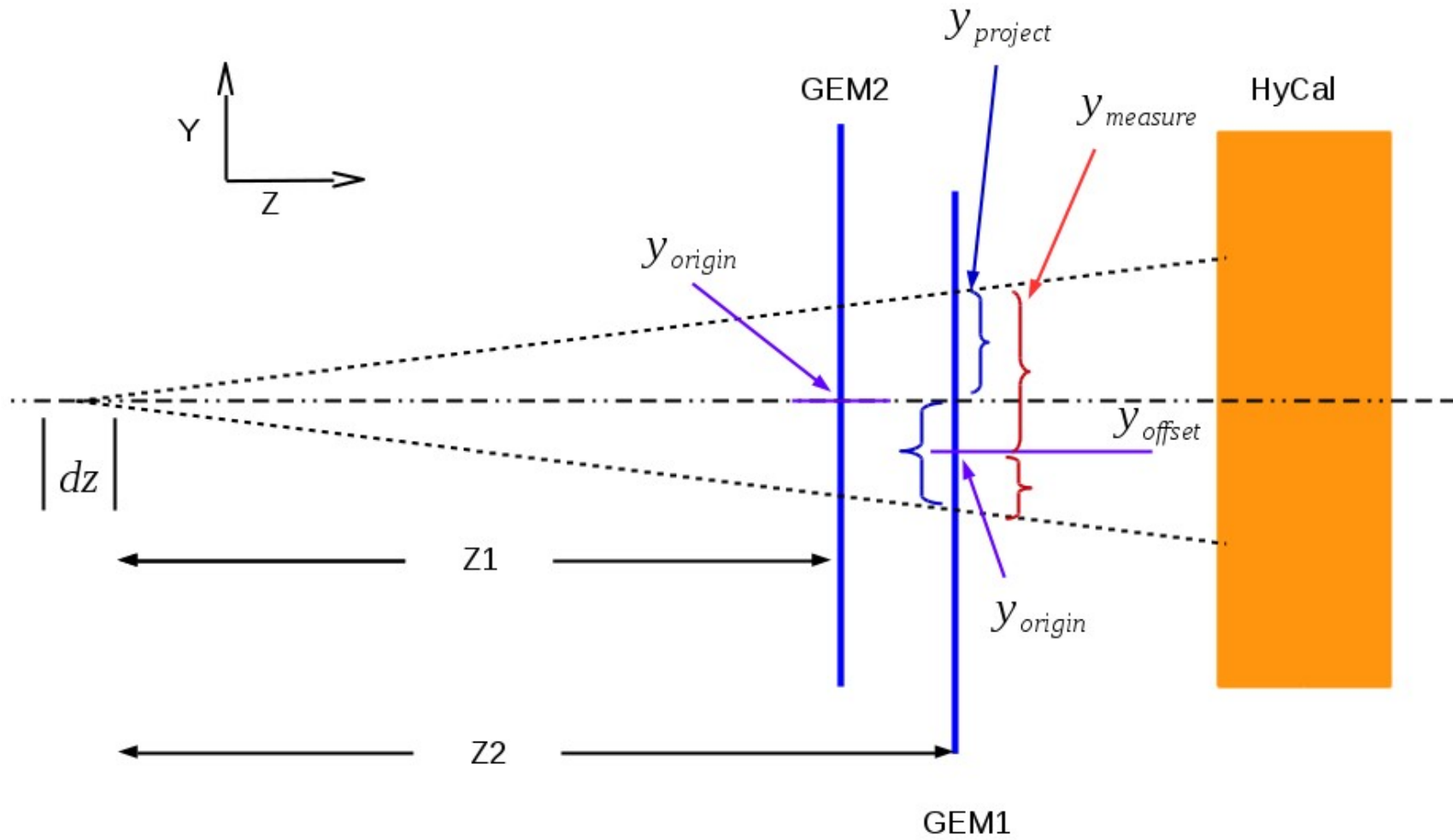


Contents

- 1), GEM Offsets.
- 2), New Clustering.
- 3), HyCal GEM Match.

Offsets Check

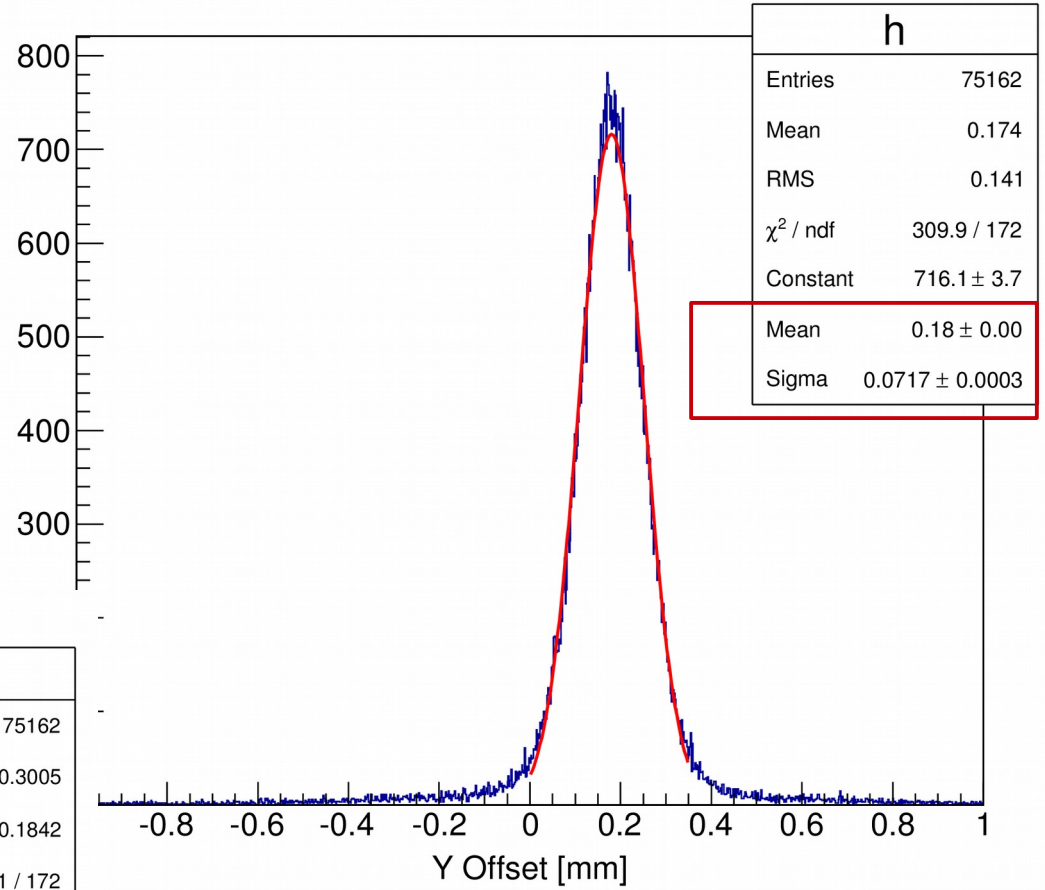


Moller events , e-p events both OK.

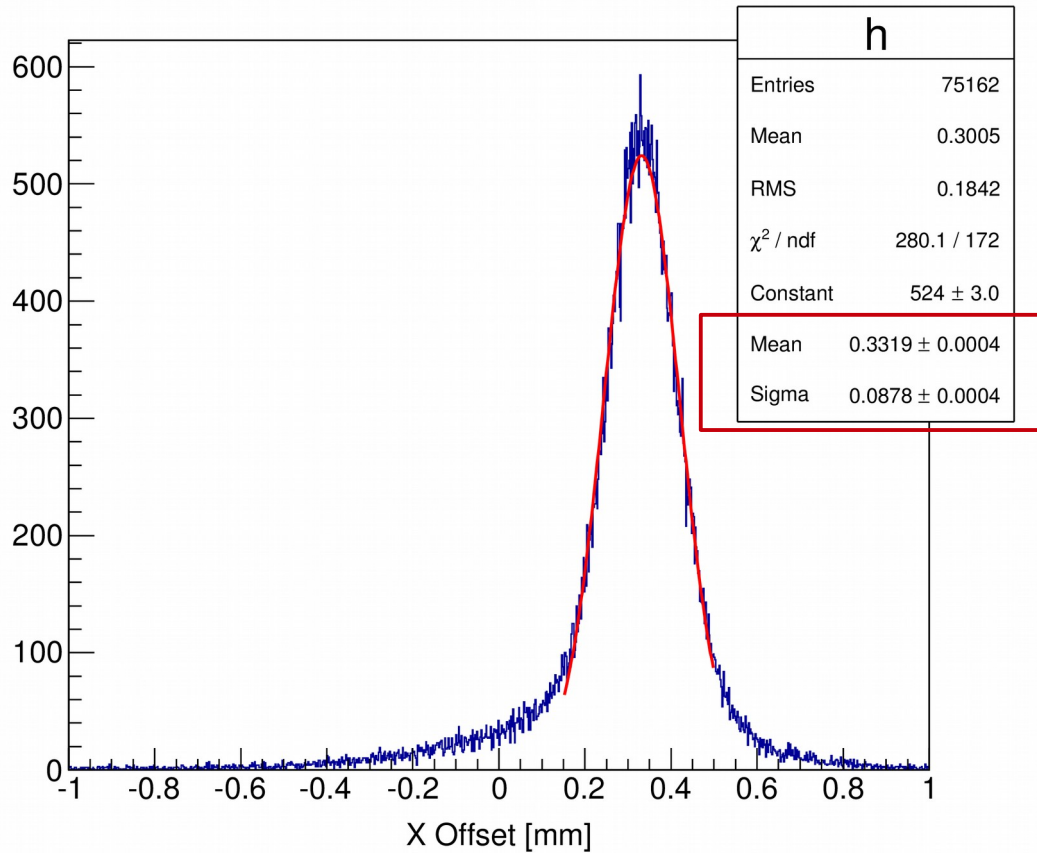
Offsets Check

gem2.y*5300/5260-gem1.y {gem1.e>2000 && gem1.e<2300 && gem2.e>2000 && gem2.e<2300}

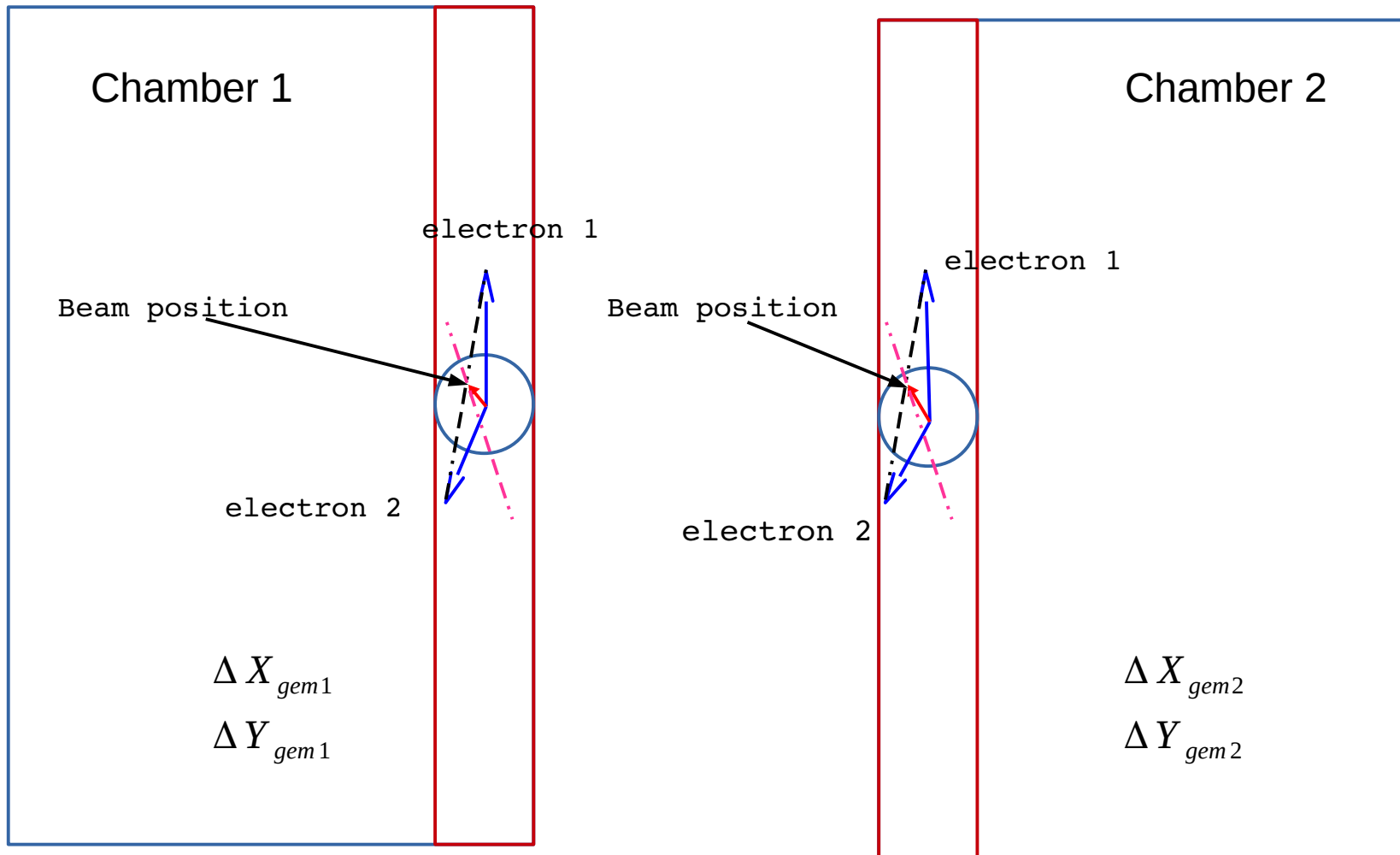
Using e-p Events



gem2.x*5300/5260-gem1.x {gem1.e>2000 && gem1.e<2300 && gem2.e>2000 && gem2.e<2300}



Offsets From Production Run

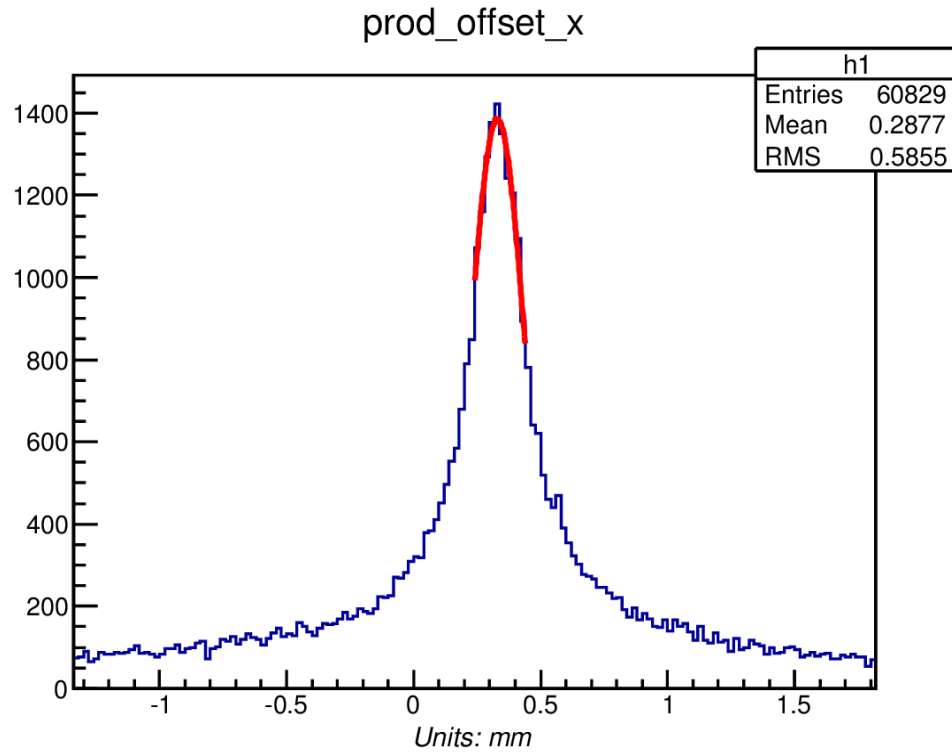


In each Event:

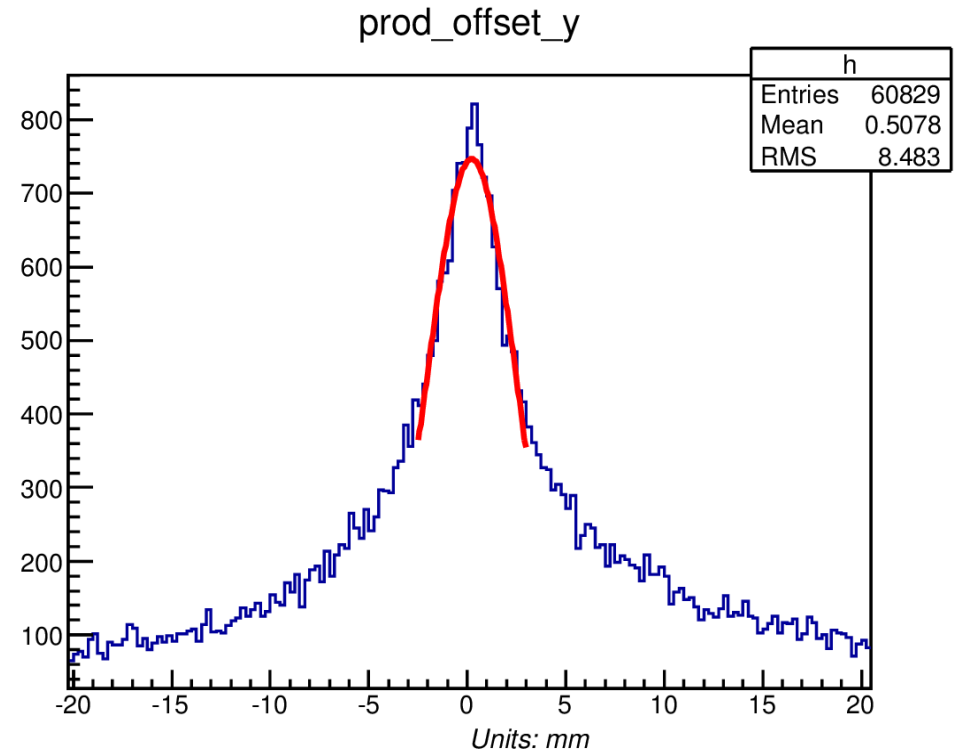
$$X_{offst} = \Delta X_{gem2} - \Delta X_{gem1}$$

$$Y_{offst} = \Delta Y_{gem2} - \Delta Y_{gem1}$$

Offsets From Production Run



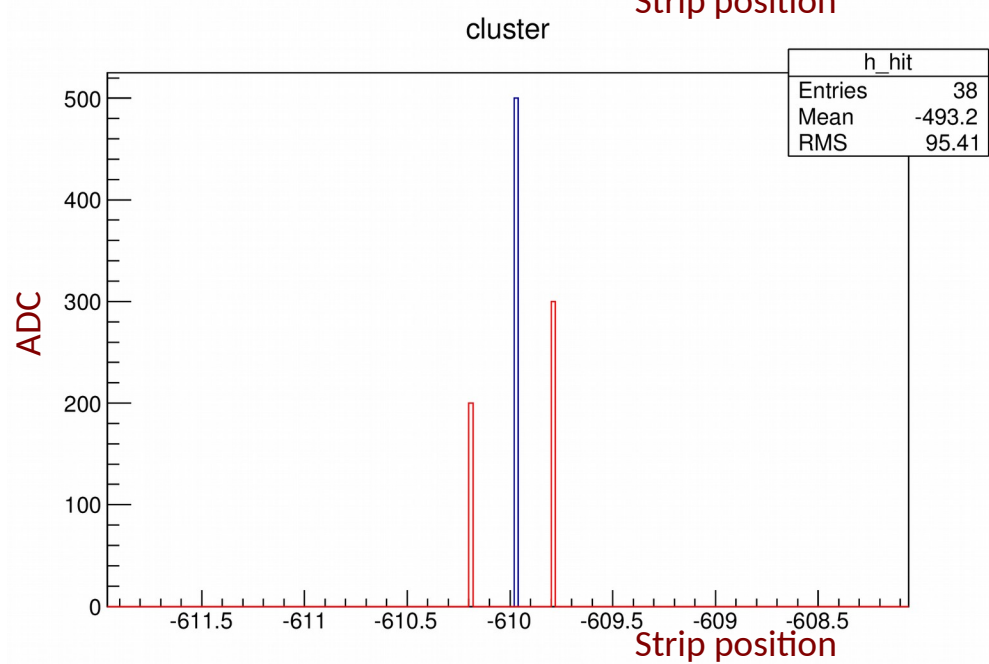
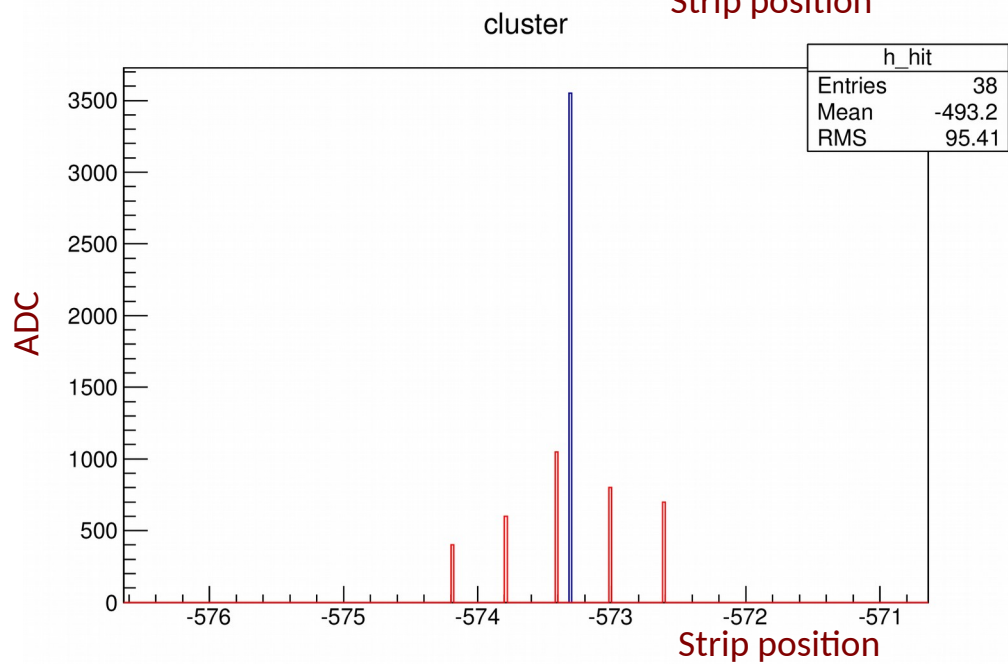
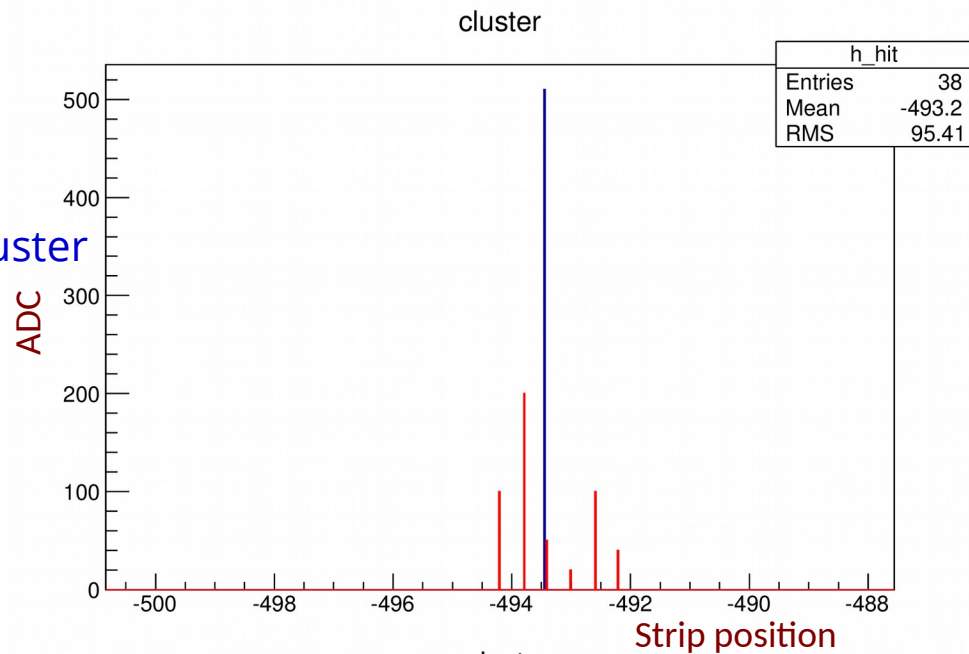
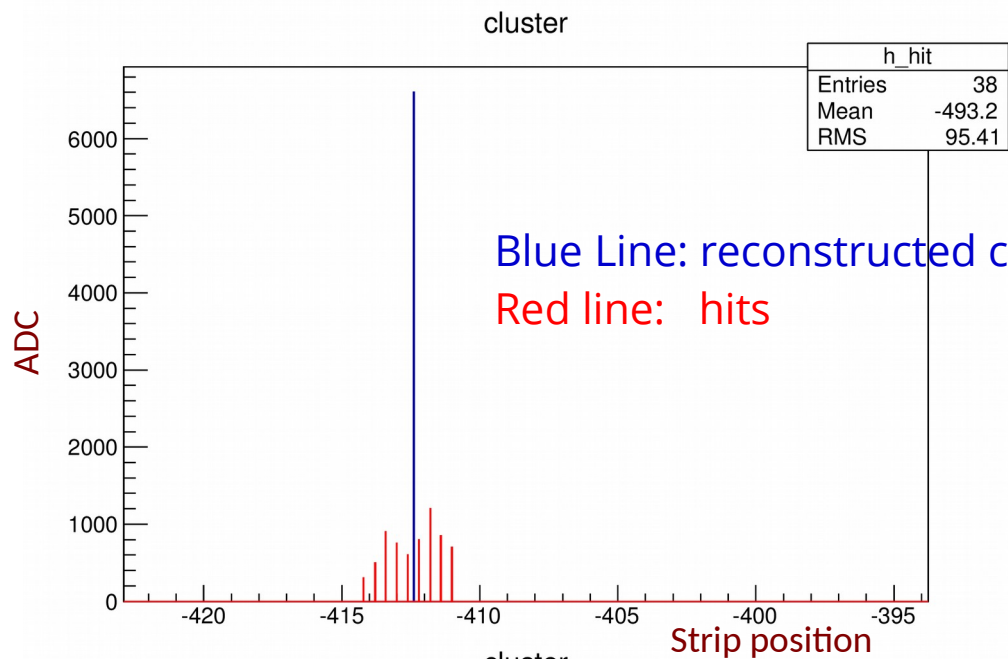
Offset: 0.33 mm
Error: 0.0021 mm



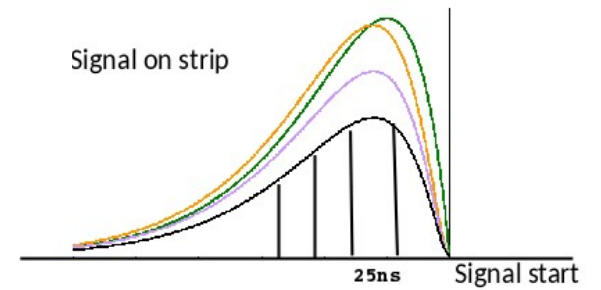
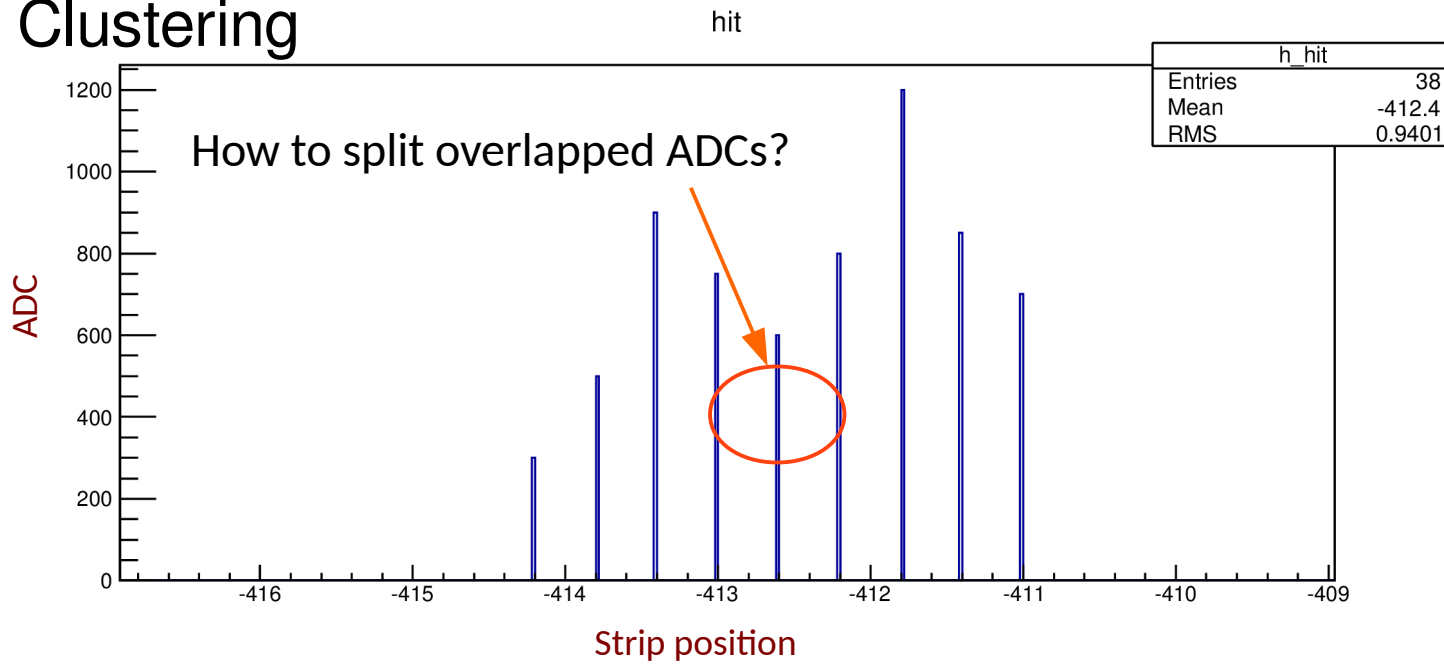
Offset: 0.223 mm
Error: 0.0309 mm

Clustering

Old clustering: take all consecutive strips as one cluster:



Clustering

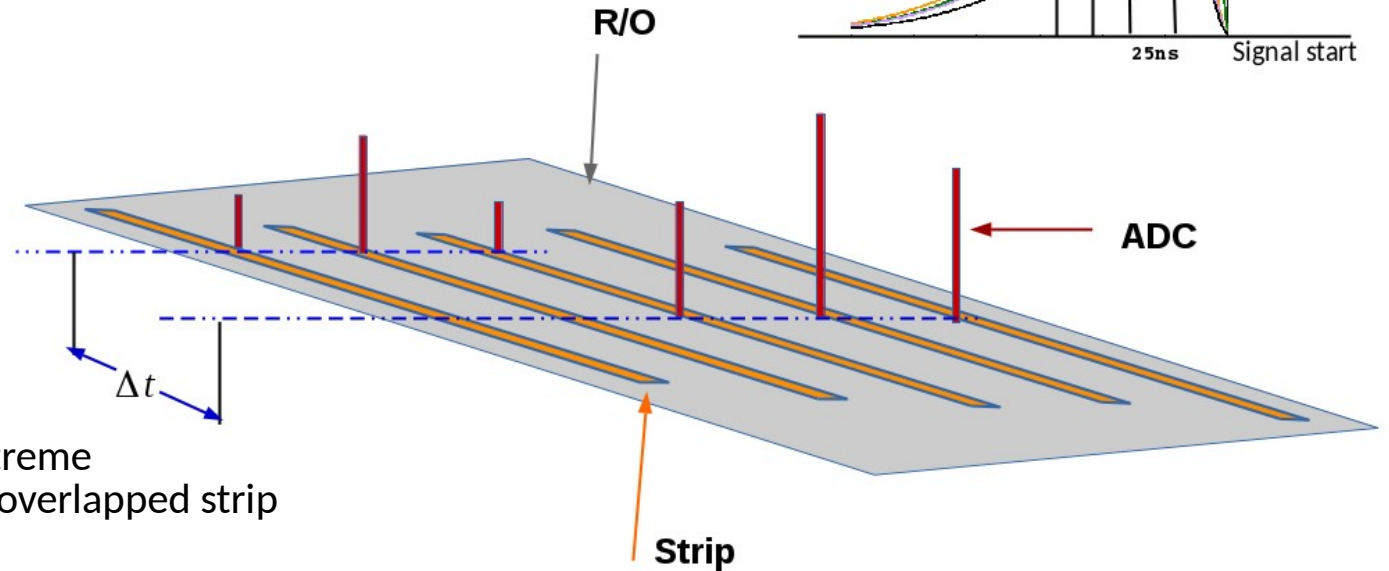


Cluster Reconstruction:

- 1), Take maximum adc value as strip ADC.
- 2), sum all consecutive strip ADCs as cluster ADC.

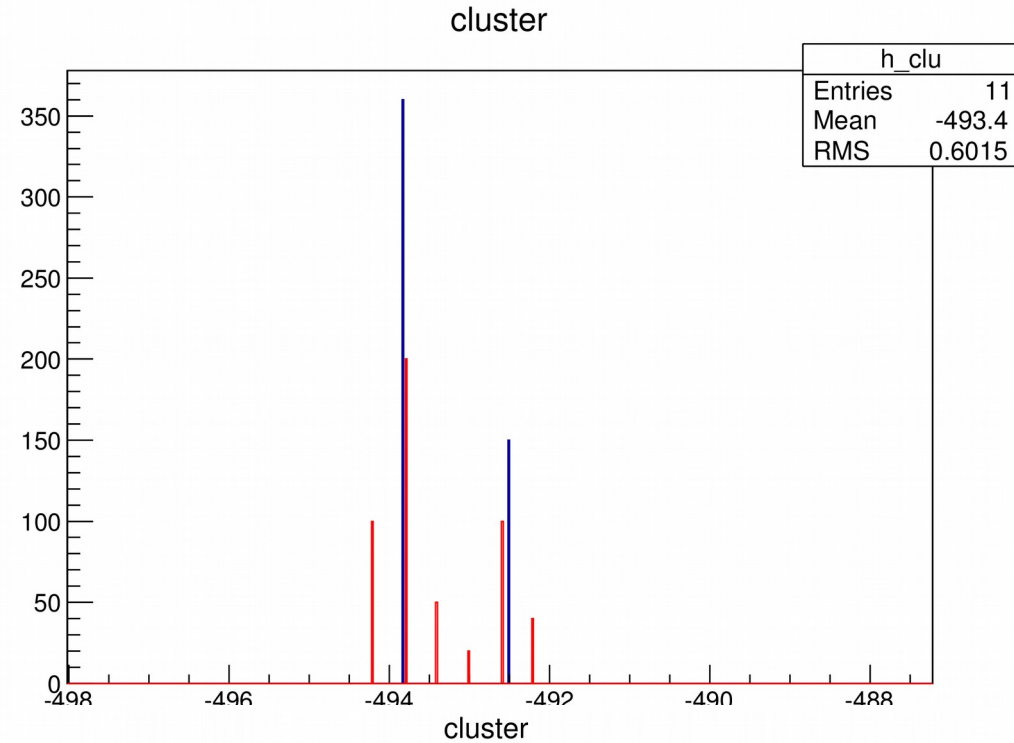
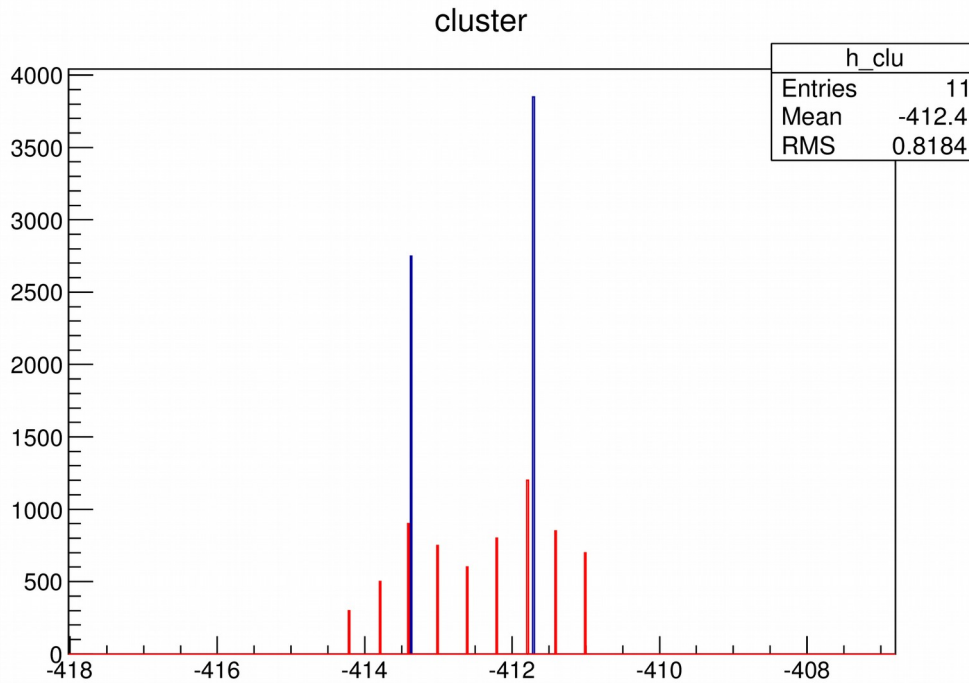
3), Overlapped ADCs are tricky. In extreme circumstances, it is possible that the overlapped strip ADC purely comes from one cluster.

4), In reality, not easy to tell which cluster has higher contribution. So, it is reasonable to cut the edge ADC in half. Each cluster take half ADC.



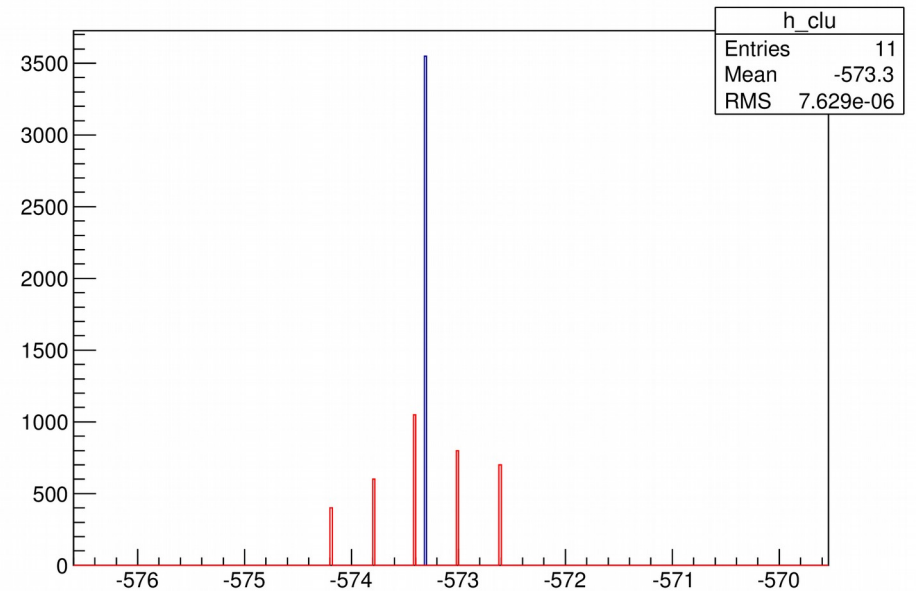
Clustering

New Clustering:



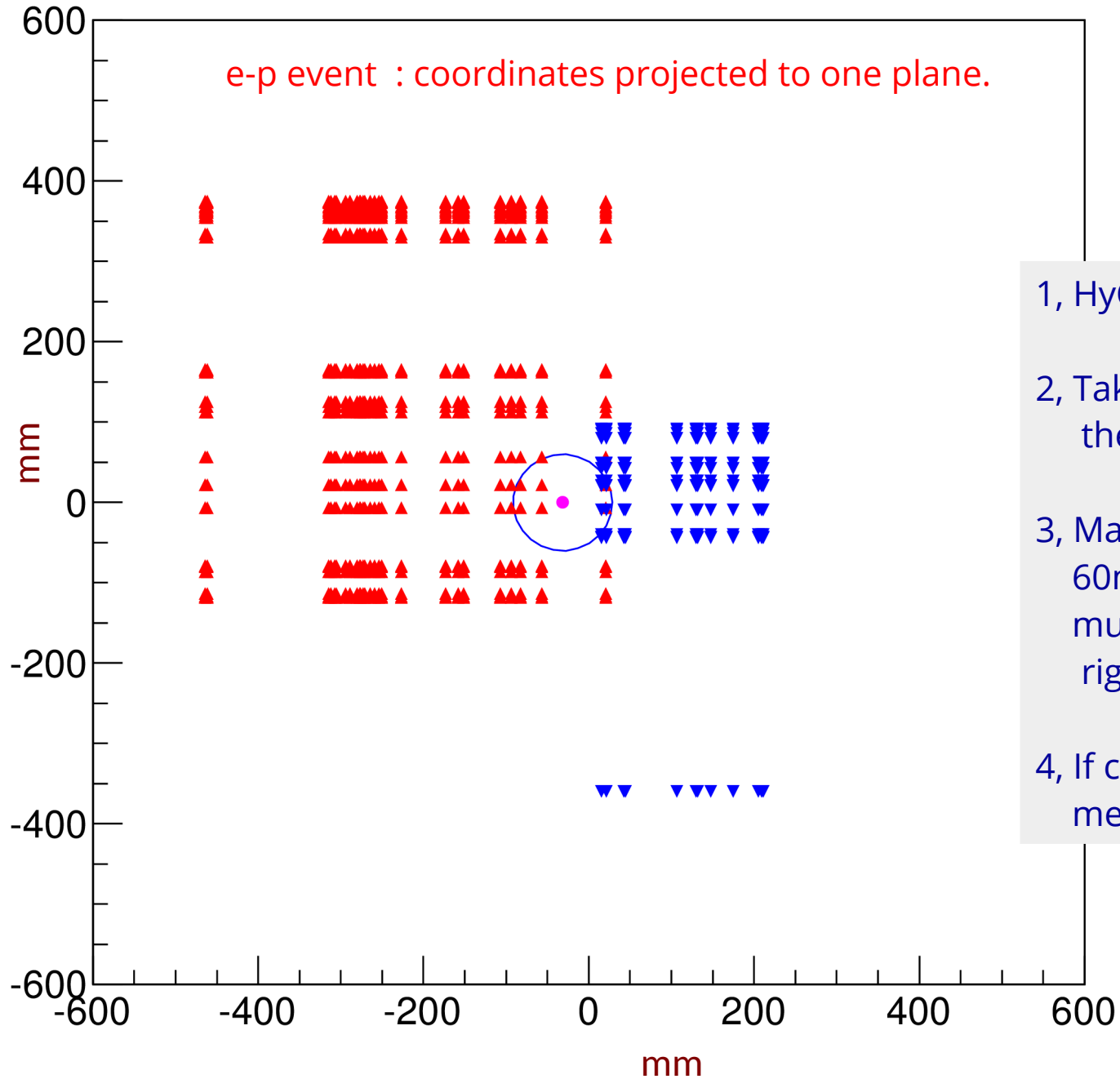
Considering that most of the cluster size ≤ 3 , so if two clusters are within a distance of 1.5 strips, we cannot separate them. So in most cases, there will be only one strip was overlapped.

for the minimum strip (shared by two clusters, the overlapped strip), divide the ADCs in half, each cluster has half of the ADCs.



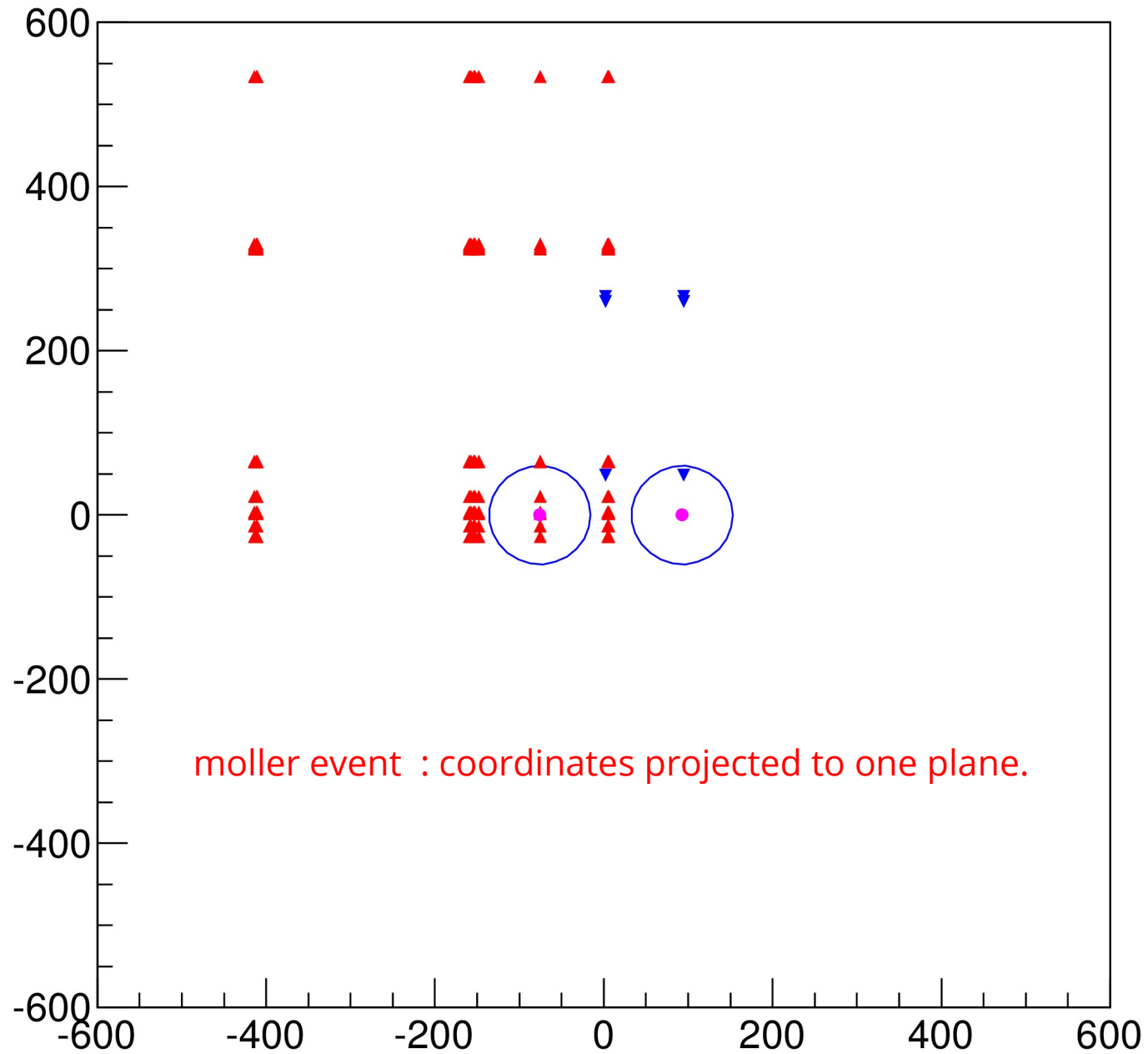
HyCal GEM Matching

For now, GEM Cluster Reconstruction Highly Dependent on HyCal



- 1, HyCal GEM Offset is not corrected.
- 2, Taking the closest one on GEM to be the match.
- 3, Many GEM clusters within the 60mm circle. They do not differ very much. The closest one may not be right.
- 4, If consider the offsets, this matching method won't give correct result.

HyCal GEM Matching



HyCal GEM Matching

