Road to cross sections

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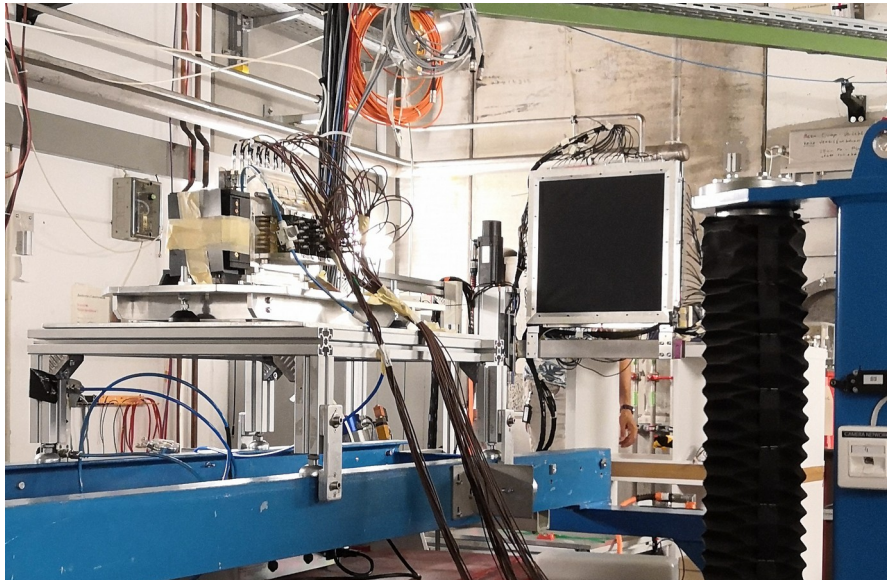
Cross section measurements

400 MeV/u ^{16}O beam on 5mm Carbon target

Run	Trigger type	Target	Events
4305	MB	C	162102
4306	MB	C	577096
4307	MB	C	513370
4310	Frag + MB	C	1012099
4313	MB	no	57133

Table 6.1: Run list GSI2021.



Cross section measurements

400 MeV/u ^{16}O beam on 5mm Carbon target

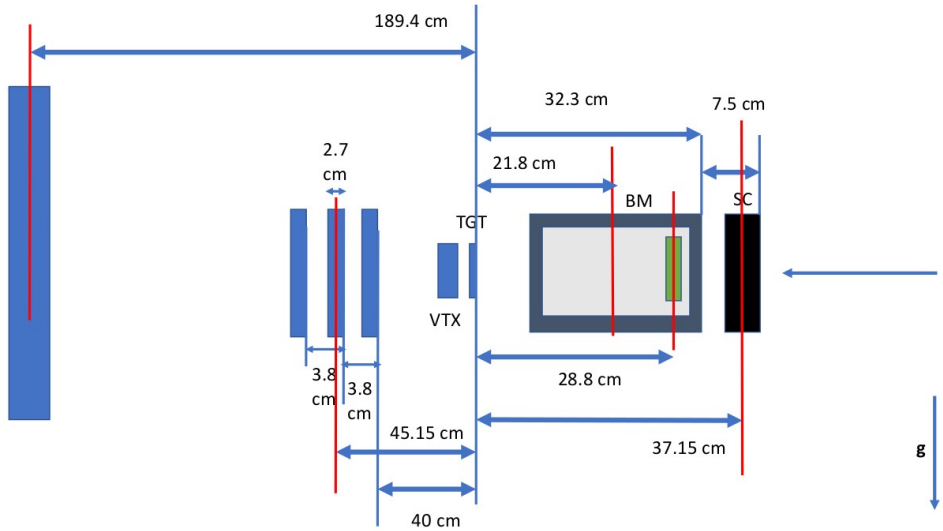
In this analysis trackers (VTX & MSD) are not included!

Fragmentation out of target will be estimated with no target runs

Detector alignment

All the geometry was handled by **SHOE** TAGgeotrafo

To align BM and TW projections of beam particles were used



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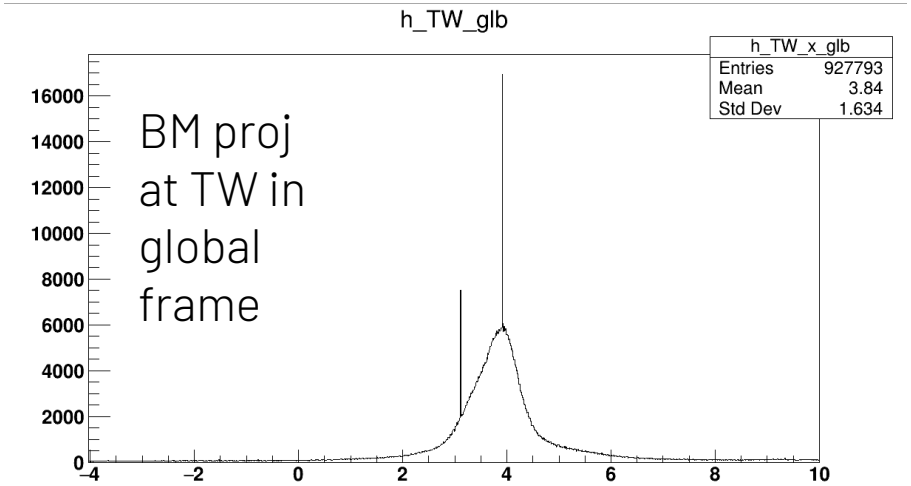
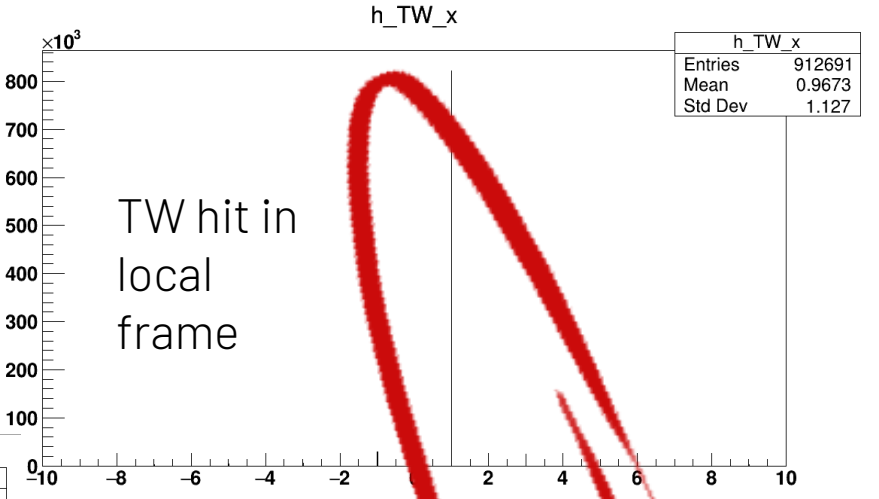
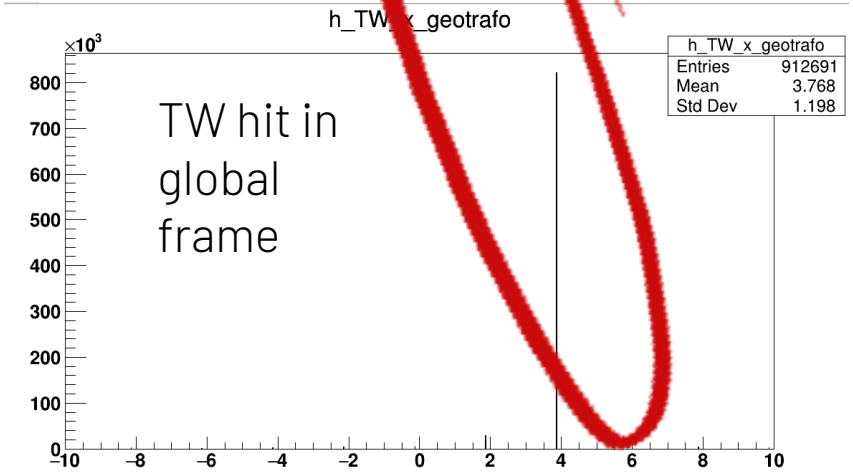
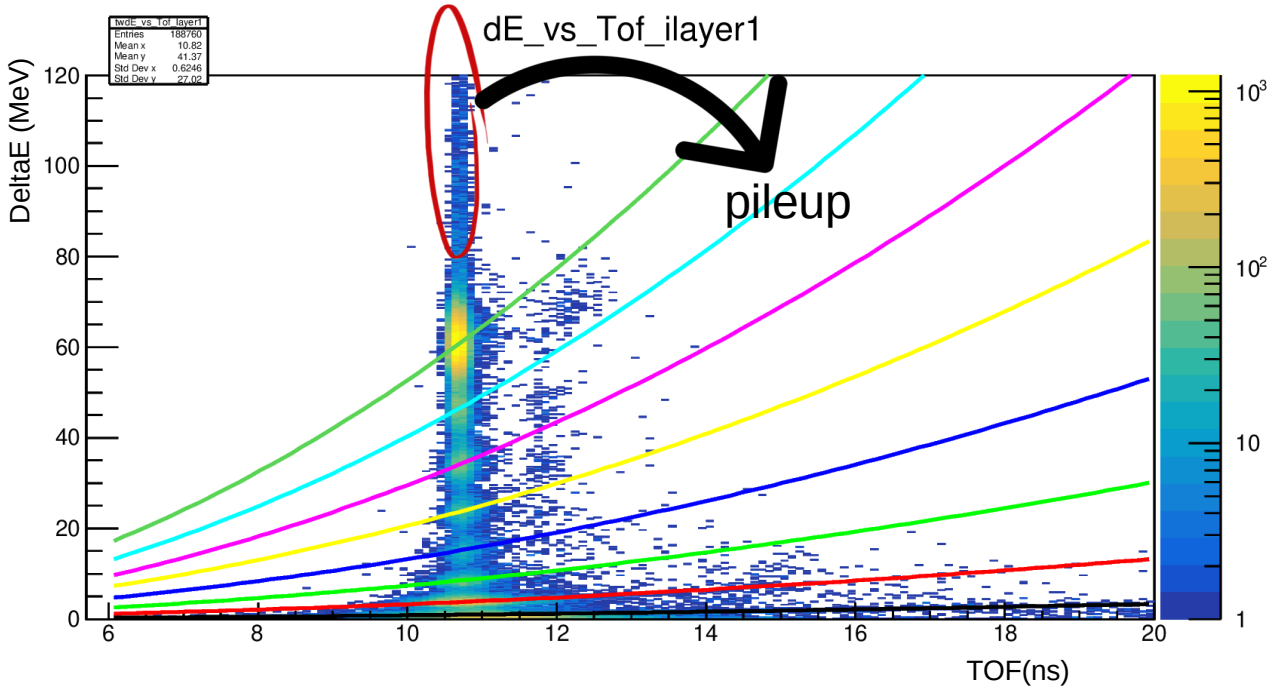




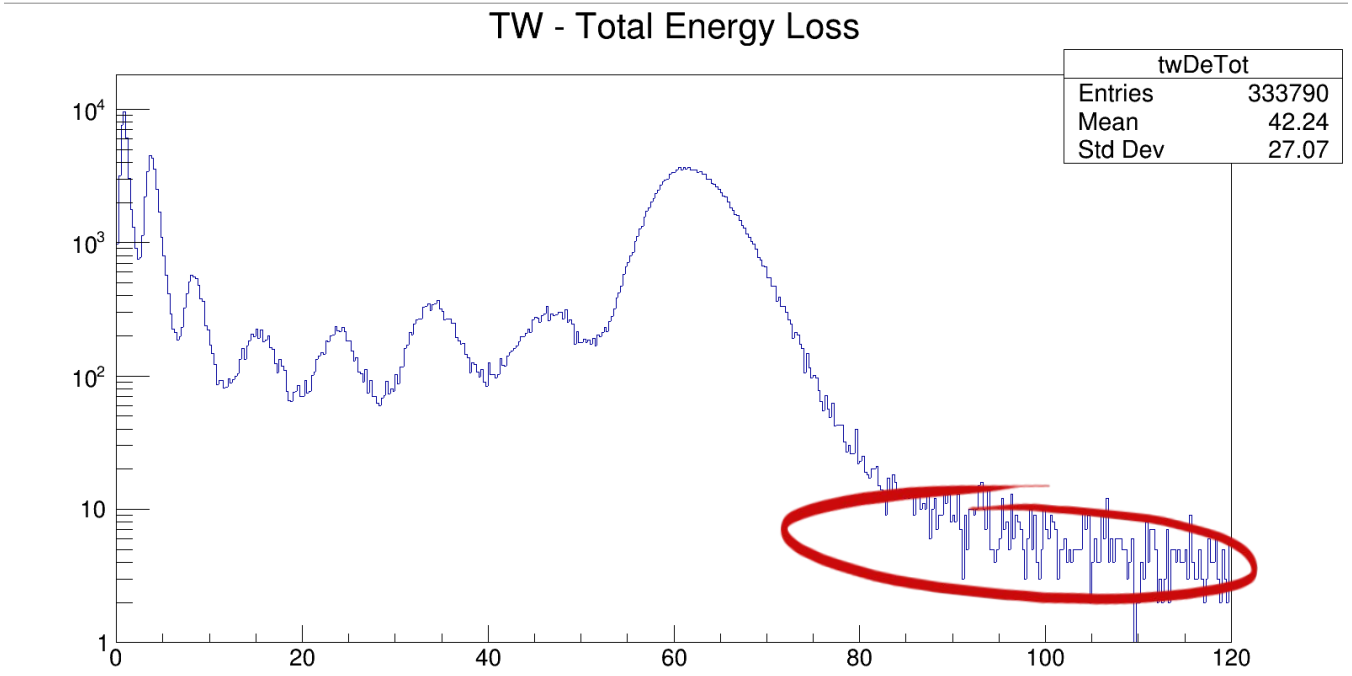


SHOE output (ZID)



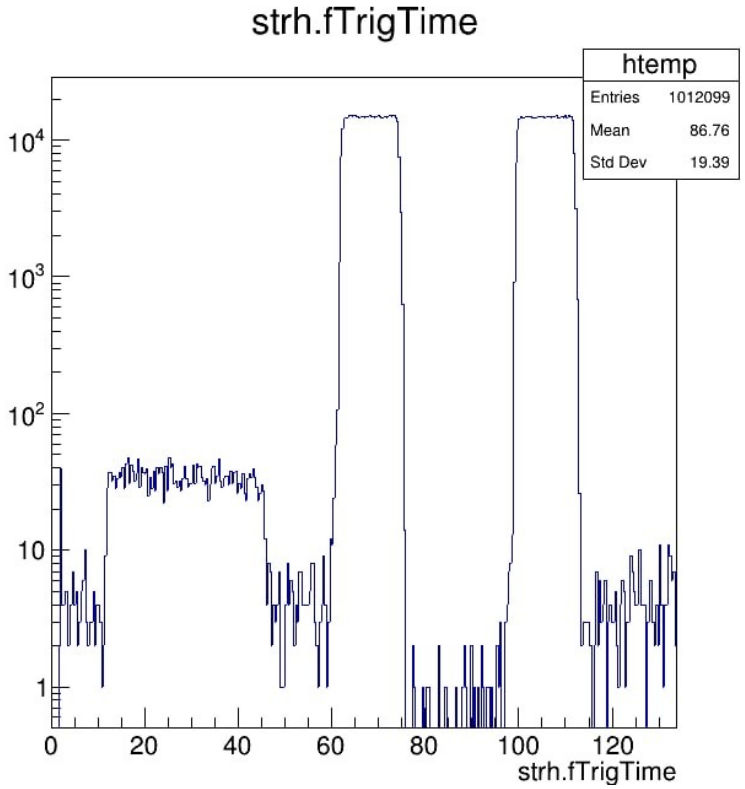
Run 4310 + BB curve implemented in SHOE for 400 MeV/u

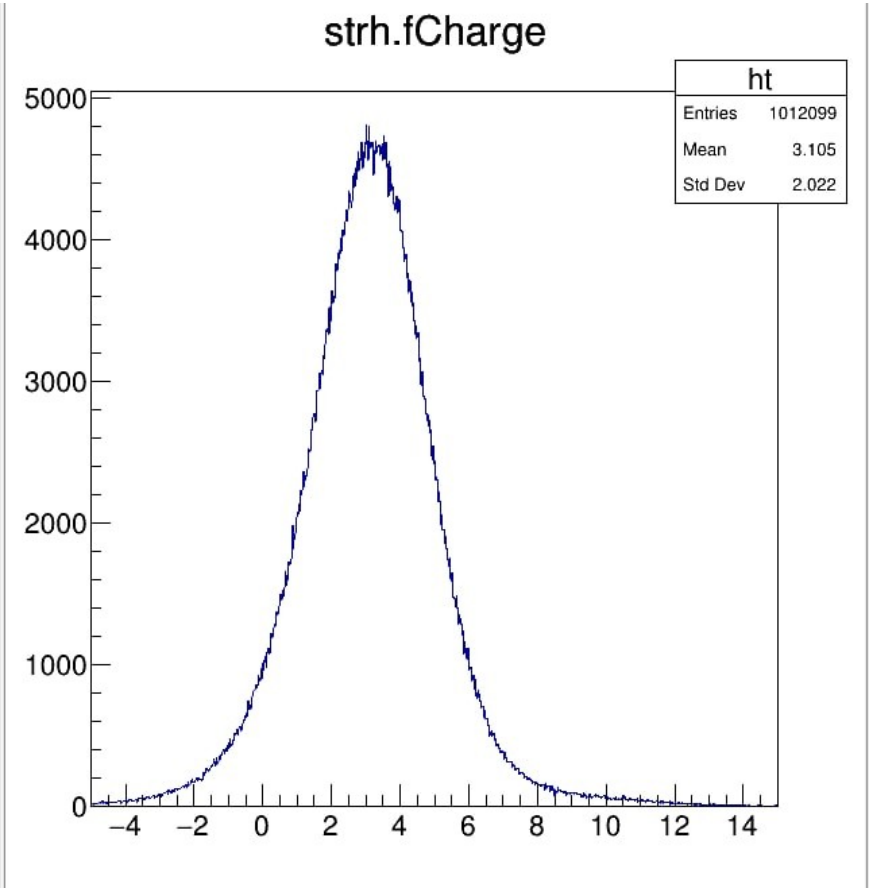
SHOE output (ZID)



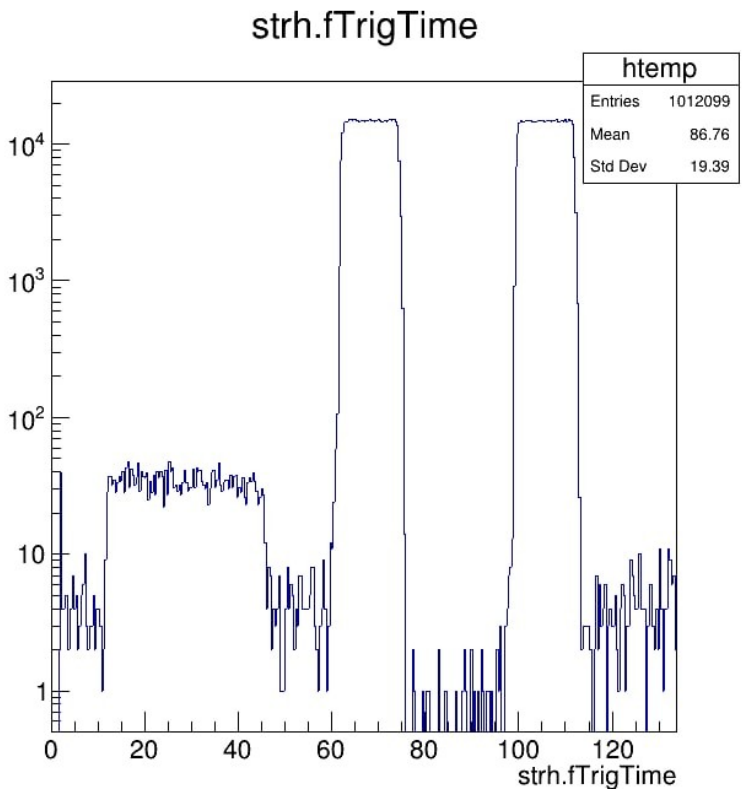
Run 4310 + BB curve implemented in SHOE for 400 MeV/u

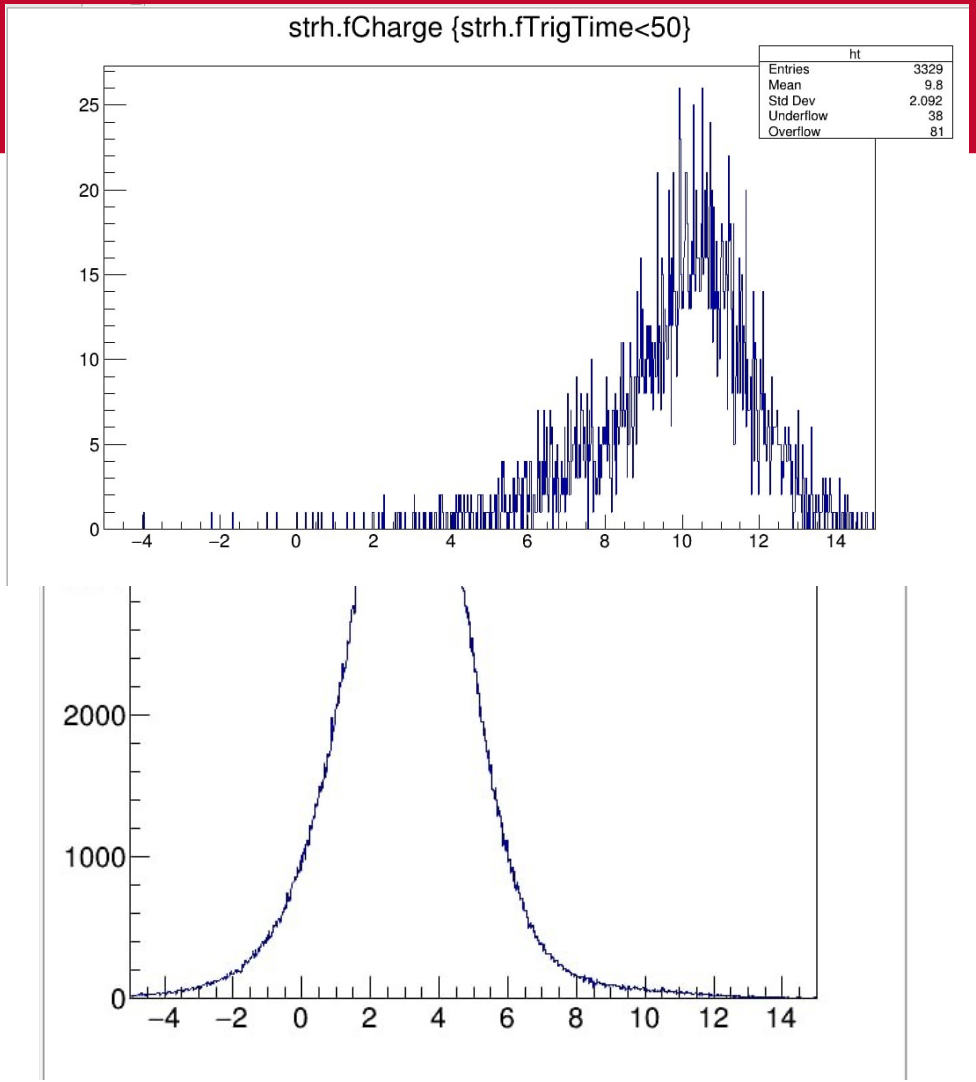
SHOE output


strh.fTrigTime
htemp
Entries 1012099
Mean 86.76
Std Dev 19.39
10^4
10^3
10^2
10
1
0 20 40 60 80 100 120
strh.fTrigTime


strh.fCharge
ht
Entries 1012099
Mean 3.105
Std Dev 2.022
5000
4000
3000
2000
1000
0
−4 −2 0 2 4 6 8 10 12 14

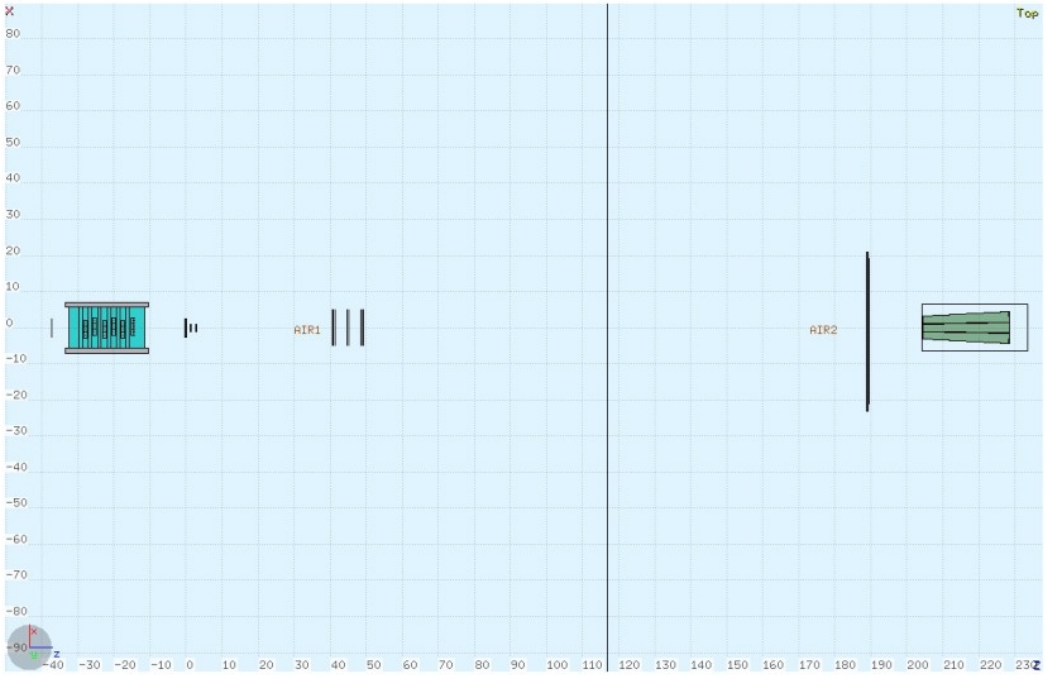
SHOE output


strh.fTrigTime
htemp
Entries 1012099
Mean 86.76
Std Dev 19.39
10^4
10^3
10^2
10
1
0 20 40 60 80 100 120
strh.fTrigTime


strh.fCharge {strh.fTrigTime<50}
ht
Entries 3329
Mean 9.8
Std Dev 2.092
Underflow 38
Overflow 81
25
20
15
10
5
0
−4 −2 0 2 4 6 8 10 12 14
2000
1000
0
−4 −2 0 2 4 6 8 10 12 14

MC analysis

Updated layout

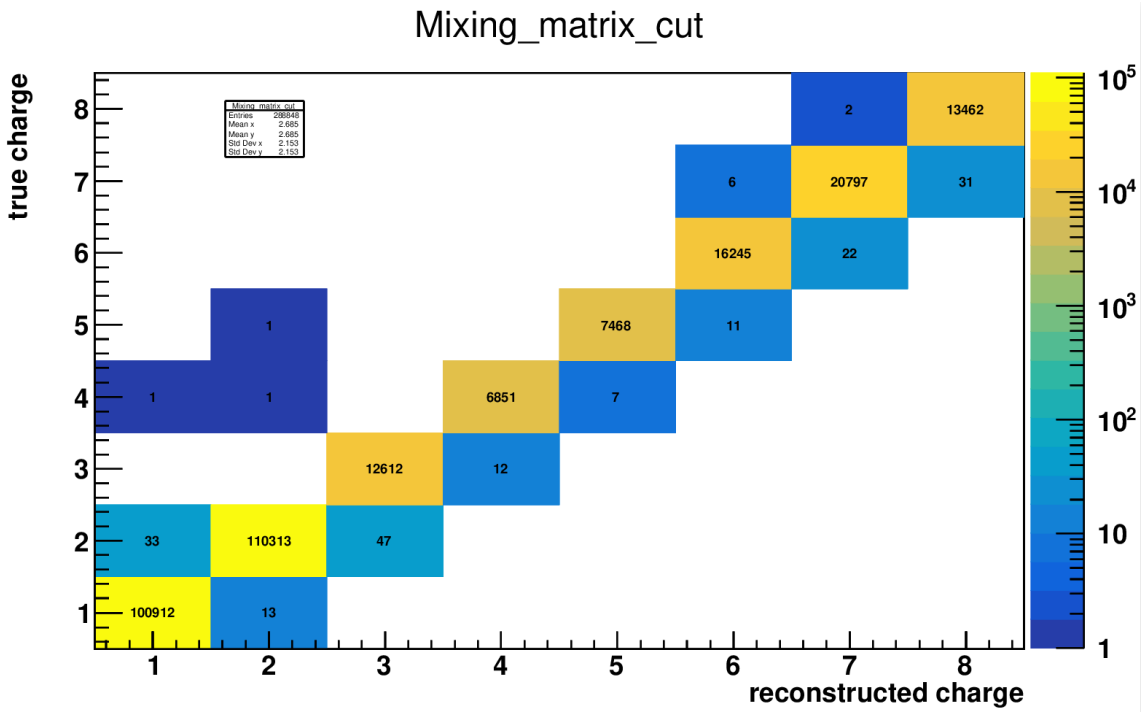


Using just the **newgeom branch**, for the moment, the geometrical layout of GSI2021_MC campaign has been updated according to the survey performed in cave A (as from the document uploaded in the Elog)

We have considered for the moment the case with all detectors centered in the XY plane (400 MeV/u runs)

Gaussian beam with σ_x = 2.3 mm
σ_y = 1.5 mm

MC analysis



Only particles with cut in Ekin, produced in target by primary beam inside TW acceptance

No unfolding up to now

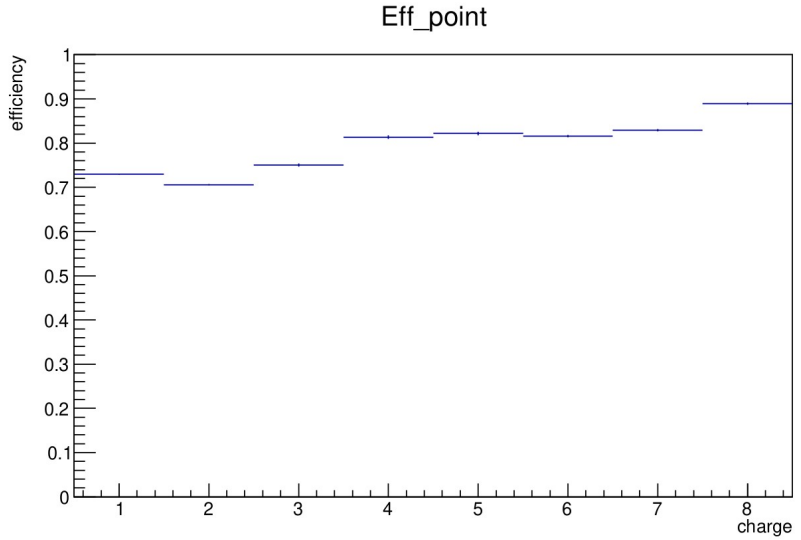
MC analysis

$$\varepsilon(Z) = \frac{N_{\mathrm{TW}}(Z) + 1}{N_{\mathrm{track}}(Z) + 2}$$

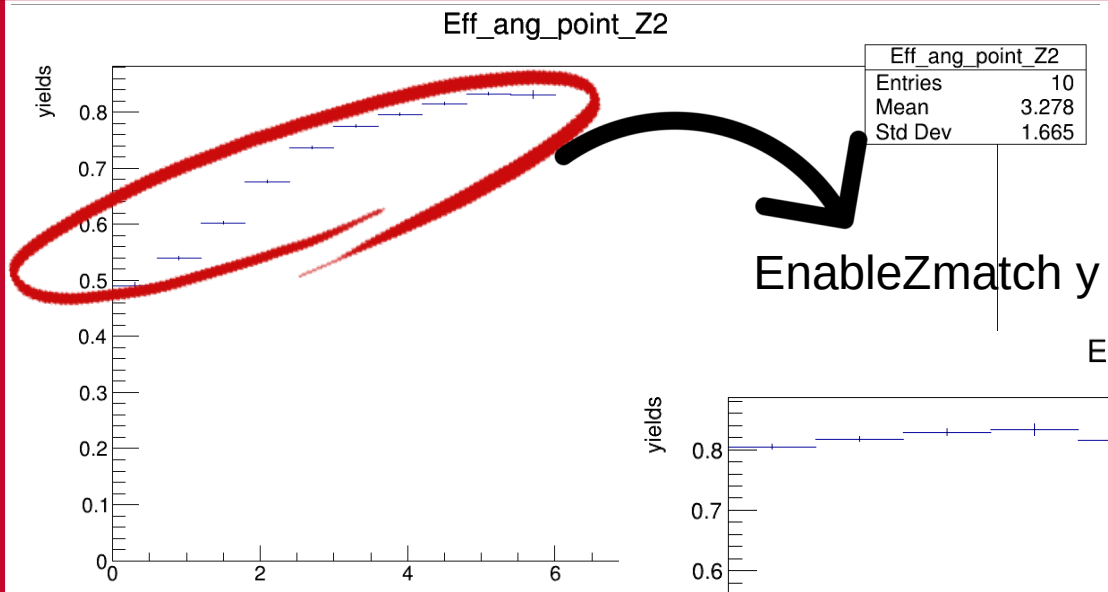
asking for a good TW point matched to a fragment produced in TG and kinetic energy between [100,600] MeV/u

asking for a fragment produced in TG within TW acceptance and kinetic energy between [100,600] MeV/u

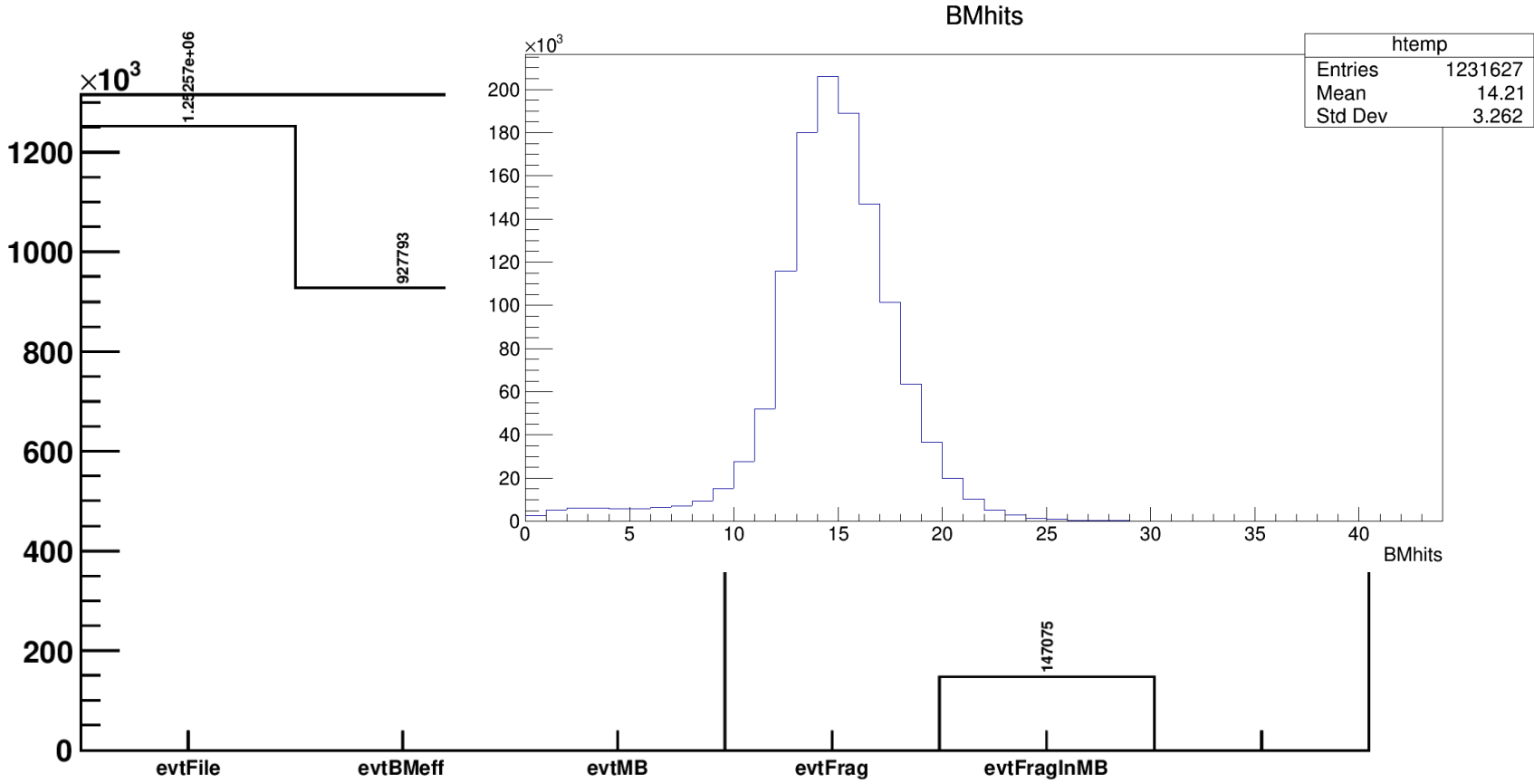
$$\epsilon_{\varepsilon}(Z) = \sqrt{\varepsilon(Z)\frac{N_{\mathrm{TW}}(Z) + 2}{N_{\mathrm{track}}(Z) + 3} - \varepsilon(Z)^2}.$$



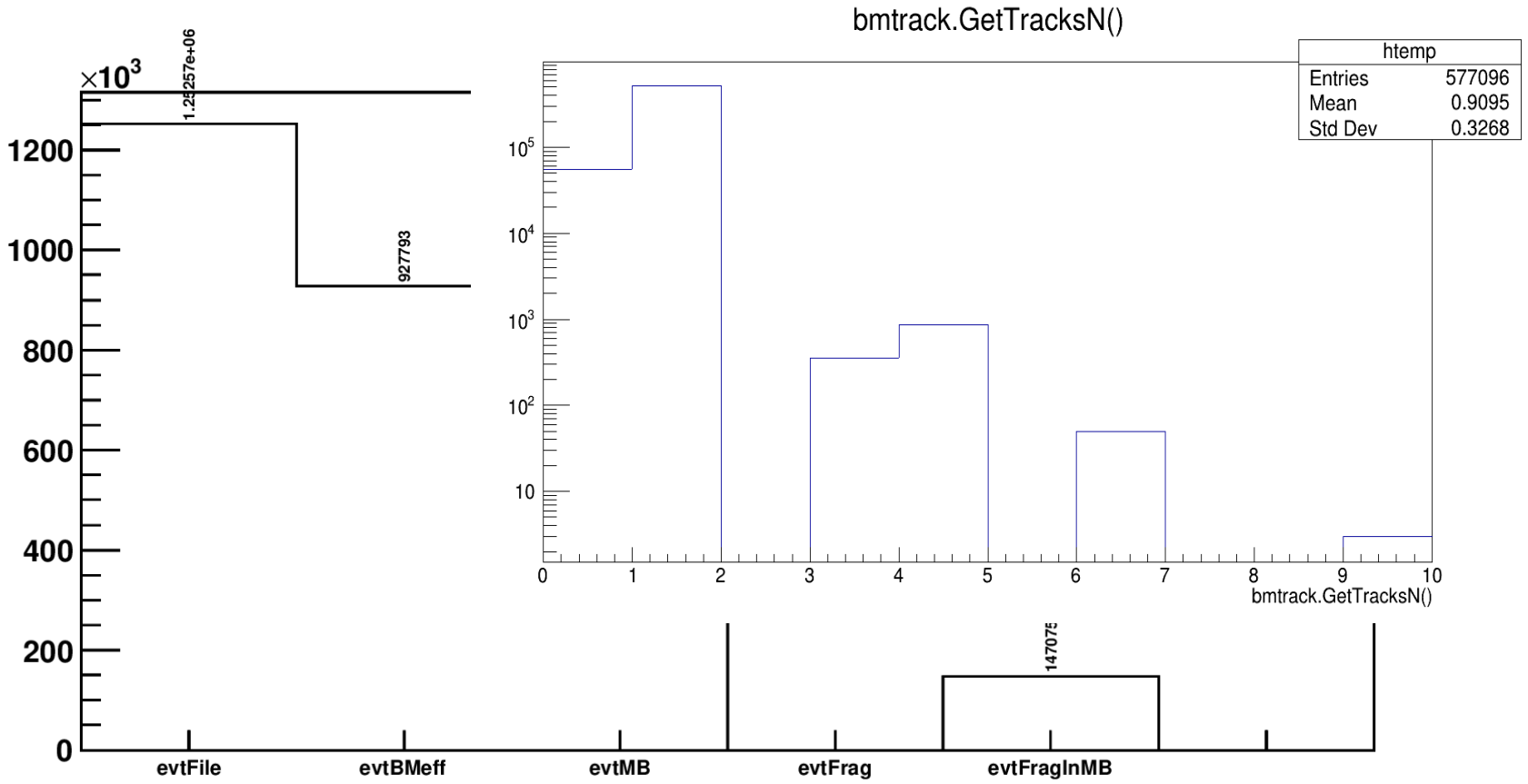
MC analysis


Eff_ang_point_Z2
yields
Eff_ang_point_Z2
Entries 10
Mean 3.278
Std Dev 1.665
EnableZmatch y
Eff_ang_point_Z6
yields
Eff_ang_point_Z6
Entries 5
Mean 1.506
Std Dev 0.8449
θ [°]

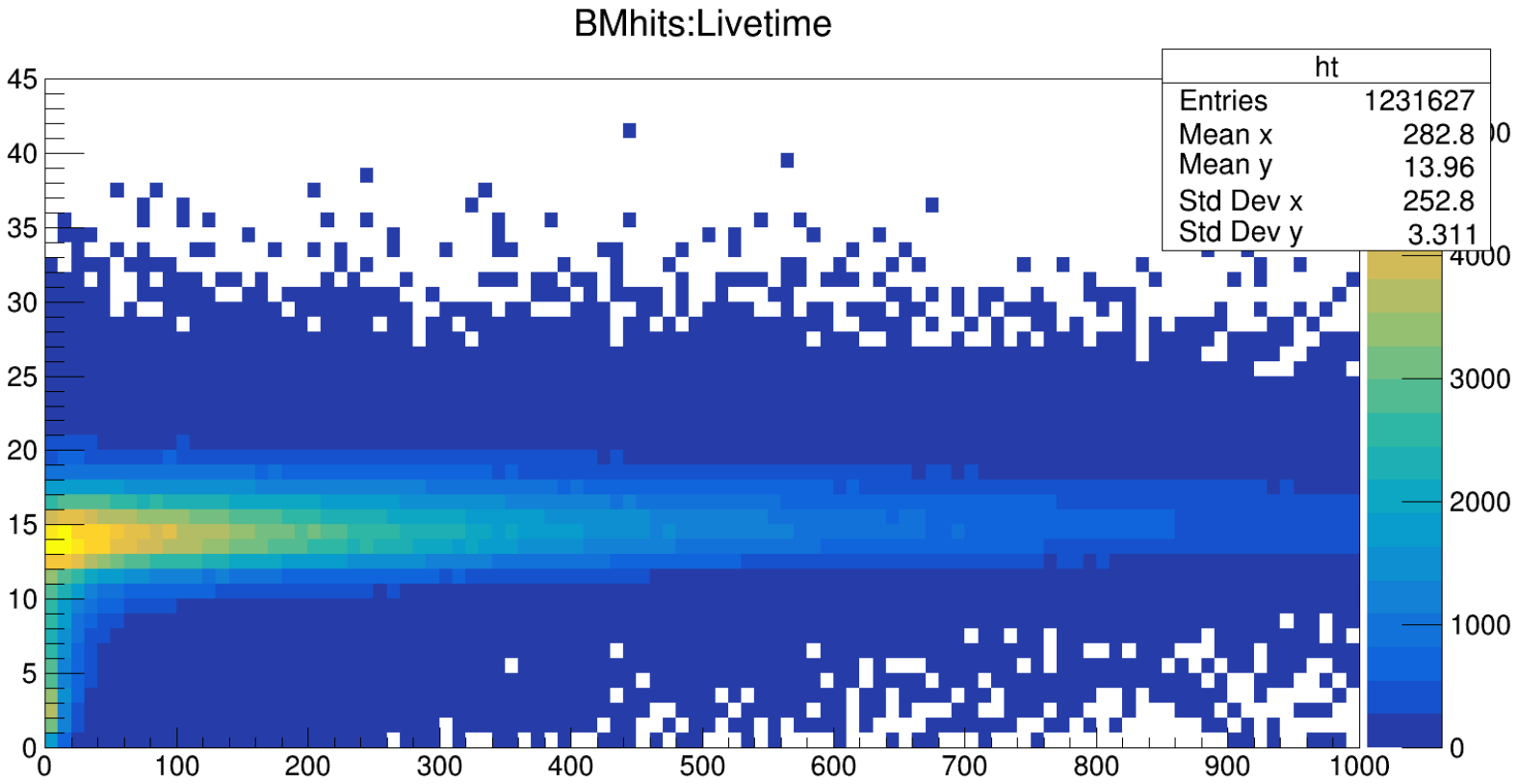
Cross section measurement MB (4305-6-7)



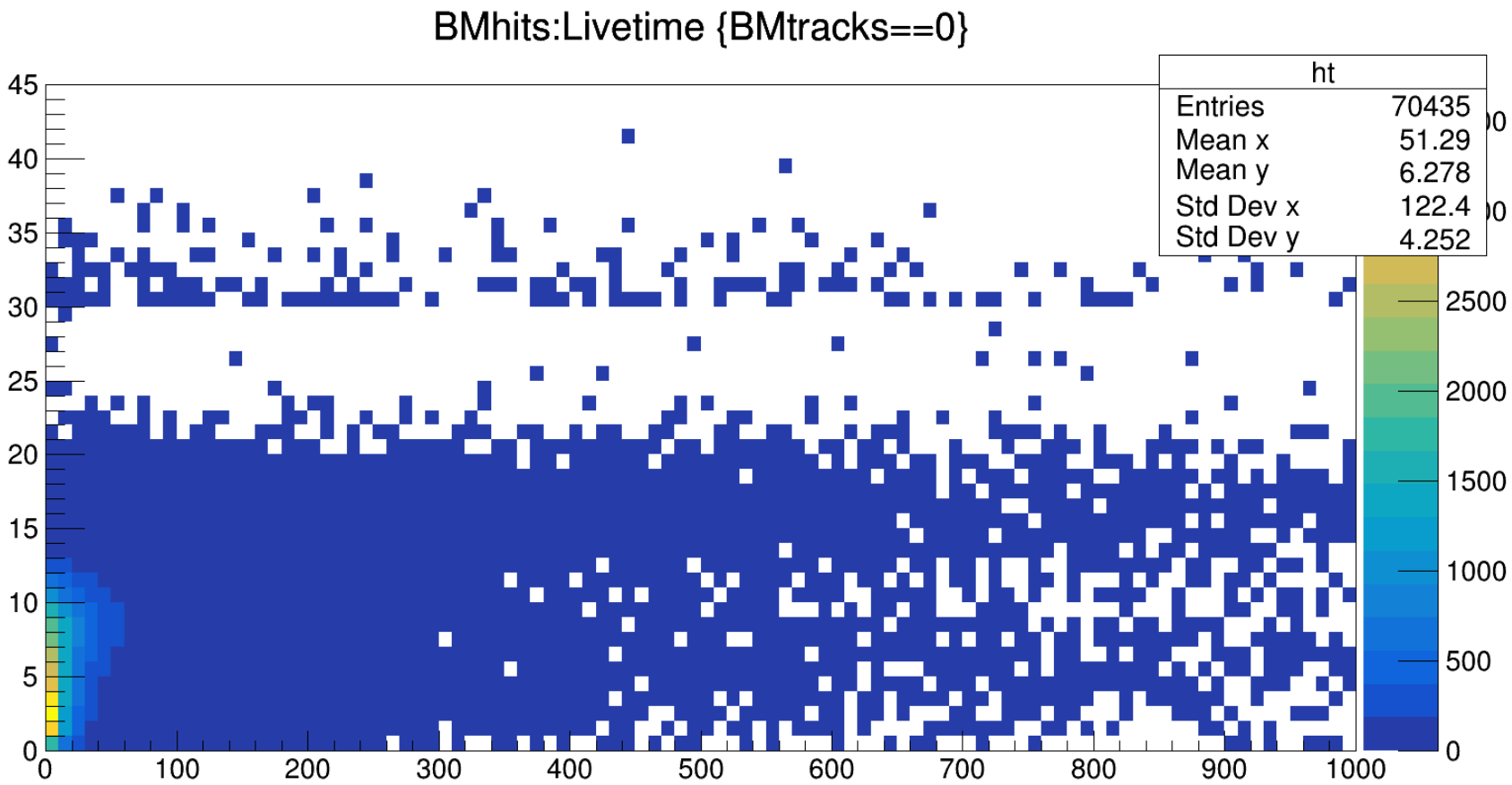
Cross section measurement MB (4305-6-7)



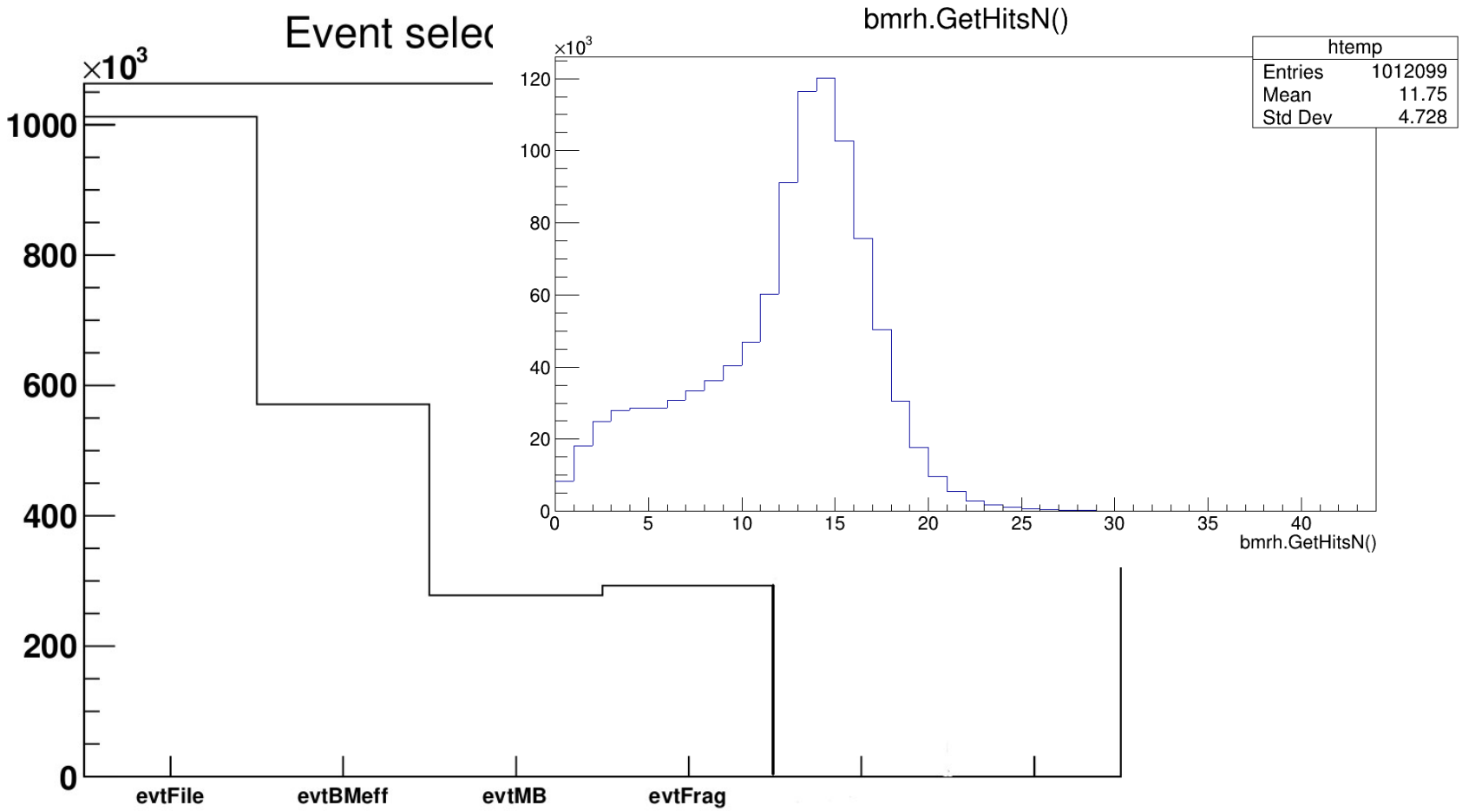
Cross section measurement MB (4305-6-7)



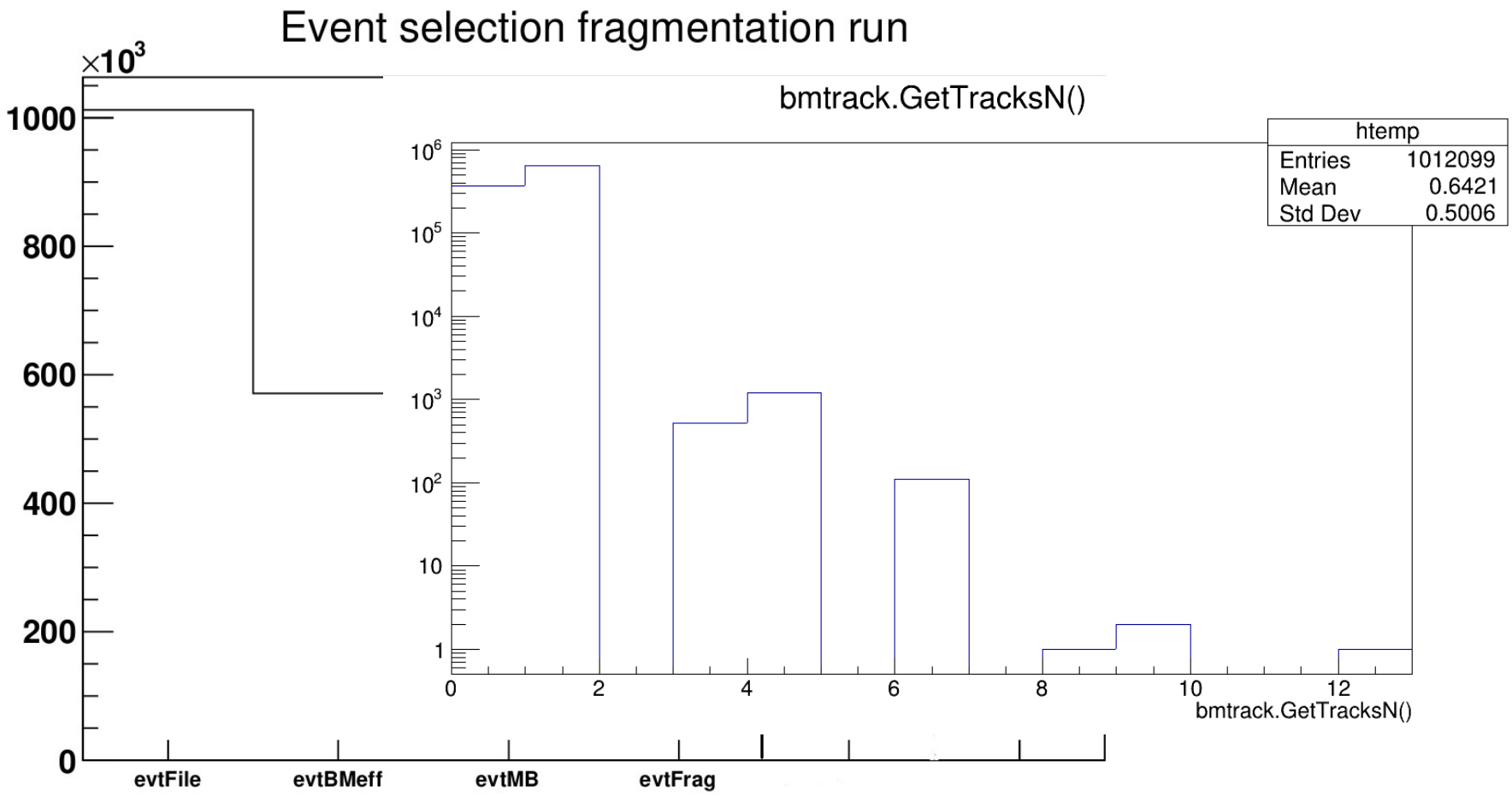
Cross section measurement MB (4305-6-7)



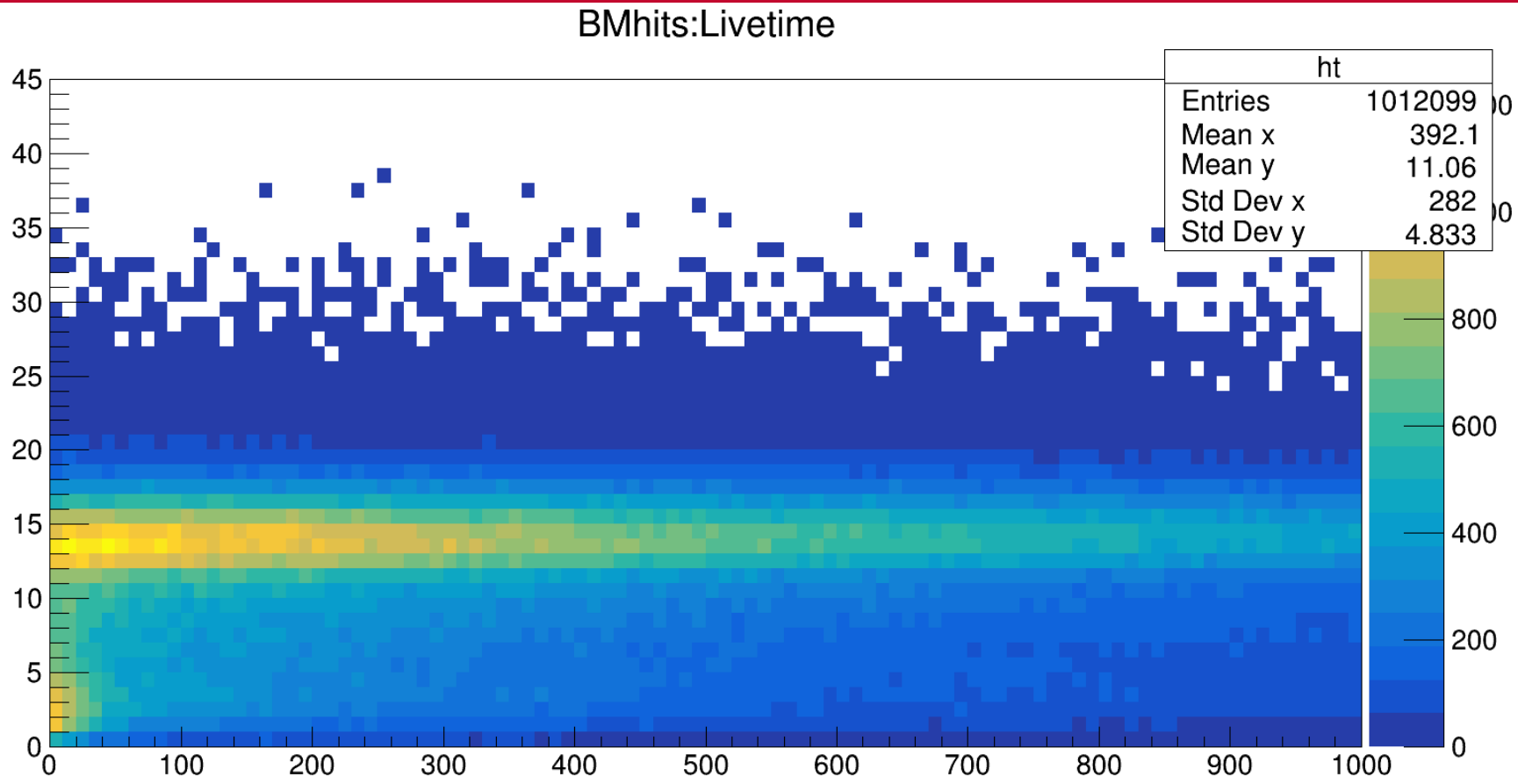
Cross section measurement frag (4310)



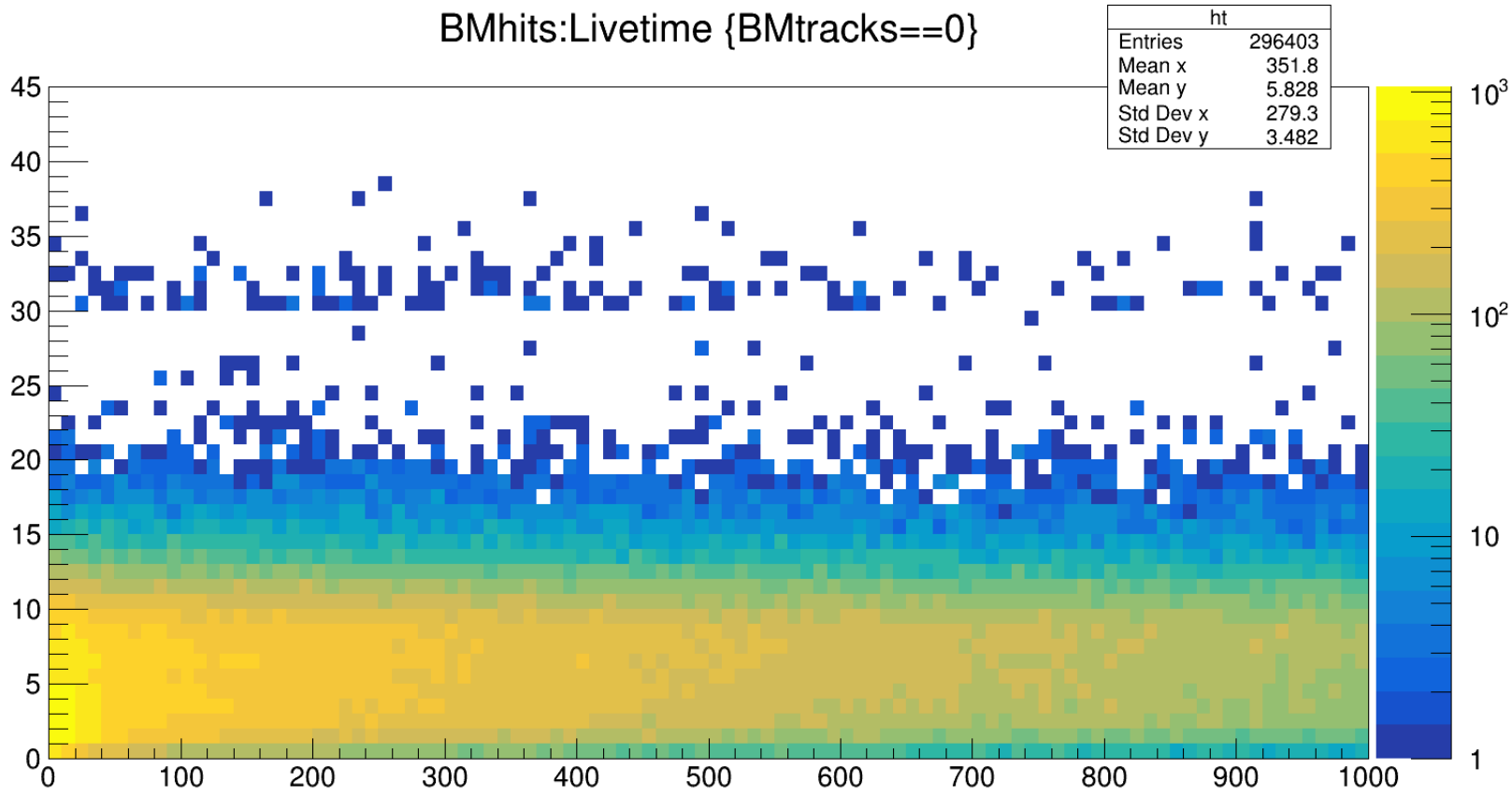
Cross section measurement frag (4310)



Cross section measurement frag (4310)



Cross section measurement frag (4310)



Conclusions

No trackers included (VTX to be synchronized, MSD?)

All other beam target configurations have to be analyzed (200 MeV/u O+C available)

TW position calibration to be implemented in SHOE

Deal with pile up in SC and TW

Disable Z match in TW clustering algorithm and look at performances (especially for lower fragments)

Systematics in Monte Carlo

Too few hits in the BM, too intense beam? Have a look to 1st night data to correlate with "real" beam rate
Examine 200MeV/u beam position

Thanks for your attention!