Comparison of BC1, BC2 signals with ZDC and dE/dx counter on ArAl data
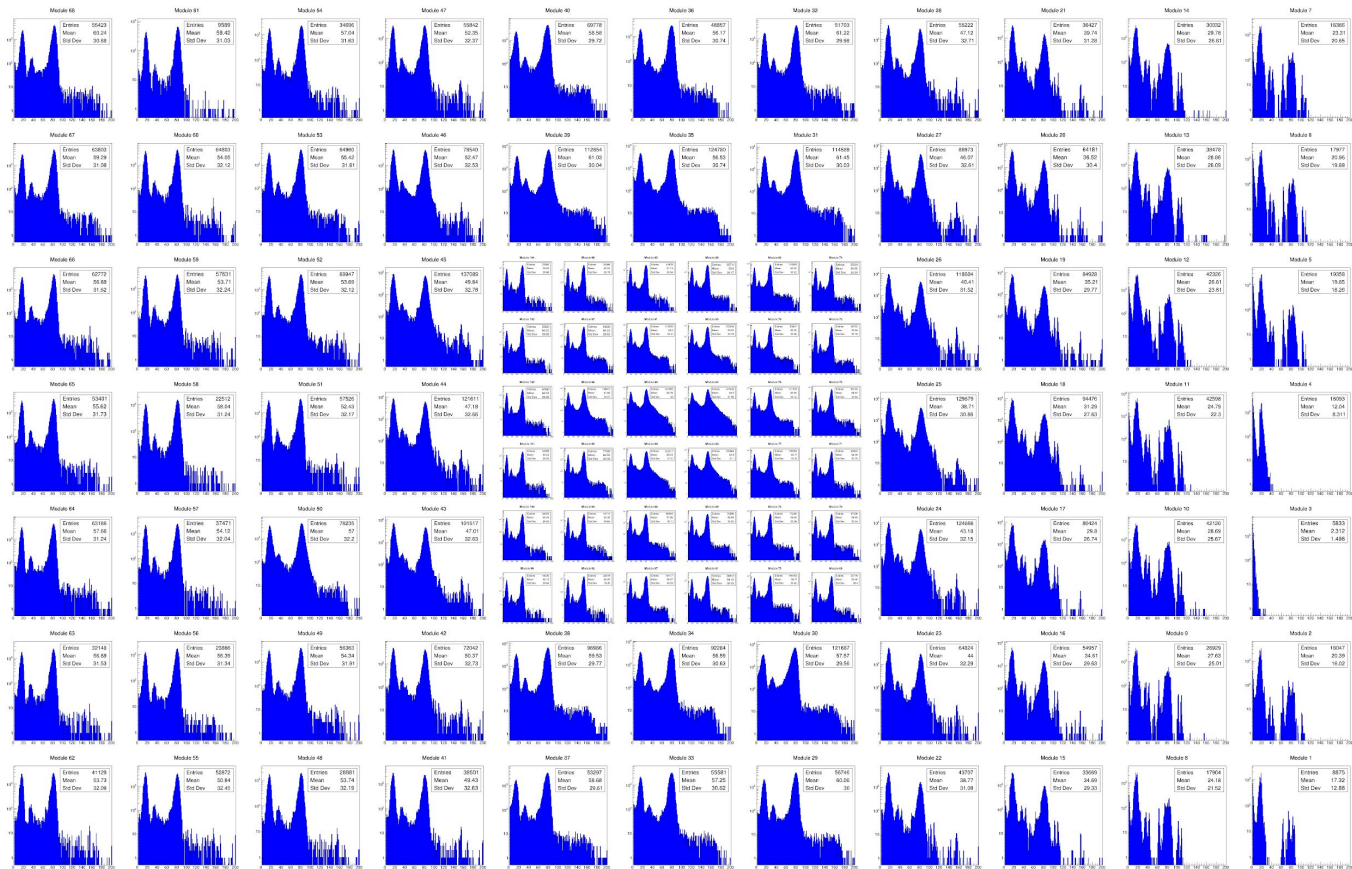
(Runs: ~~4649~~, 3842, 3843, 3847, 3850)
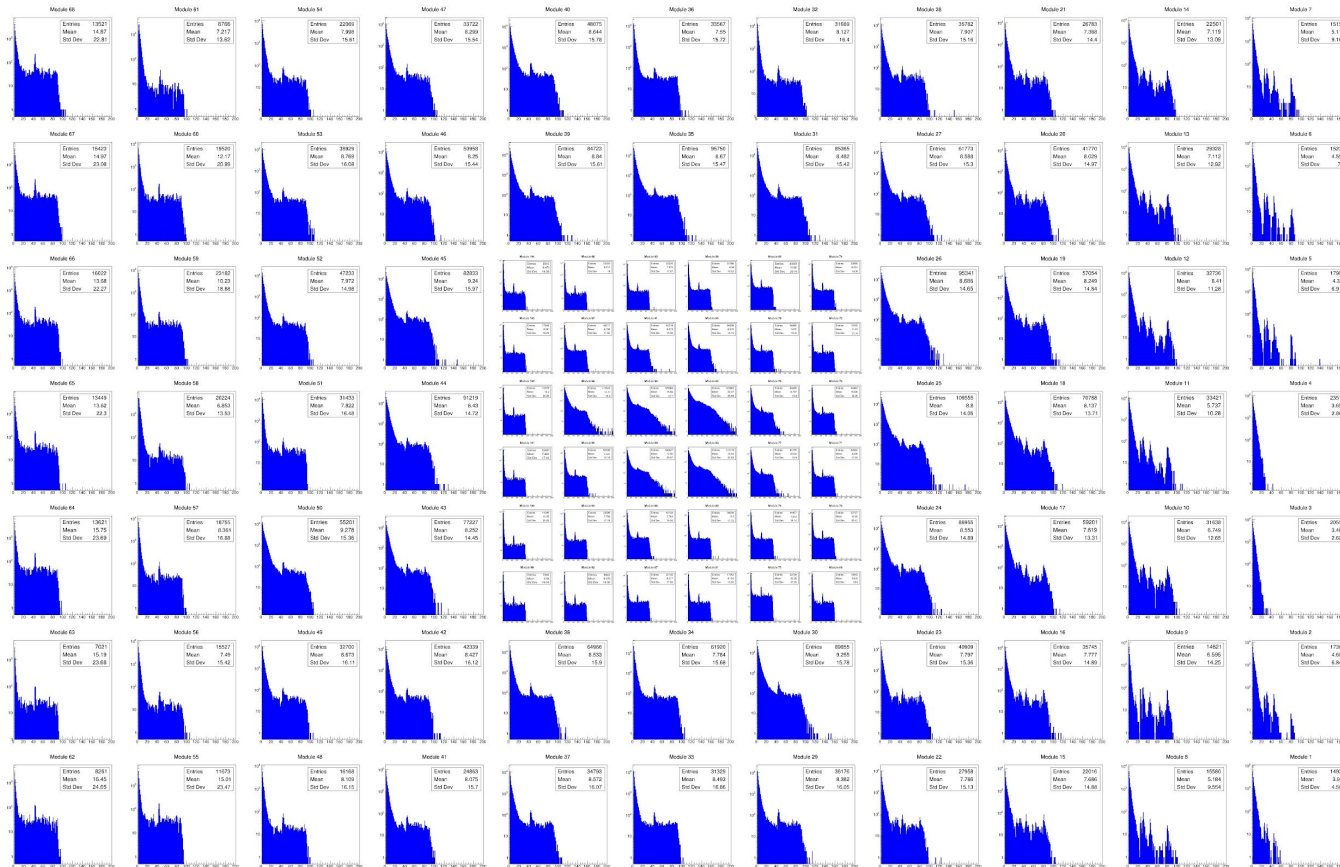
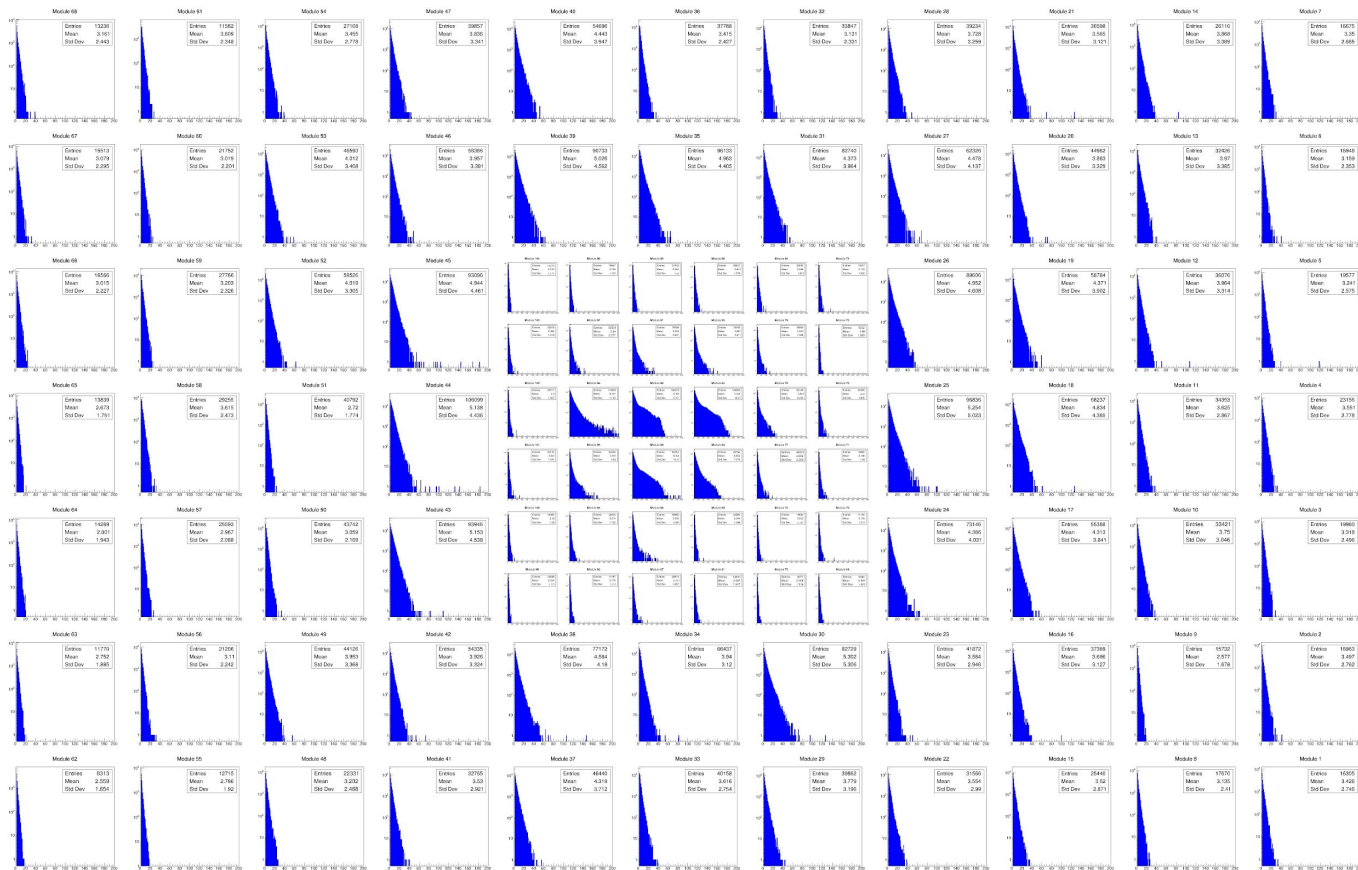*Petr Alekseev*
April 8, 2020

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TQDC branches are in /eos/nica/bmn/exp/digi/run7/20.02.0/ but that files has wrong data in ZDC branch

19.05.0/bmn/bmn_run4649_digi.root ZDC modules spectra

ZDC data in /eos/nica/bmn/exp/digi/run 7/19.05.0/ are currently used for analysis
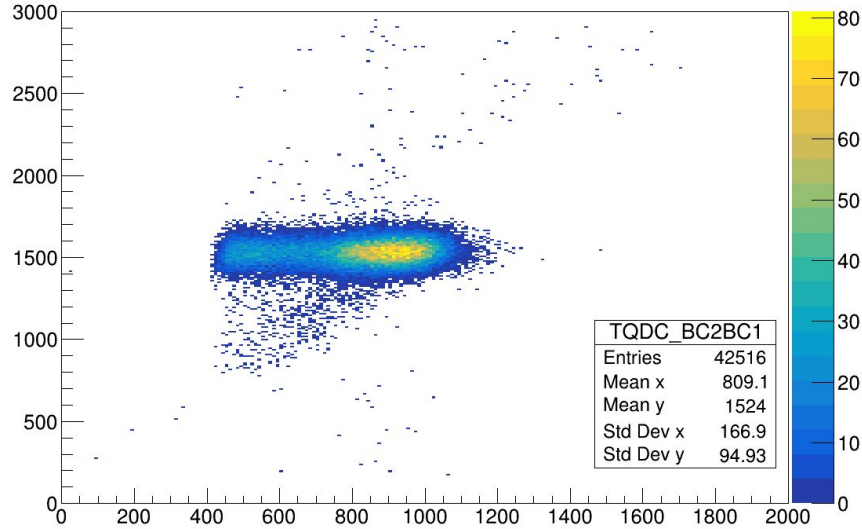
19.05.0/bmn/bmn_run3842_digi.root ZDC modules spectra

ZDC data in /eos/nica/bmn/exp/digi/run 7/19.05.0/ are currently used for analysis
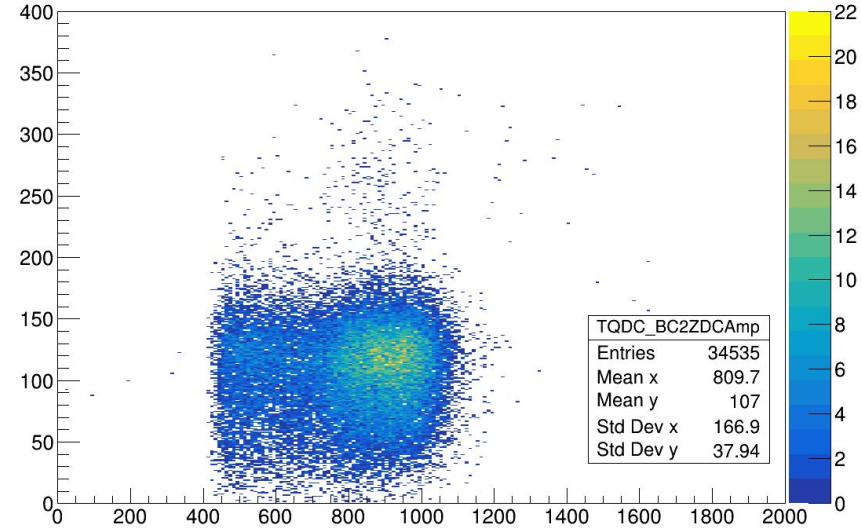
Run 3842
TQDC and ZDC data was taken from different dirs and matched by **event id**

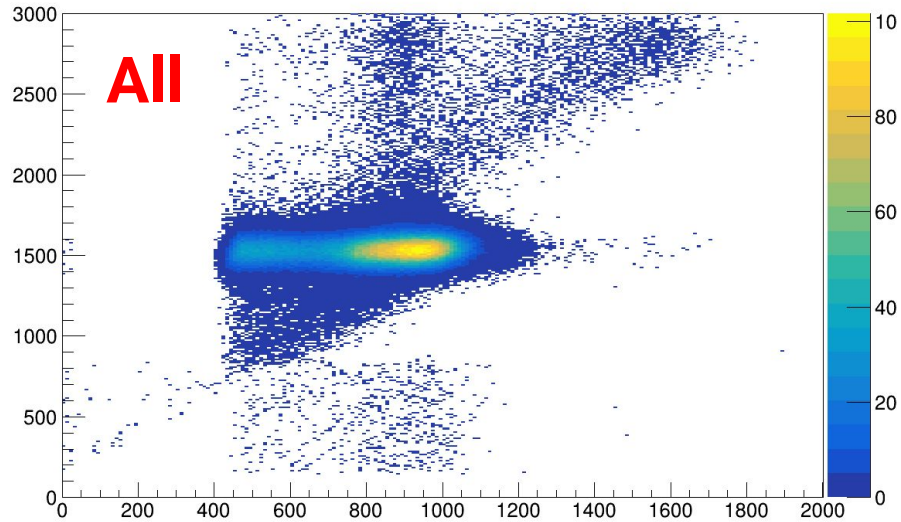### TQDC BC1 peack vs BC2 peack

ZDC sum energy vs BC2 peack
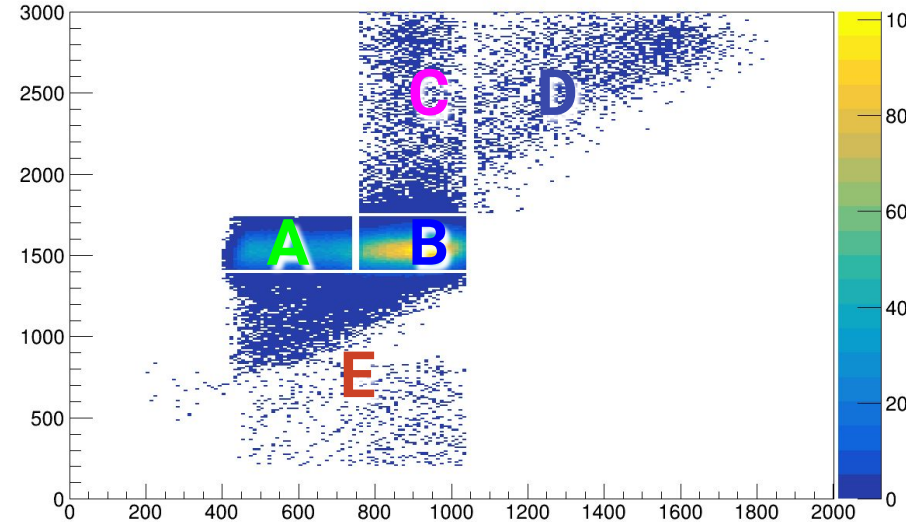

VETO events removed

Run 3842, 3843, 3847, 3850
TQDC and ZDC data was taken from different dirs and matched by **event id**
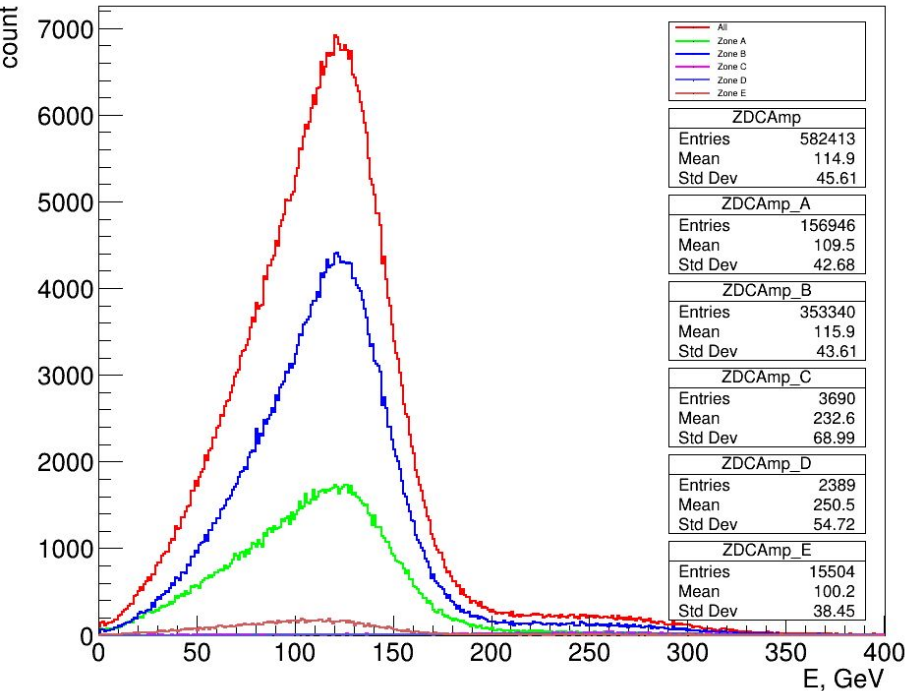

TQDC_BC2BC1

All

All events (no VETO cut)
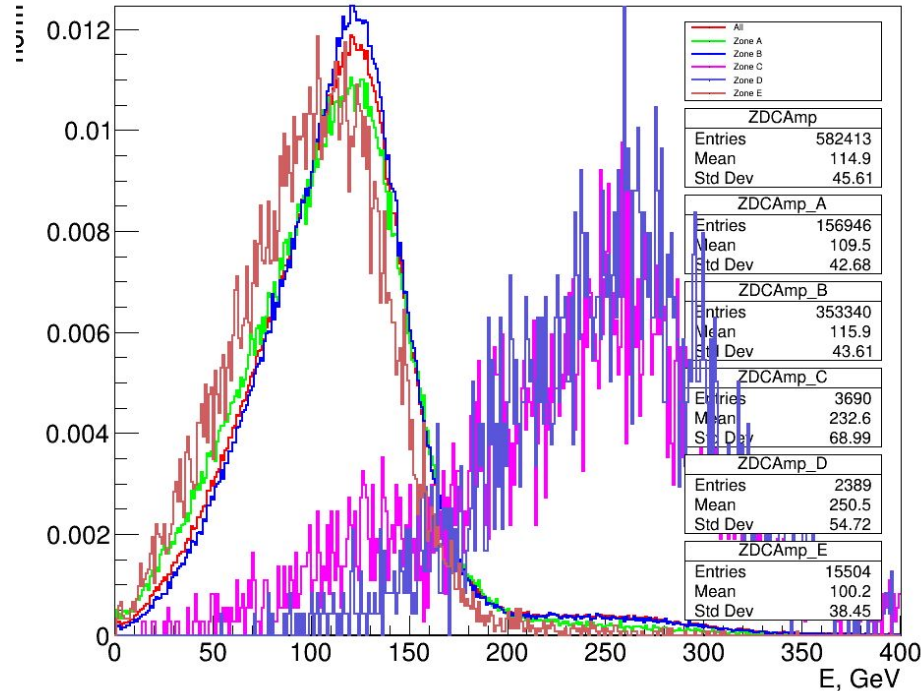
TQDC_BC2BC1

C D

A B

E

Zones

Run 3842, 3843, 3847, 3850 ZDC Energy
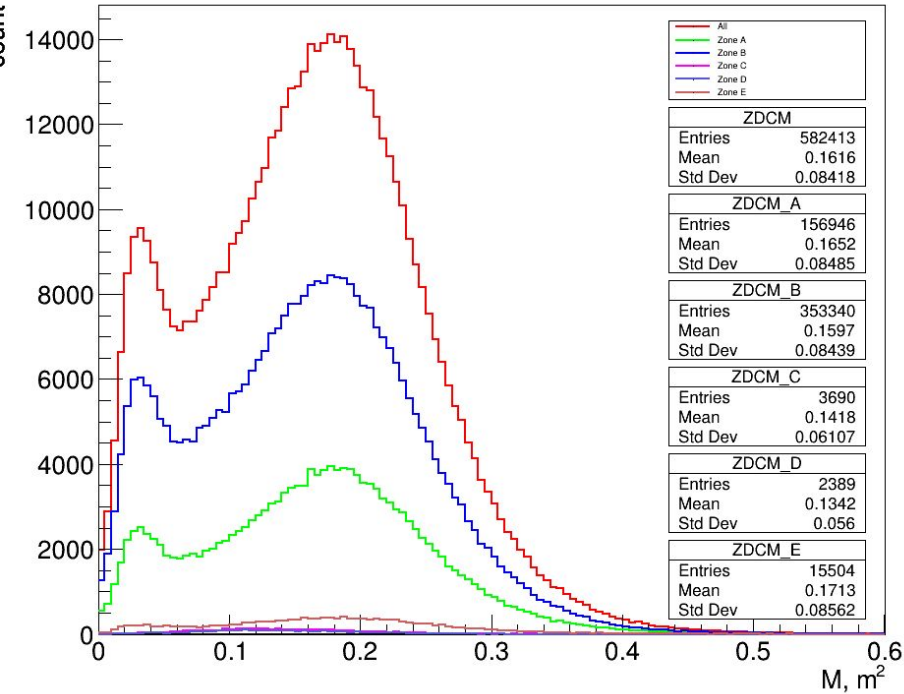## not scaled (left) and scaled on entries number (right)

ZDC energy

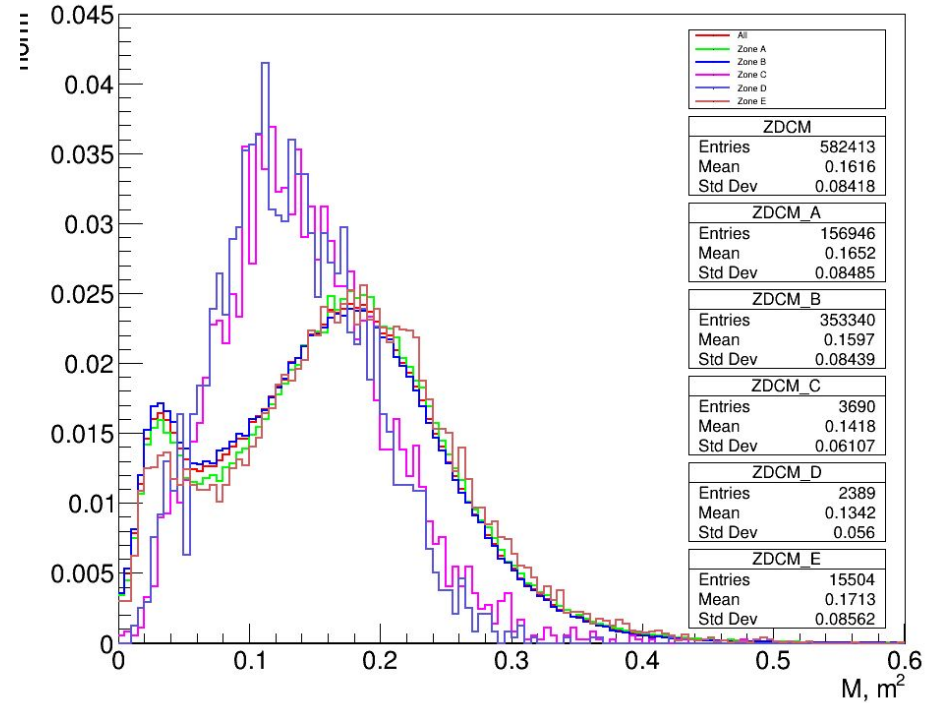ZDC energy

Run 3842, 3843, 3847, 3850 ZDC moment
## not scaled (left) and scaled on entries number (right)

ZDC moment

All	
Zone A	
Zone B	
Zone C	
Zone D	
Zone E	

ZDCM	
Entries	582413
Mean	0.1616
Std Dev	0.08418

ZDCM_A	
Entries	156946
Mean	0.1652
Std Dev	0.08485

ZDCM_B	
Entries	353340
Mean	0.1597
Std Dev	0.08439

ZDCM_C	
Entries	3690
Mean	0.1418
Std Dev	0.06107

ZDCM_D	
Entries	2389
Mean	0.1342
Std Dev	0.056

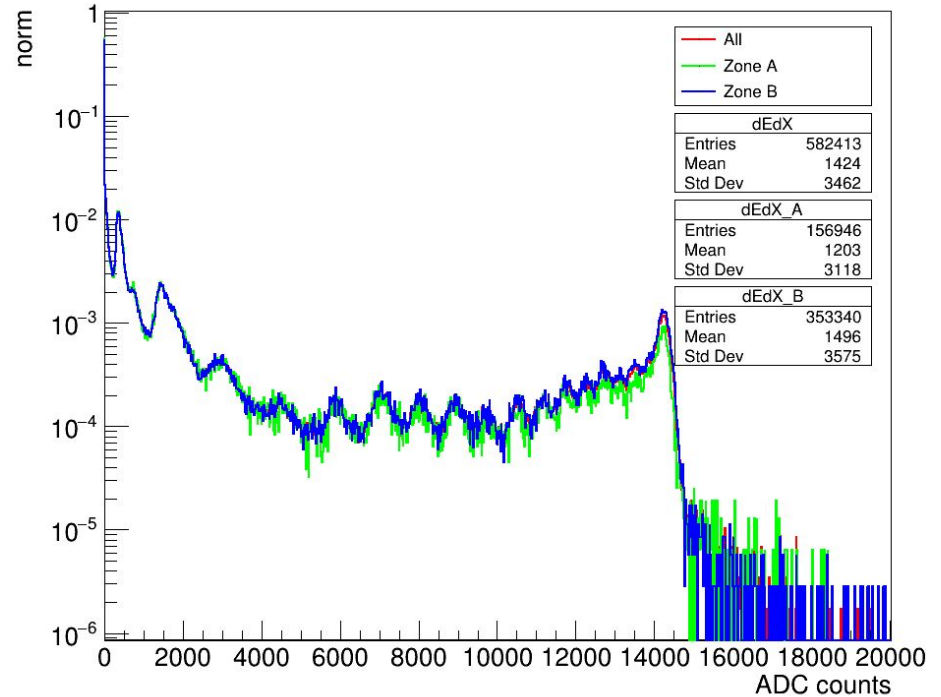| ZDCM_E	
Entries	15504
Mean	0.1713
Std Dev	0.08562

Run 3842, 3843, 3847, 3850 dE/dX-counter
not scaled (left) and scaled on entries number (right)

dEdX counter amp
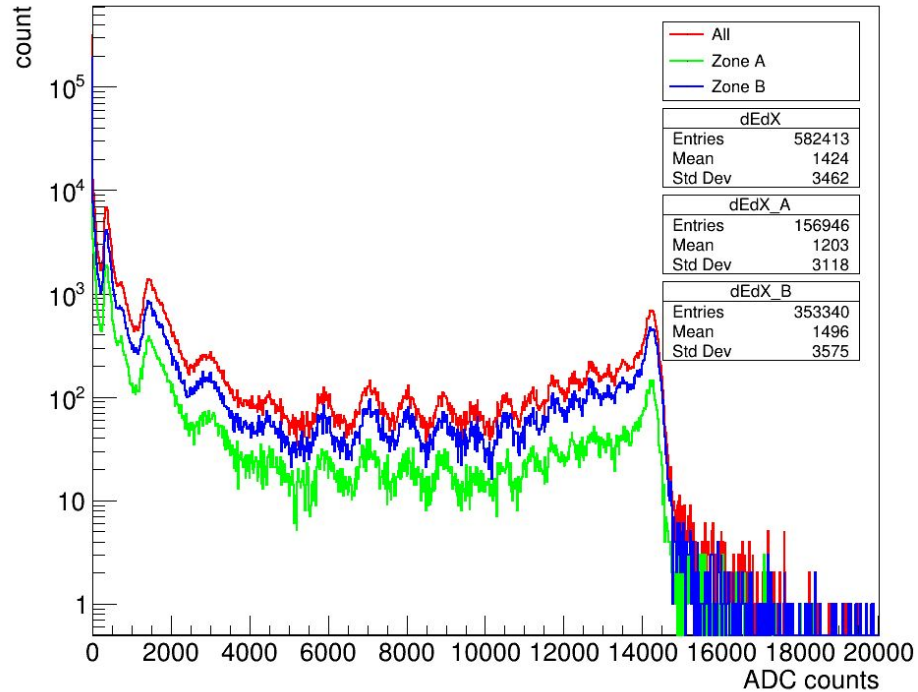
dEdX counter amp

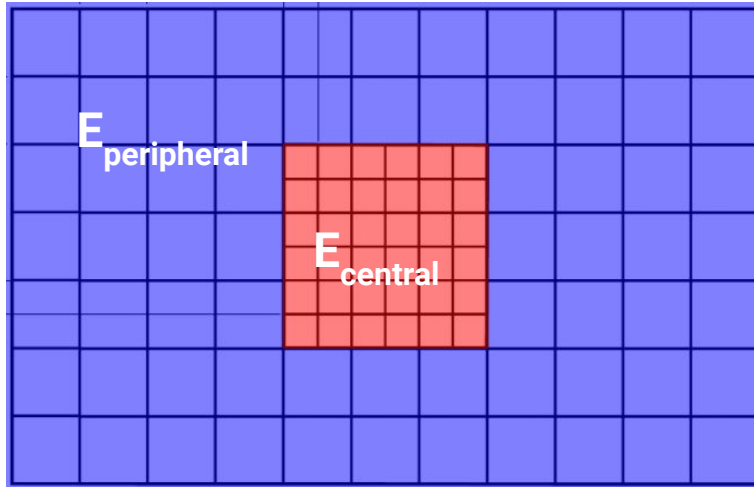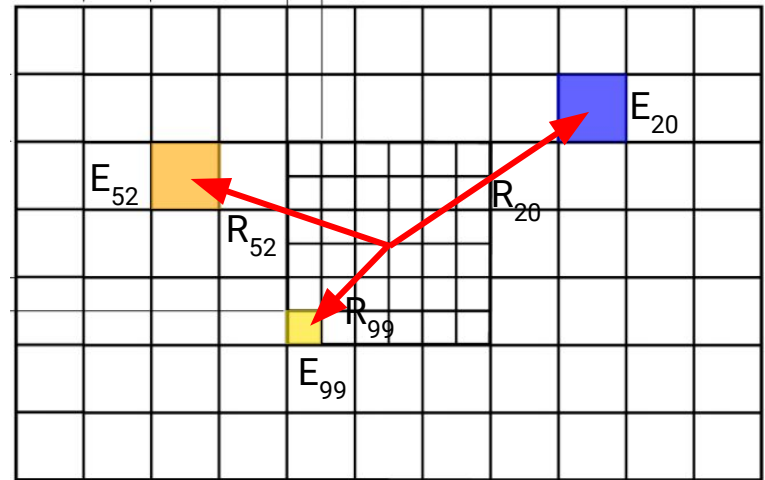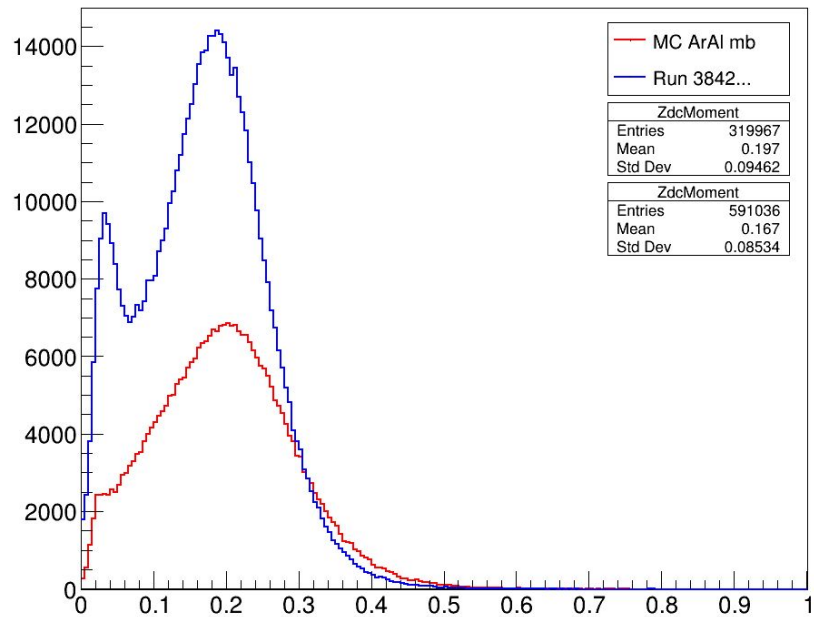# Thanks for your attention

Cluster shape

Asymmetry

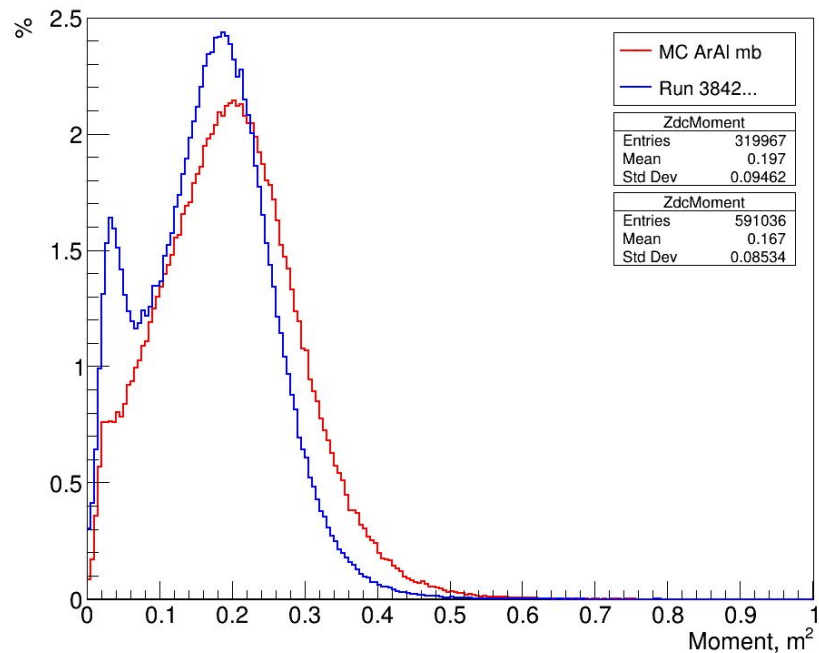$$A = \frac{E_{central} - E_{peripheral}}{E_{central} + E_{peripheral}}$$

Normalized moment

$$M_{norm} = \frac{\Sigma(E_i \times R_i^2)}{\Sigma E_i}$$

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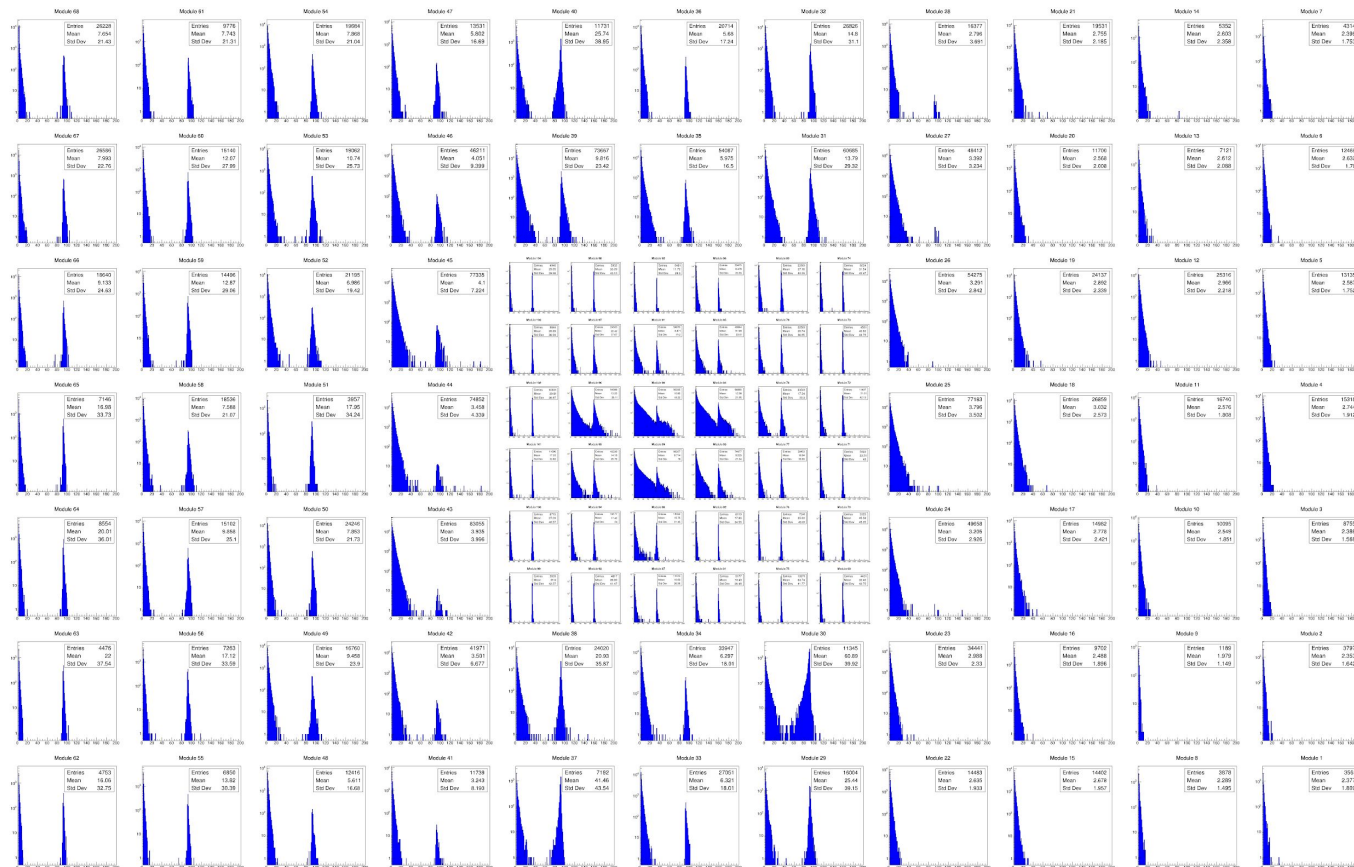
ZDC normalized moment, m²

20.02.0/3590-4707_BMN_Argon/bmn_run3842_digi.root ZDC modules spectra
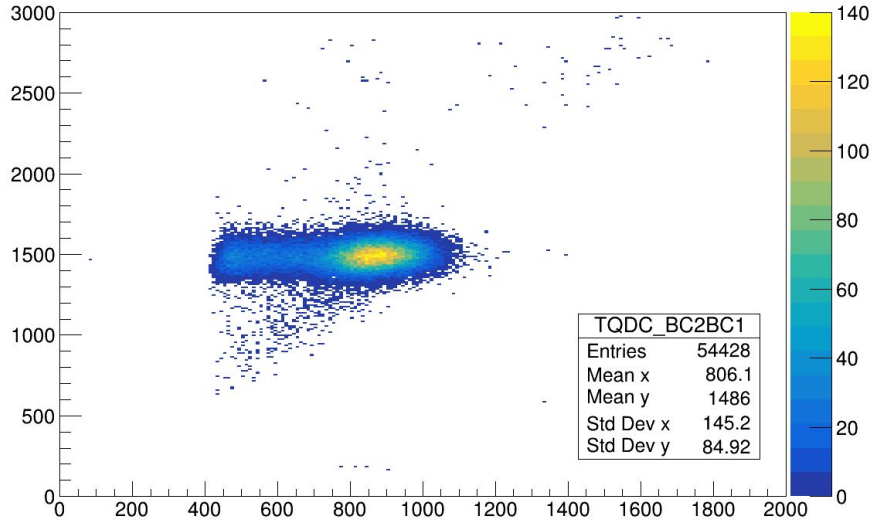

TQDC branches are in /eos/nica/bmn/exp/digi/run7/20.02.0/ but that files has wrong data in ZDC branch
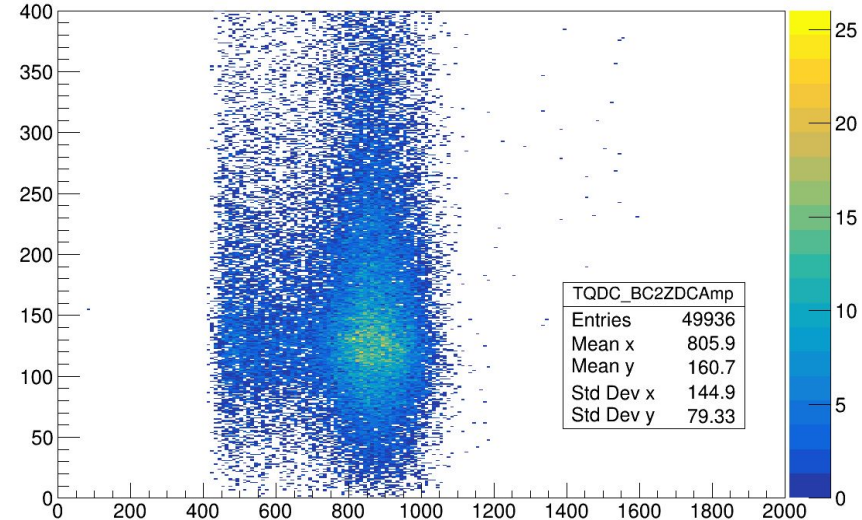
Run 4649
TQDC and ZDC data was taken from different dirs and matched by **event id**

TQDC BC1 peack vs BC2 peack

TQDC_BC2BC1	
Entries	54428
Mean x	806.1
Mean y	1486
Std Dev x	145.2
Std Dev y	84.92

ZDC sum energy vs BC2 peack

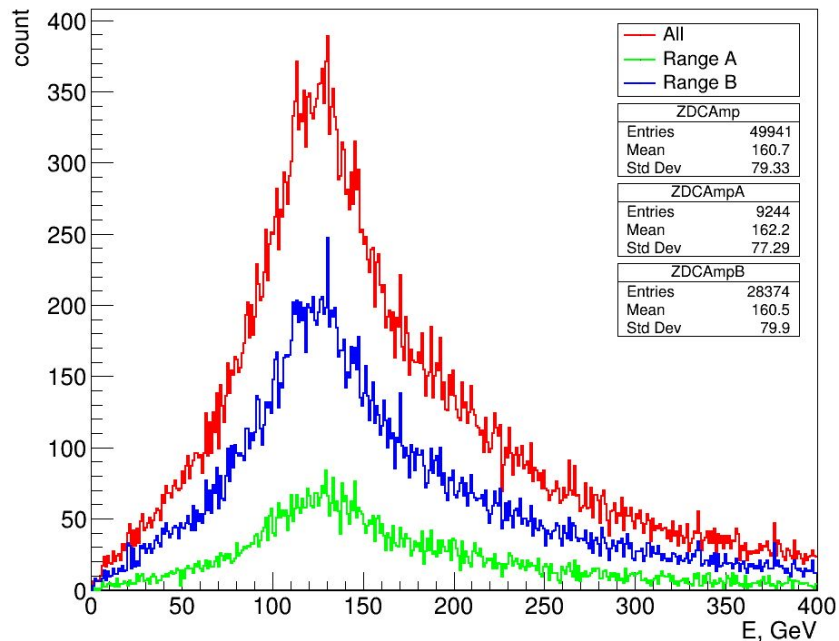| TQDC_BC2ZDCAmp	
Entries	49936
Mean x	805.9
Mean y	160.7
Std Dev x	144.9
Std Dev y	79.33

VETO events removed

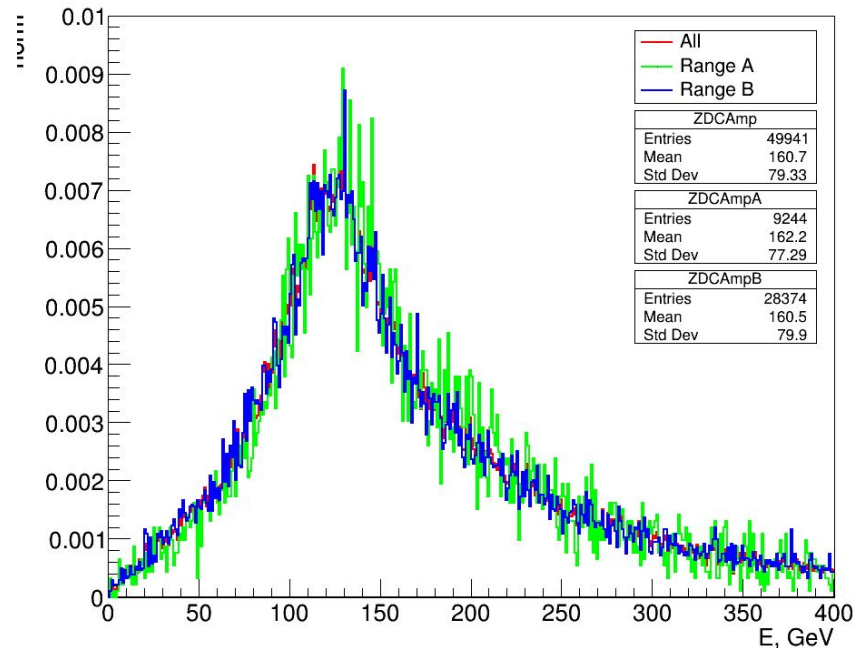# Run 4649 ZDC energy
not scaled (left) and scaled on entries number (right)

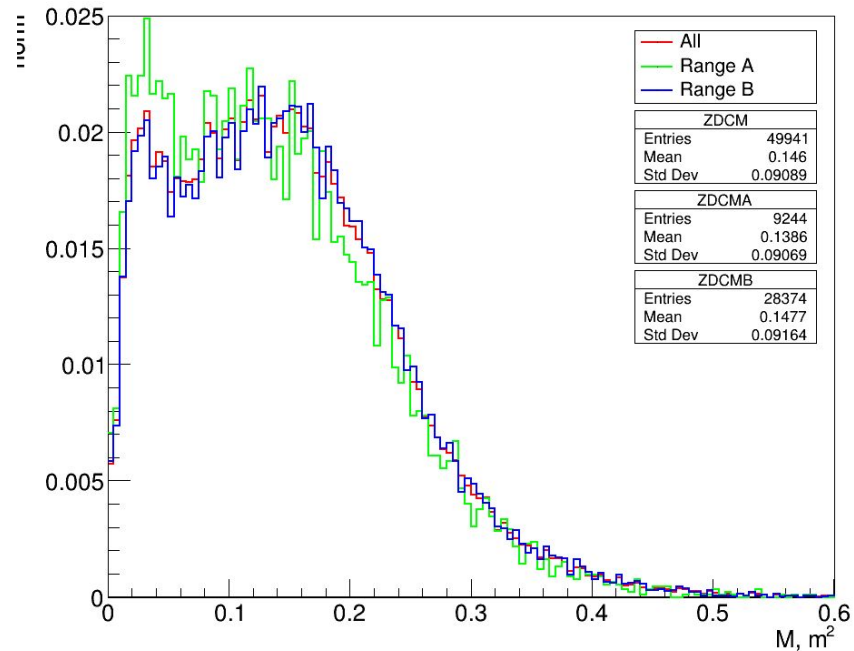# Run 4649 ZDC moment
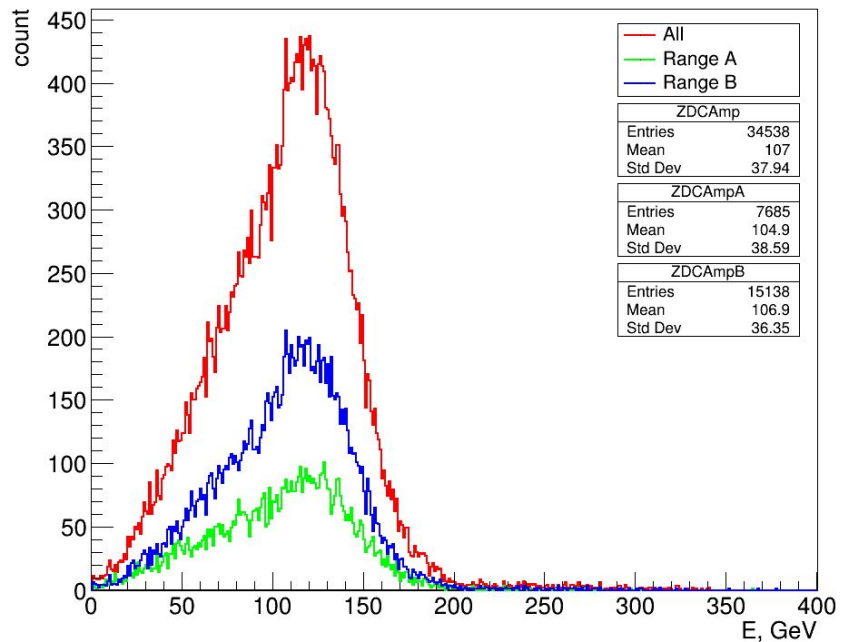## not scaled (left) and scaled on entries number (right)

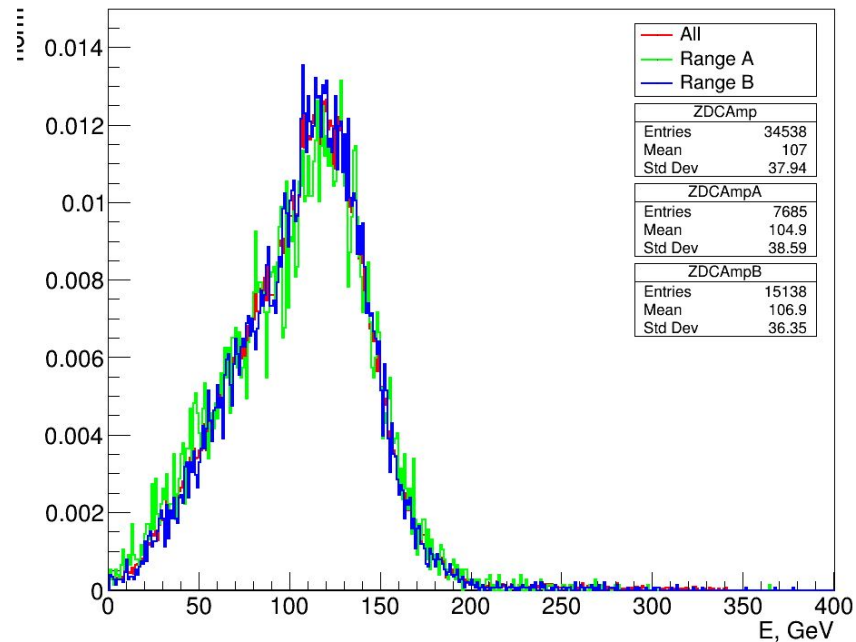# Run 3842 ZDC energy
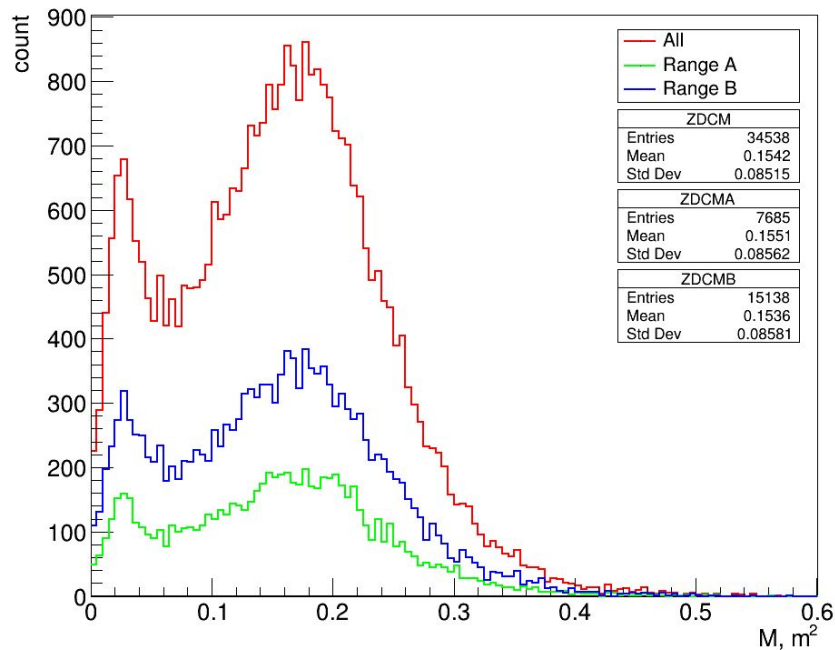## not scaled (left) and scaled on entries number (right)

Run 3842 ZDC moment
not scaled (left) and scaled on entries number (right)