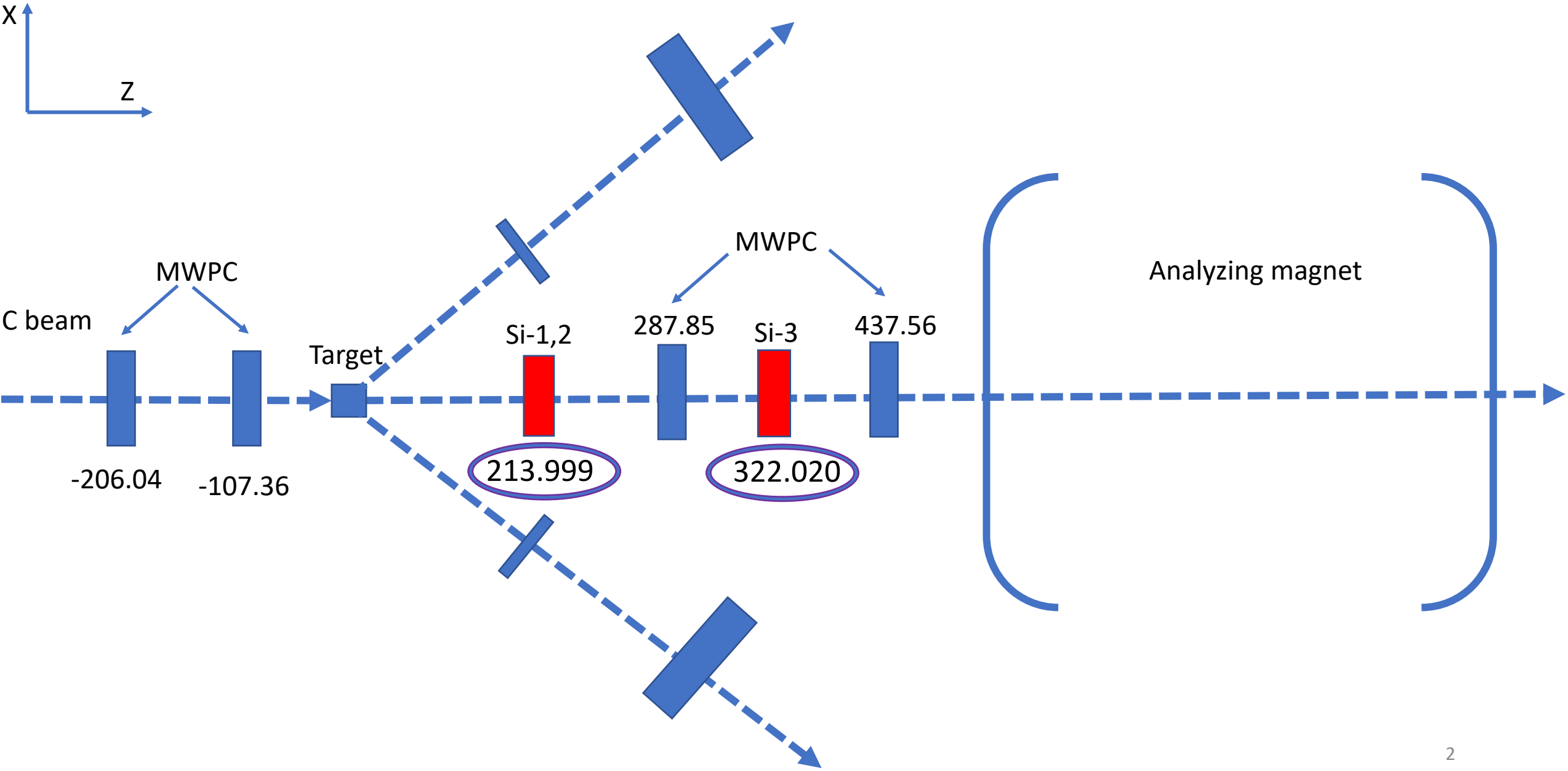
Si detectors in SRC Run

Vasilisa Lenivenko

2019/02/04

SRC Run configuration:



- **Run number** : 3431
- **Beam** : C
- **Target** : 0 mm

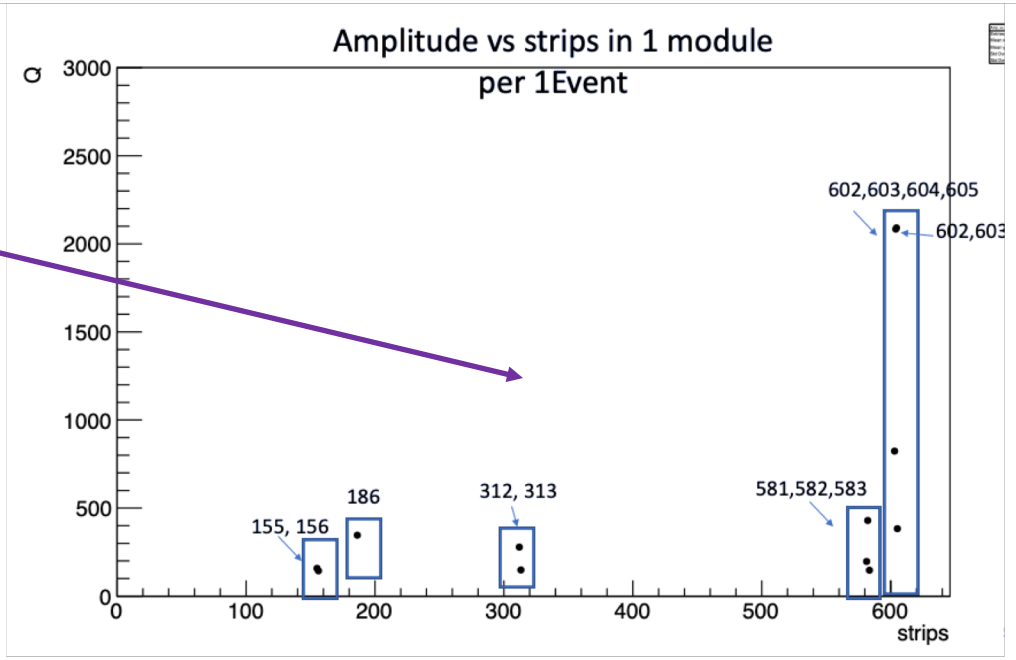
Date	Shift Leader	Type	№ Run	Trigger	DAQ Status	SP-41, A	SP-57, A	VKM2, A	Beam	Energy, GeV	Target	Comment
2018-03-16 10:35:56	Dryablov	New Run	3431 per.7	SRC BT (Beam Trigger) = BC1 & BC2	All	100			C	3.17	(0 mm)	Beam duration: 2.5 sec. Flux: 4*10^5, 5.6 mv, 100 K events. BT: BC1&BC2&!VC, Empty Air

Cluster: neighbor strips with signal

Cluster coordinate:

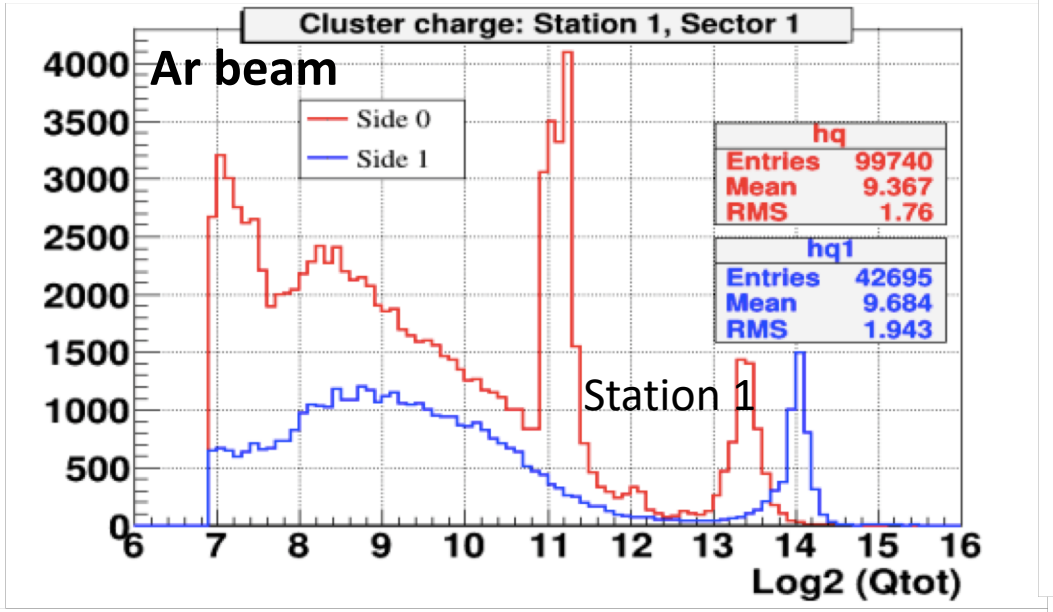
Center-of-gravity $CoG = \frac{\sum^N A_i * i}{\sum^N A_i}$

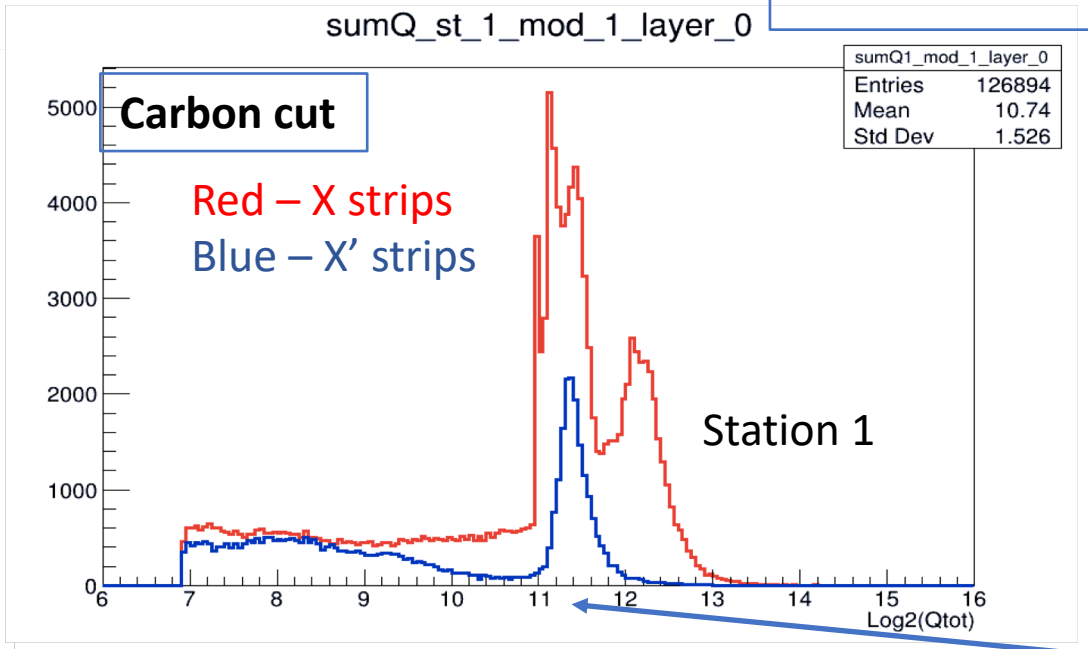
Use clusters at least 1 strip overflow for alignment



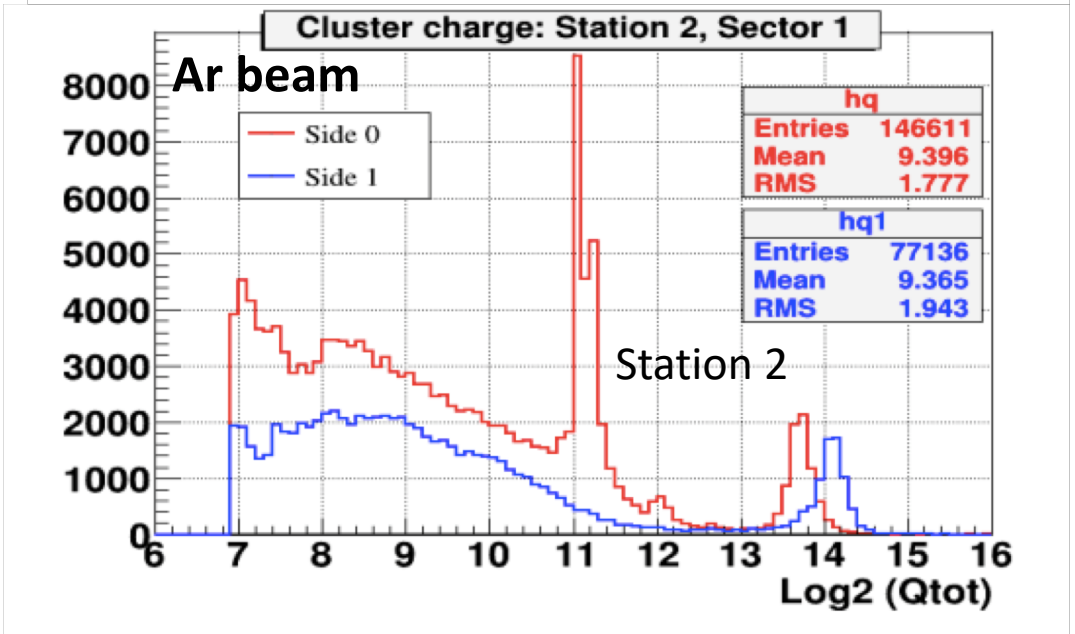
Cluster charge distribution

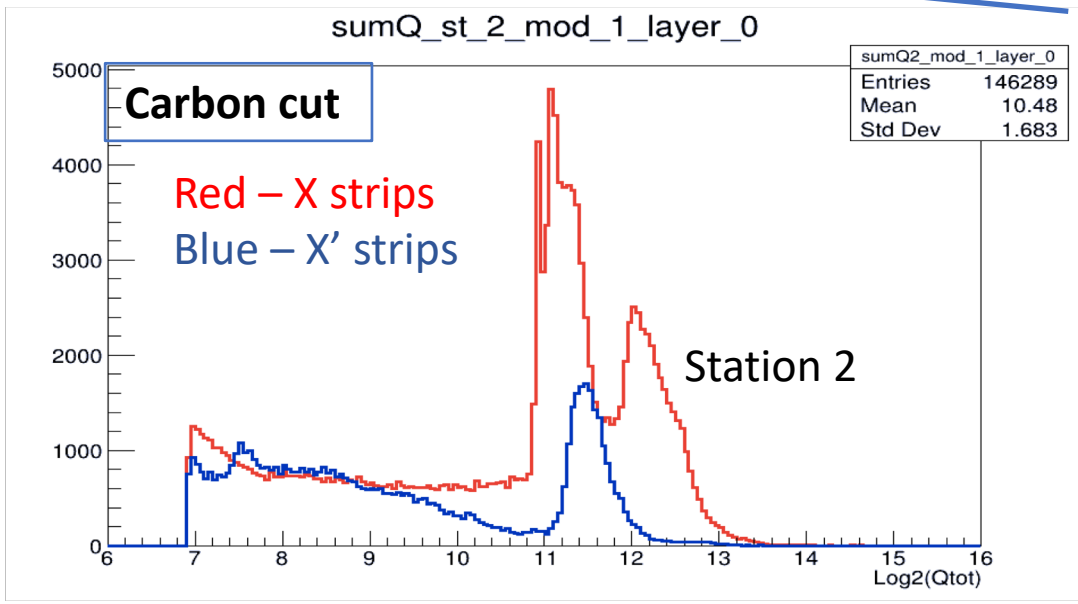
$$Qtot = \sum Ampl_i$$





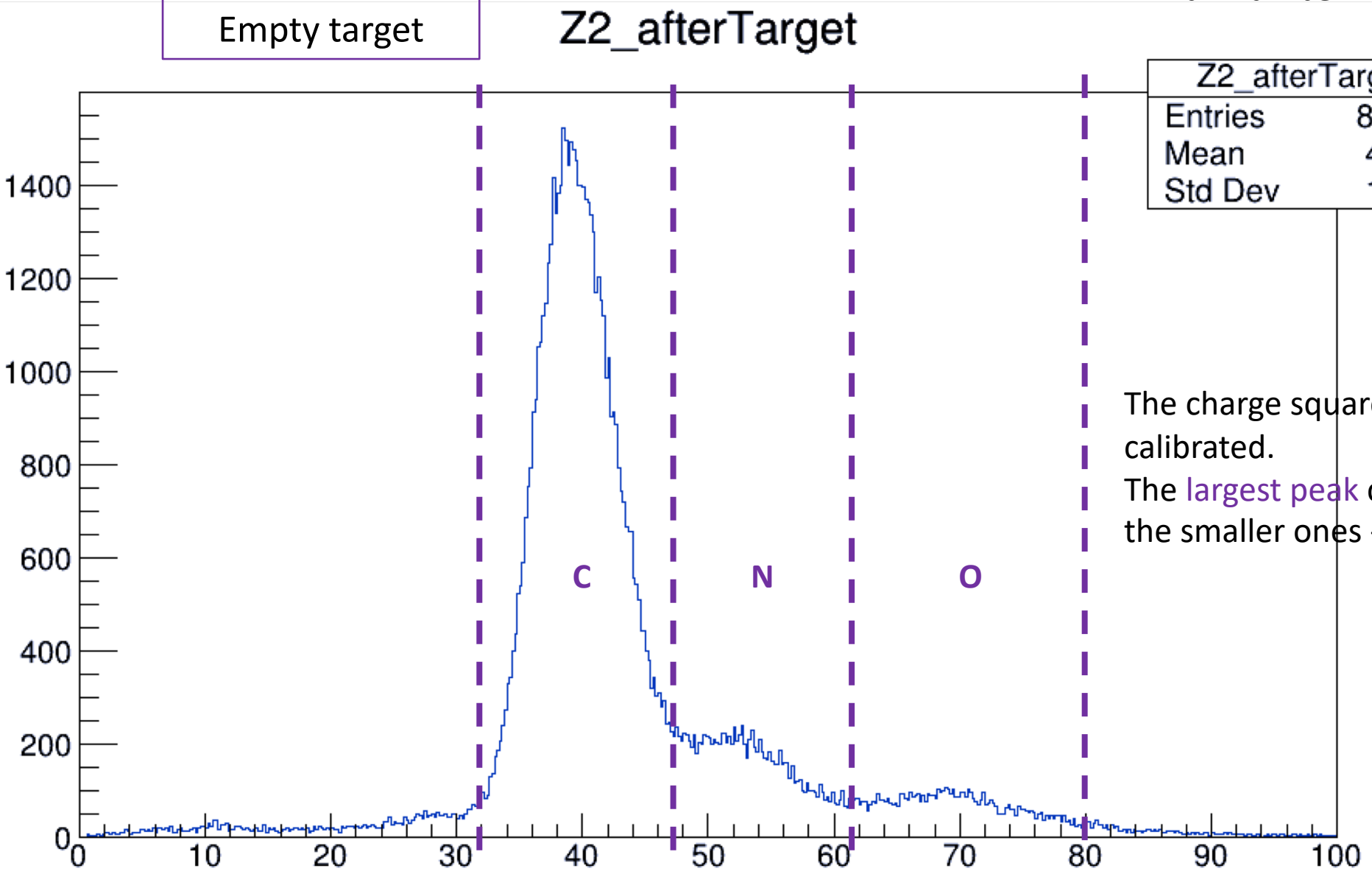
$2^{11} = 2048 =$ 1strip overflow





Run number : 3431

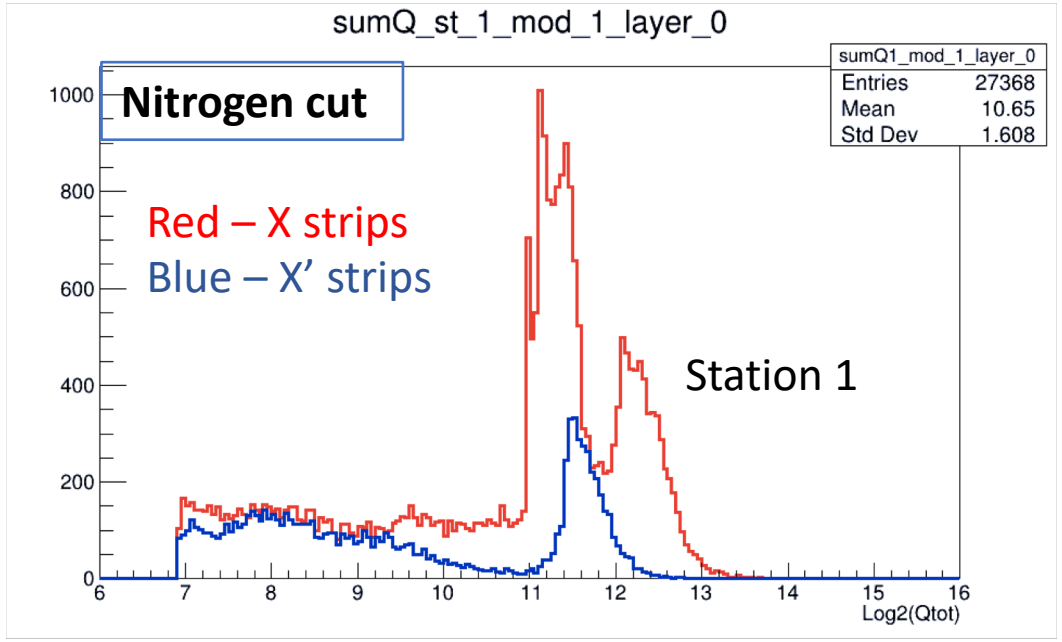
Empty target

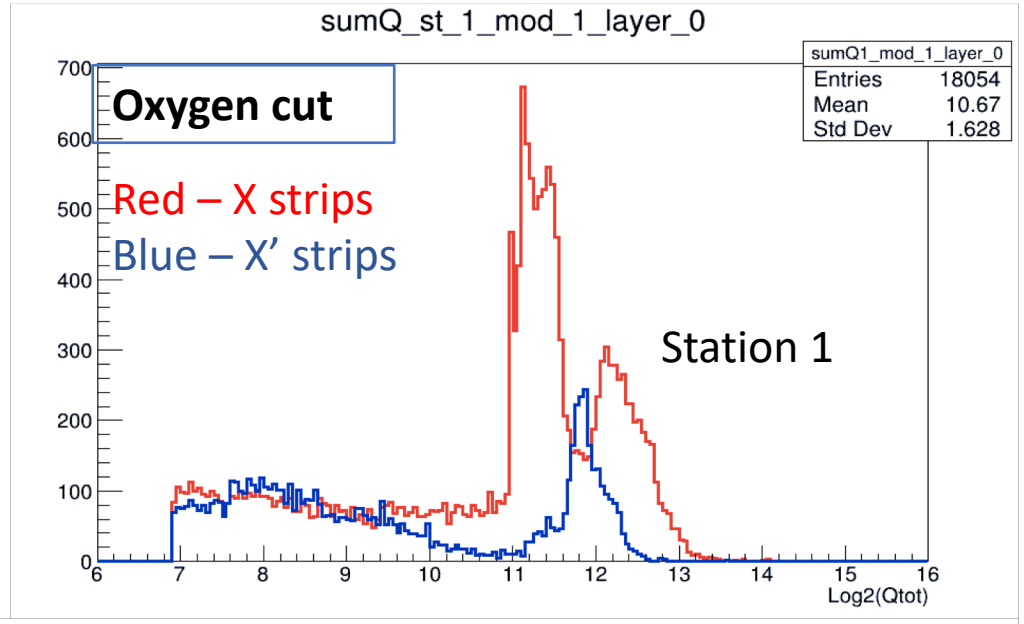


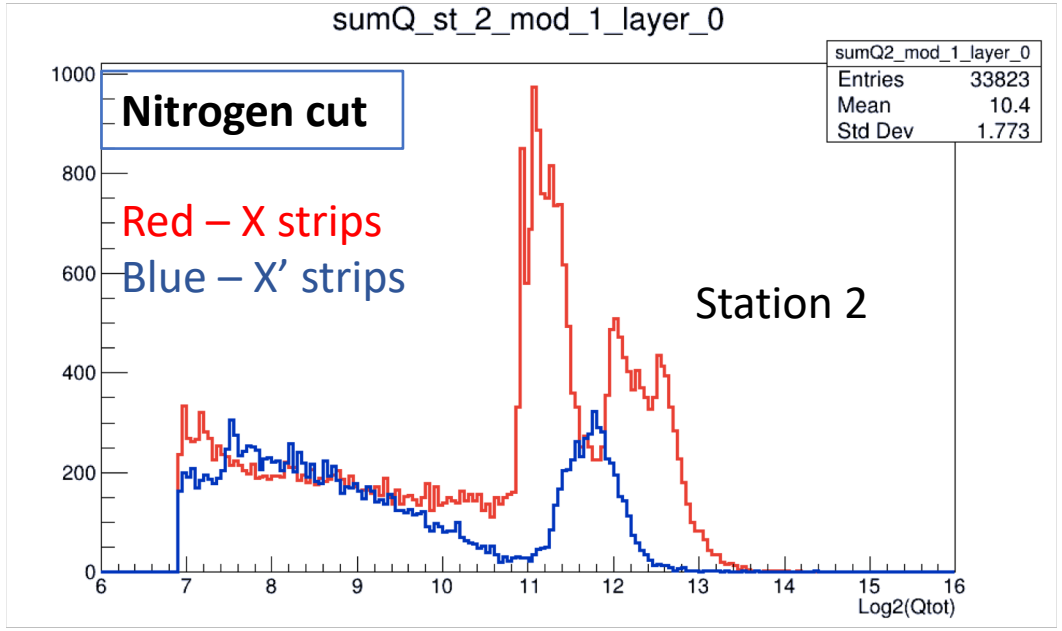
The charge squared shown on X axis is not calibrated.

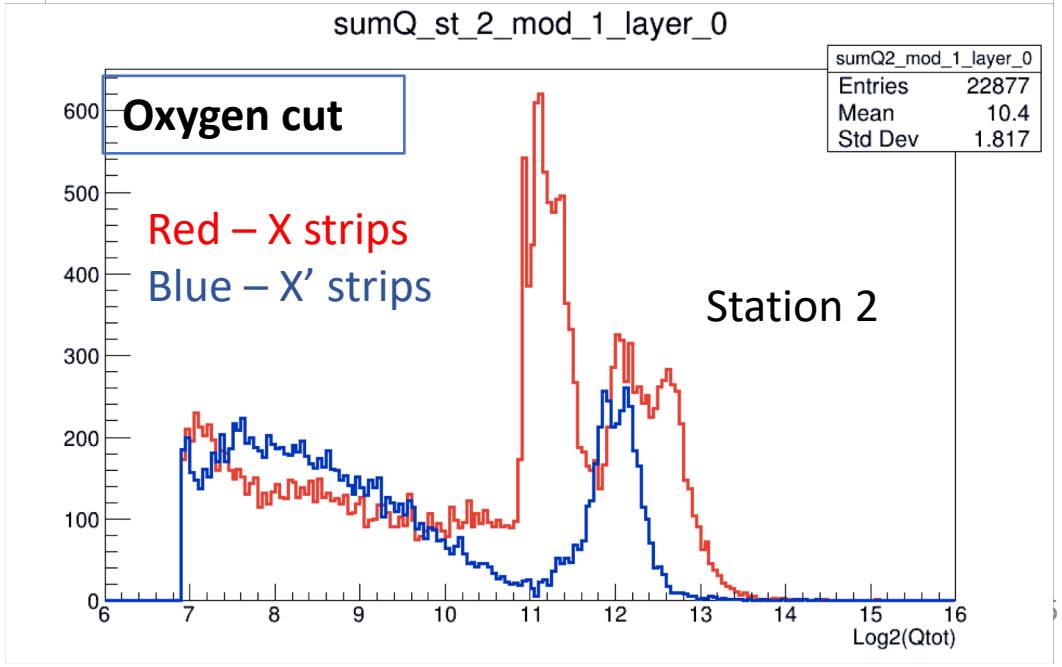
The largest peak corresponds to C, the smaller ones - N and O

Cluster charge distribution



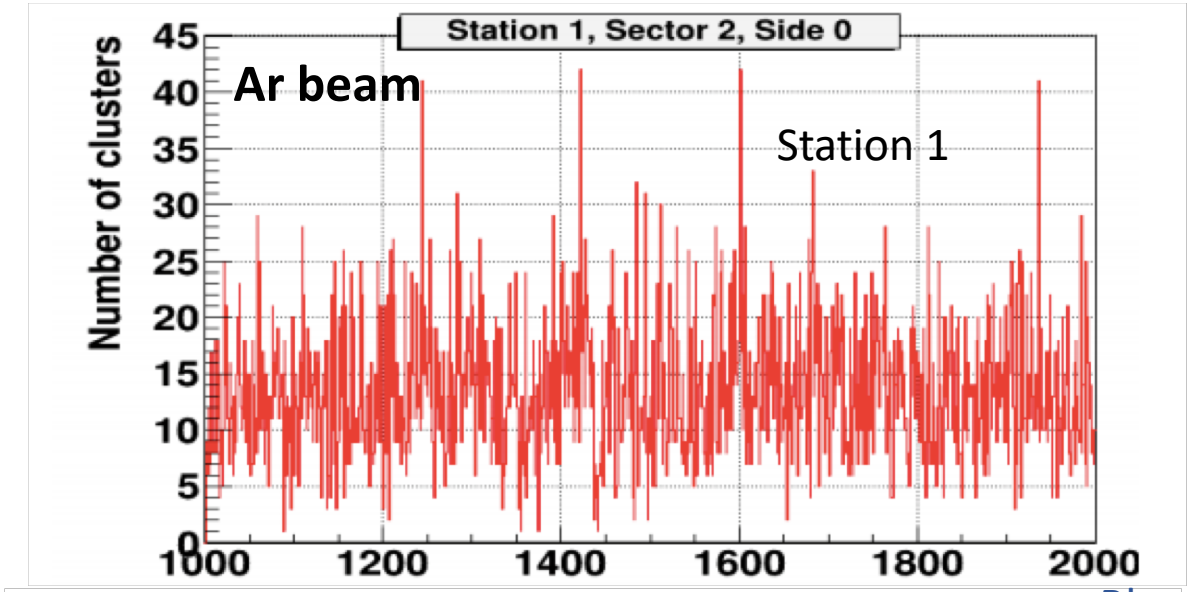


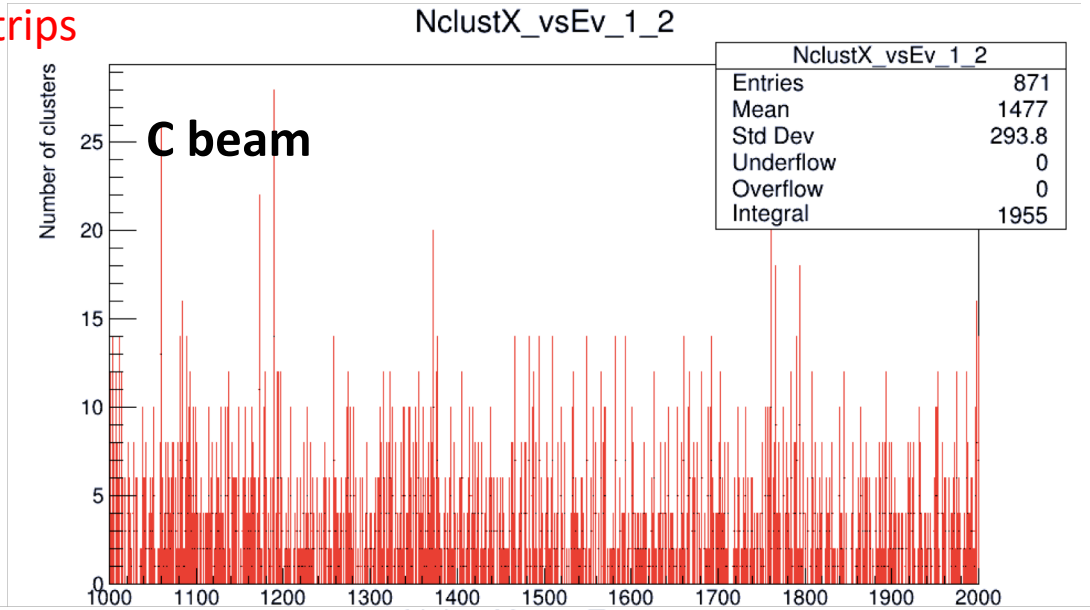




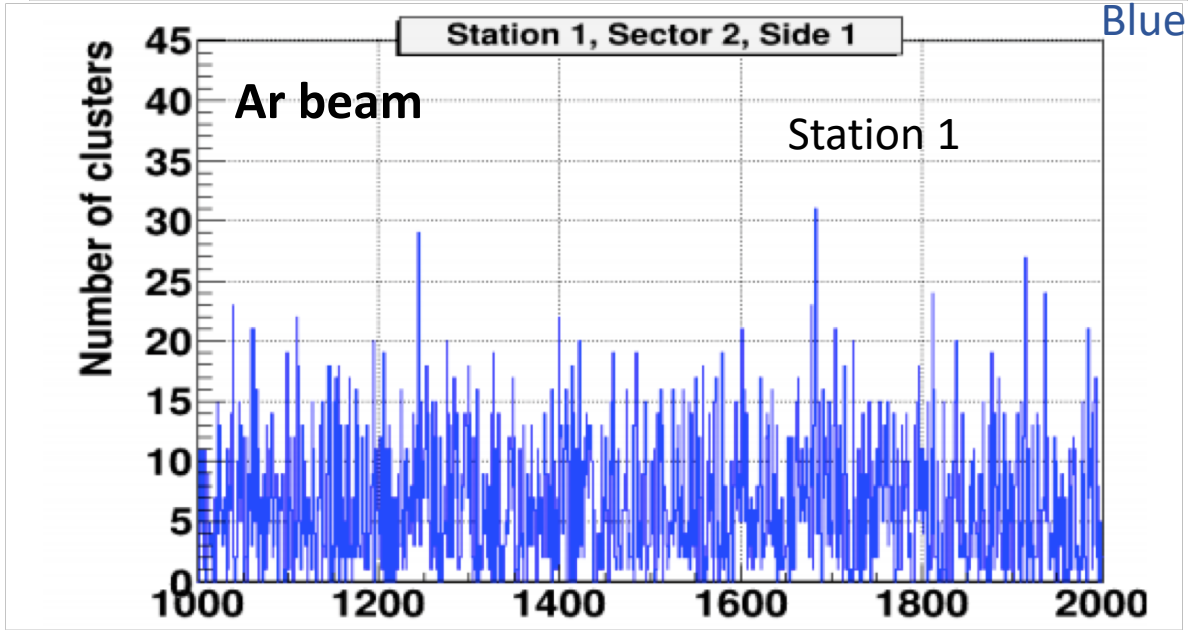
Numbers of clusters vs event number

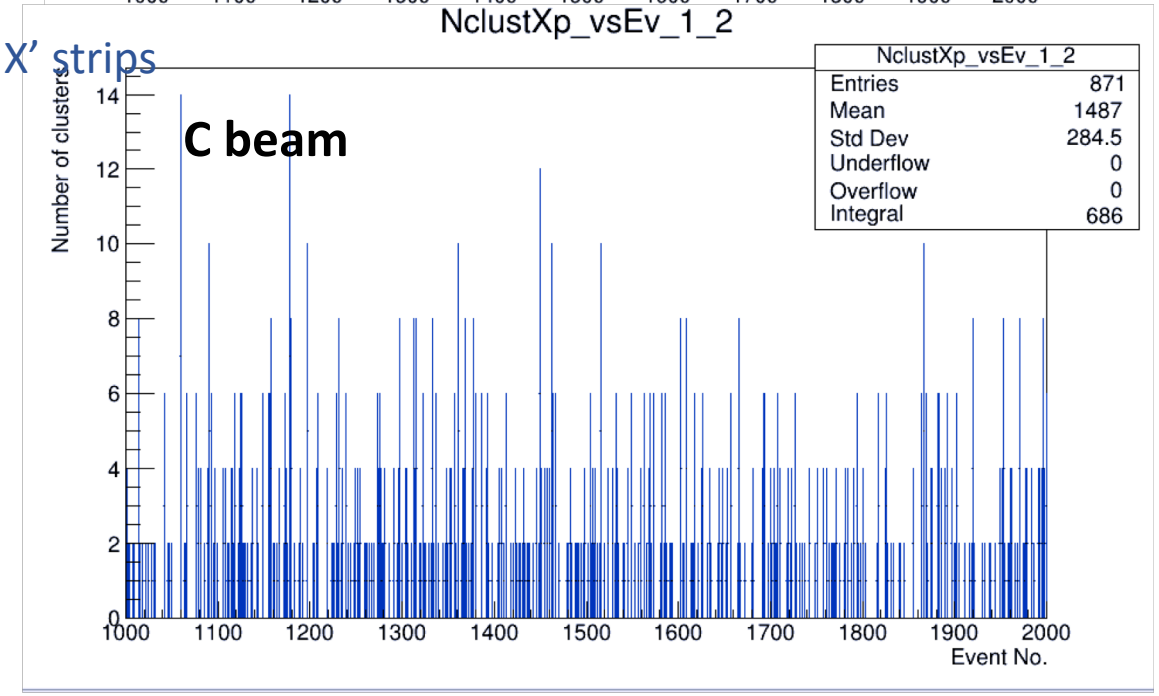
Red – X strips





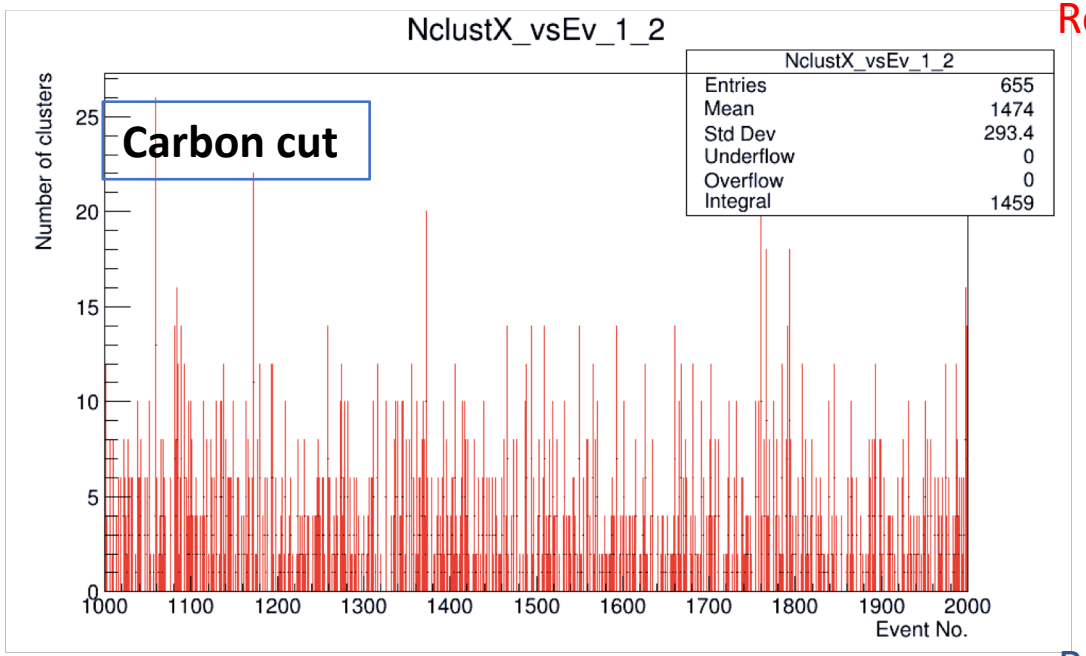
Blue – X’ strips

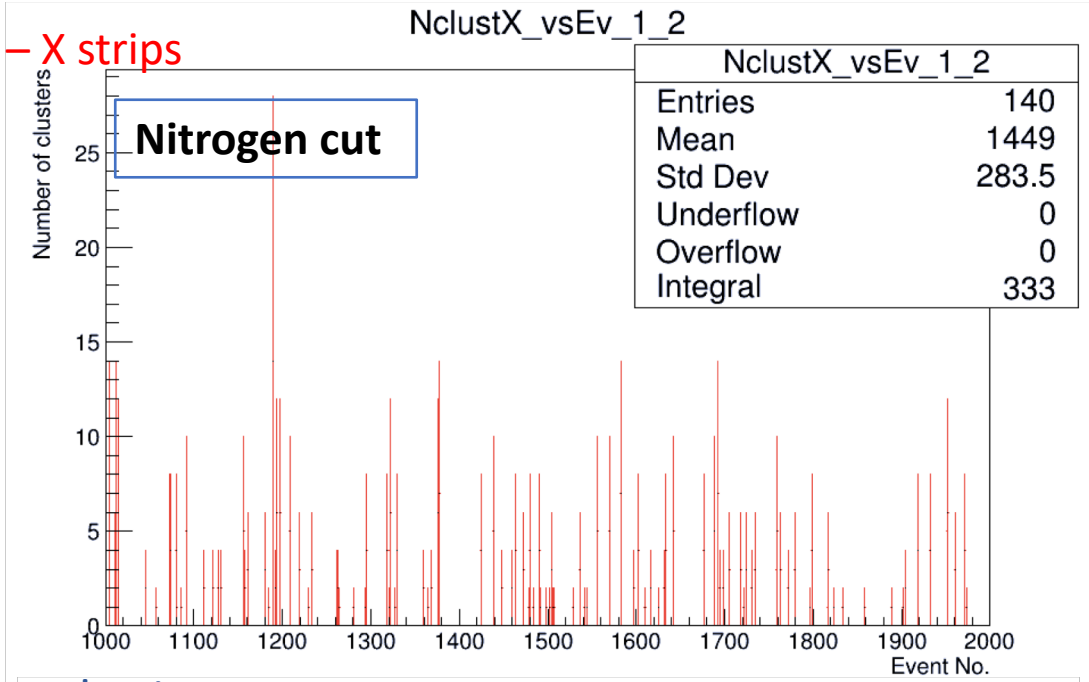




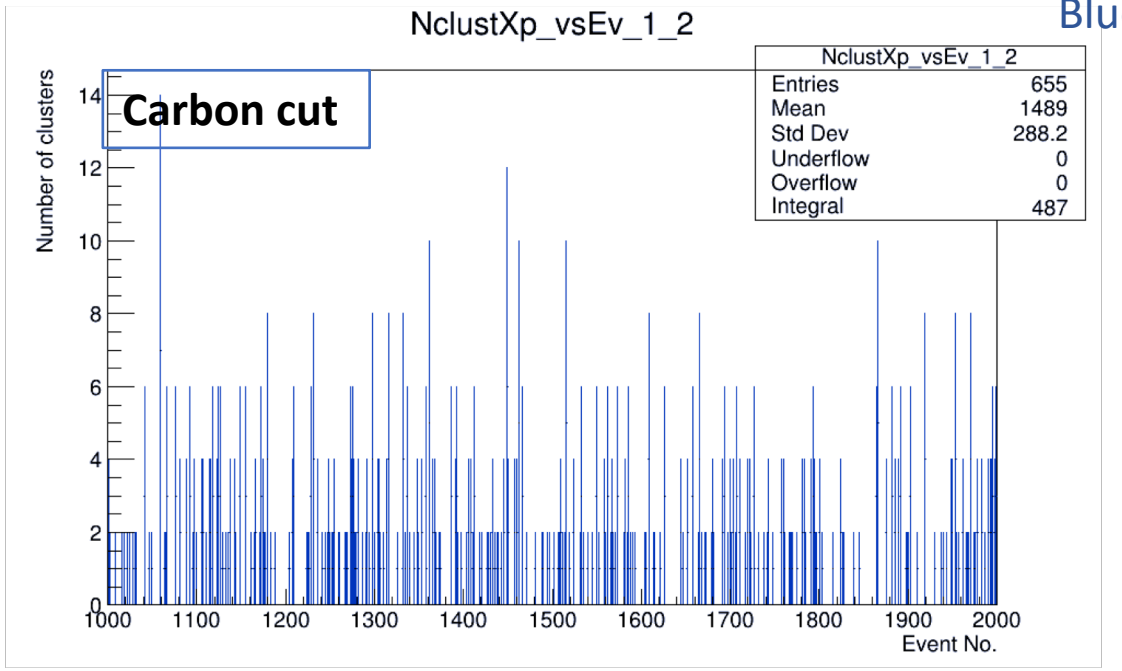
Numbers of clusters vs event number

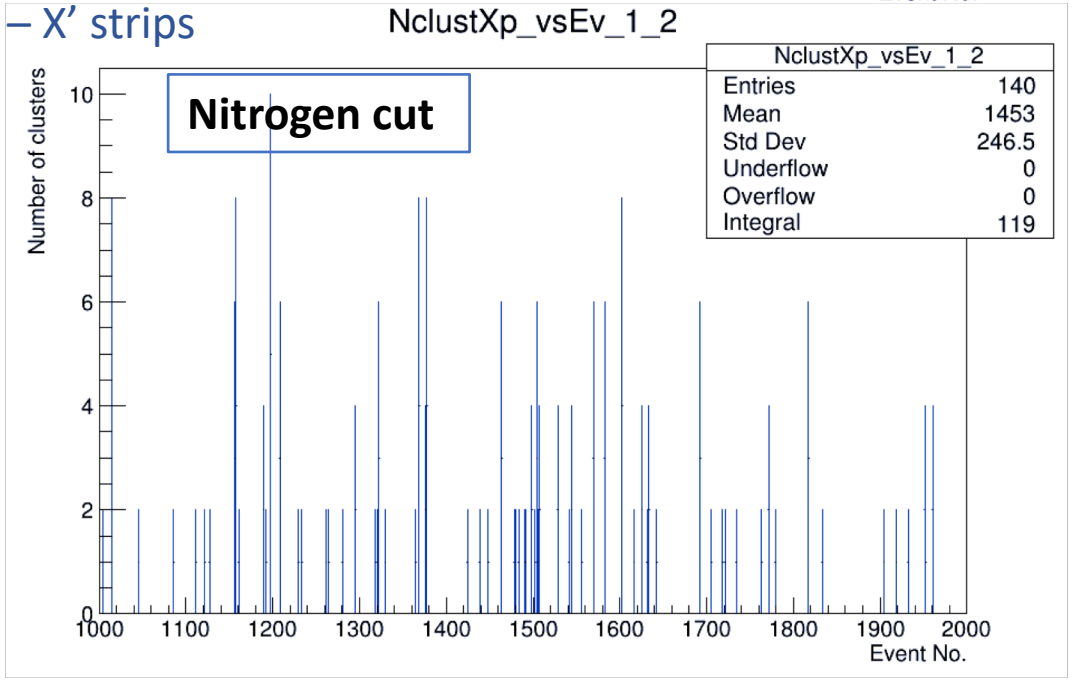
Red – X strips





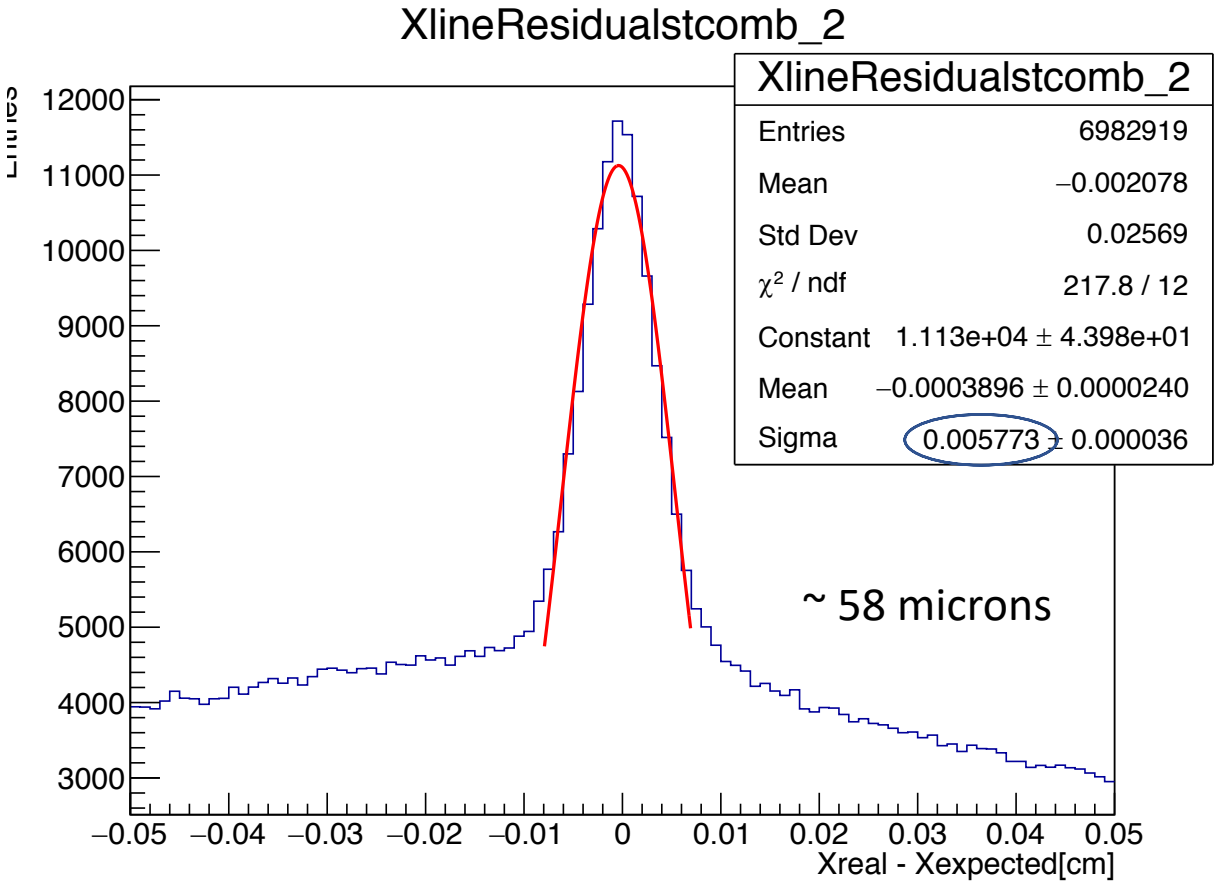
Blue – X' strips

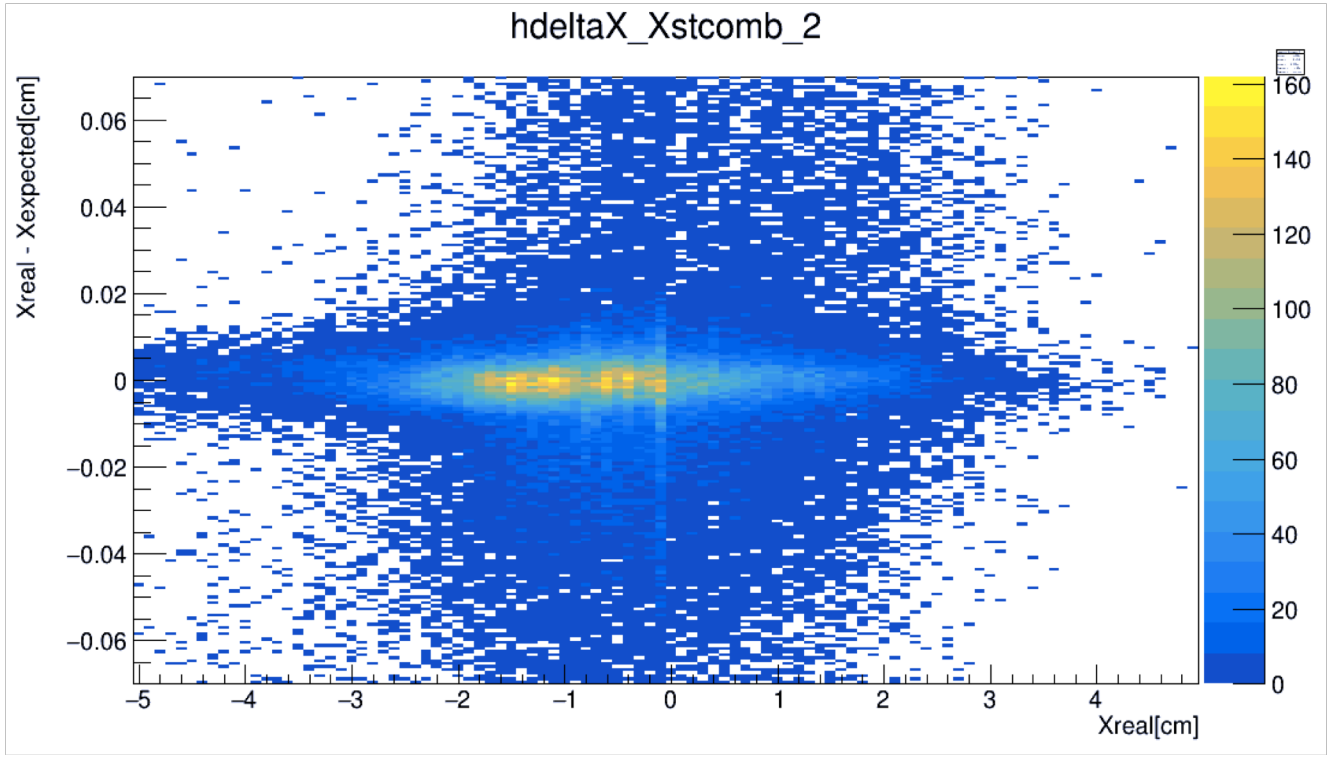




Status

- Alignment X&Z coordinates





The expected resolution ~ 50 microns

Next steps

✓Alignment of X coordinates

- Alignment of Y coordinates

? Alignment of Z coordinates

- Track through X and X’

  1. X-track

✓2. X-track + find X’-hits around X (min 3X + 1X’)

  3. minimum point 2(3) spatial + X/X’ – > spatial track

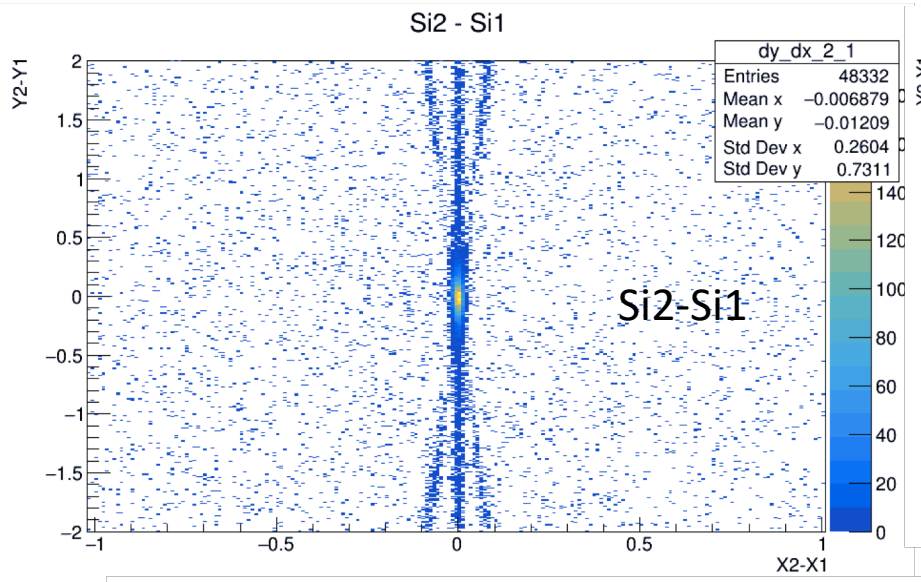
=> combined track through Si-detector and MWPCs

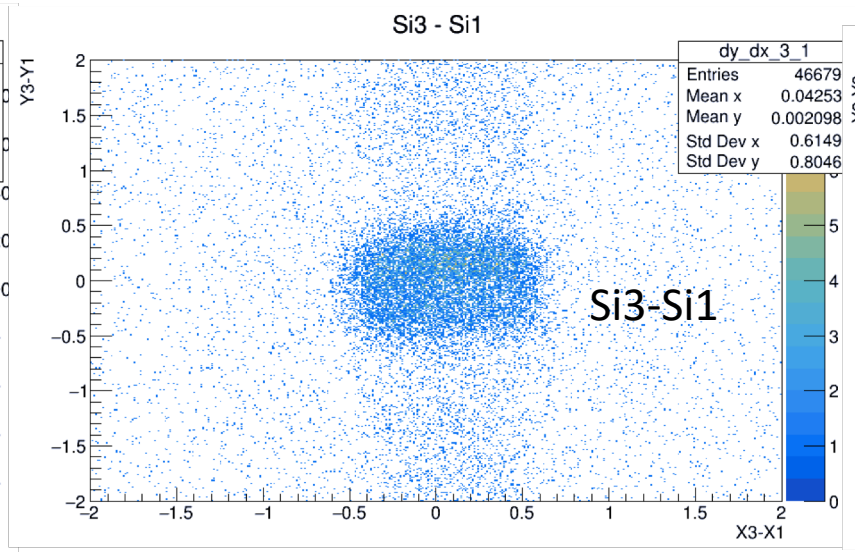
- minimum Si-point 2(3) spatial + MWPC-segment

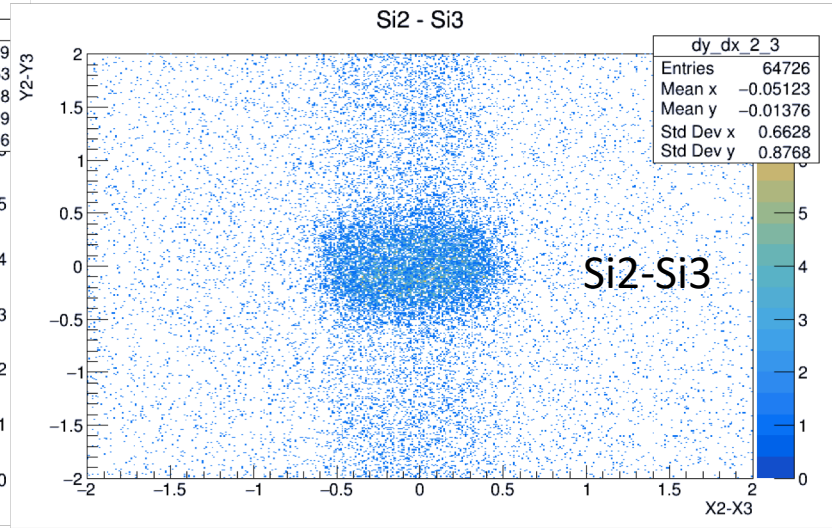
✓ Add Cut beam - Z2;

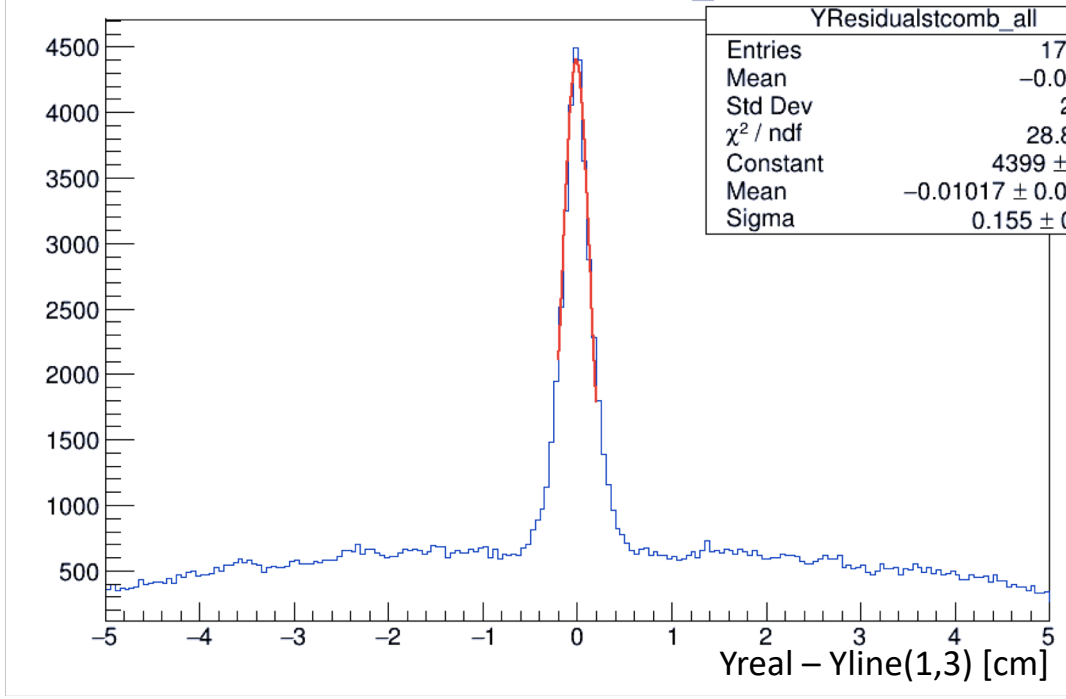
? Add Cut: DCH, TOF700(left side)

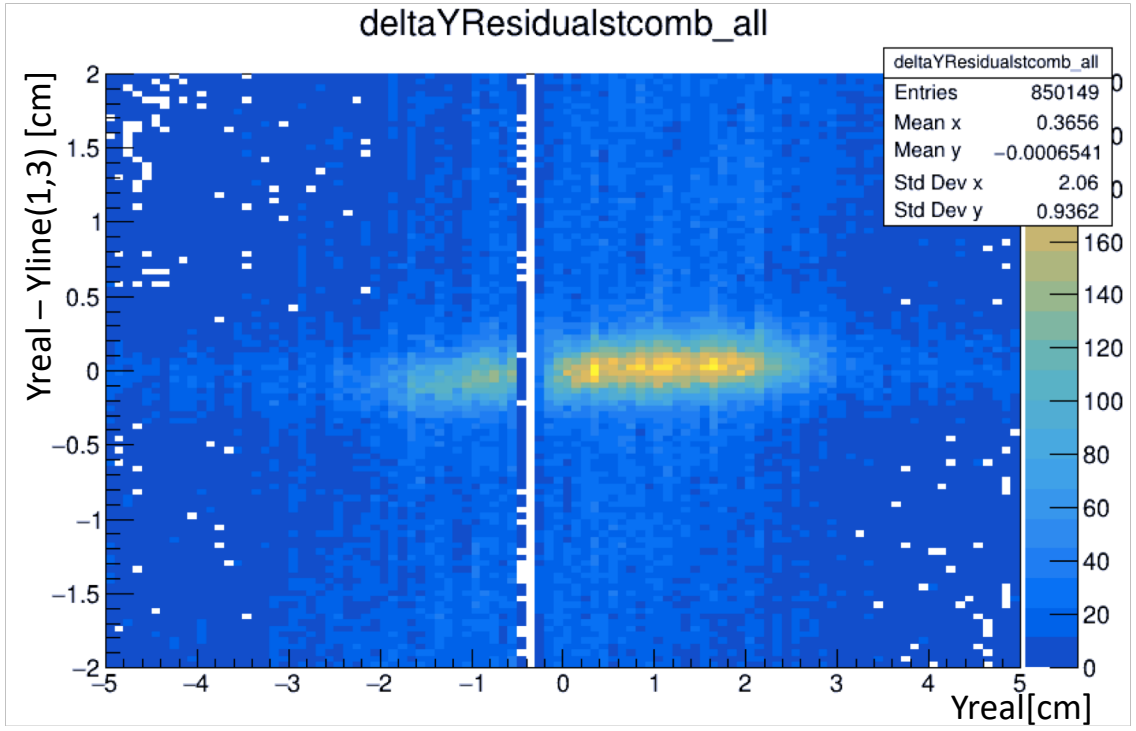
$$Y = \frac{X' - X}{tg2.5°}$$











Cluster conditions

- X - clusters:

  1. Carbon cut

  2. to make clusters with overflow of 1 strip for alignment

- X’- clusters (angle is 2.5°)

  I require the same conditions (1.,2.)

- Y - clusters:

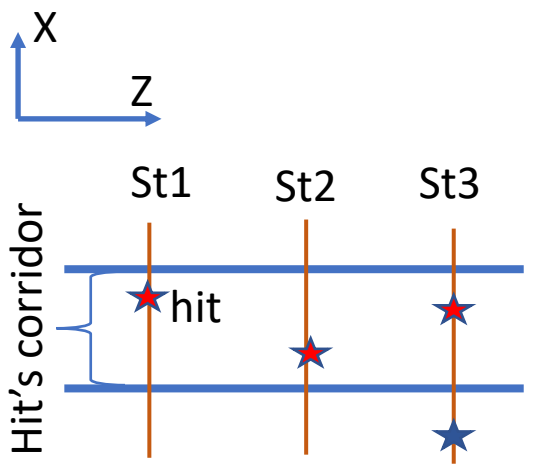
$$Y = \frac{X' - X}{tg2.5^\circ}$$

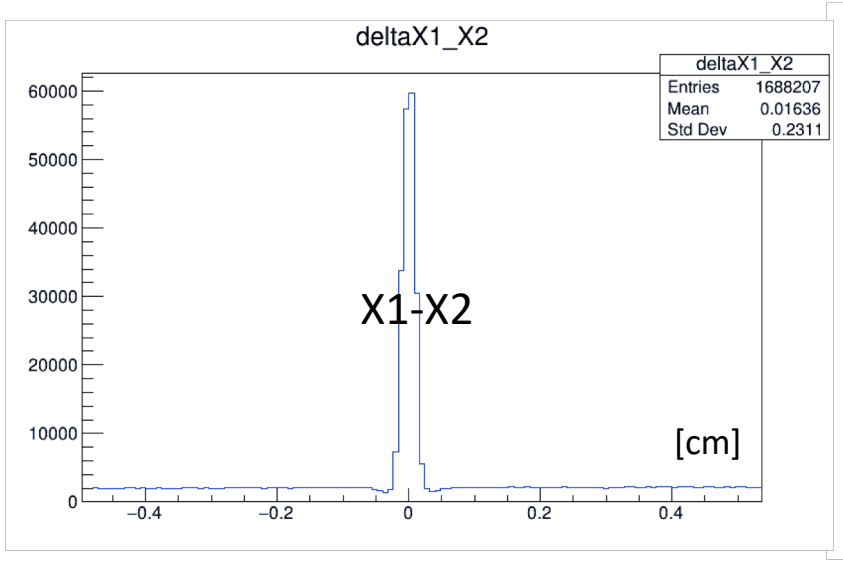
if the cluster is in the sensitive area of the detector module

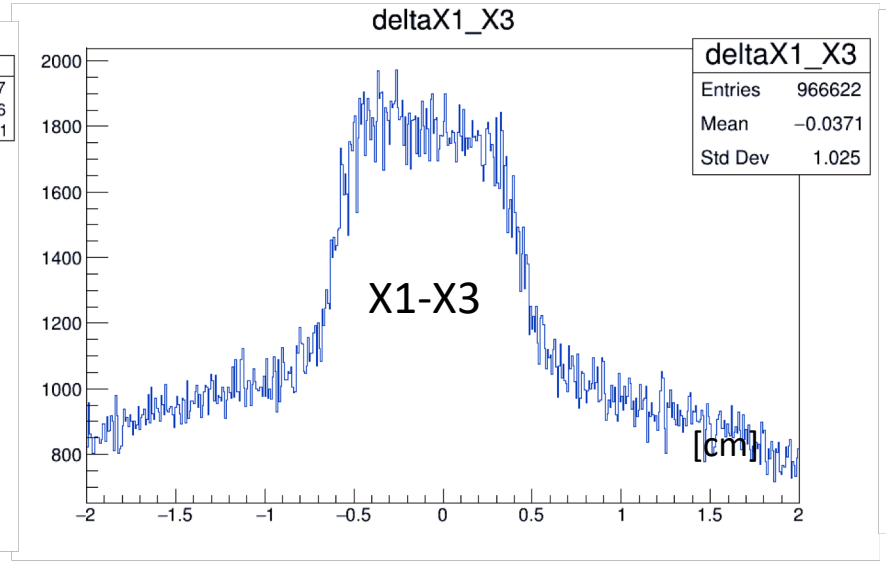
Track conditions:

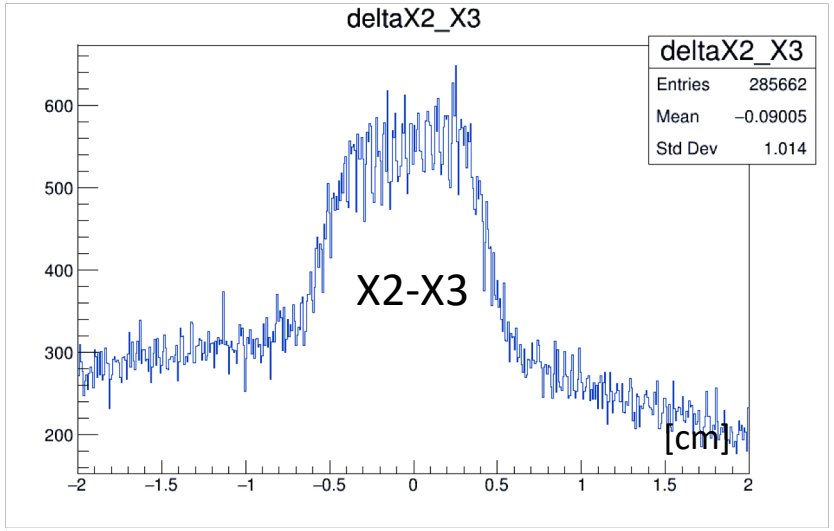
track through 3 stations (has 3(X) hits per track)

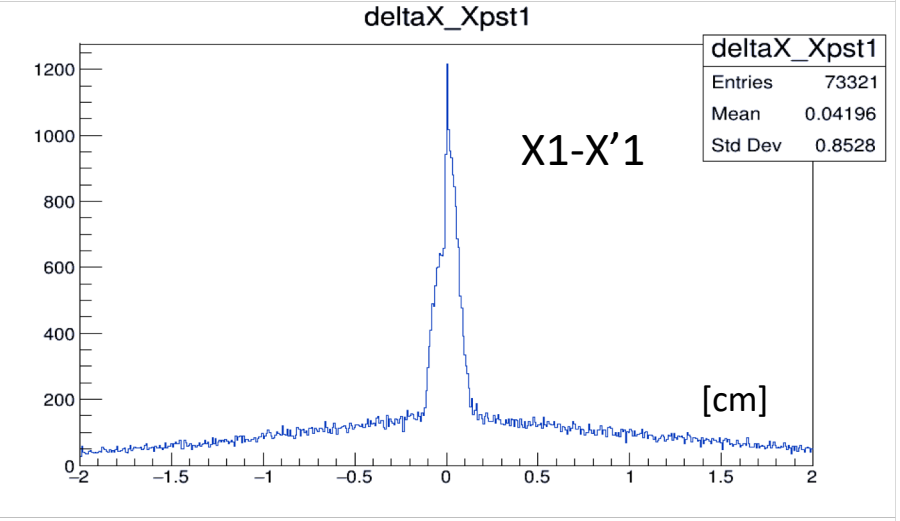
Hit’s corridor?

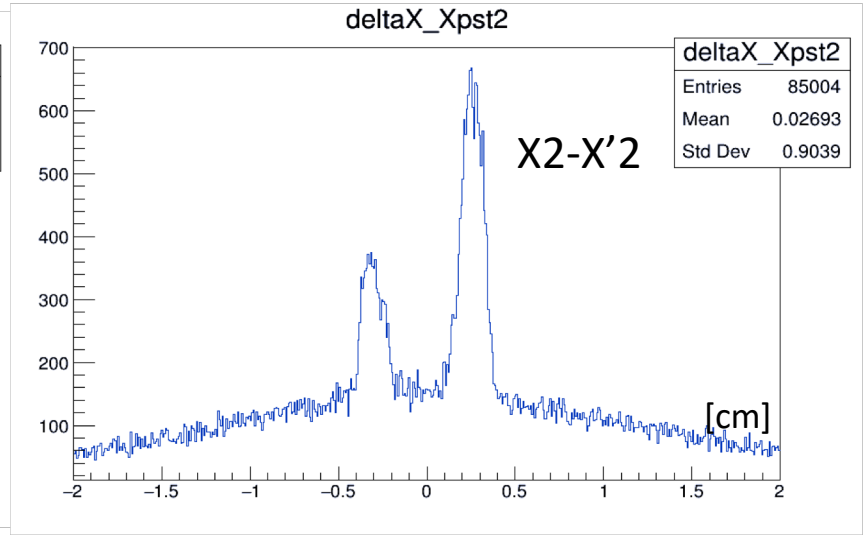


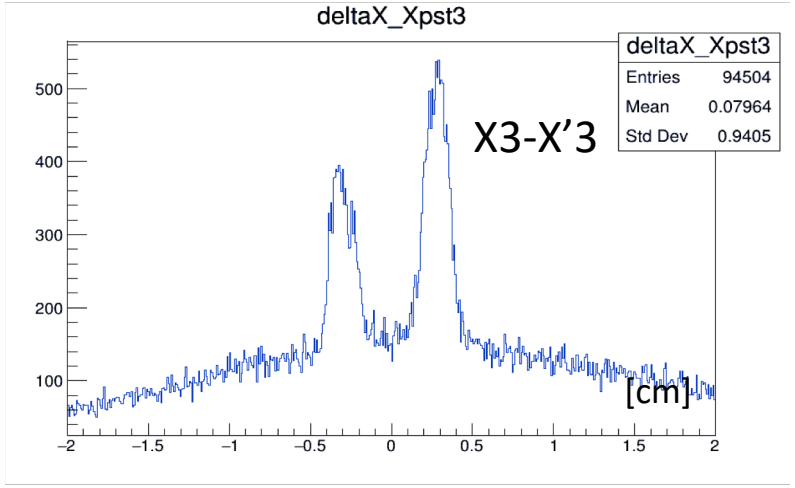




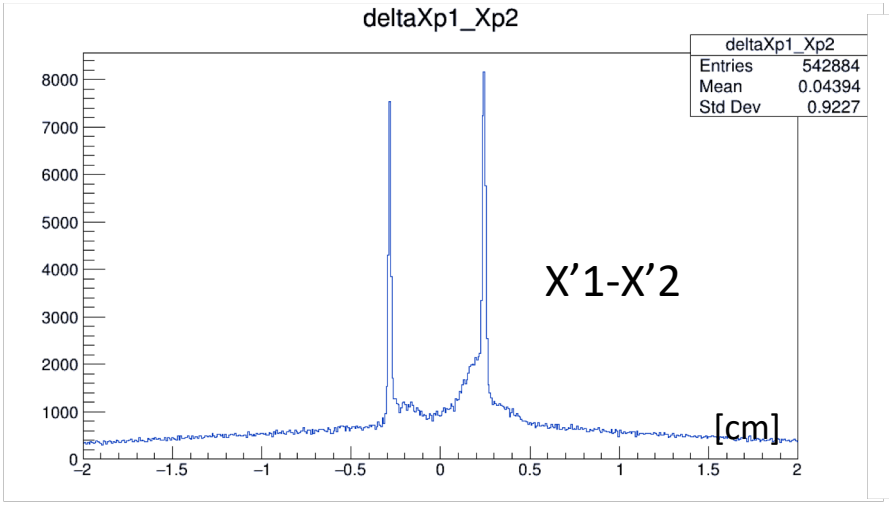


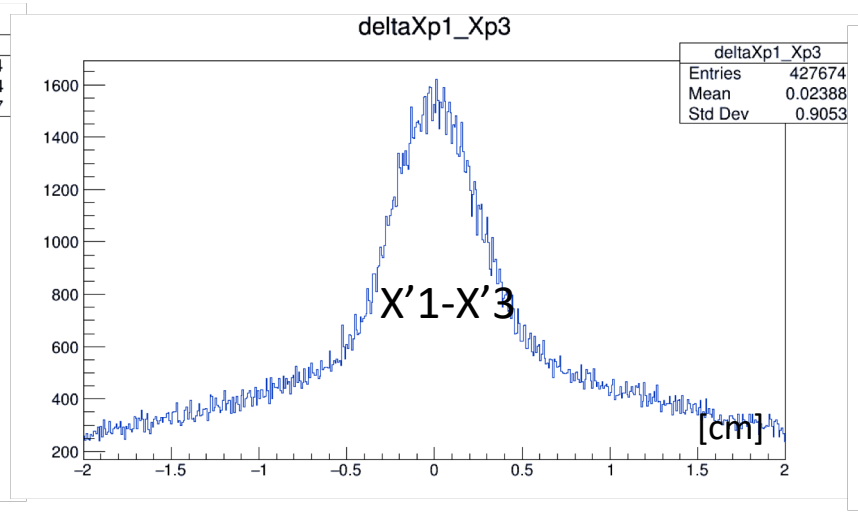


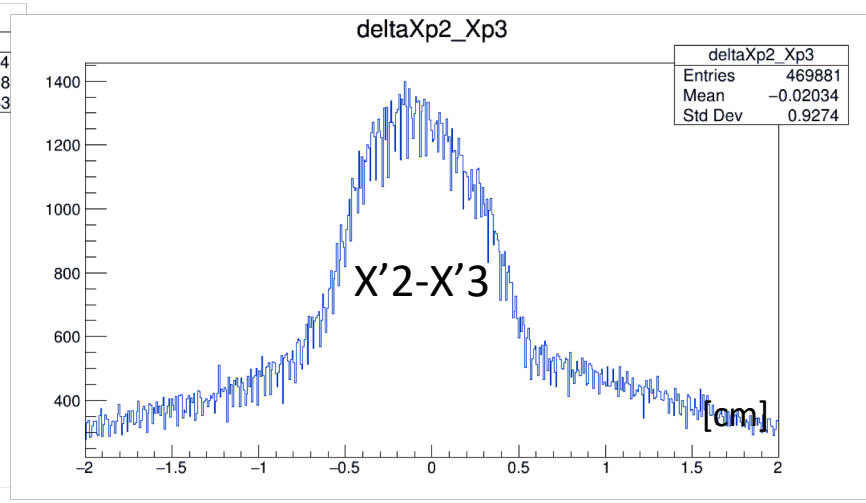


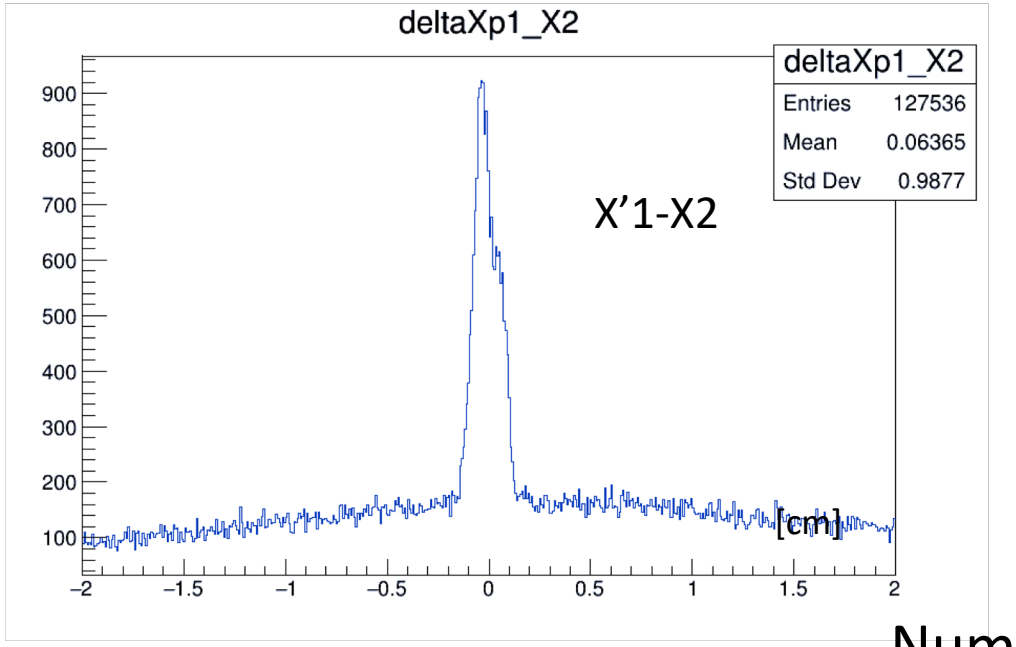


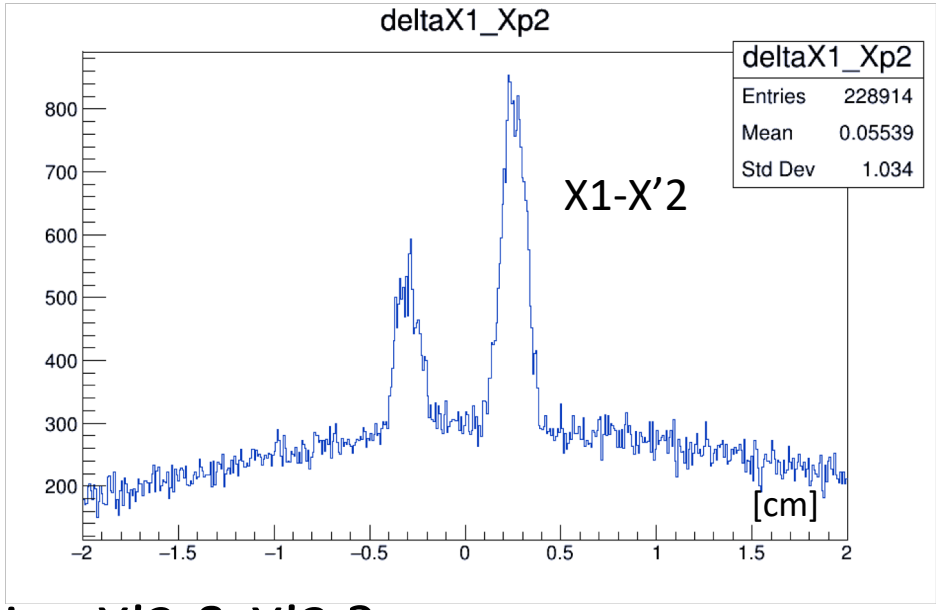
Numbering X'2 & X'3 ?







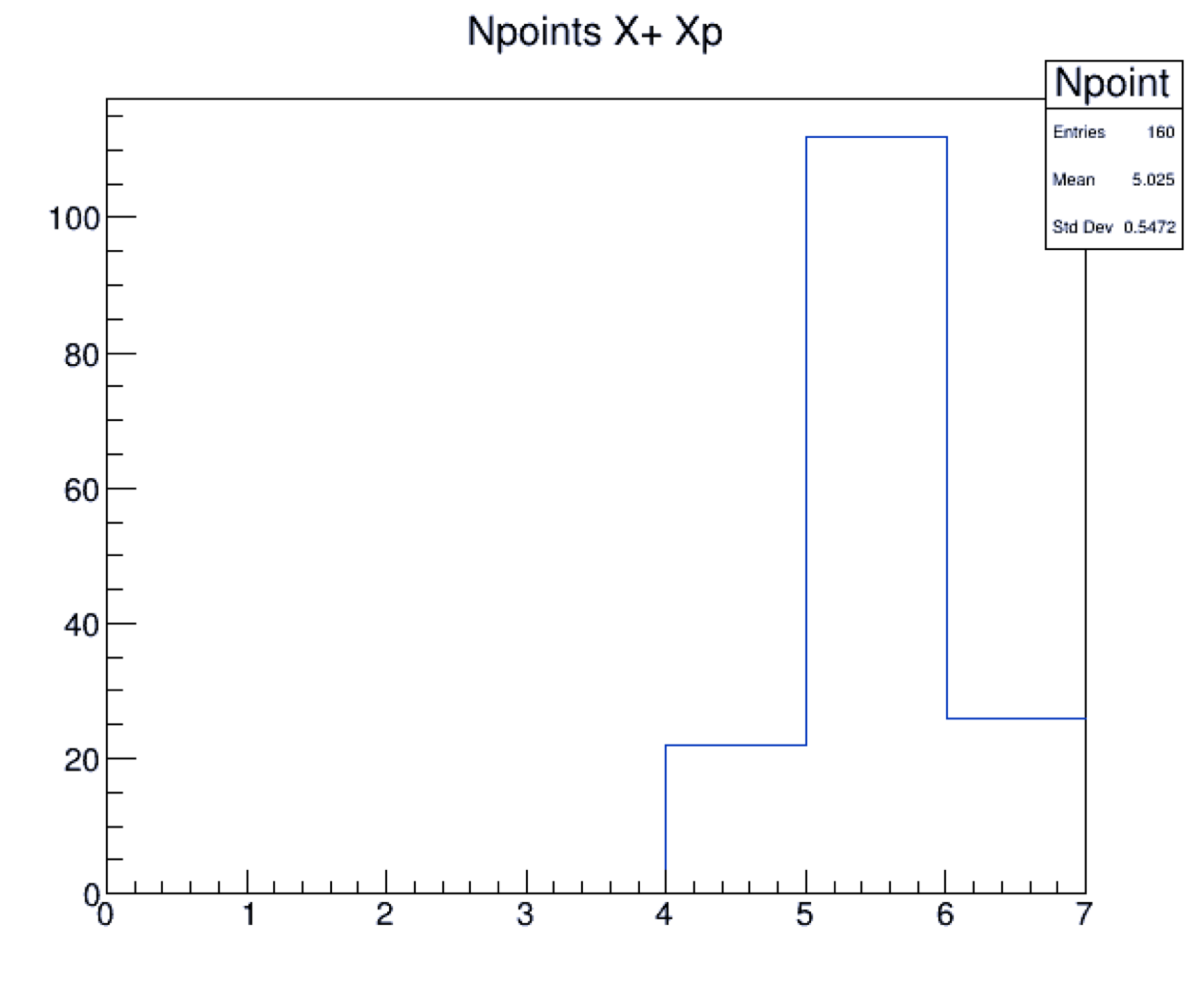


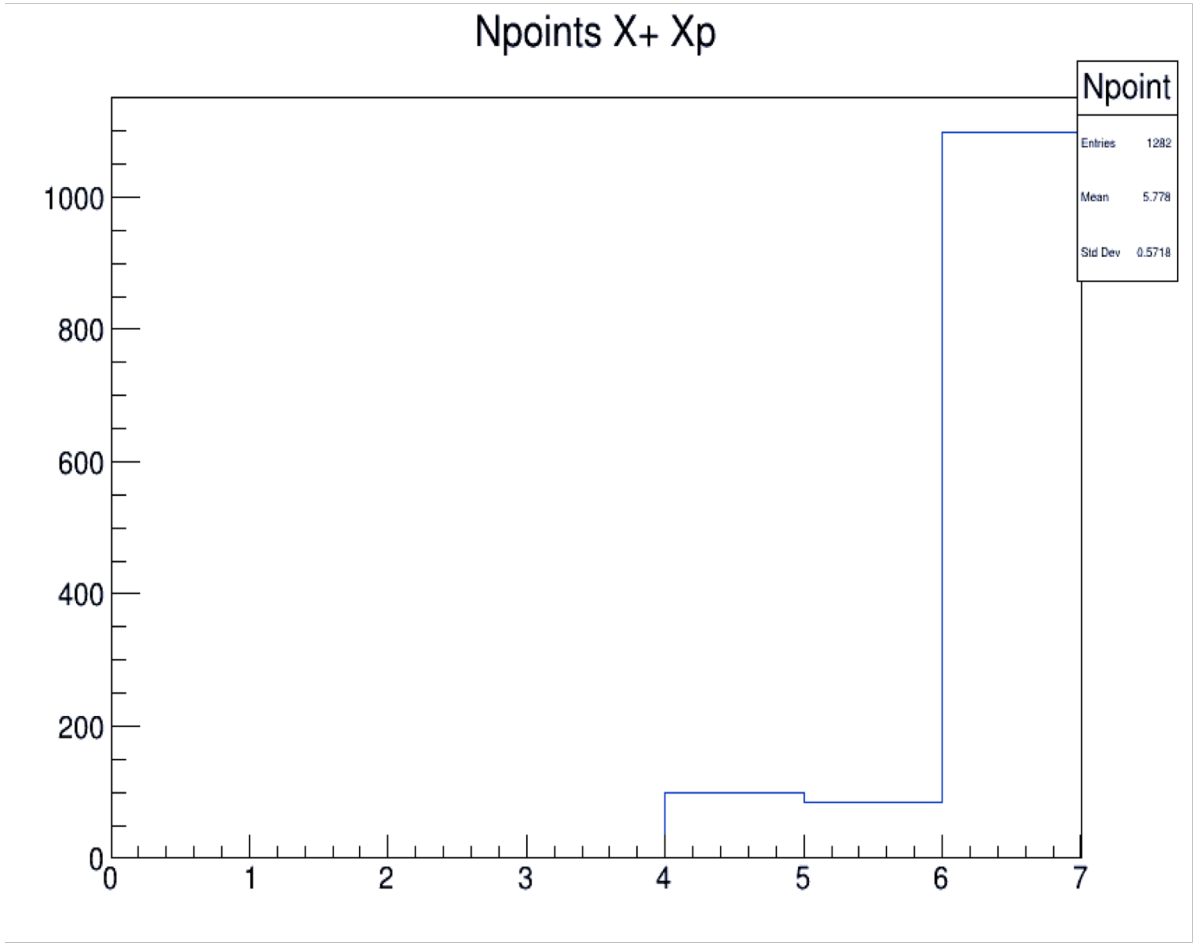


Numbering X'2 & X'3 ?

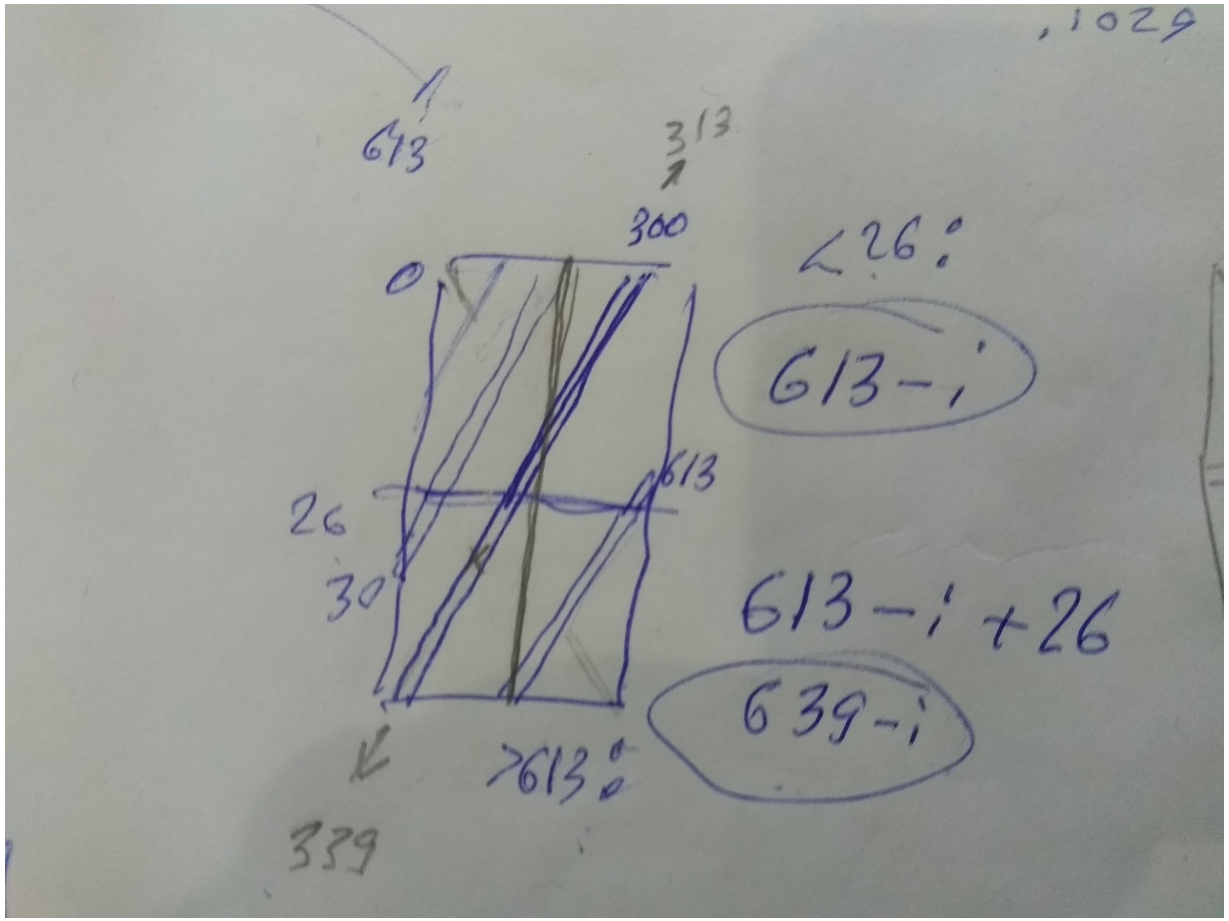
Now (min 3X + 1X')

With coordinate uncertainty

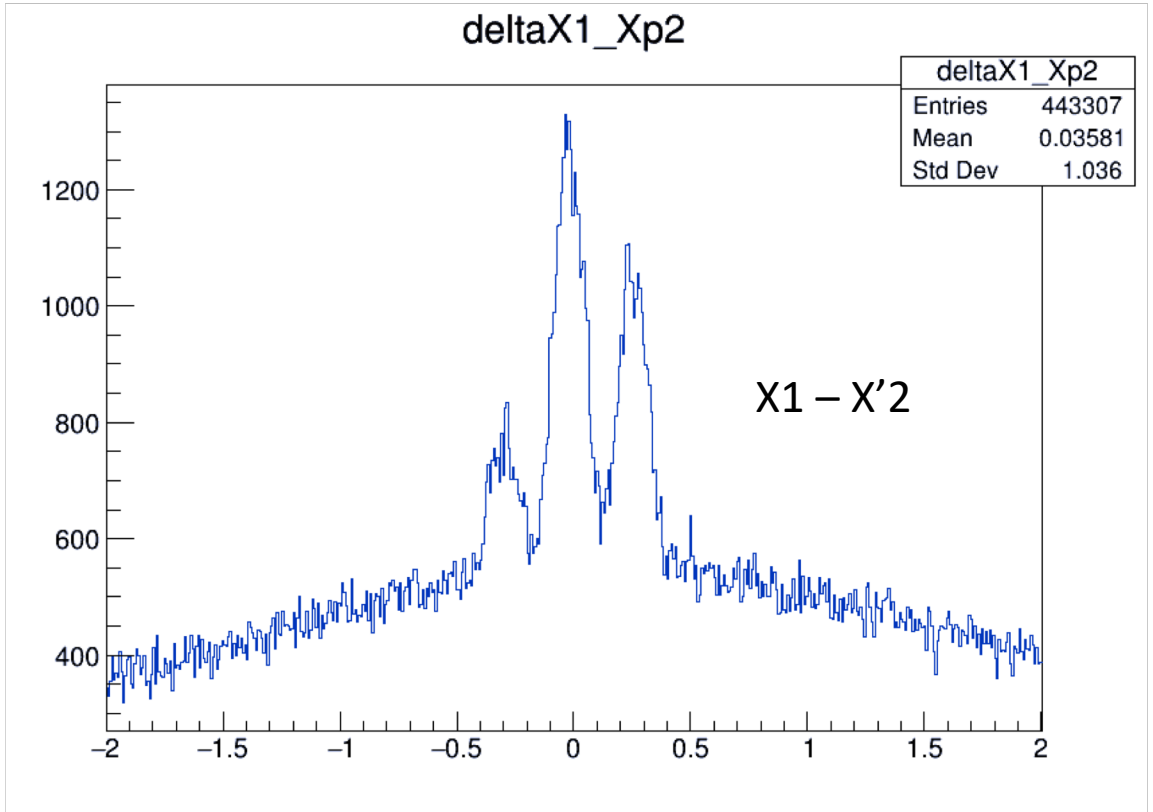


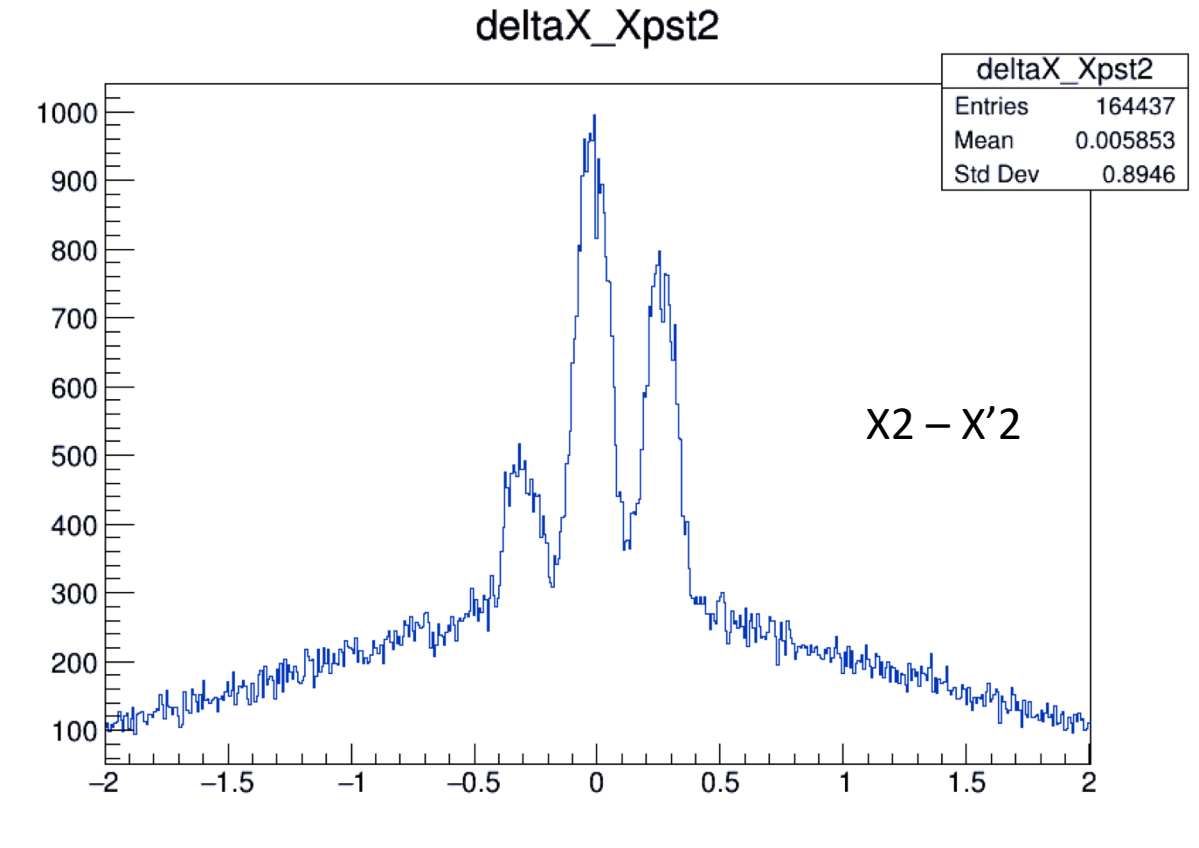


With coordinate uncertainty



With coordinate uncertainty





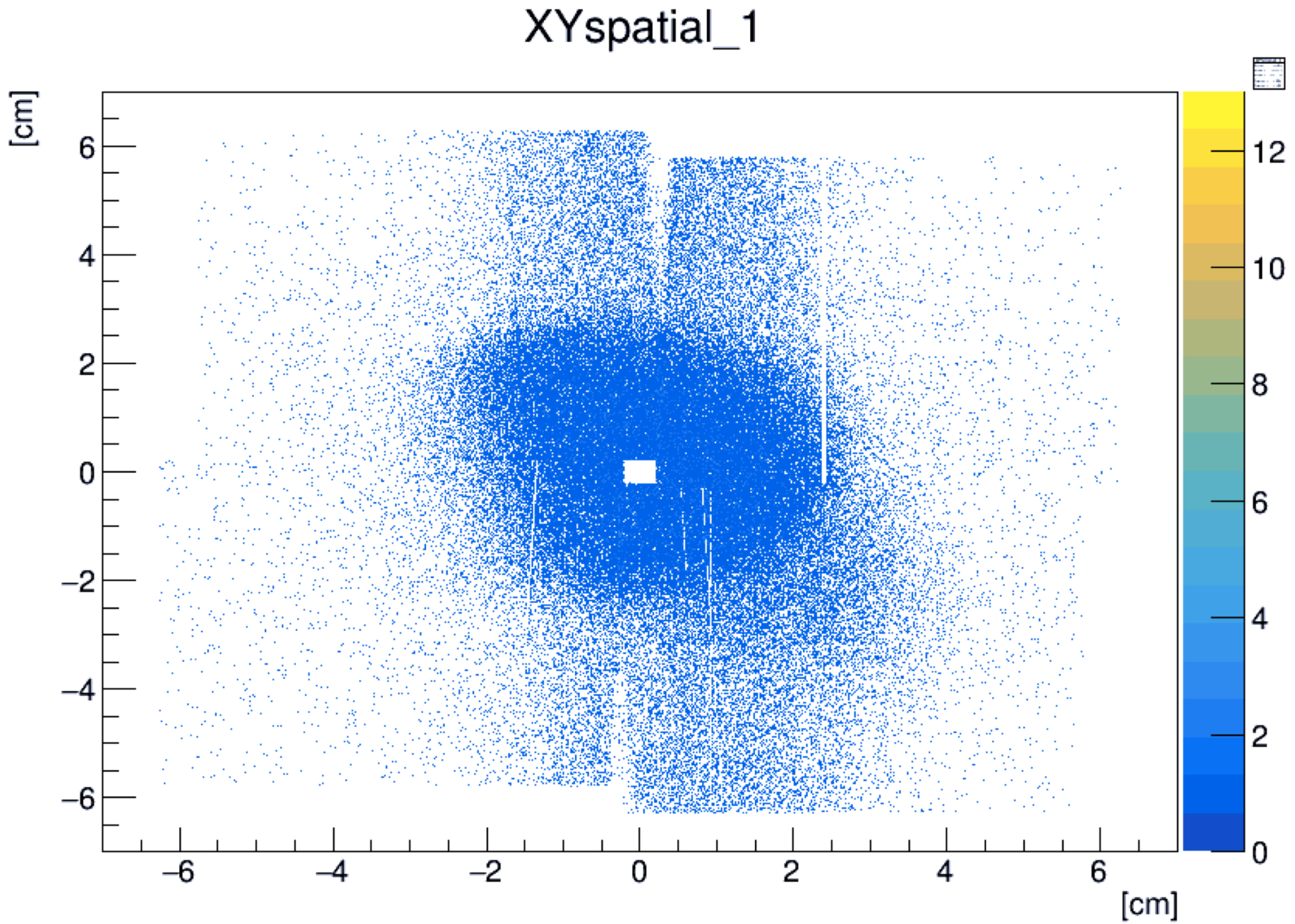
Back up

Amplitude cut

Proton amplitude $\approx 250 \ -300\ adc$ (from the expert)

Carbon amplitude = 36 * proton amplitude

Alpha amplitude = 4 * proton amplitude $\approx 1200\ adc$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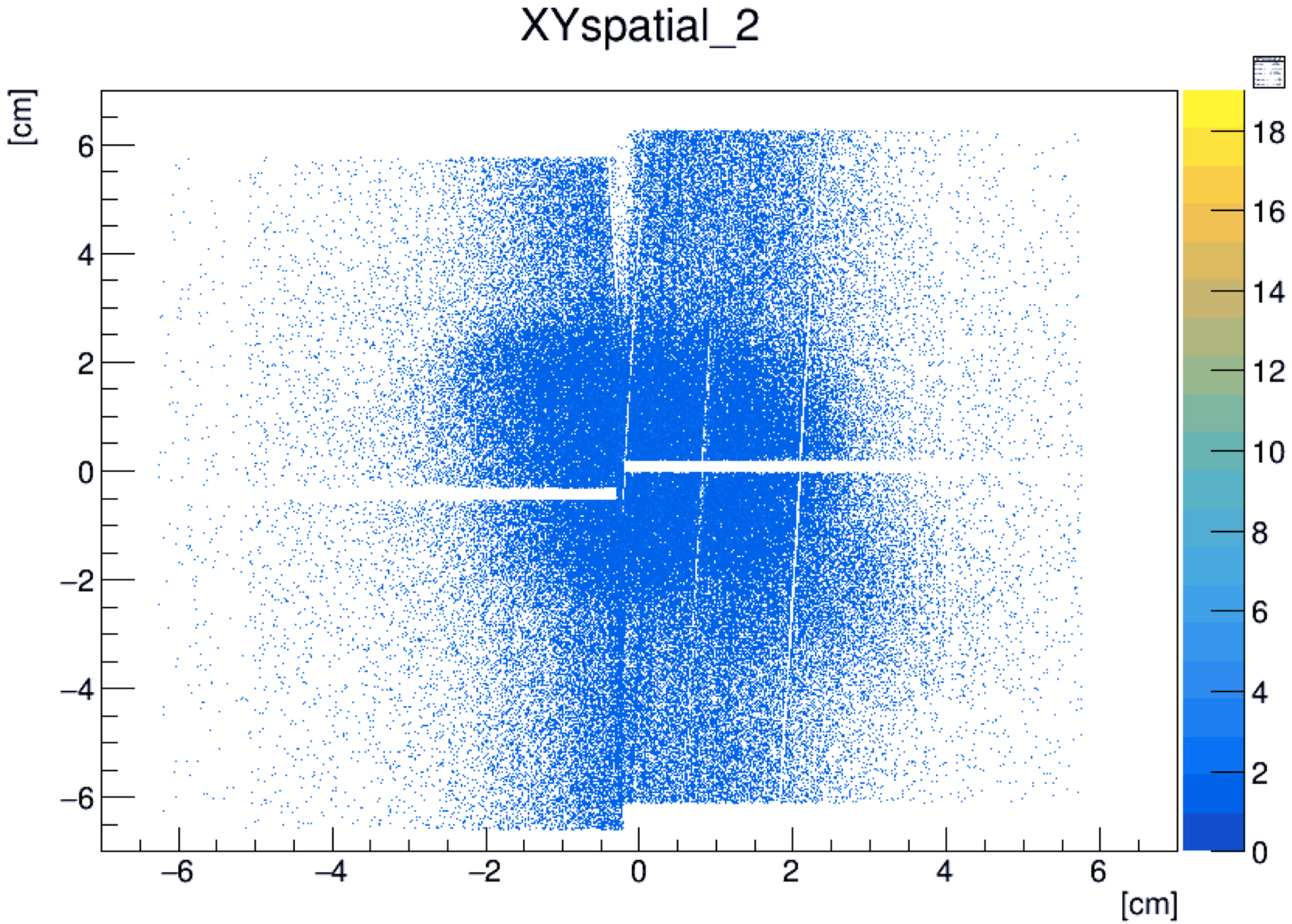
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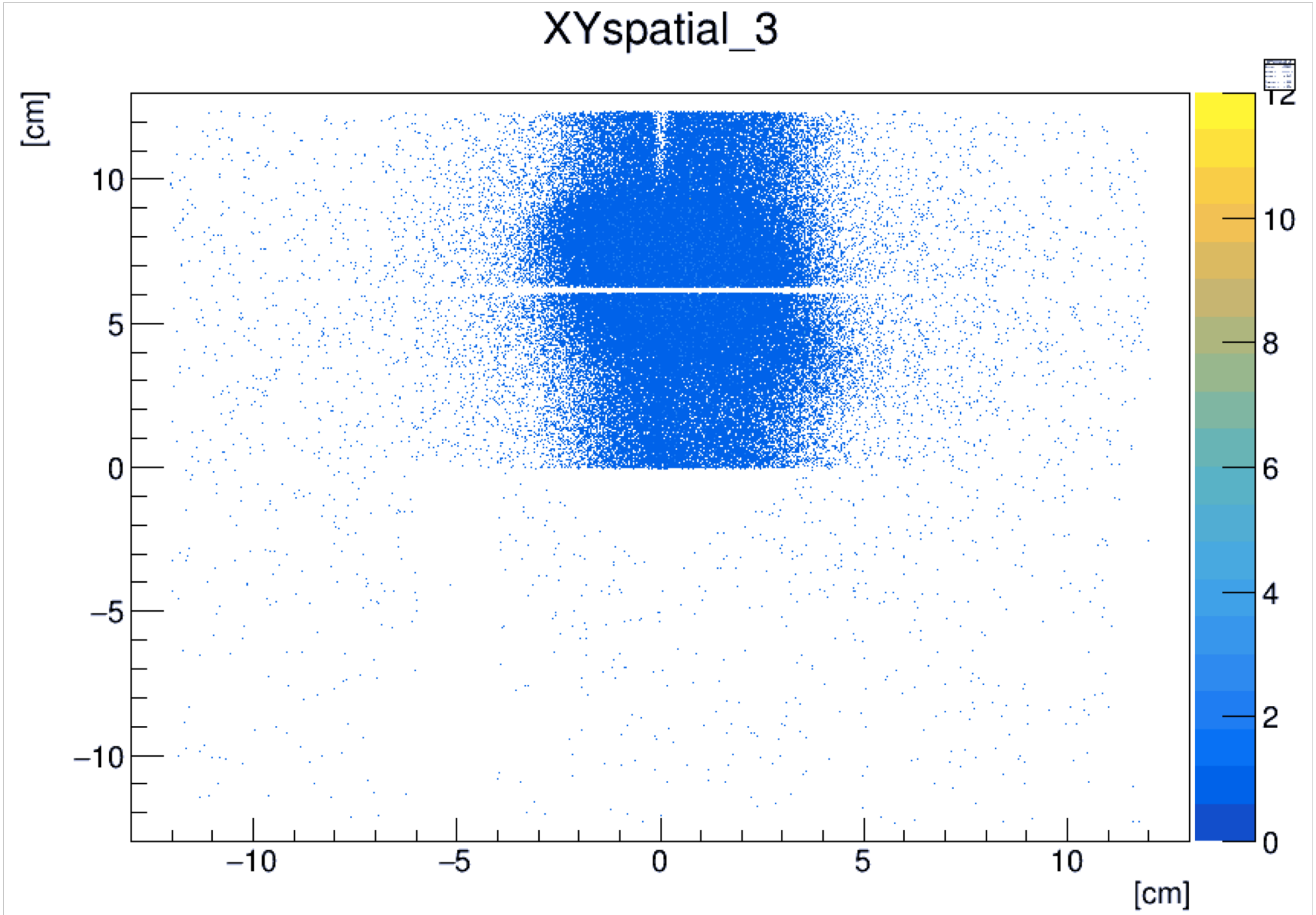
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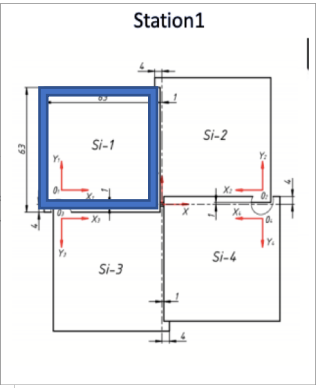
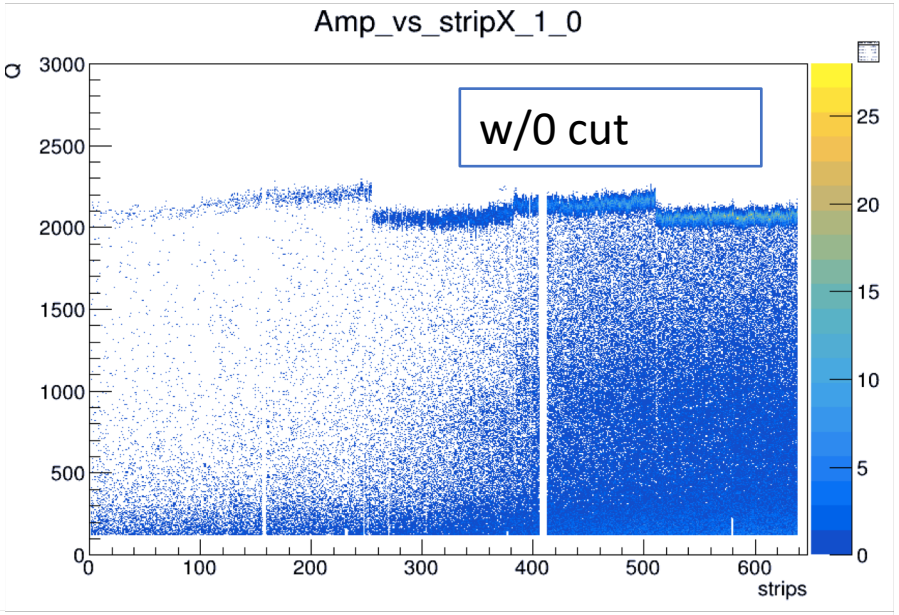
0

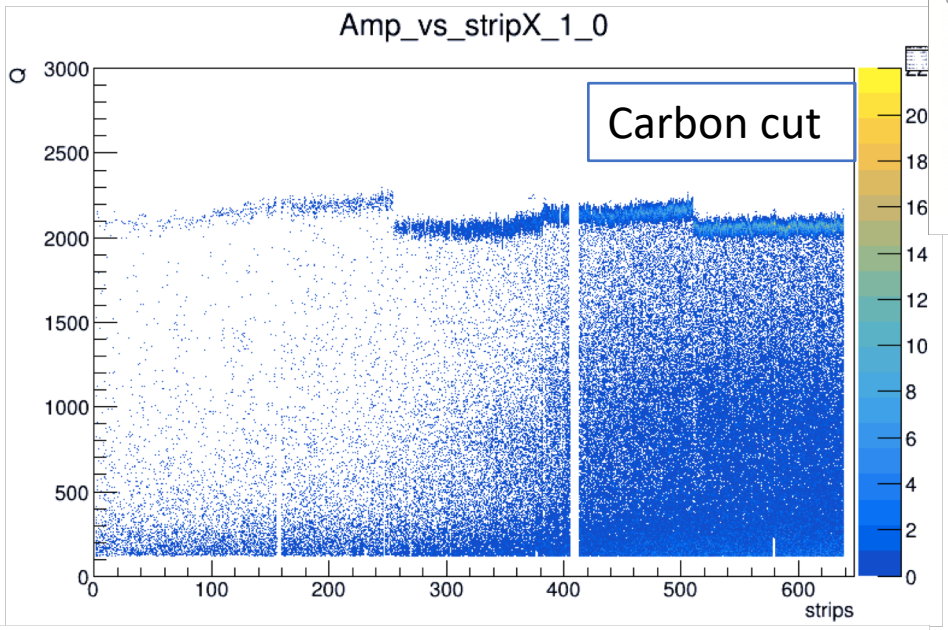
Amplitude vs strips in module for all Events (Station1)

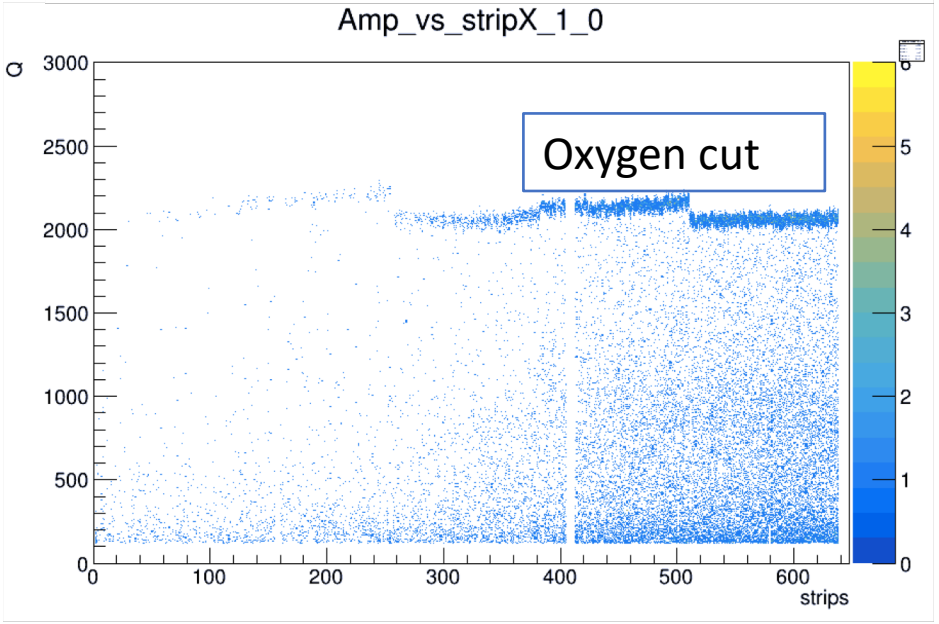
X strips

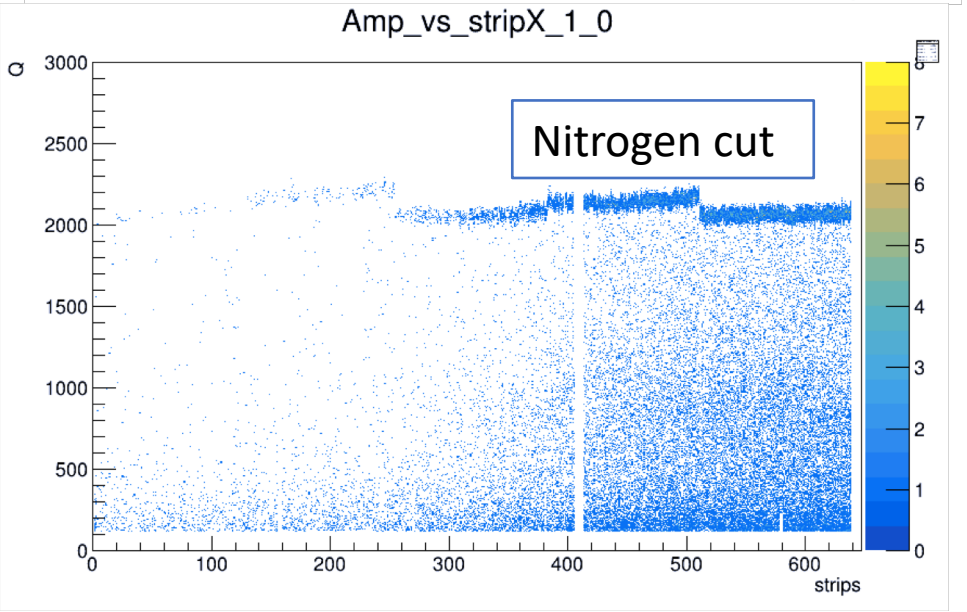
Module 1











Amplitude vs strips in module for all Events (Station1)

X’ strips

Module 1