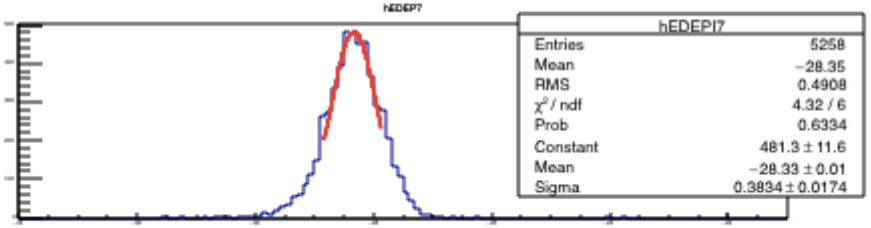


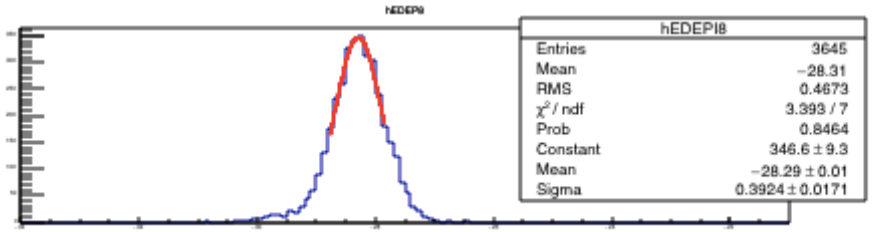


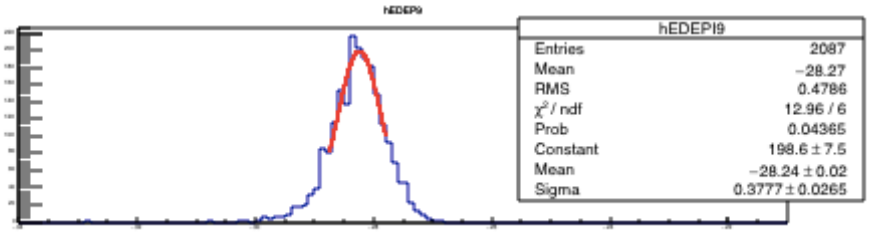




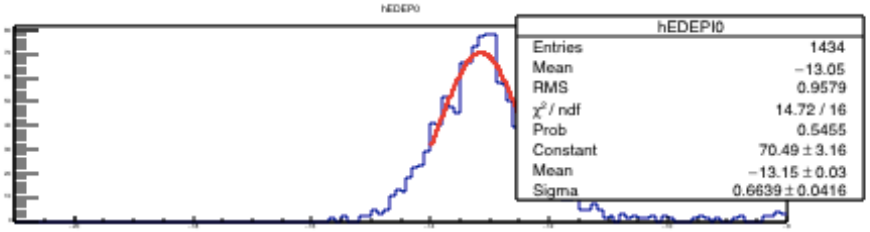


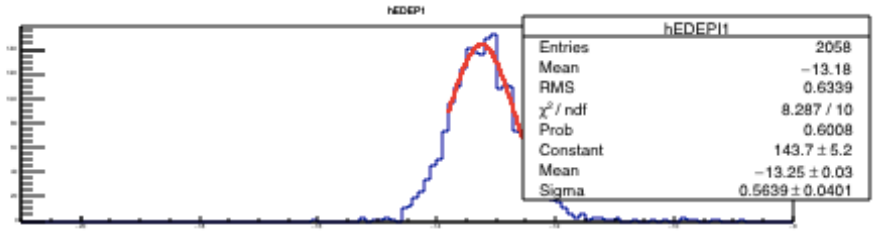


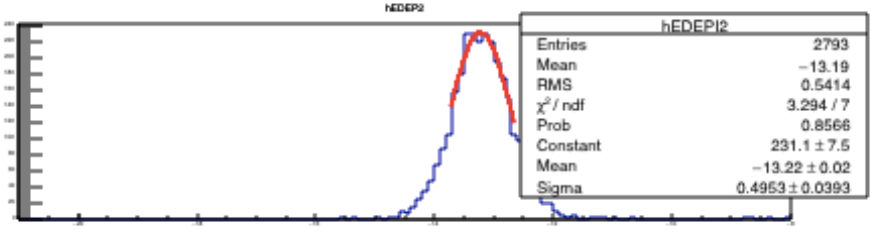


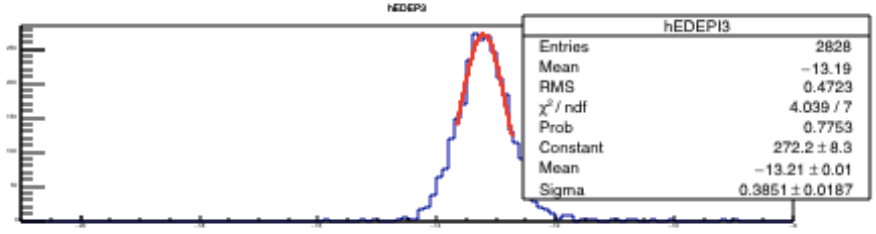


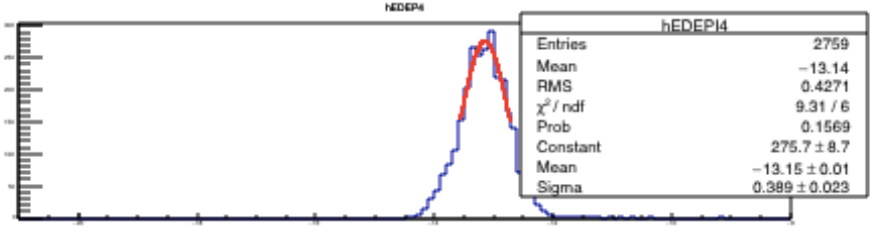
MC

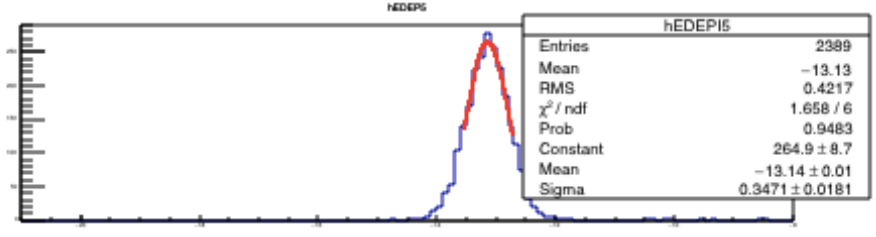

hEDEPI0
Entries 1434
Mean −13.05
RMS 0.9579
χ² / ndf 14.72 / 16
Prob 0.5455
Constant 70.49 ± 3.16
Mean −13.15 ± 0.03
Sigma 0.6639 ± 0.0416

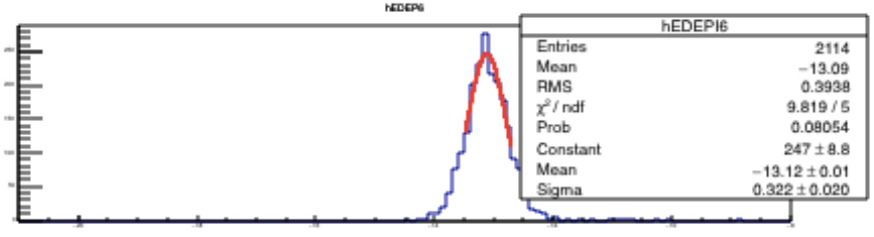

hEDEPI1
Entries 2058
Mean −13.18
RMS 0.6339
χ² / ndf 8.287 / 10
Prob 0.6008
Constant 143.7 ± 5.2
Mean −13.25 ± 0.03
Sigma 0.5639 ± 0.0401

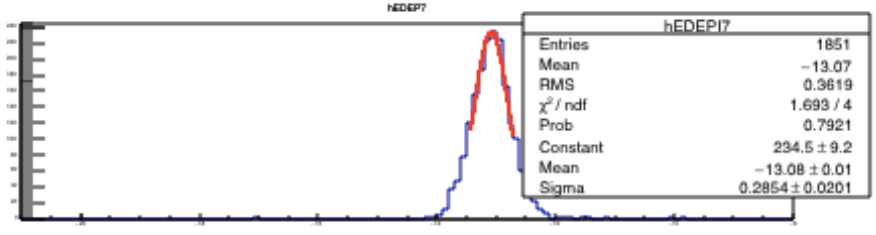

hEDEPI2
Entries 2793
Mean −13.19
RMS 0.5414
χ² / ndf 3.294 / 7
Prob 0.8566
Constant 231.1 ± 7.5
Mean −13.22 ± 0.02
Sigma 0.4953 ± 0.0393

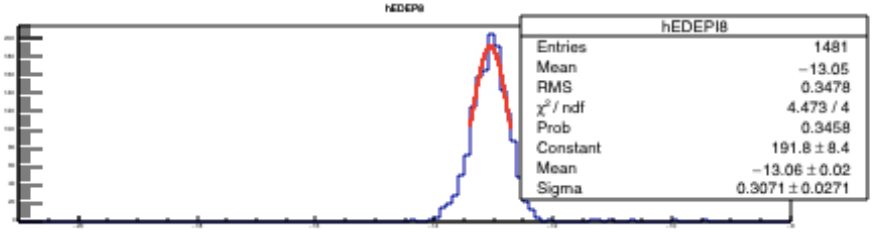

hEDEPI3
Entries 2828
Mean −13.19
RMS 0.4723
χ² / ndf 4.039 / 7
Prob 0.7753
Constant 272.2 ± 8.3
Mean −13.21 ± 0.01
Sigma 0.3851 ± 0.0187

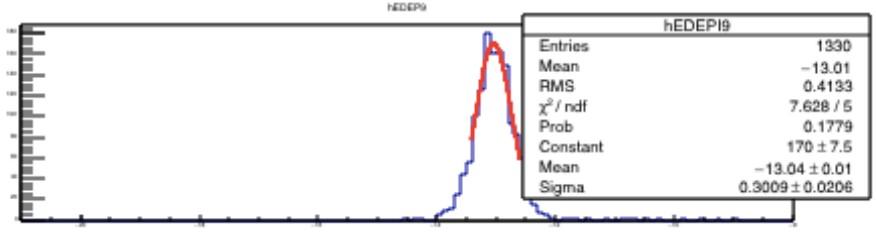

hEDEPI4
Entries 2759
Mean −13.14
RMS 0.4271
χ² / ndf 9.31 / 6
Prob 0.1569
Constant 275.7 ± 8.7
Mean −13.15 ± 0.01
Sigma 0.389 ± 0.023


hEDEPI5
Entries 2389
Mean −13.13
RMS 0.4217
χ² / ndf 1.658 / 6
Prob 0.9483
Constant 264.9 ± 8.7
Mean −13.14 ± 0.01
Sigma 0.3471 ± 0.0181

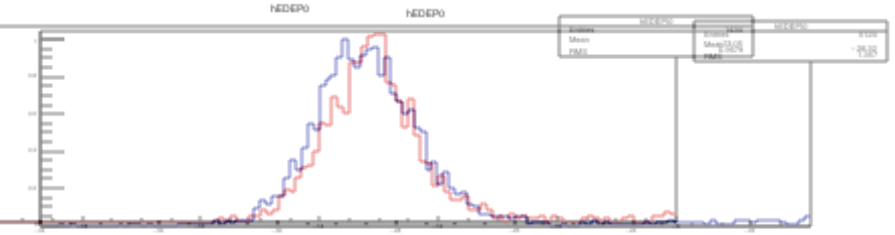

hEDEPI6
Entries 2114
Mean −13.09
RMS 0.3938
χ² / ndf 9.819 / 5
Prob 0.08054
Constant 247 ± 8.8
Mean −13.12 ± 0.01
Sigma 0.322 ± 0.020

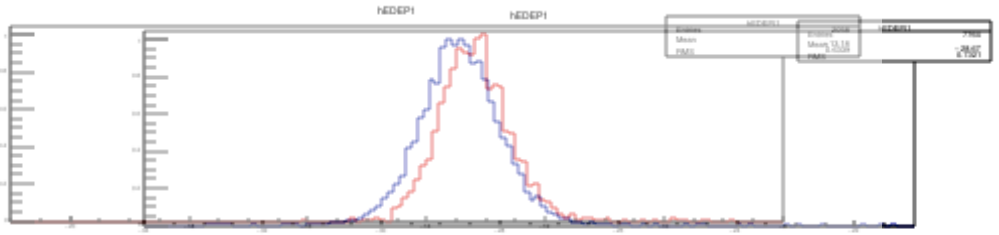

hEDEPI7
Entries 1851
Mean −13.07
RMS 0.3619
χ² / ndf 1.693 / 4
Prob 0.7921
Constant 234.5 ± 9.2
Mean −13.08 ± 0.01
Sigma 0.2854 ± 0.0201

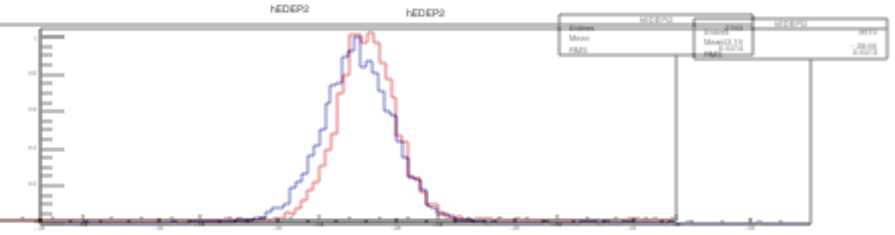

hEDEPI8
Entries 1481
Mean −13.05
RMS 0.3478
χ² / ndf 4.473 / 4
Prob 0.3458
Constant 191.8 ± 8.4
Mean −13.06 ± 0.02
Sigma 0.3071 ± 0.0271

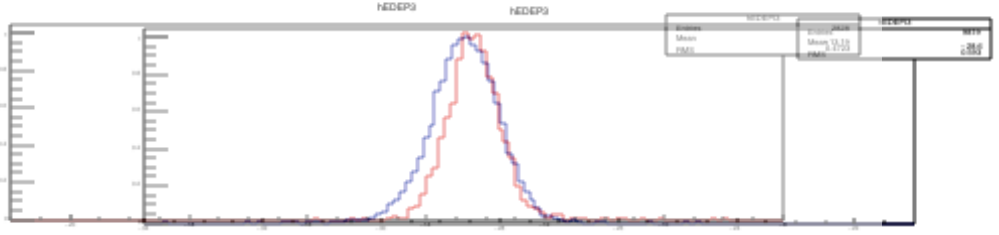

hEDEPI9
Entries 1330
Mean −13.01
RMS 0.4133
χ² / ndf 7.628 / 5
Prob 0.1779
Constant 170 ± 7.5
Mean −13.04 ± 0.01
Sigma 0.3009 ± 0.0206

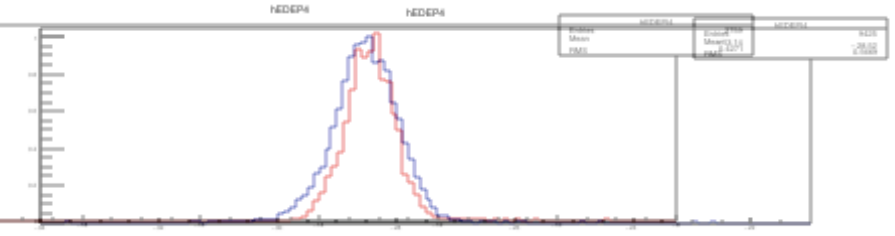
Blue : data with correction, Red : MC

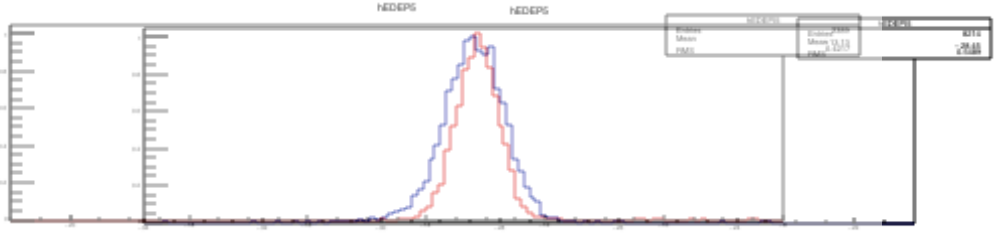


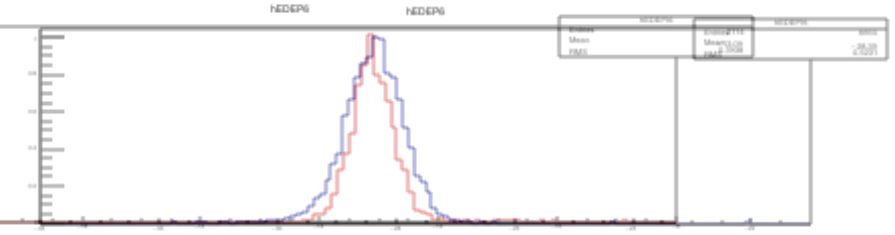


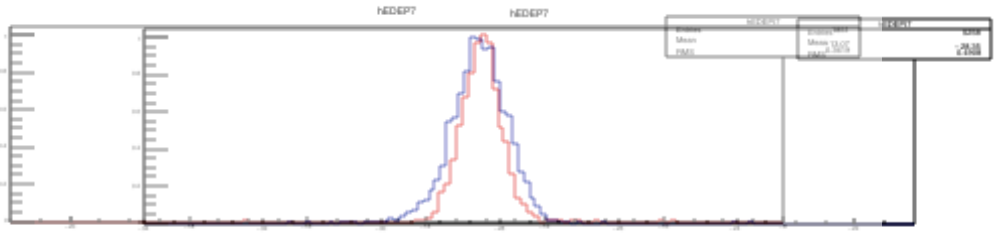


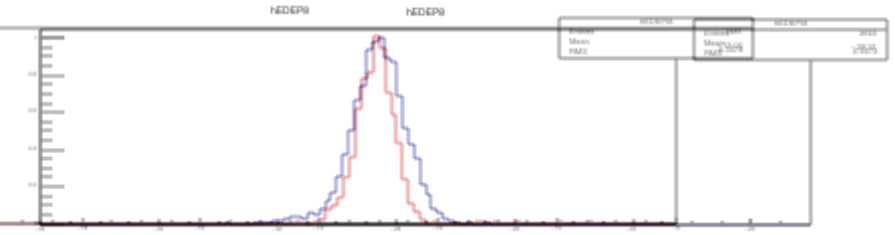


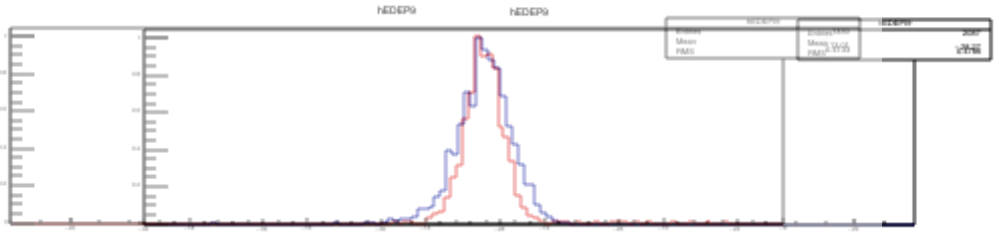






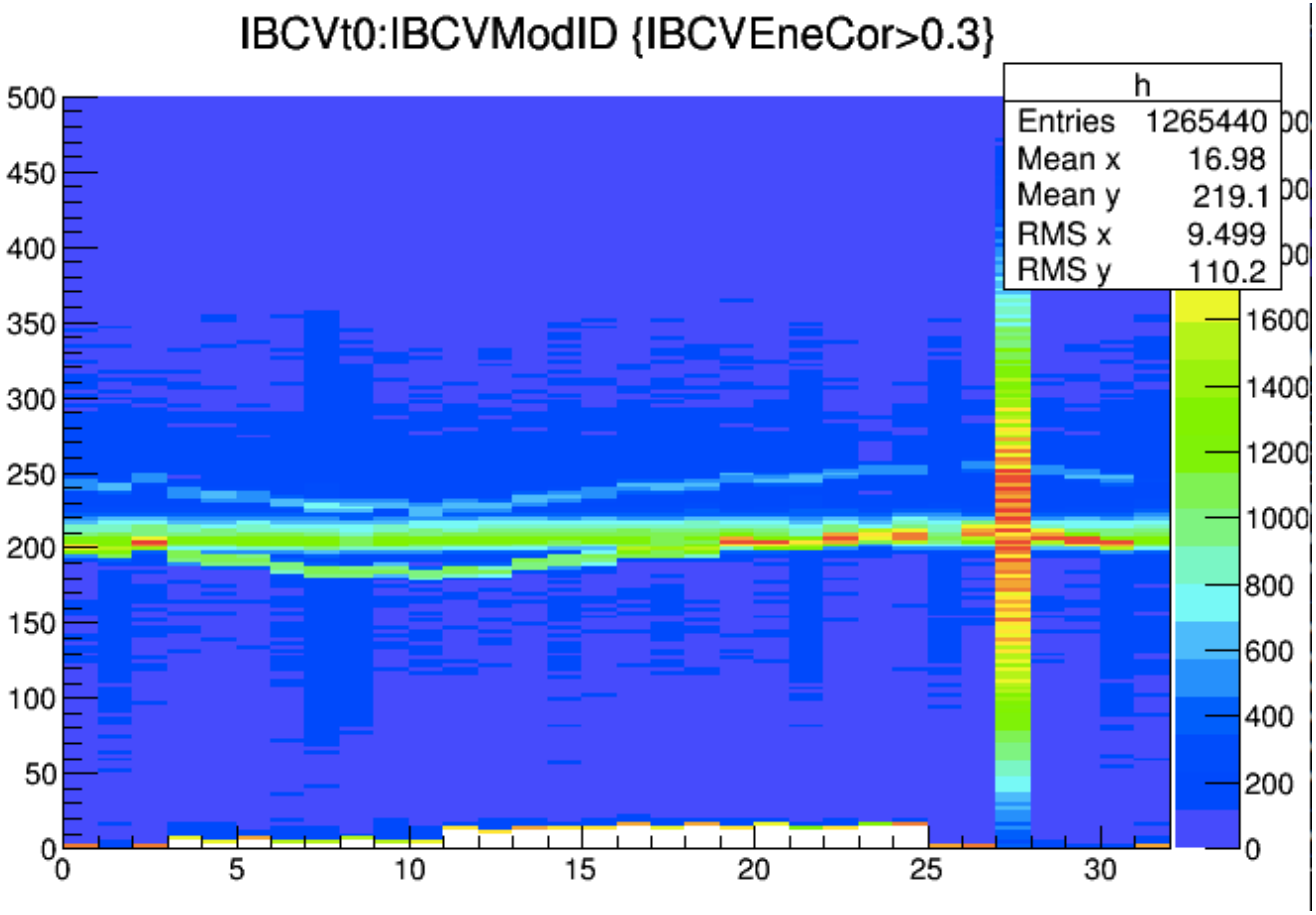






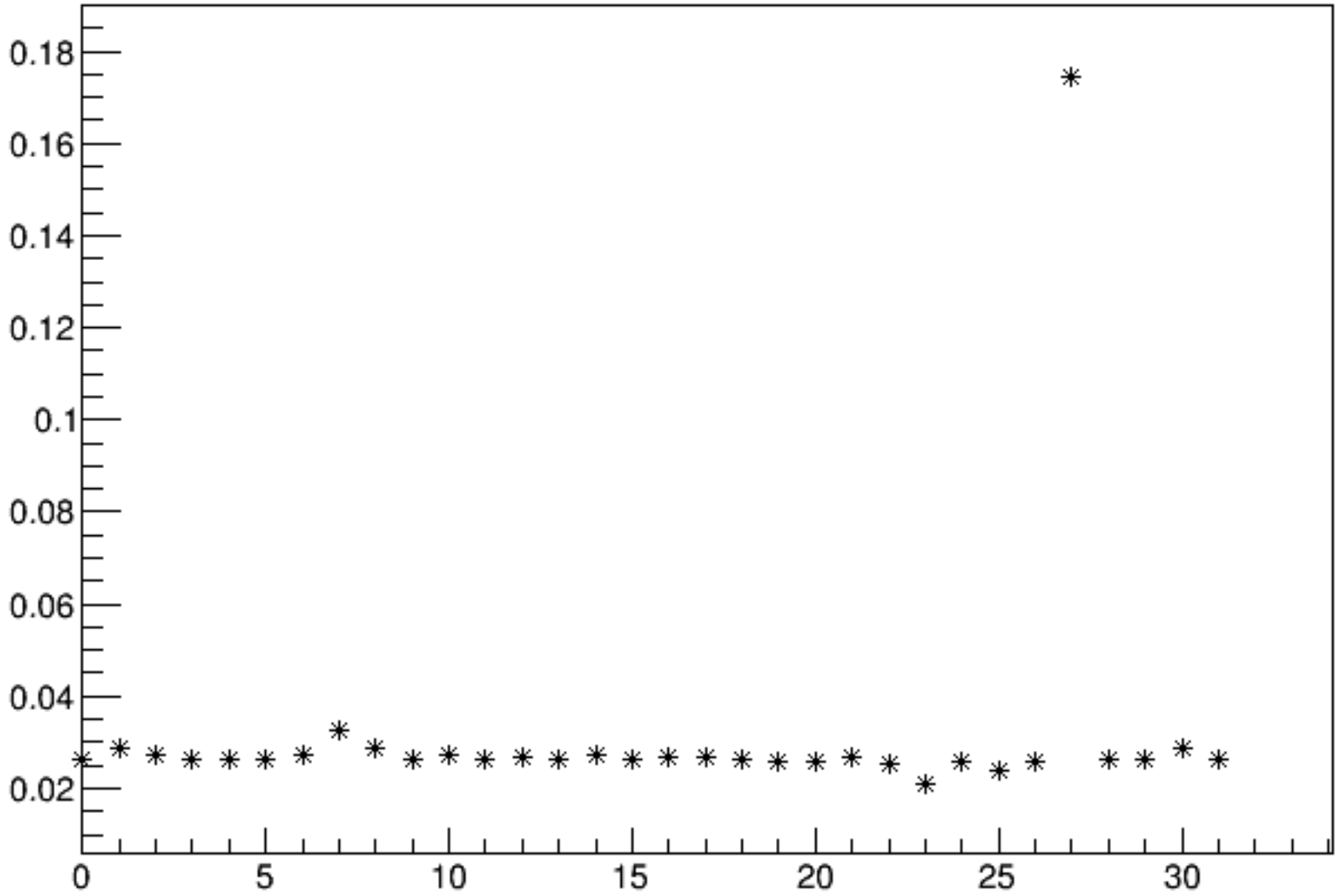
IBCV t0

Enough for setting veto window



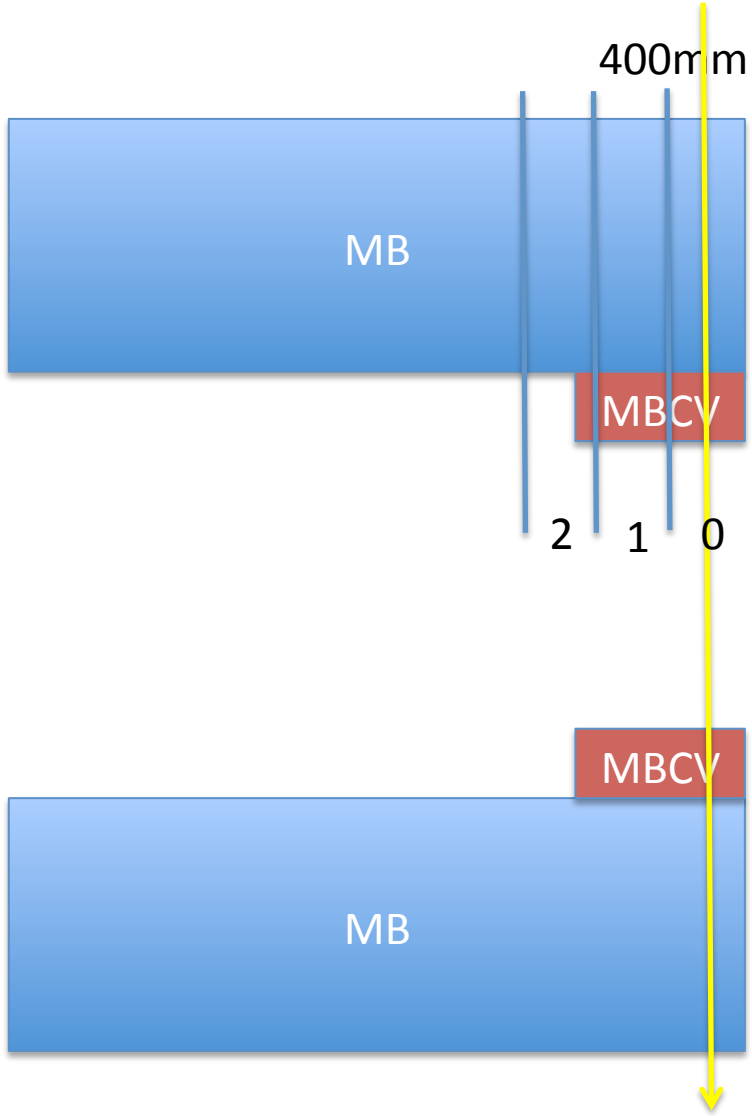
IBCVEneCor

Fraction of
energy corrected with attenuation > 0.3



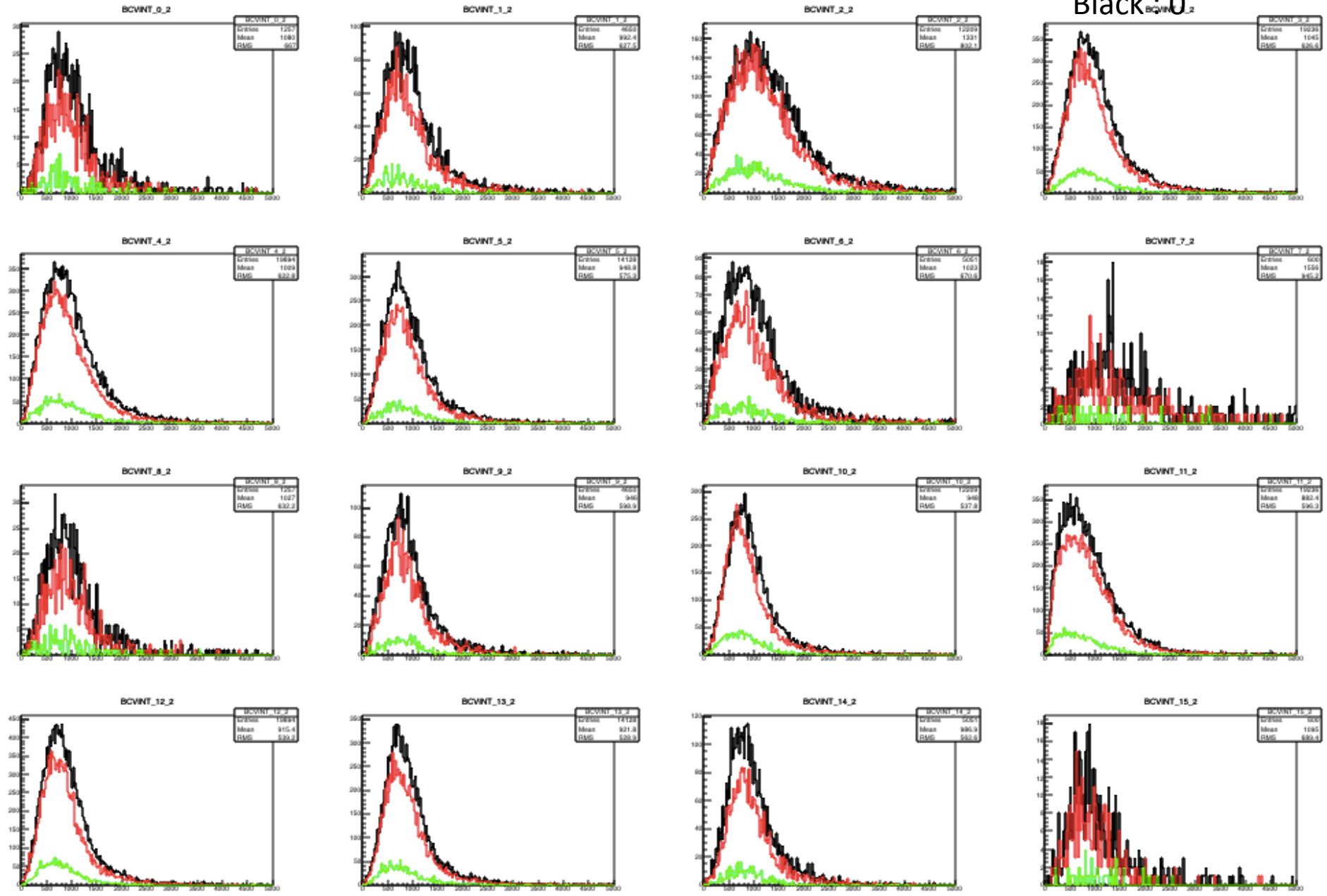
MBCV Calibration

- Use Main Barrel for MBCV calibration
  - Tagging Hit Position && Module
- Hard to see attenuation effect

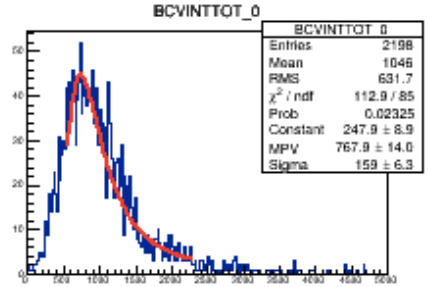


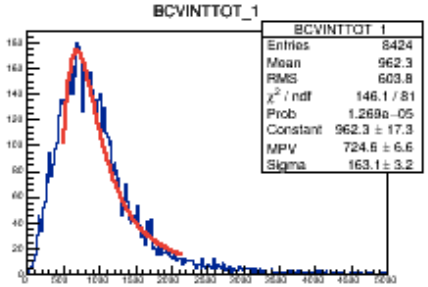
MBCV MIP

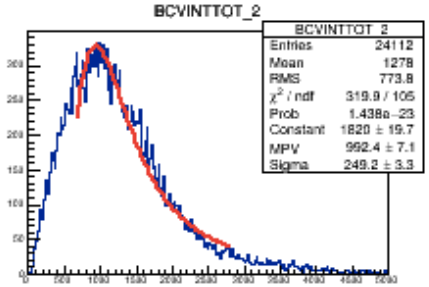
Green : 2
Red : 1
Black : 0

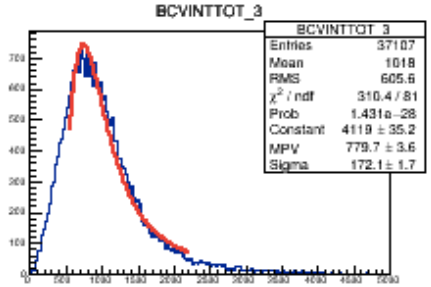


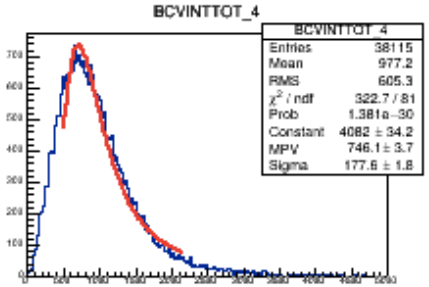
Fitting quality

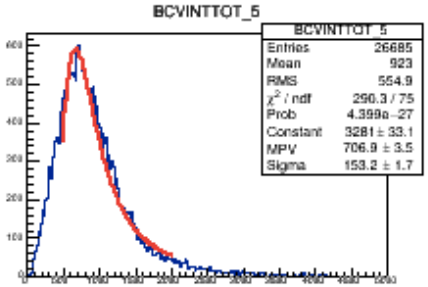


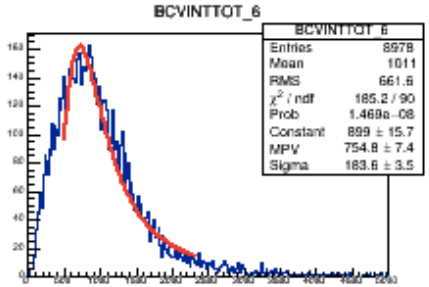


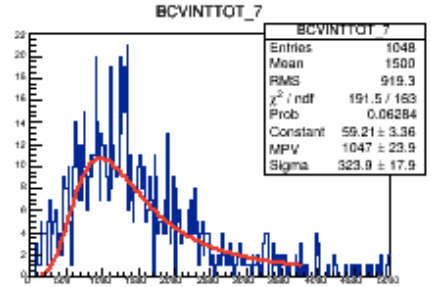


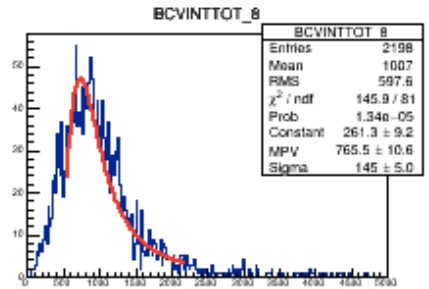


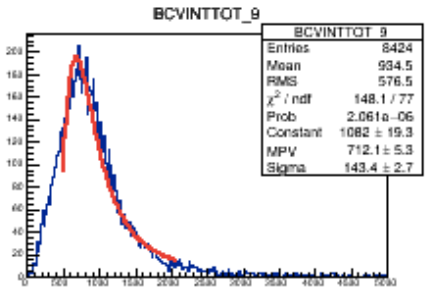


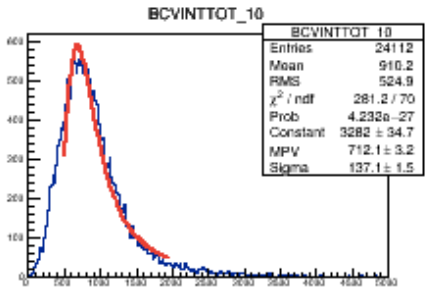


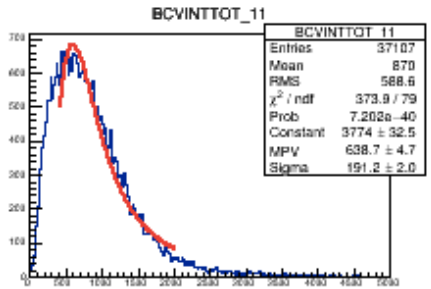


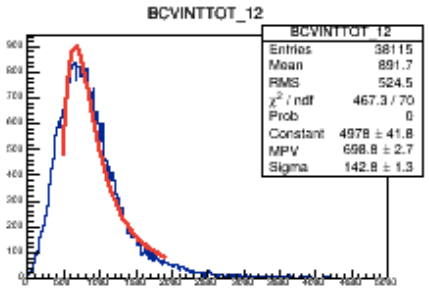


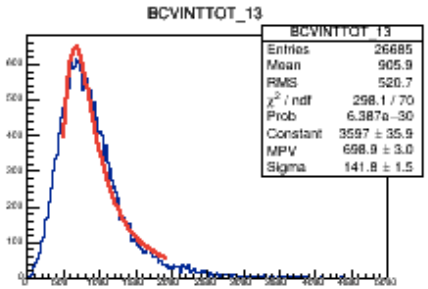


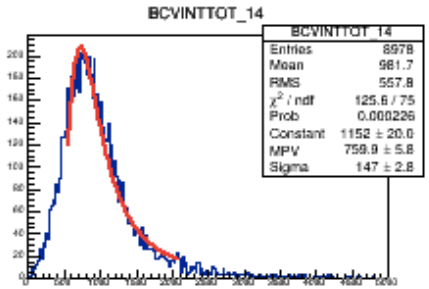


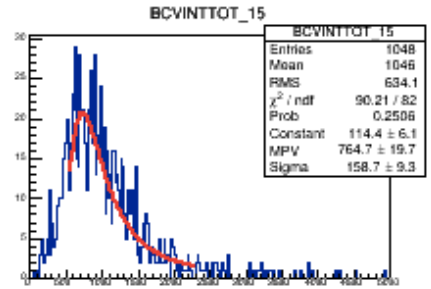






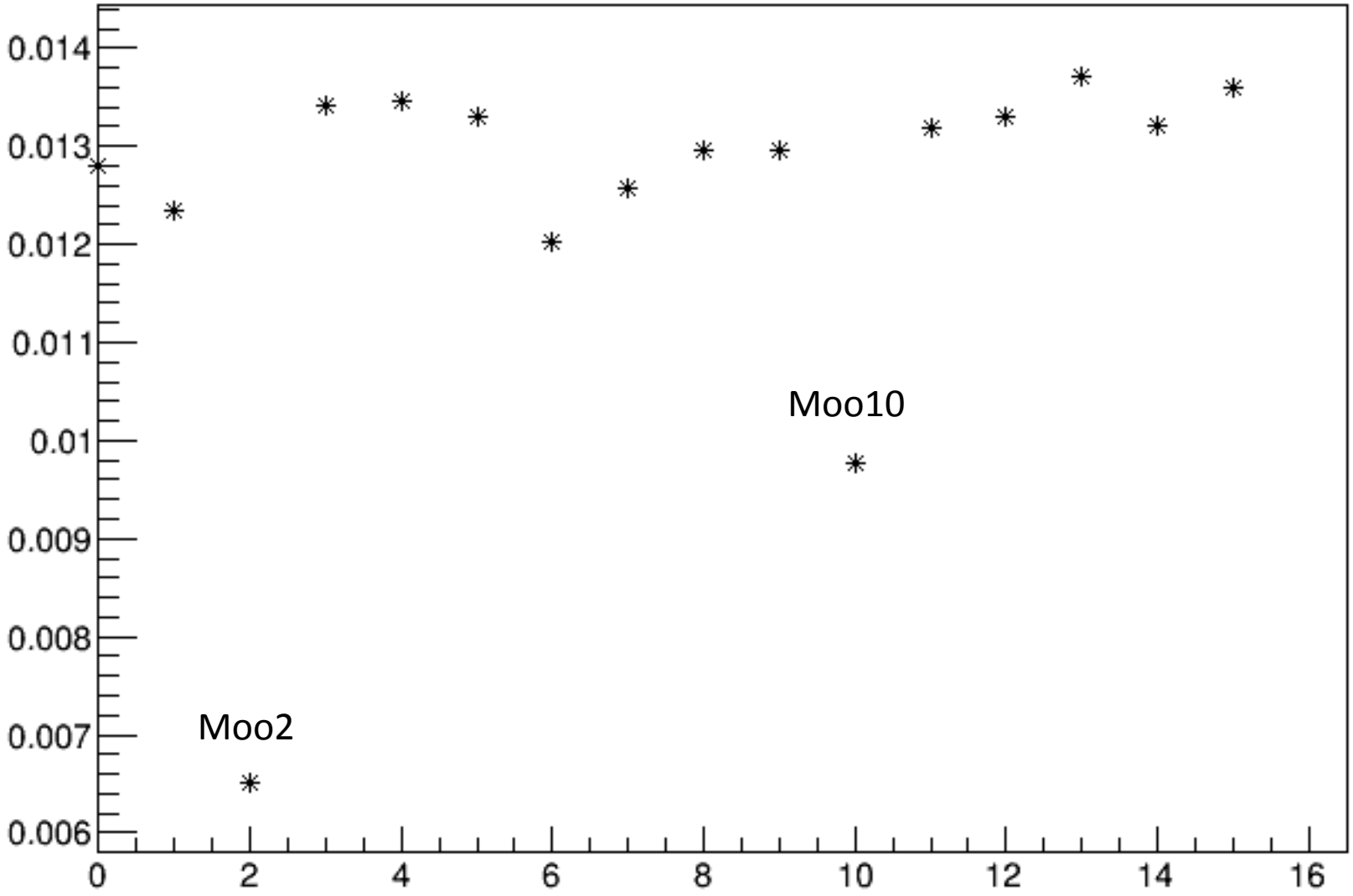




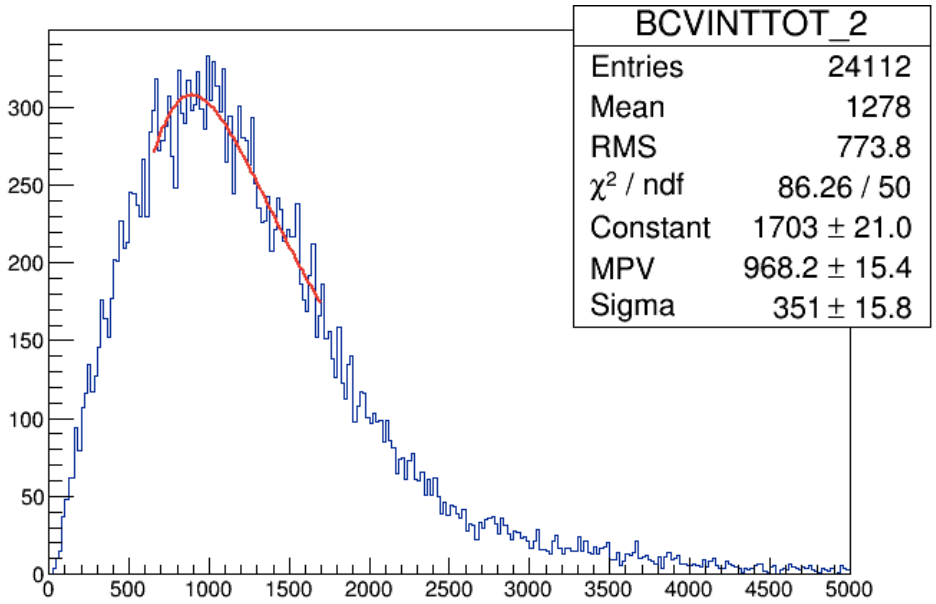


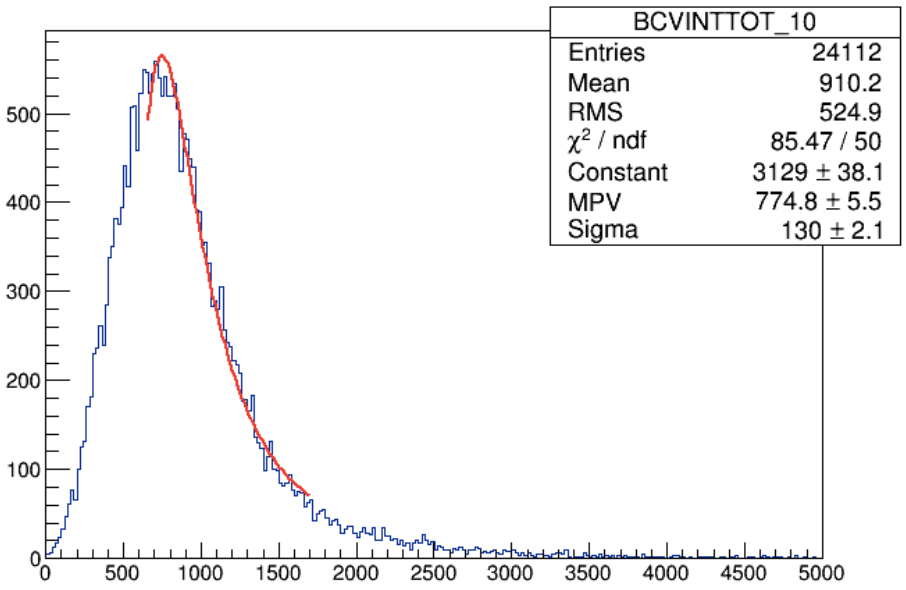
Energy fraction

Fraction of energy > 1.0

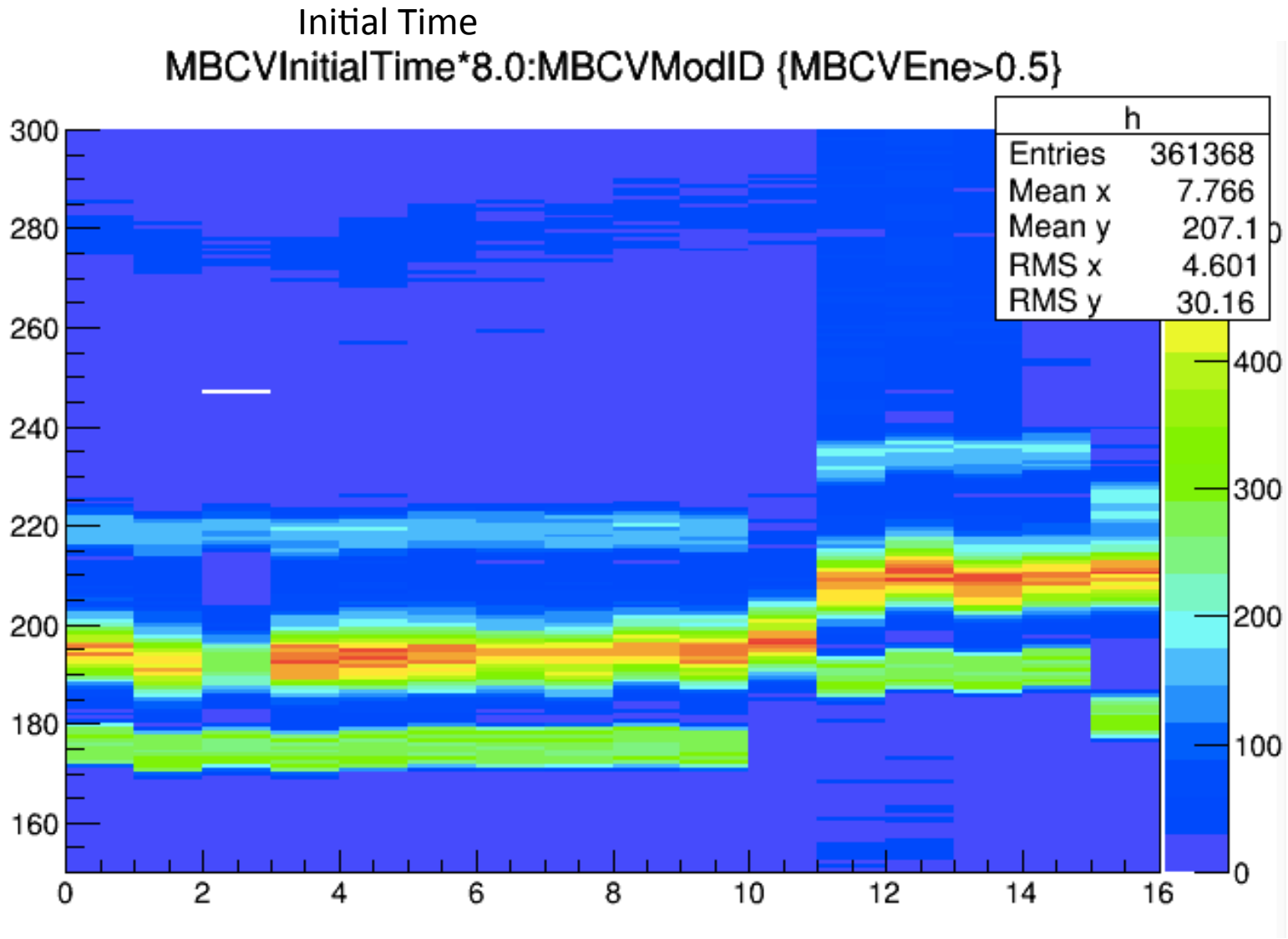


Fitting


BCVINTTOT_2
Entries 24112
Mean 1278
RMS 773.8
χ² / ndf 86.26 / 50
Constant 1703 ± 21.0
MPV 968.2 ± 15.4
Sigma 351 ± 15.8

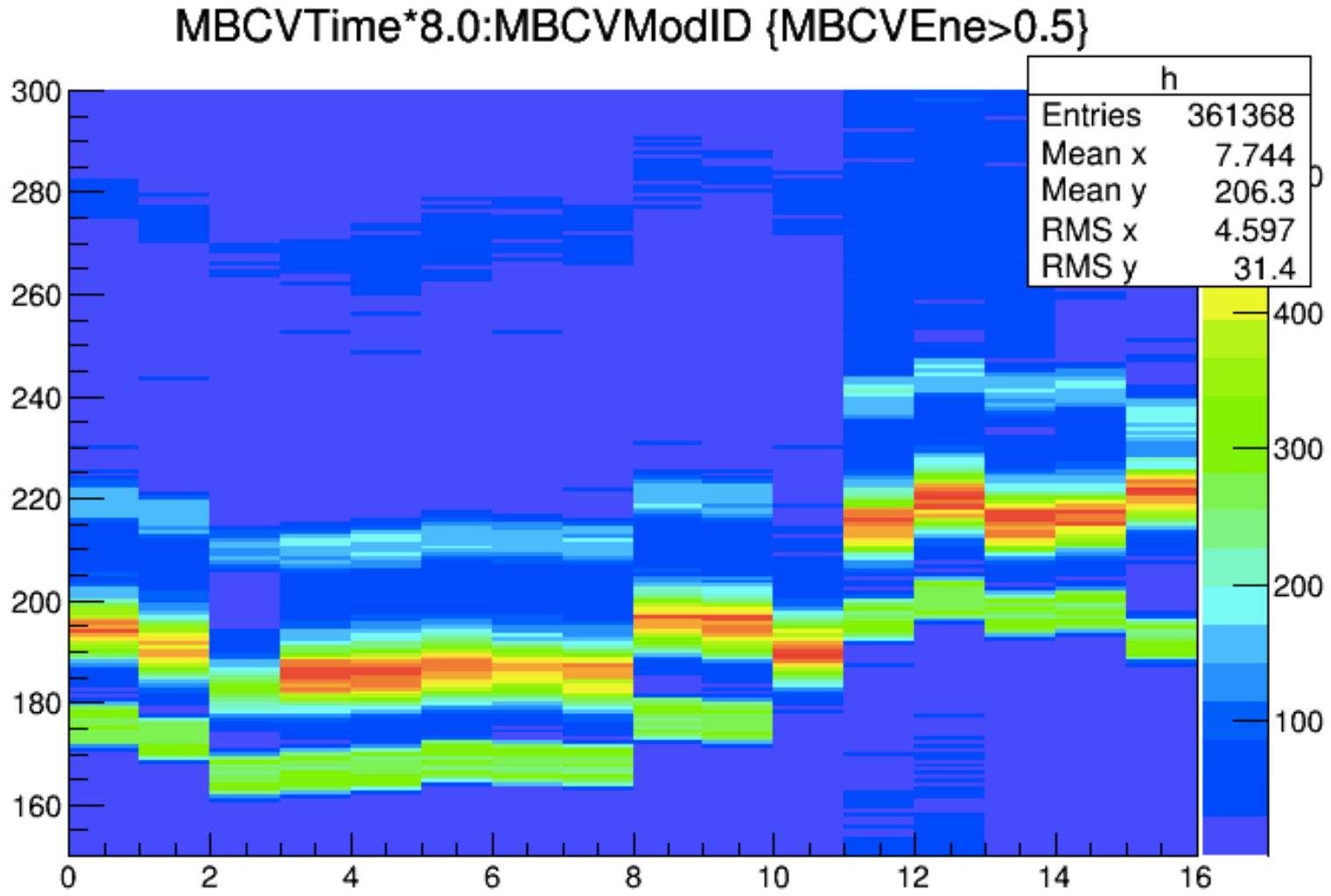

BCVINTTOT_10
Entries 24112
Mean 910.2
RMS 524.9
χ² / ndf 85.47 / 50
Constant 3129 ± 38.1
MPV 774.8 ± 5.5
Sigma 130 ± 2.1

MBCV t0


Initial Time
MBCVInitialTime*8.0:MBCVModID {MBCVEne>0.5}
h
Entries 361368
Mean x 7.766
Mean y 207.1
RMS x 4.601
RMS y 30.16
300
280
260
240
220
200
180
160
0
2
4
6
8
10
12
14
16
400
300
200
100
0

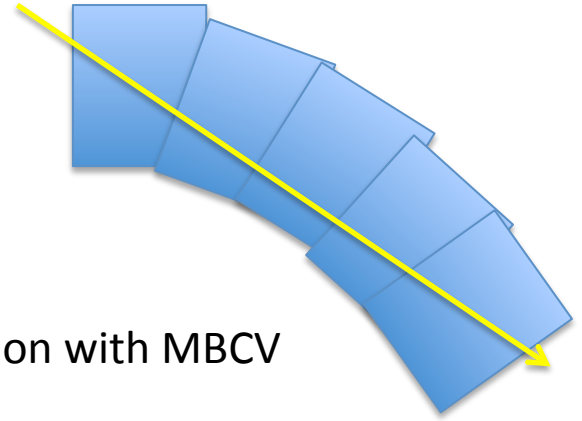
MBCV t0

After Calibration (??)



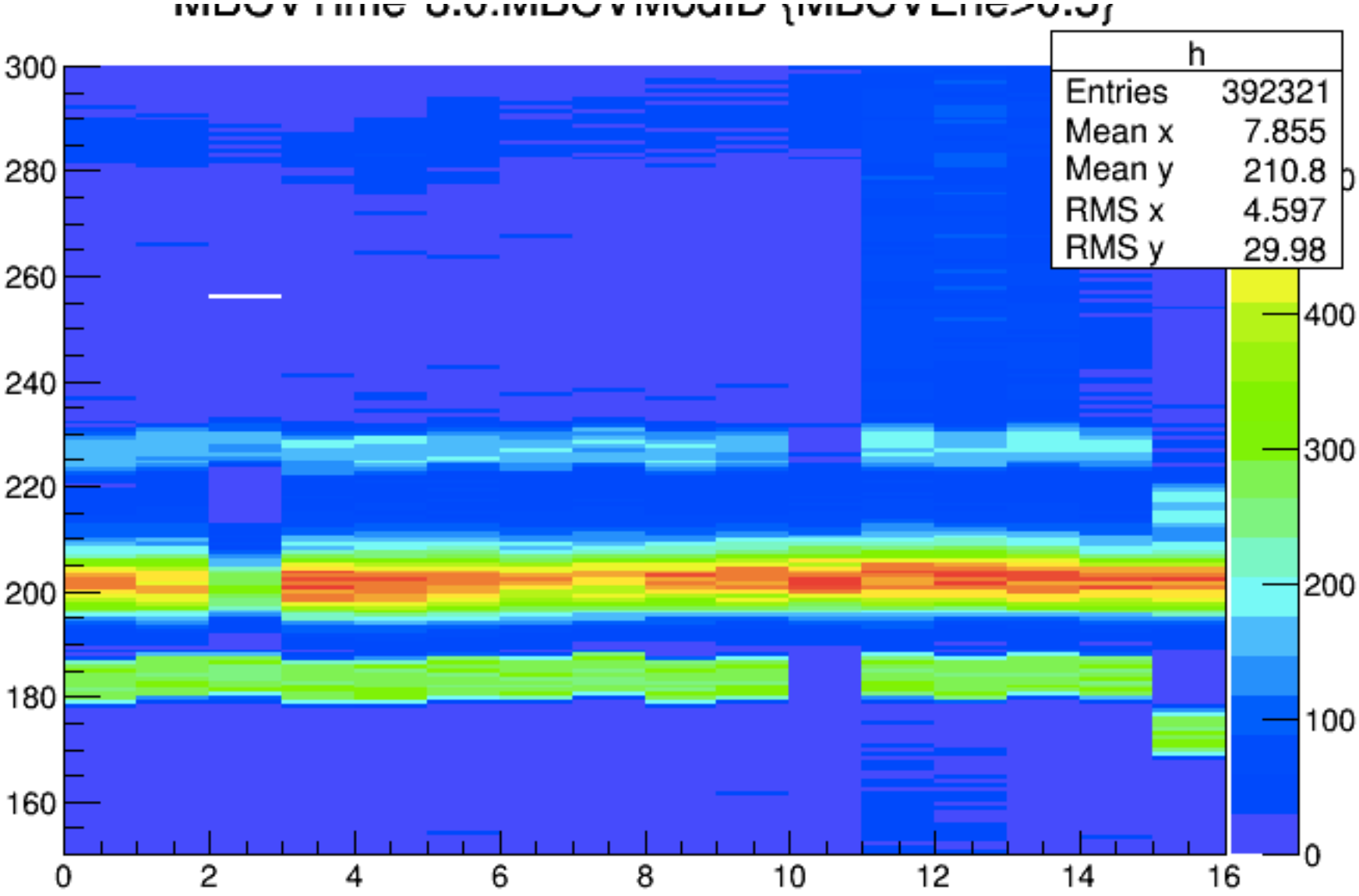
problem

- Hard to get full information
  - Module0 – module2 time distribution
    - For checking module0 or module2, conformation of Hit on MBCV is needed by Main Barrel
    - But when cosmic ray pass Barrel with depositing many hit on Main Barrel, It is hard to go inside MBCV.
- Re-definition of Hit on MBCV
  - MBCVPeak > 30
    - With ignoring MB



No interaction with MBCV

After Redefinition



summary

- Conversion from IntegratedADC to energy is done for IBCV, MBCV
  - Need special treatment of IBCV Module27
  - Mis-gain matching of MBCV 2, 10 (?)
    - Fittings look reasonable
- T0 Calibration is done
  - We can set proper veto window for IBCV and MBCV
- Problem about resolution of IB is not solved yet
  - Removing differences between MC and Data
    - Module, Run Correction are done
    - Spill by Spill ??