

# Problem of S2 right tail

Campaign V  
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23 Nov 2018

# Algorithm:

11713f949ea5bffc2f0ceb22d1267b5f314a5af

Merge branch 'barycenter' into 'master'

## Cut list:

```
bool cls0_is_S1 = clusters.at(0)->f90 > 0.2;
bool cls0_is_full = clusters.at(0)->rep == 1;

bool S1_Am_peak = (clusters.at(0)->charge > 440) &&
(clusters.at(0)->charge < 630); // mean +- 1.5sigma using run 537

//bool S1_Am_peak = (clusters.at(0)->charge > 419) &&
(clusters.at(0)->charge < 587); // mean +- 1.5sigma using run 542

//bool S1_Am_peak = (clusters.at(0)->charge > 342) &&
(clusters.at(0)->charge < 482); // mean +- 1.5sigma using run 544

bool cls0 = nc_i == 0;//cluster 0
bool cls1 = nc_i == 1;//cluster 1

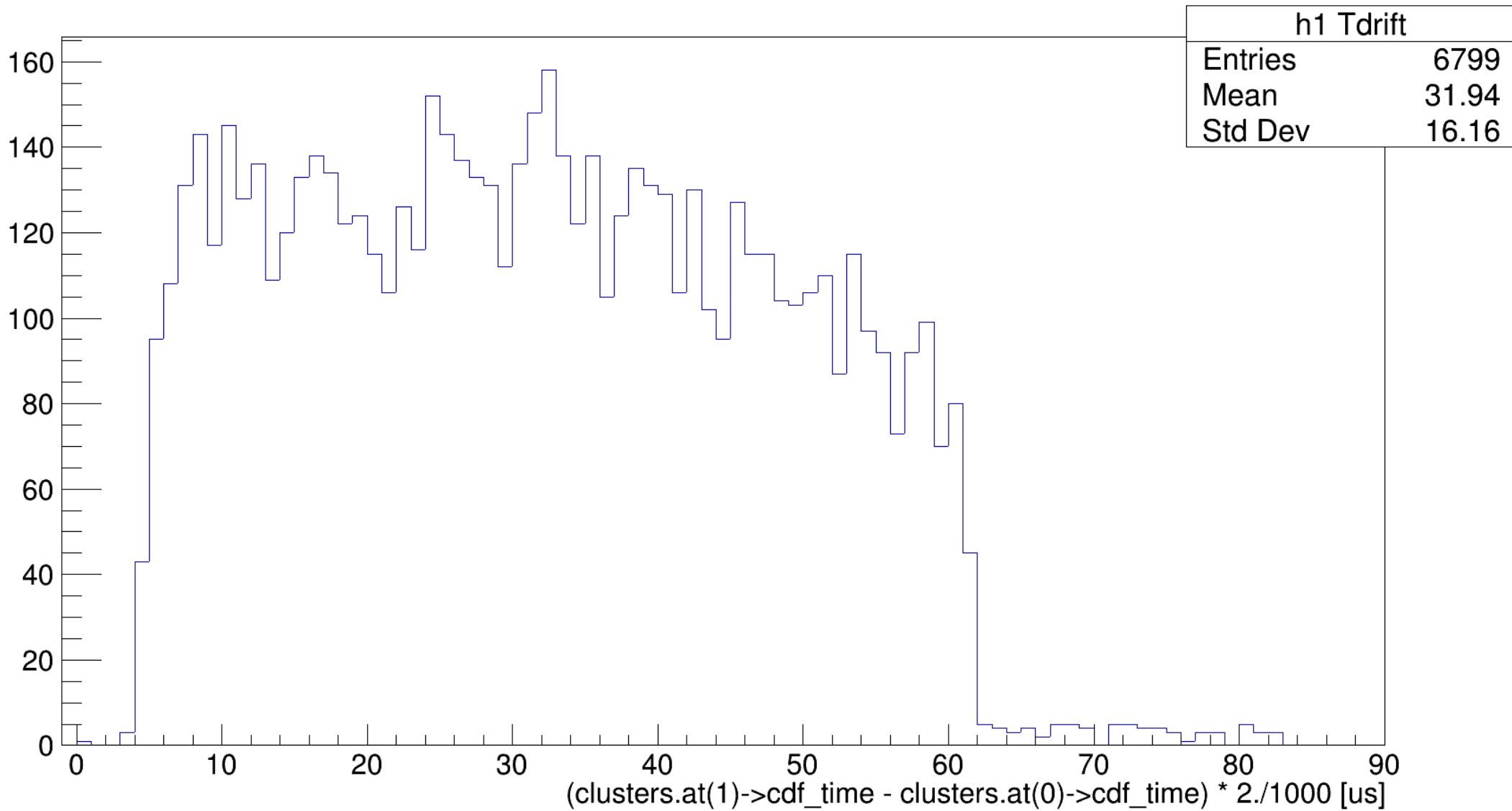
bool is_S1 = nc == 2 && cls0 && cls0_is_full && cls0_is_S1;
bool is_S2 = nc == 2 && cls1 && cls0_is_full && cls0_is_S1;
bool is_S2_v2 = is_S2 && clusters.at(0)->f90 < 0.2;

bool is_S1_only = nc == 1 && cls0_is_full && cls0_is_S1;
bool is_S1_S2 = nc == 2 && cls0_is_full && cls0_is_S1;
```

Ph2, Am241, run 537

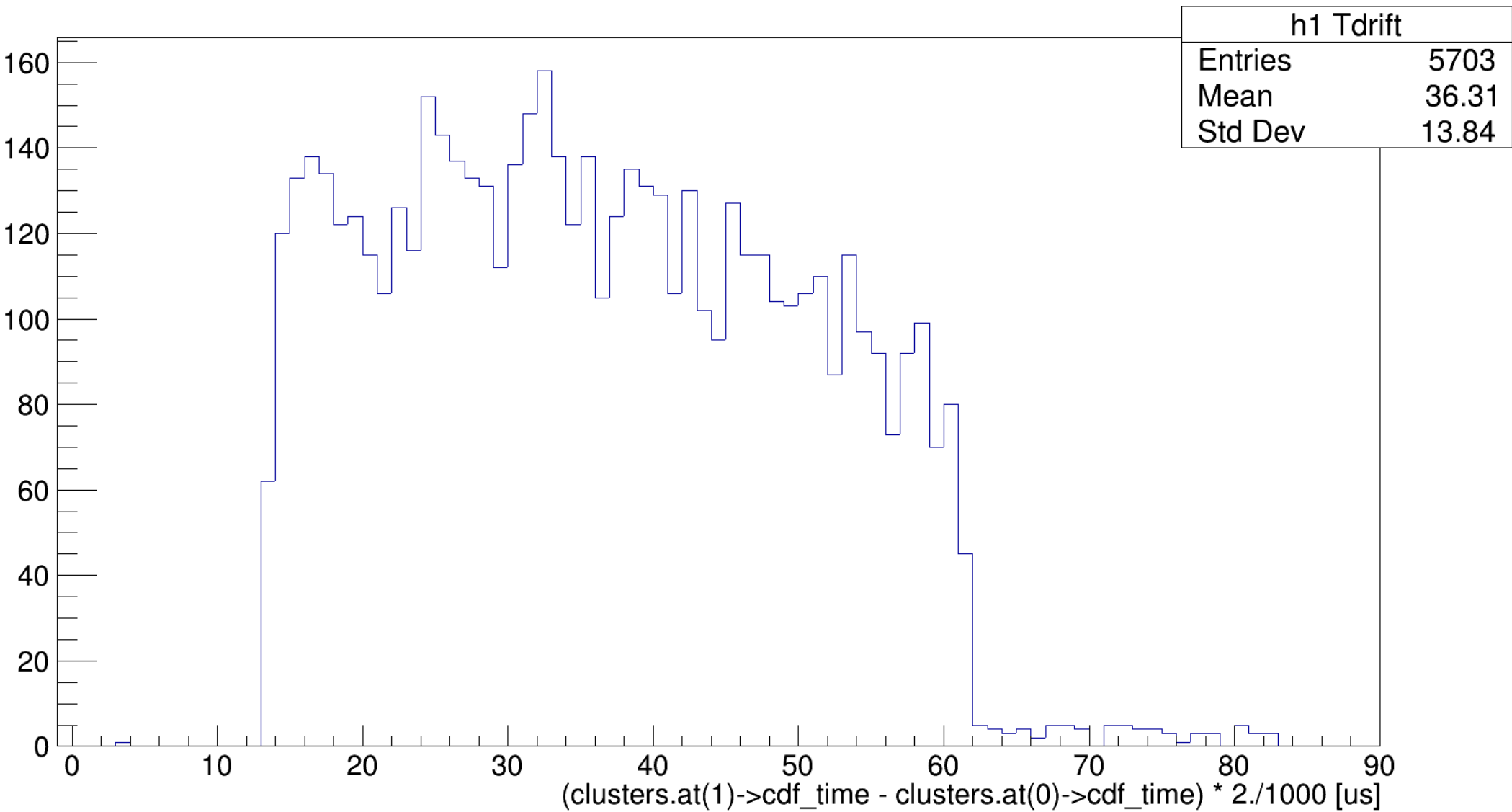
# Ph2, Am241, run 537

C0.nc == 2



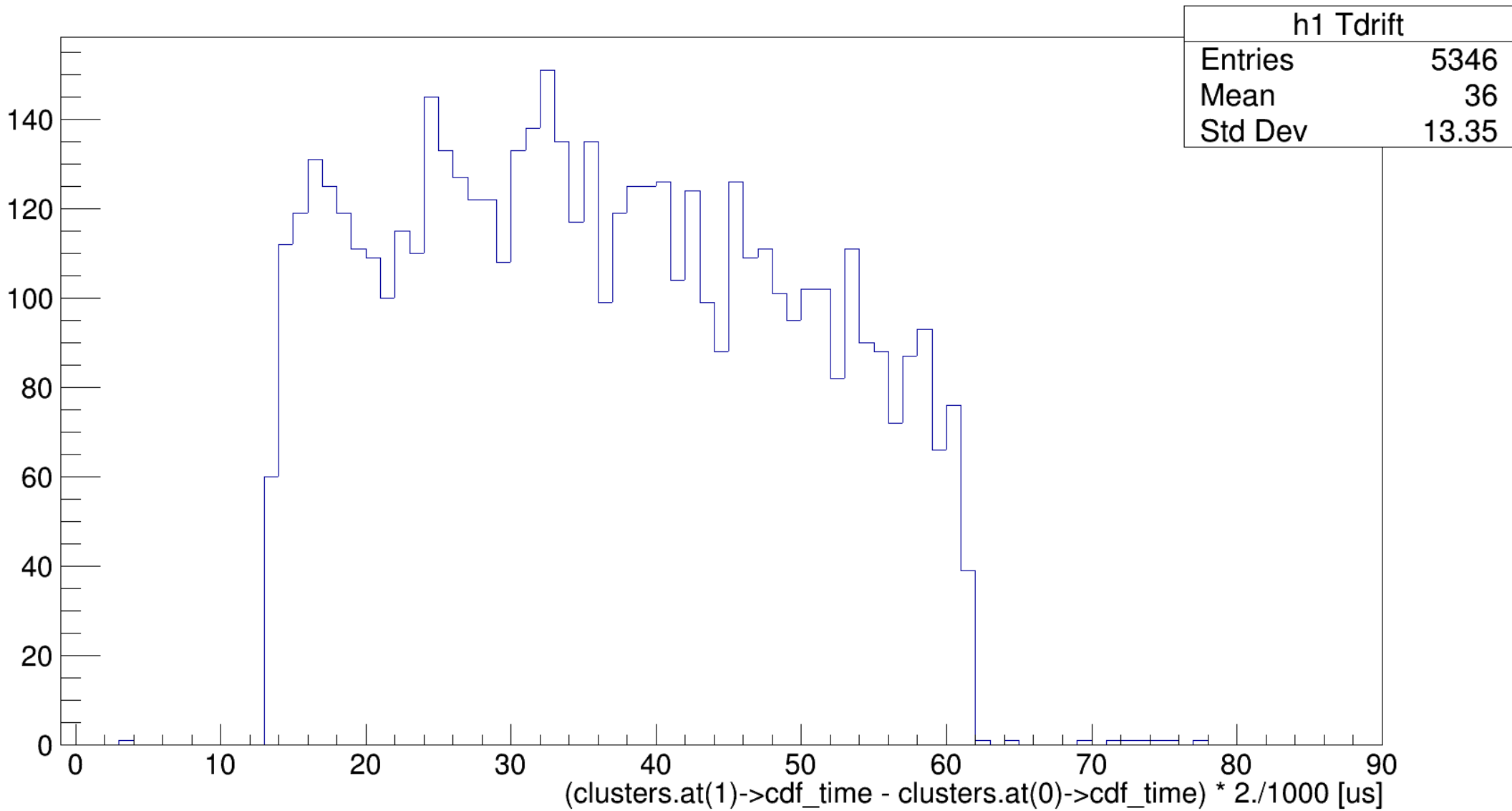
# Ph2, Am241, run 537

C0.nc == 2 && C0.cls0\_is\_full



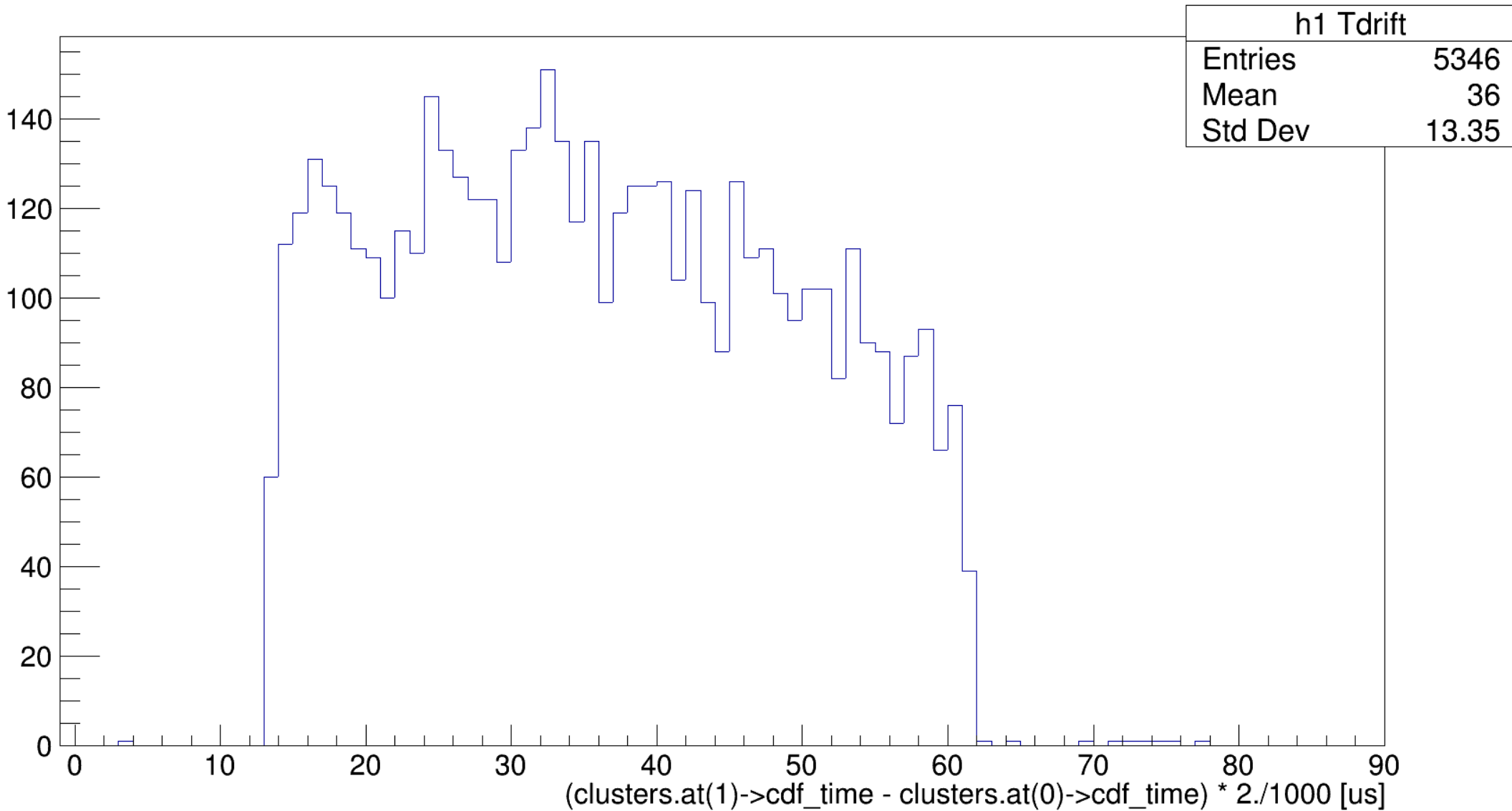
# Ph2, Am241, run 537

C0.nc == 2 && C0.cls0\_is\_full && C0.cls0\_is\_S1



# Ph2, Am241, run 537

C0.is\_S1\_S2

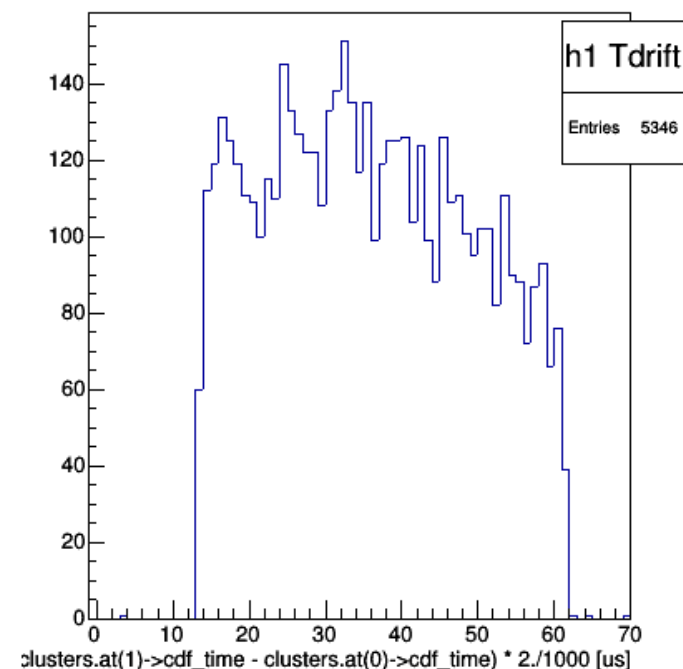
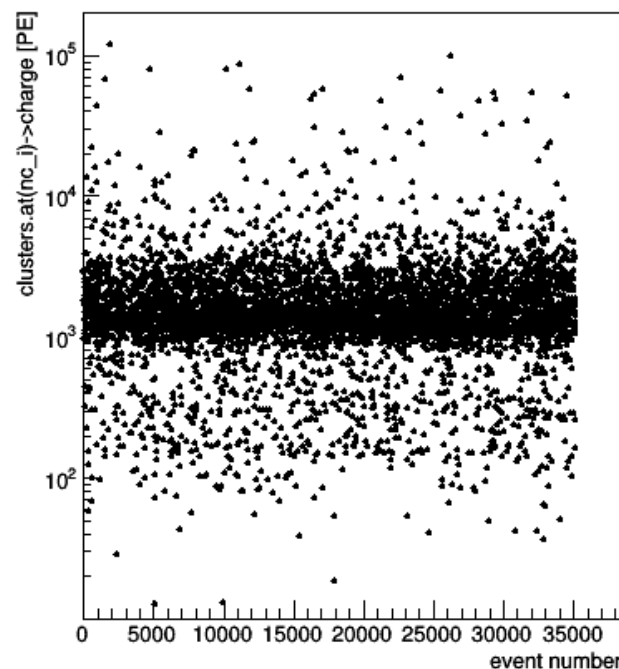
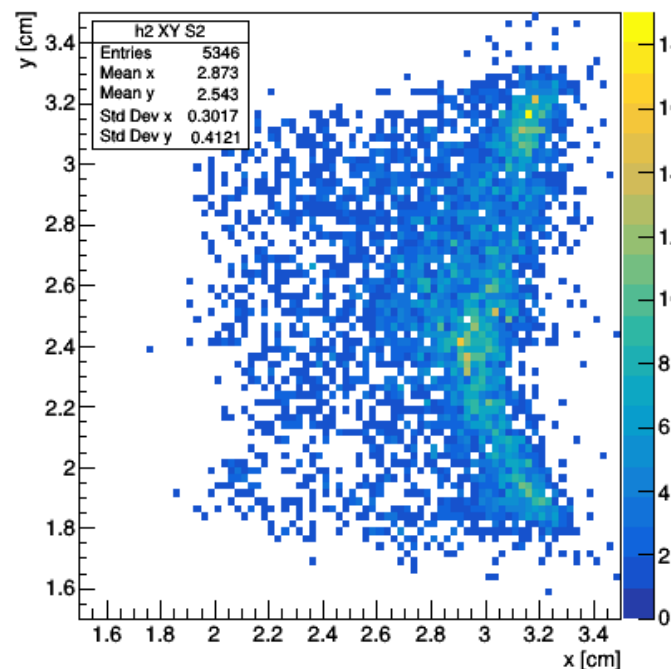




master cut  
C0.is\_S1\_S2

C1.is\_S2

C1.is\_S2

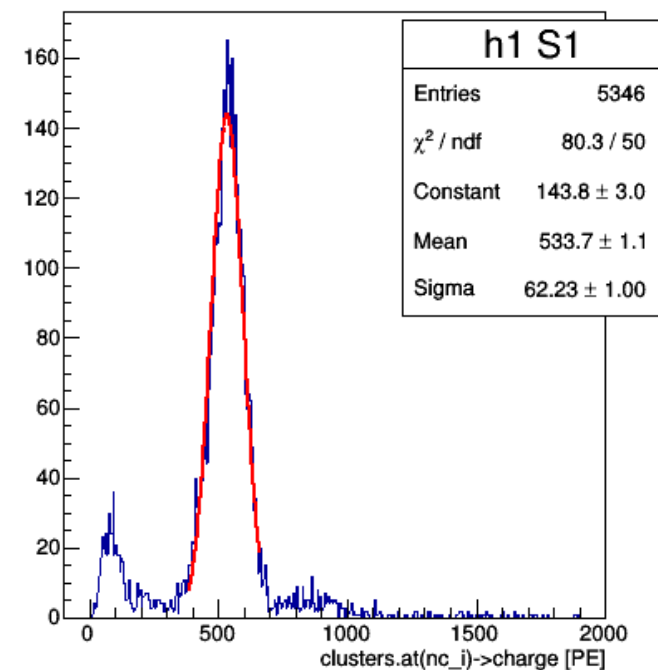
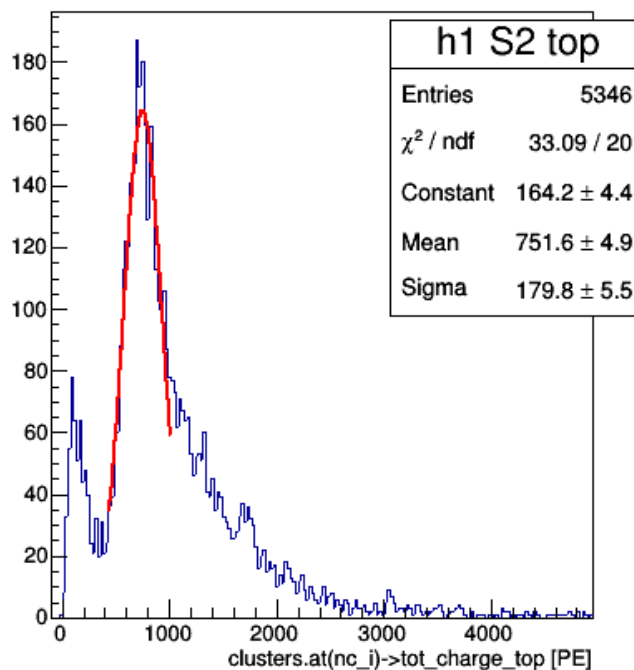
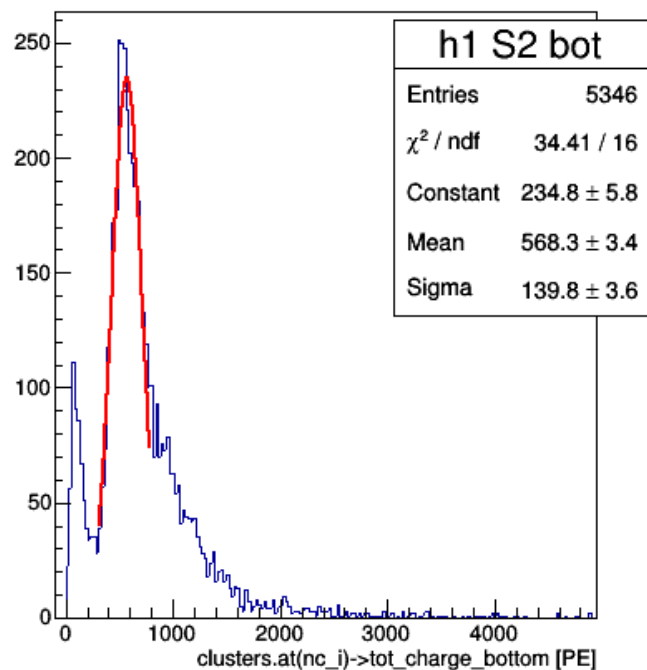


C1.is\_S2

Ph2, Am241, run 537

C1.is\_S2

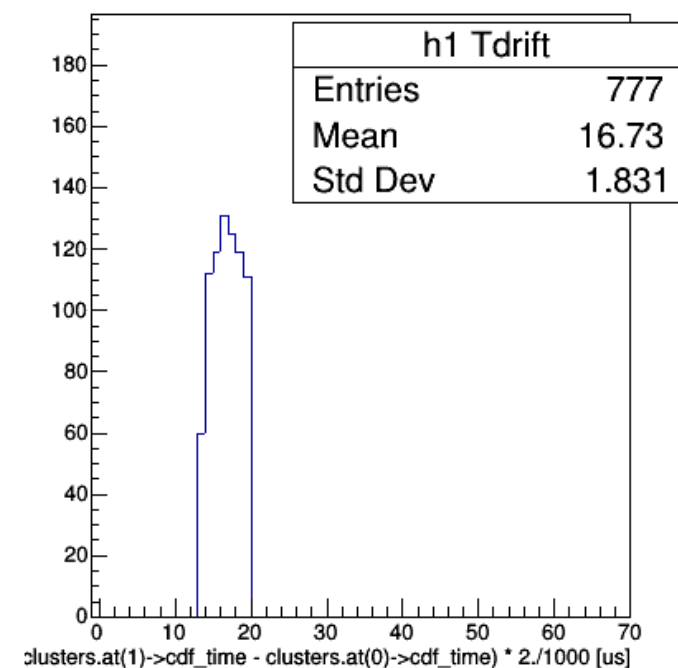
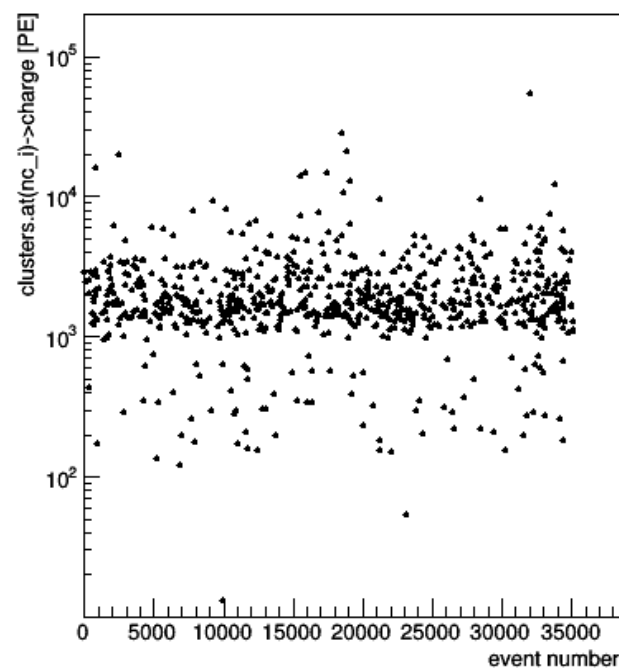
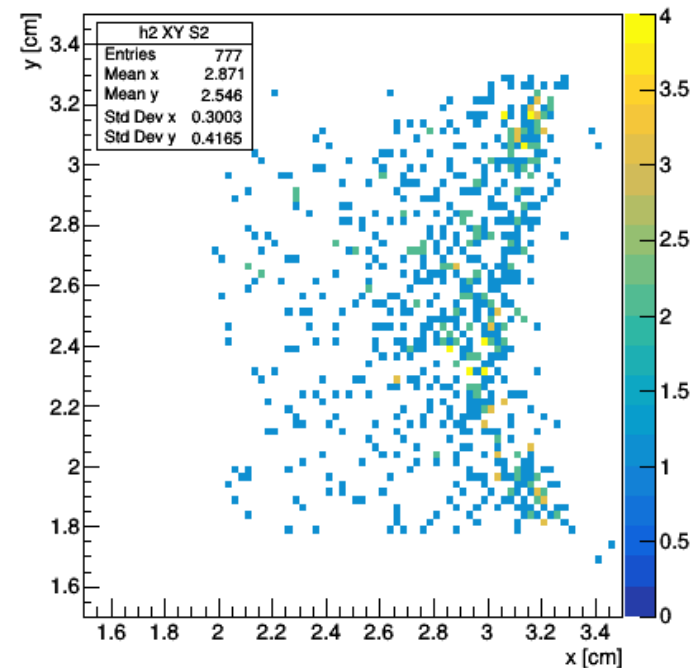
C2.is\_S1



master cut  
C0.is\_S1\_S2

C1.is\_S2 && Tdrift > 10 && Tdrift < 20

C1.is\_S2 && Tdrift > 10 && Tdrift < 20

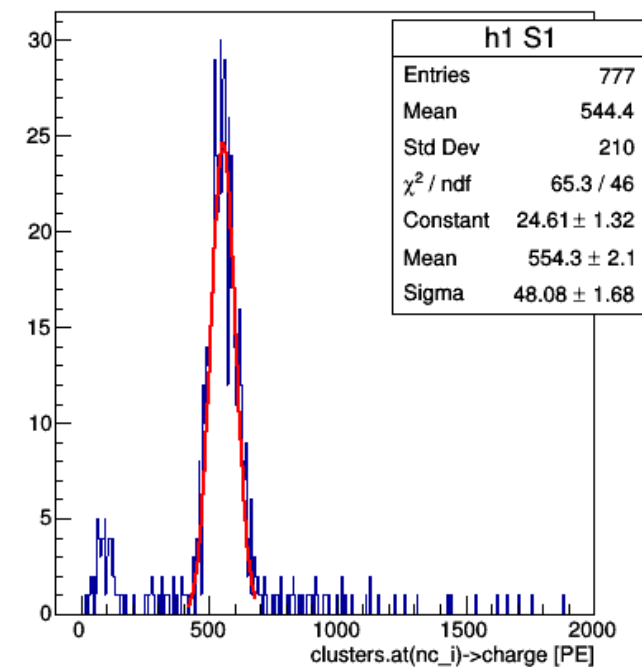
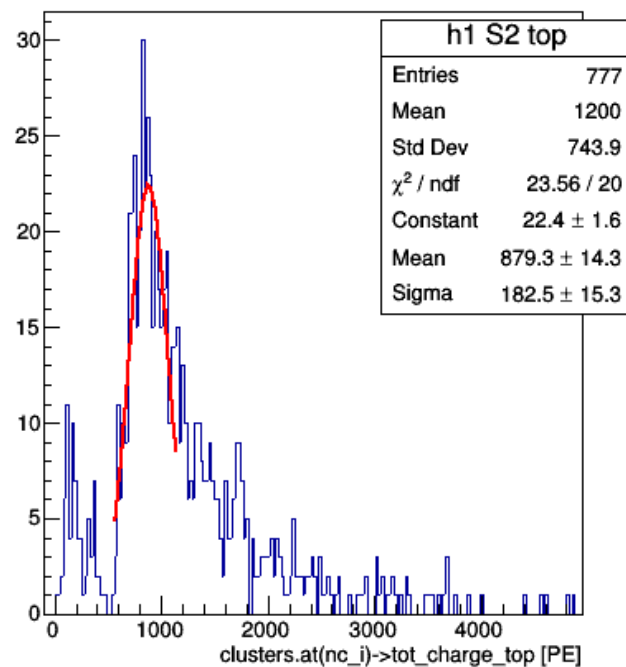
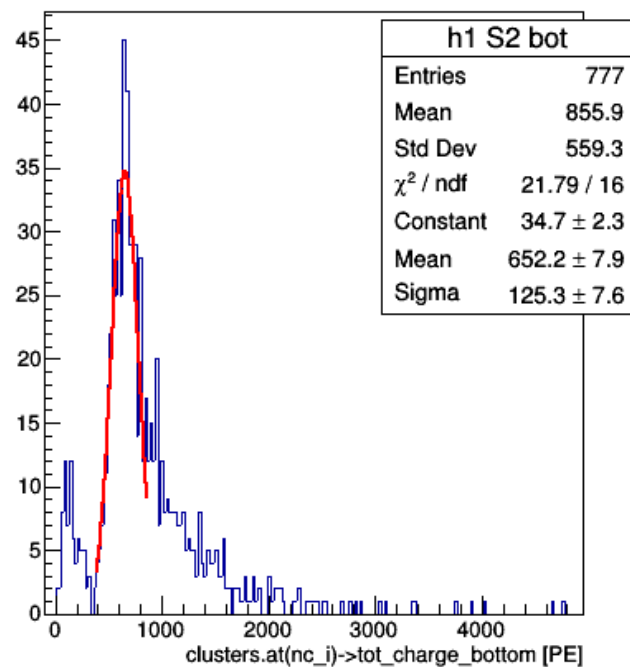


Ph2, Am241, run 537

C1.is\_S2 && Tdrift > 10 && Tdrift < 20

C1.is\_S2 && Tdrift > 10 && Tdrift < 20

C2.is\_S1

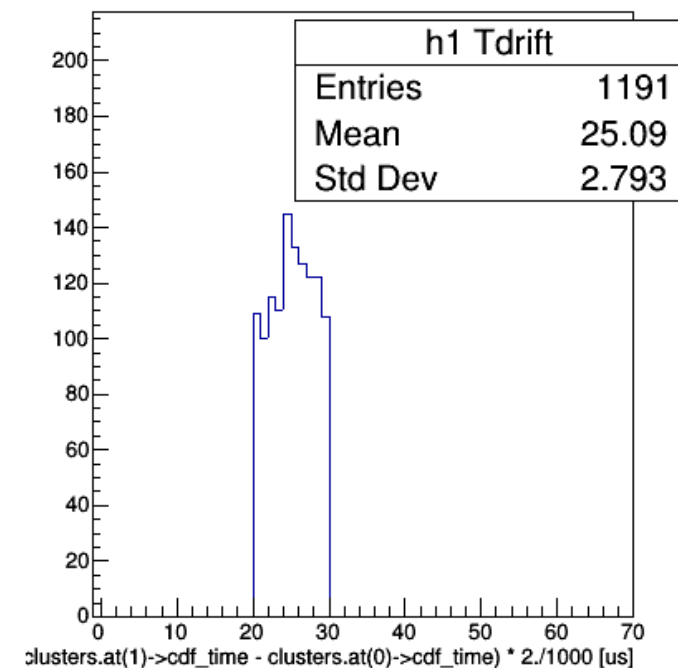
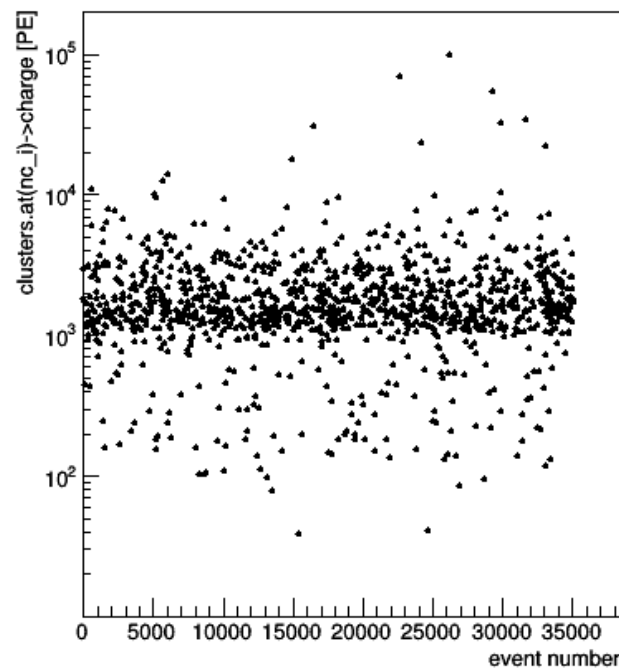
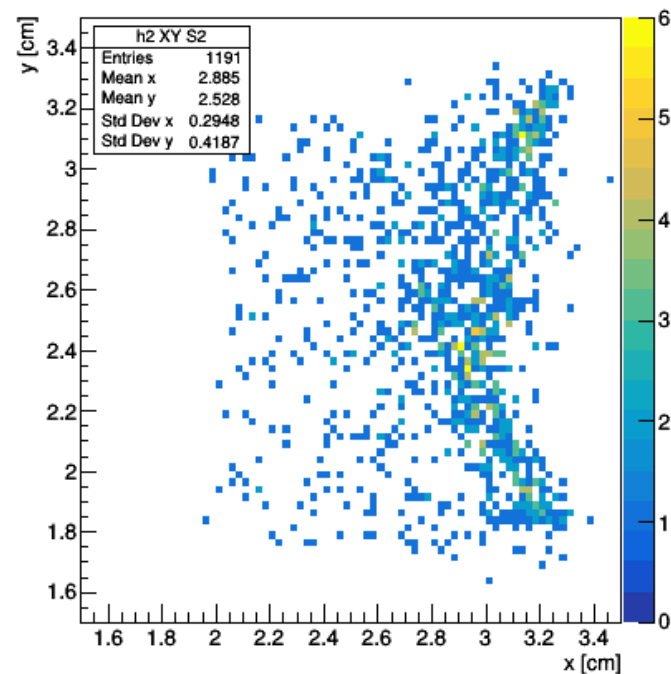


master cut

C1.is\_S2 && Tdrift > 20 && Tdrift < 30

C1.is\_S2 && Tdrift > 20 && Tdrift < 30

C0.is\_S1\_S2

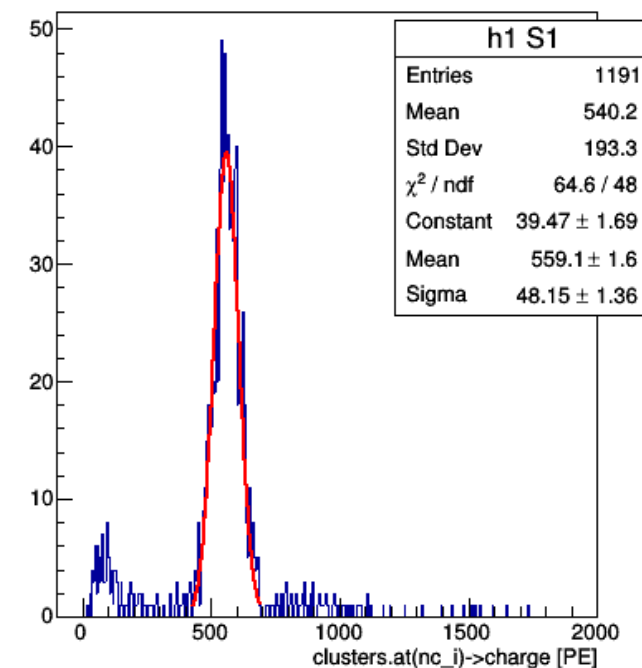
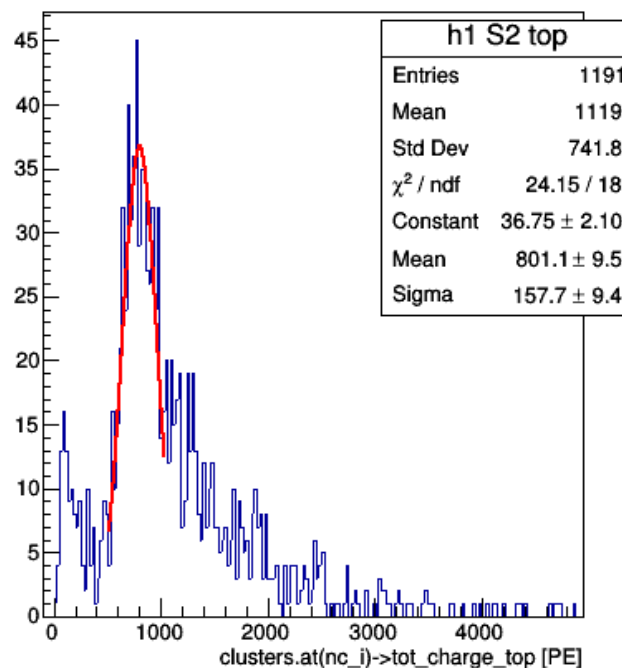
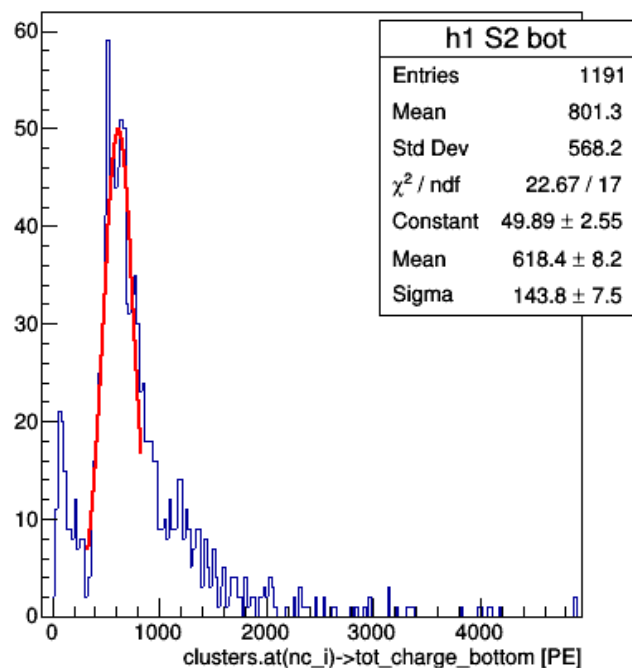


Ph2, Am241, run 537

C1.is\_S2 && Tdrift > 20 && Tdrift < 30

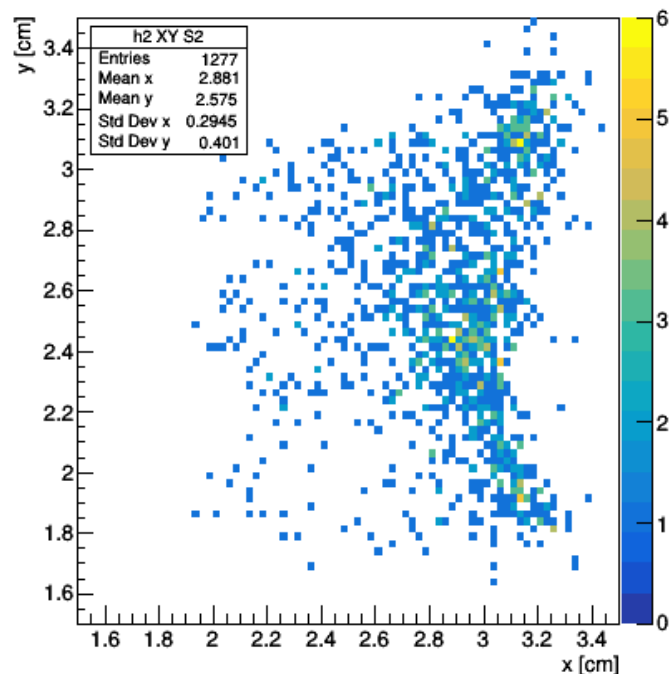
C1.is\_S2 && Tdrift > 20 && Tdrift < 30

C2.is\_S1

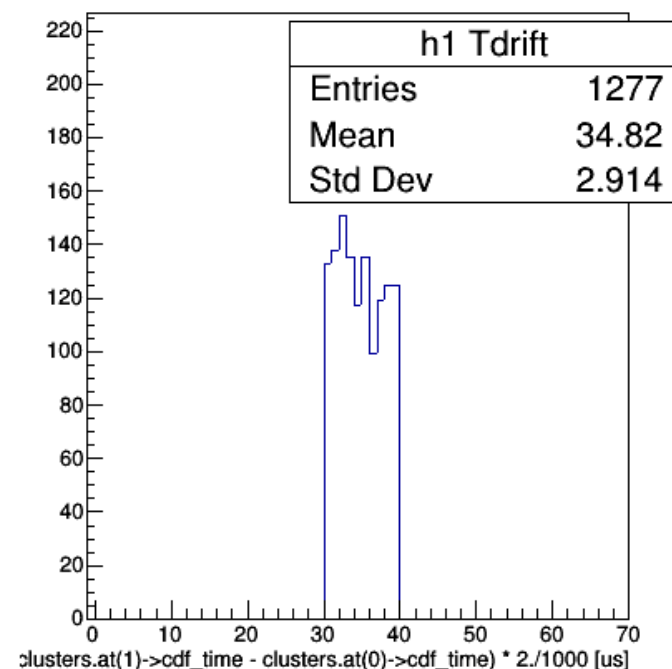
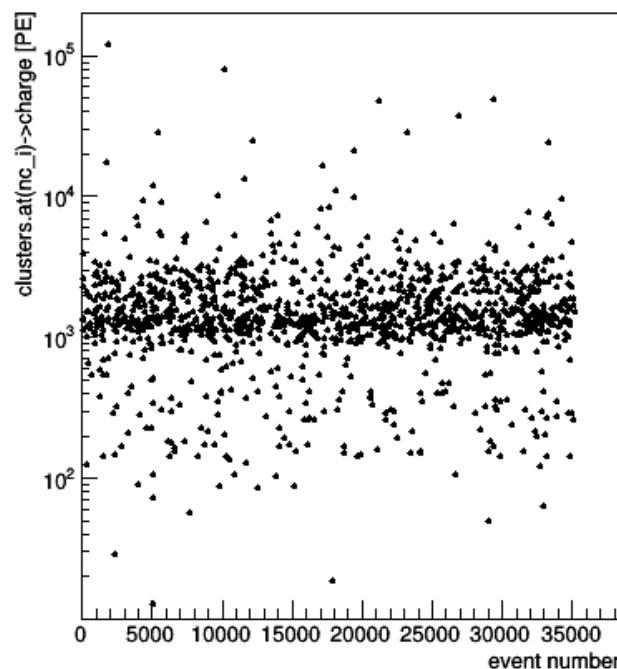


master cut  
C0.is\_S1\_S2

C1.is\_S2 && Tdrift > 30 && Tdrift < 40

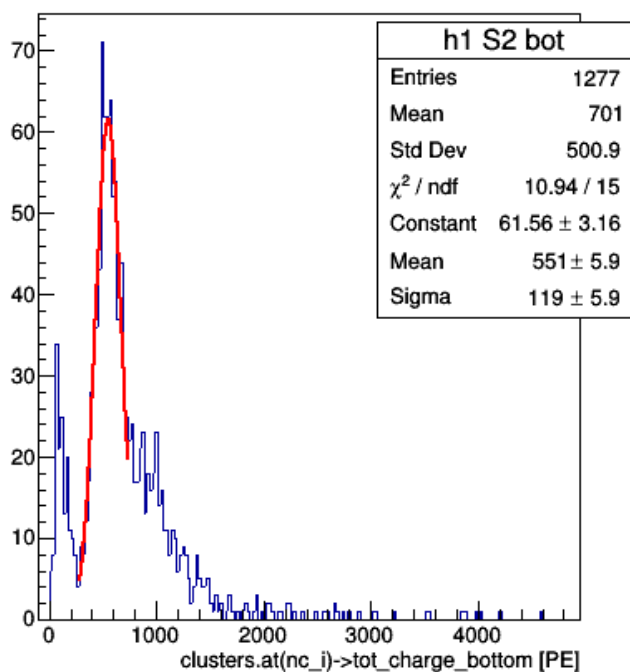


C1.is\_S2 && Tdrift > 30 && Tdrift < 40

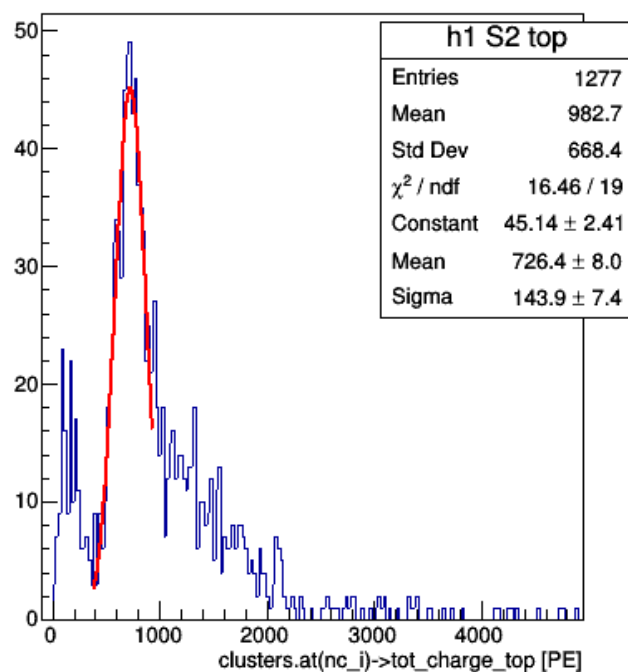


Ph2, Am241, run 537

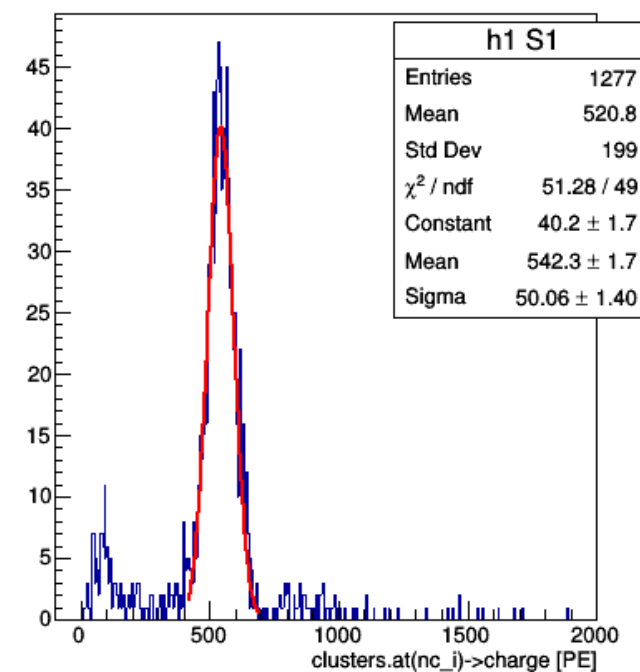
C1.is\_S2 && Tdrift > 30 && Tdrift < 40



C1.is\_S2 && Tdrift > 30 && Tdrift < 40



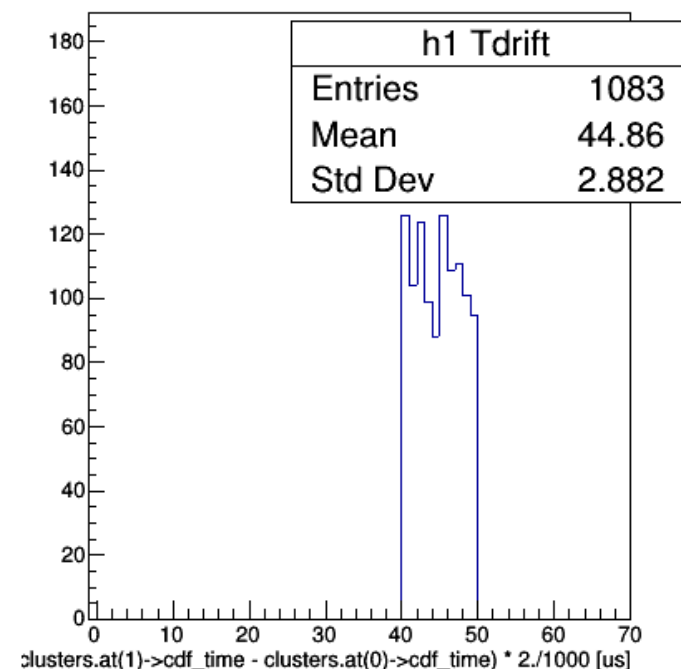
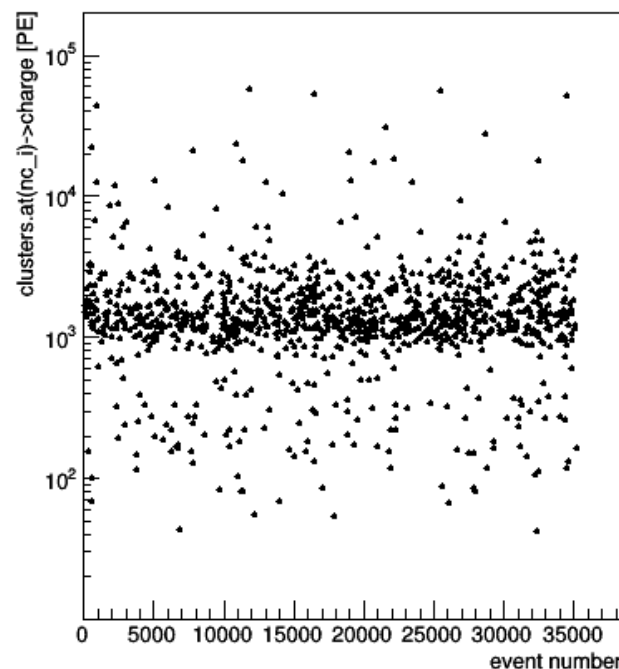
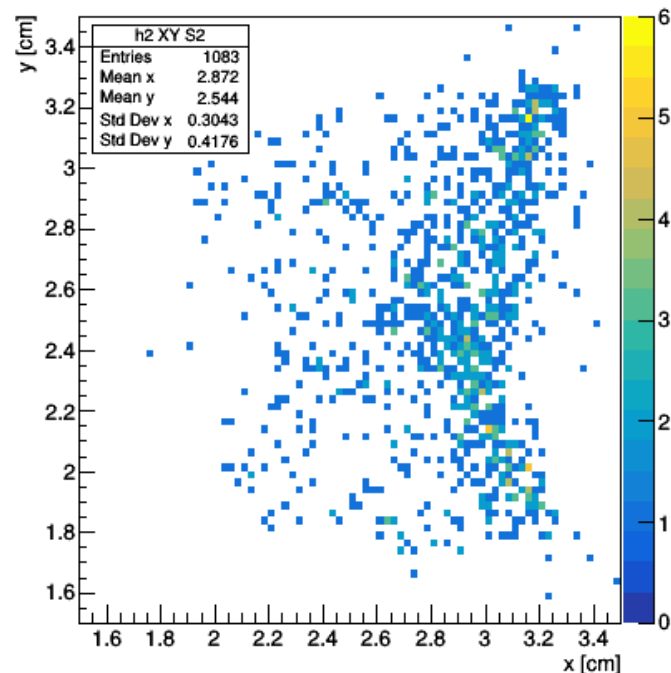
C2.is\_S1



master cut  
C0.is\_S1\_S2

C1.is\_S2 && Tdrift > 40 && Tdrift < 50

C1.is\_S2 && Tdrift > 40 && Tdrift < 50

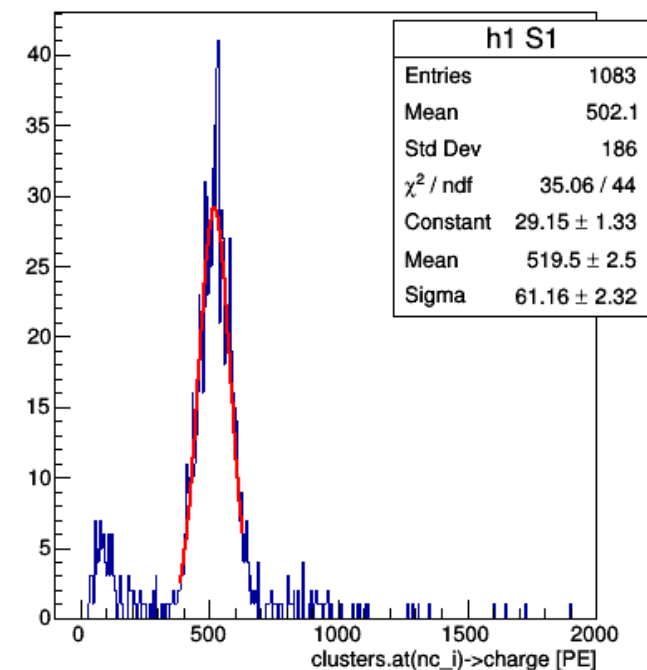
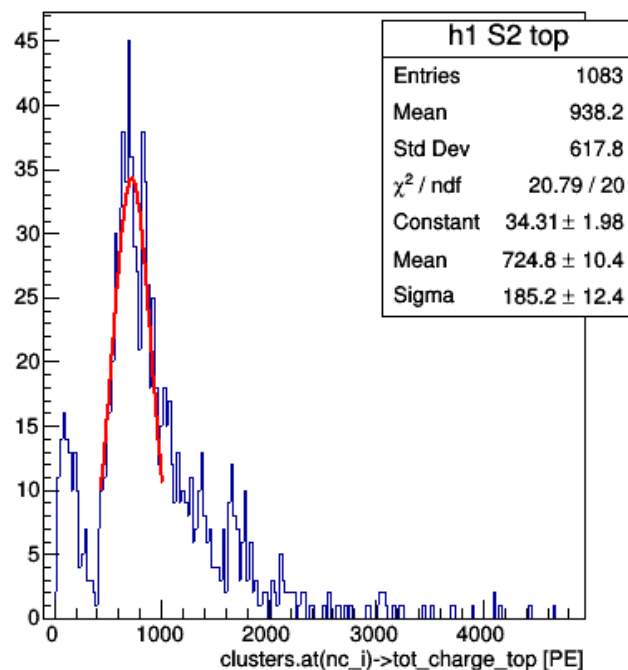
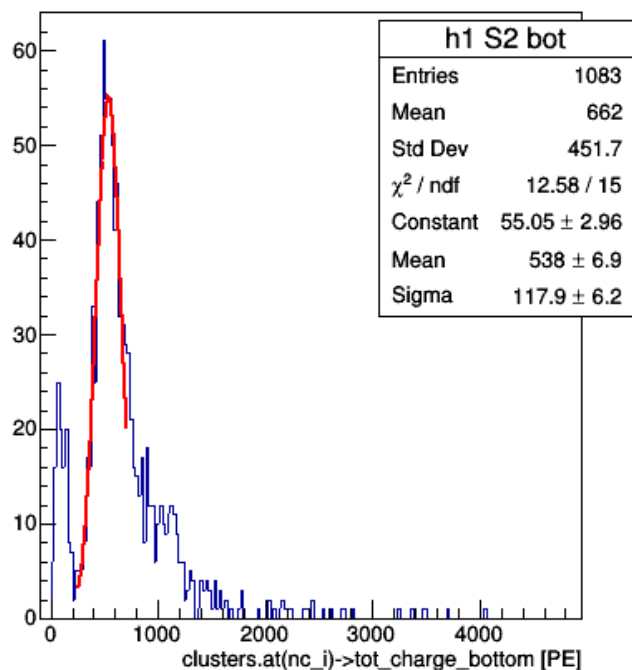


Ph2, Am241, run 537

C1.is\_S2 && Tdrift > 40 && Tdrift < 50

C1.is\_S2 && Tdrift > 40 && Tdrift < 50

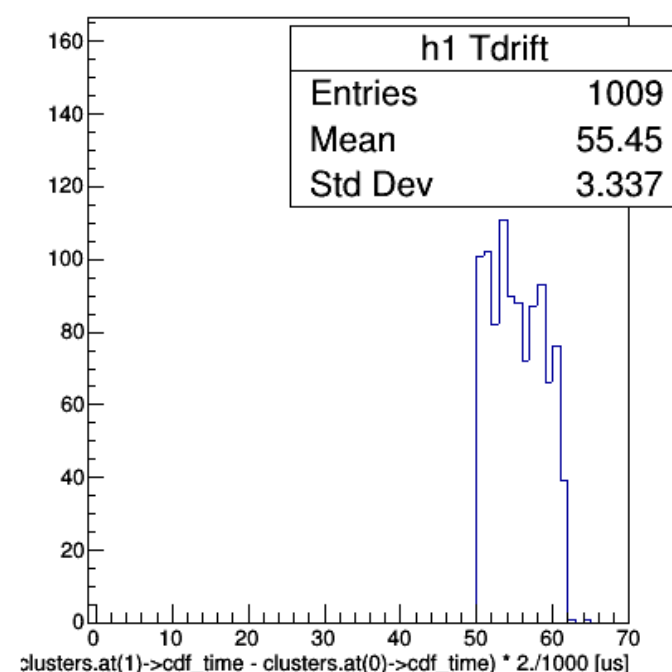
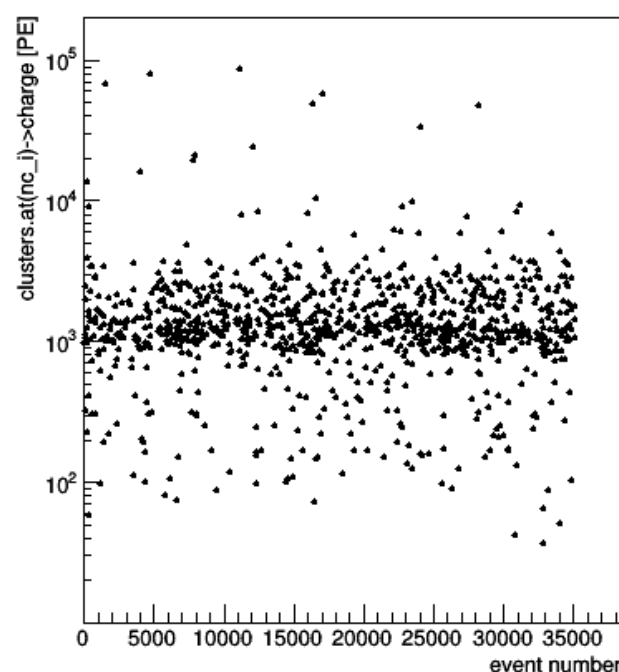
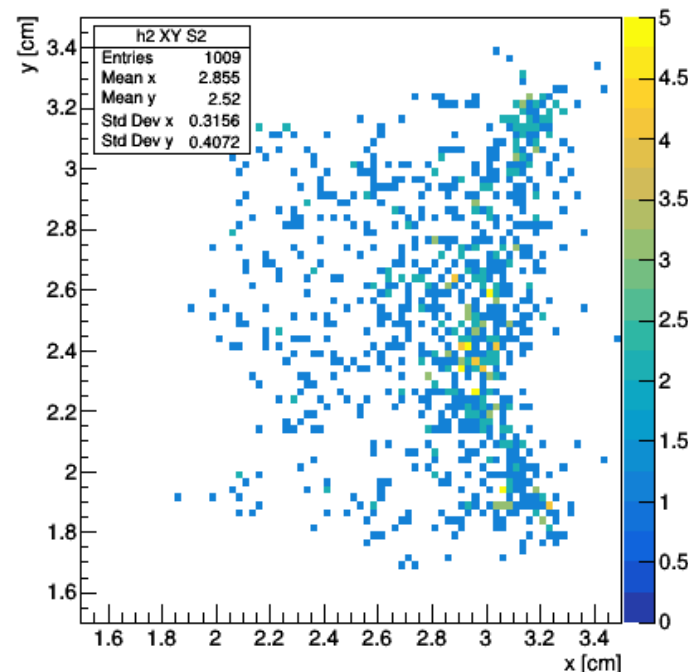
C2.is\_S1



master cut  
C0.is\_S1\_S2

C1.is\_S2 && Tdrift > 50 && Tdrift < 65

C1.is\_S2 && Tdrift > 50 && Tdrift < 65

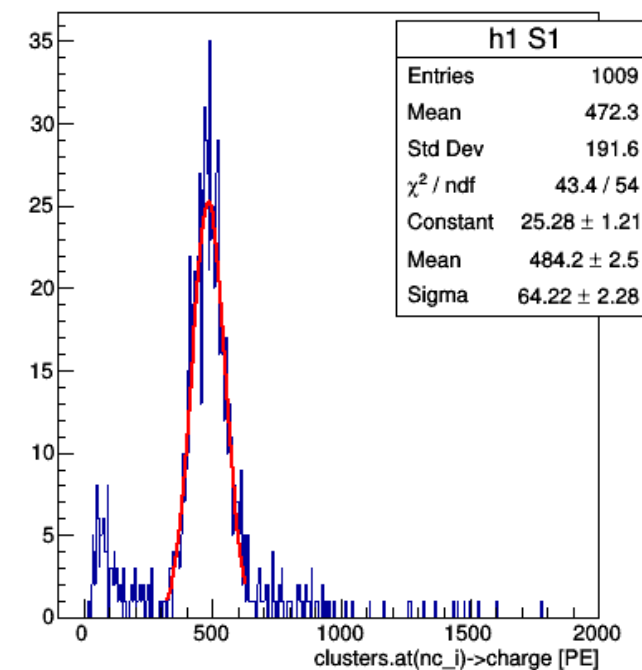
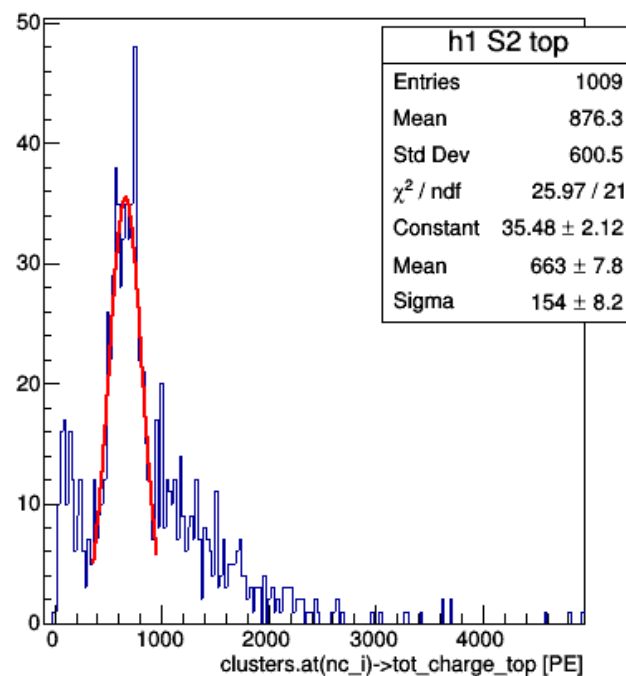
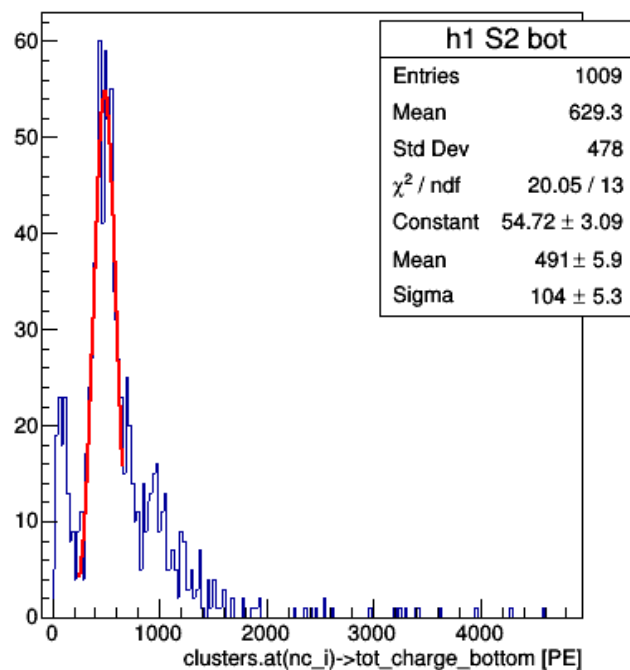


Ph2, Am241, run 537

C1.is\_S2 && Tdrift > 50 && Tdrift < 65

C1.is\_S2 && Tdrift > 50 && Tdrift < 65

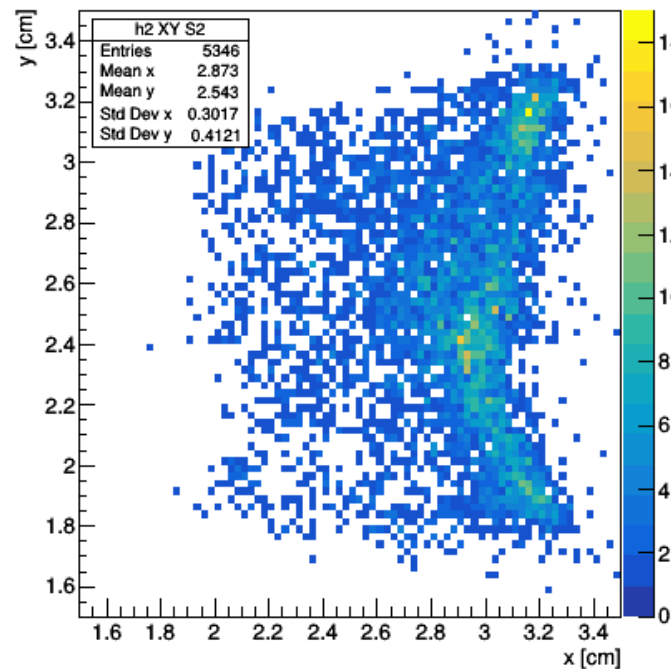
C2.is\_S1



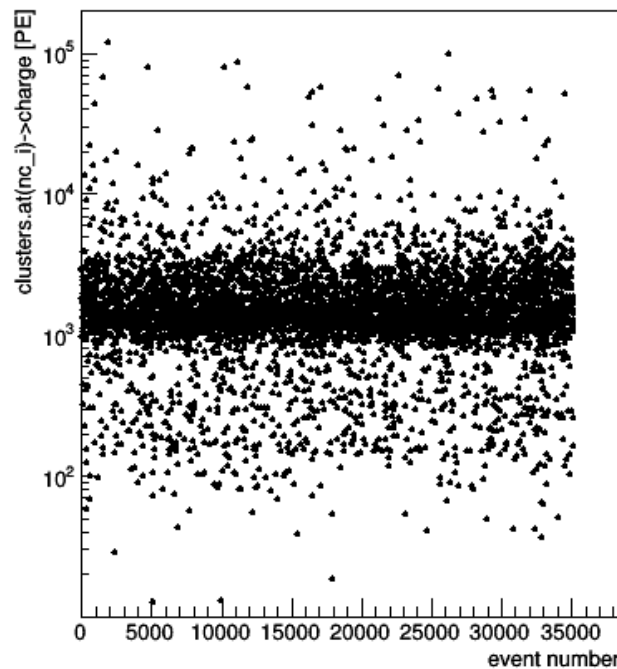


master cut

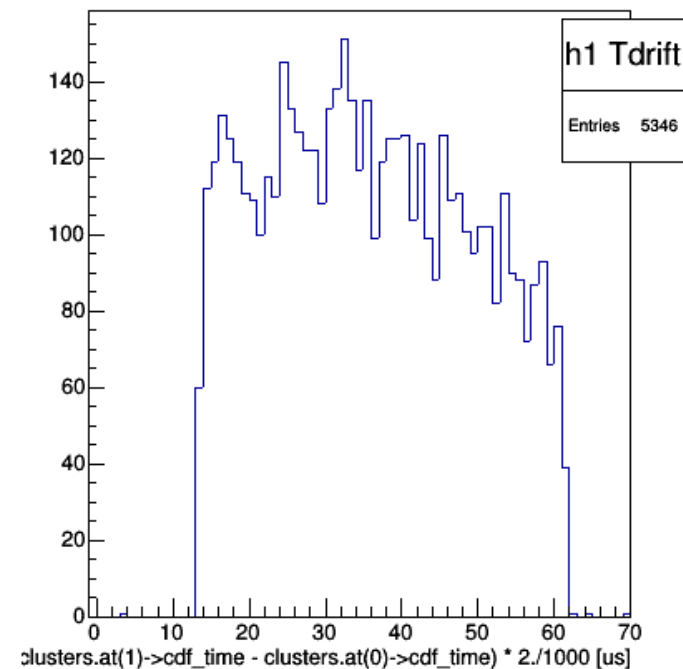
C1.is\_S2



C1.is\_S2



C0.is\_S1\_S2

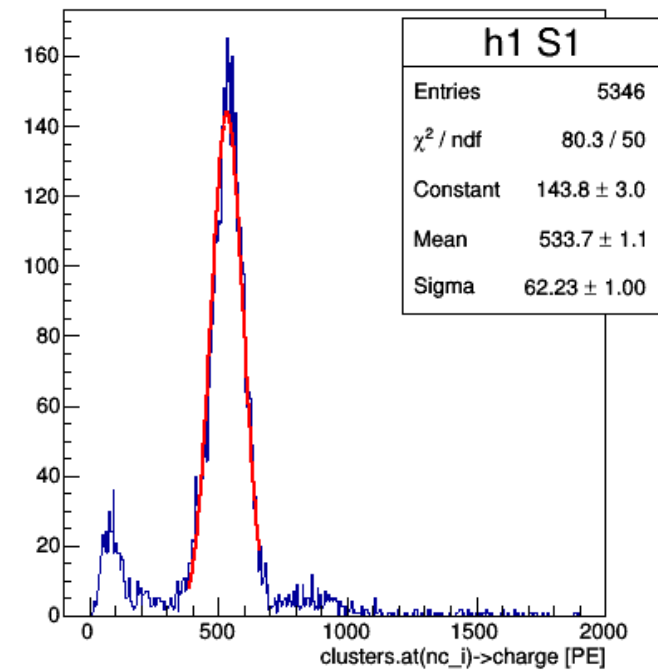
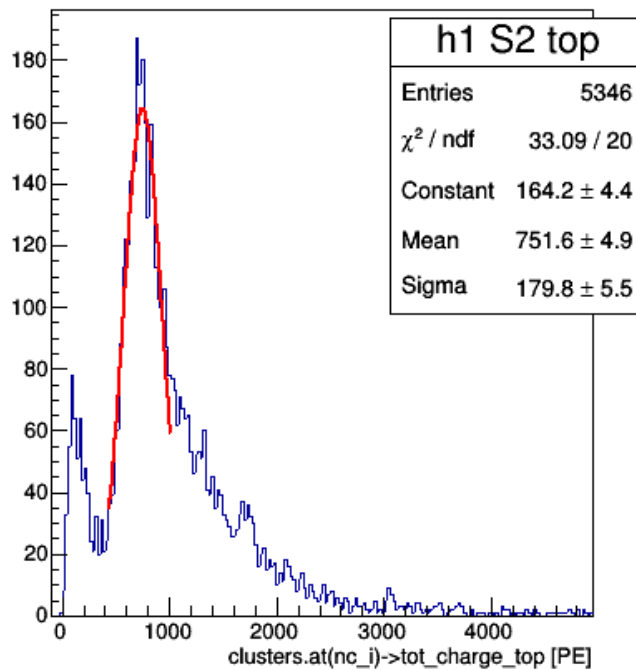
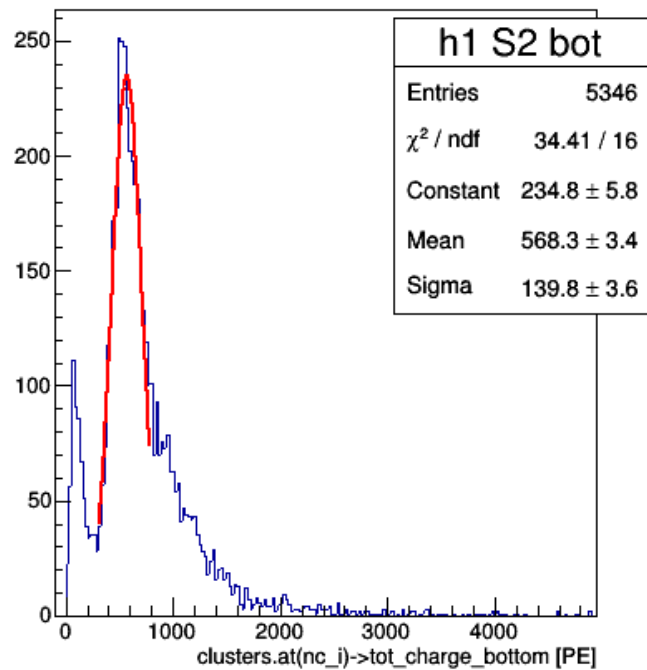


C1.is\_S2

Ph2, Am241, run 537

C1.is\_S2

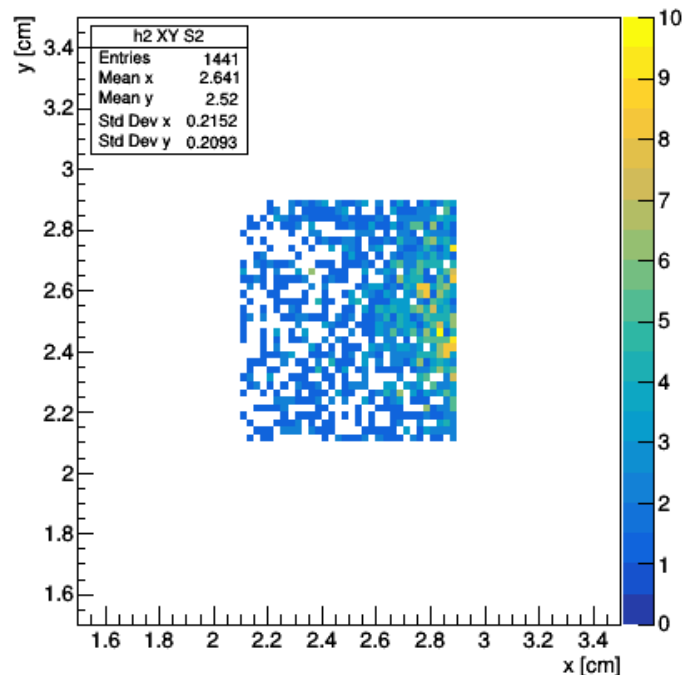
C2.is\_S1



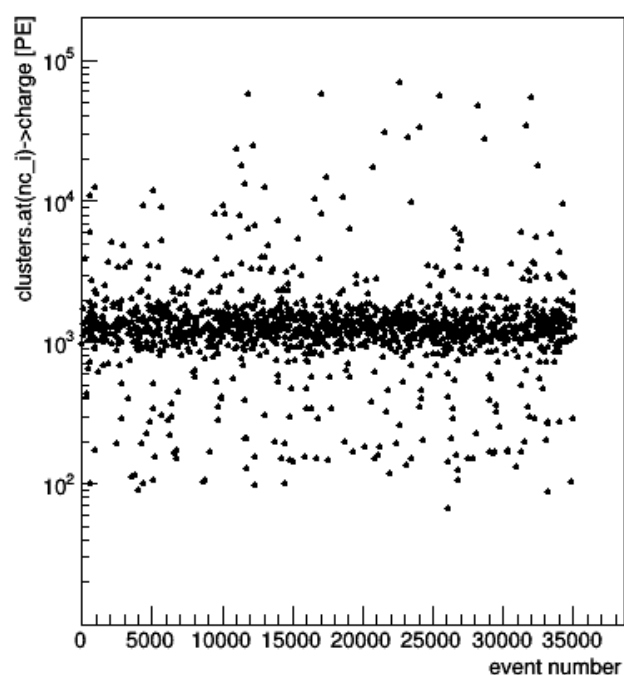


master cut

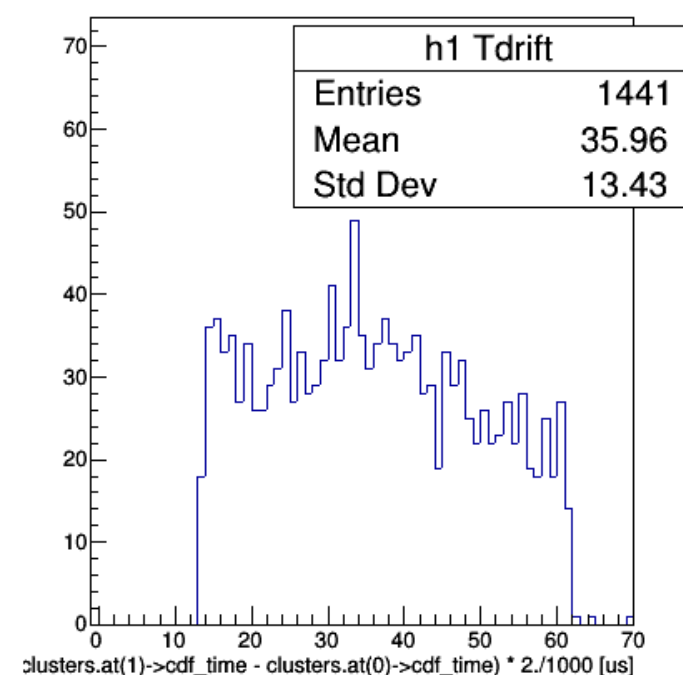
C1.is\_S2 && C1.cent\_spot



C1.is\_S2 && C1.cent\_spot

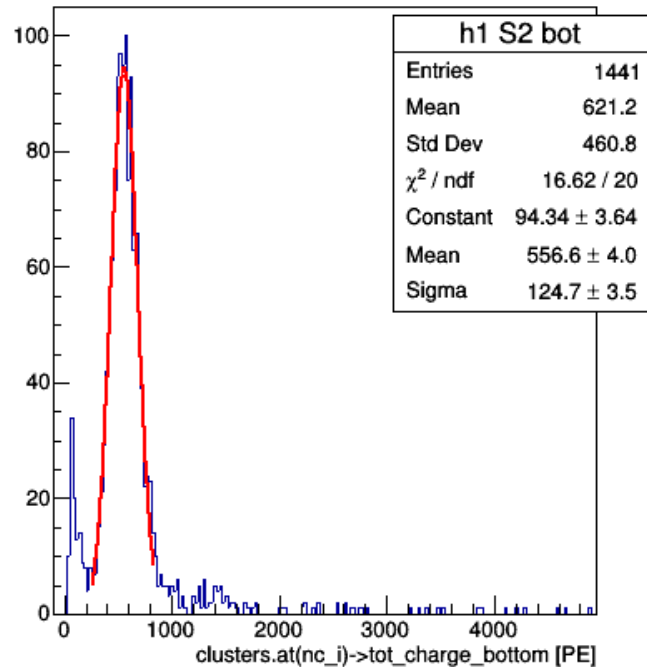


C0.is\_S1\_S2

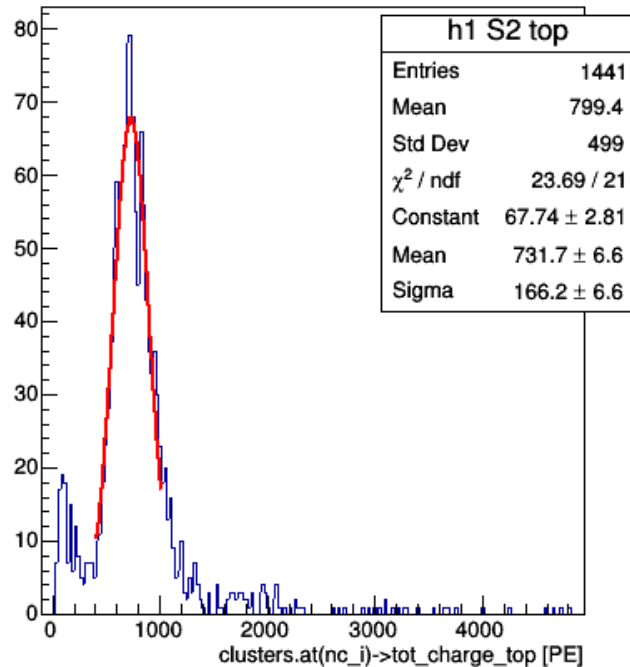


Ph2, Am241, run 537

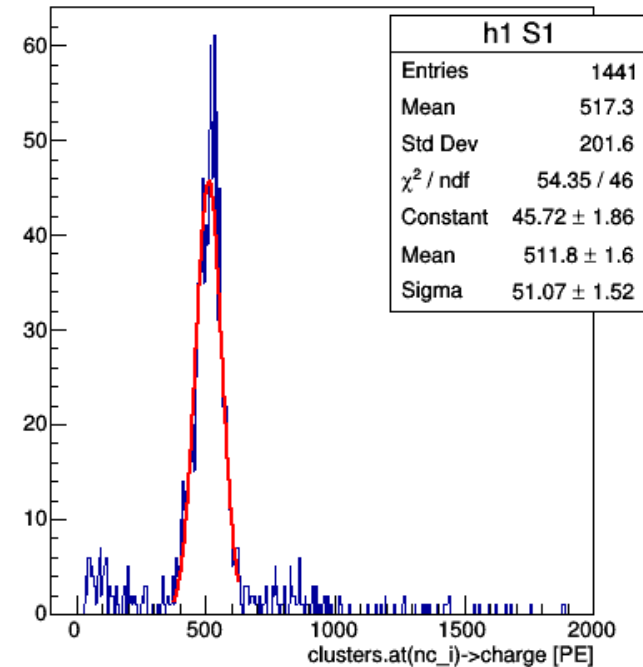
C1.is\_S2 && C1.cent\_spot



C1.is\_S2 && C1.cent\_spot

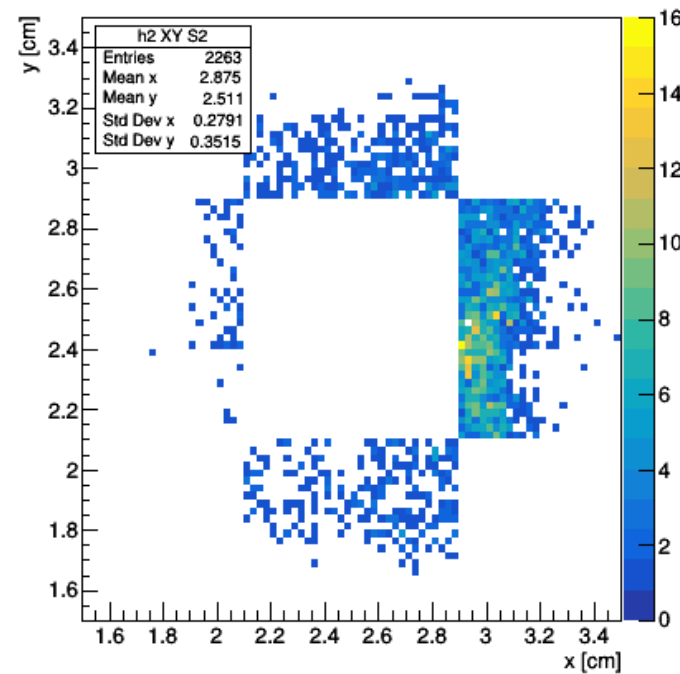


C2.is\_S1

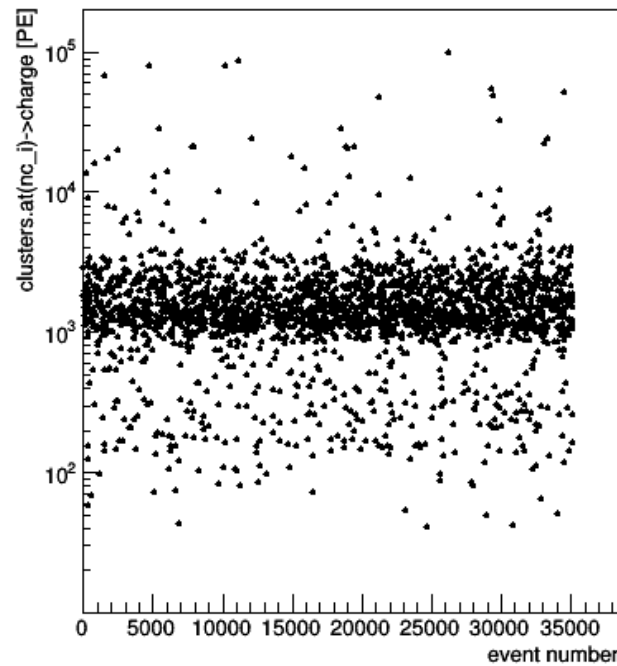


master cut

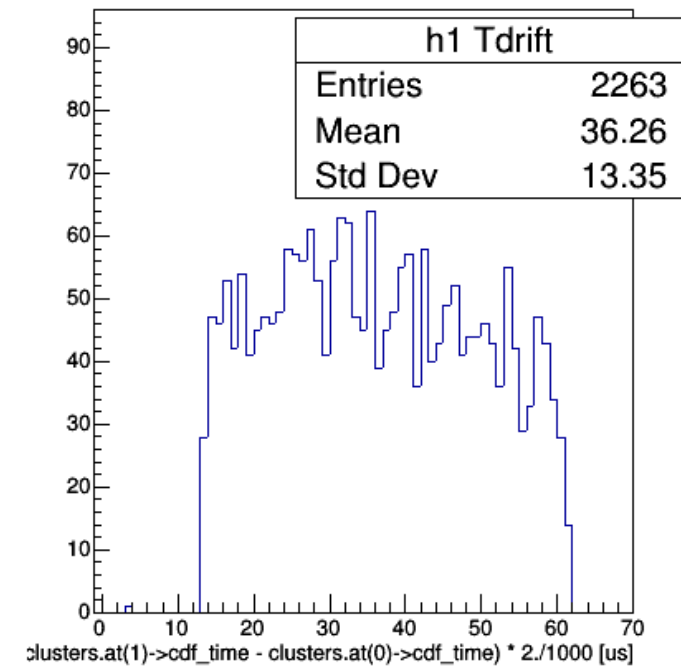
C1.is\_S2 && C1.edges



C1.is\_S2 && C1.edges

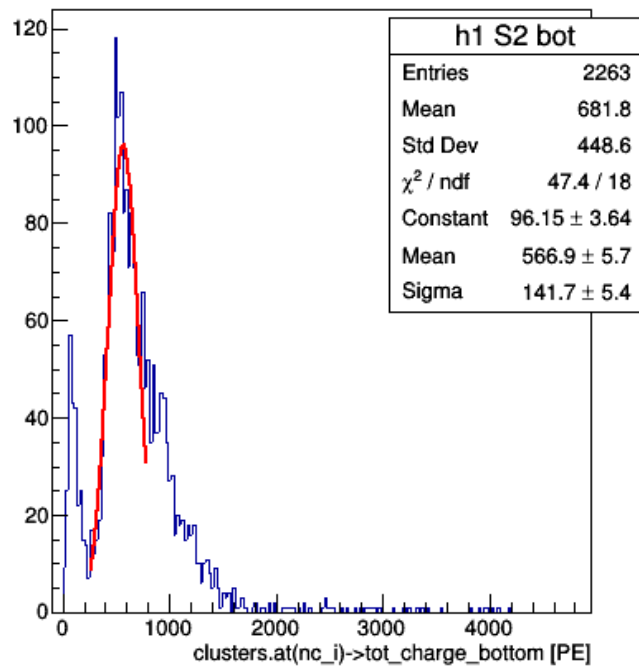


C0.is\_S1\_S2

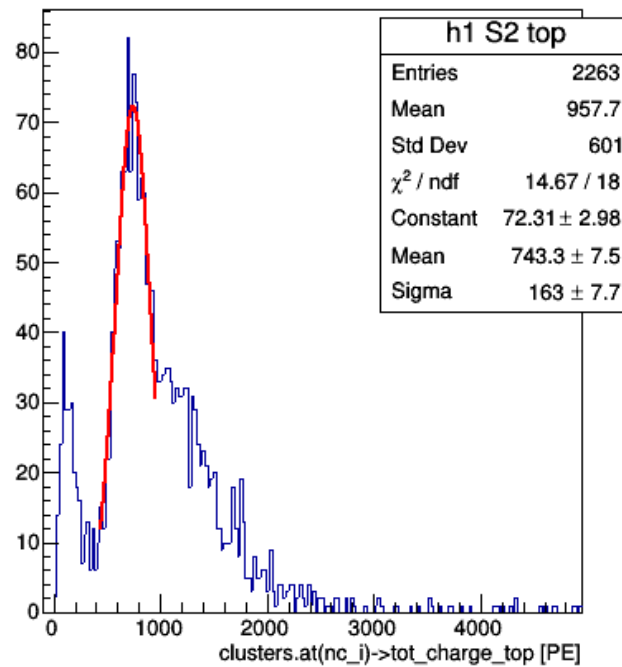


Ph2, Am241, run 537

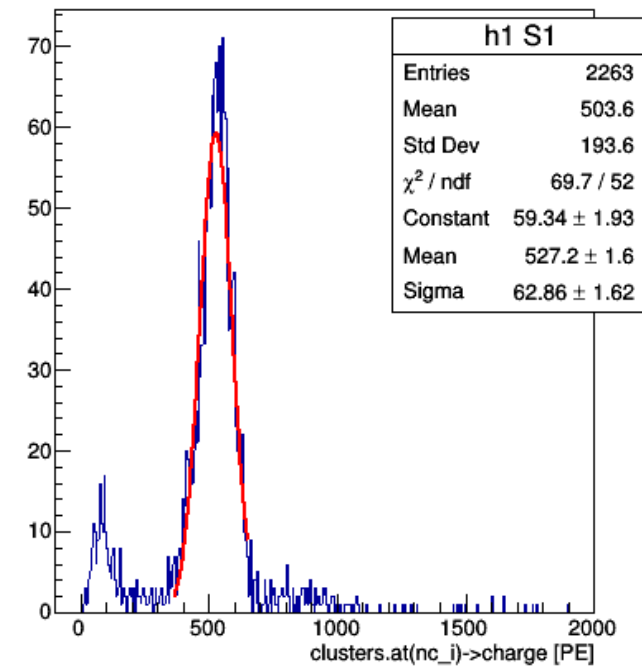
C1.is\_S2 && C1.edges



C1.is\_S2 && C1.edges

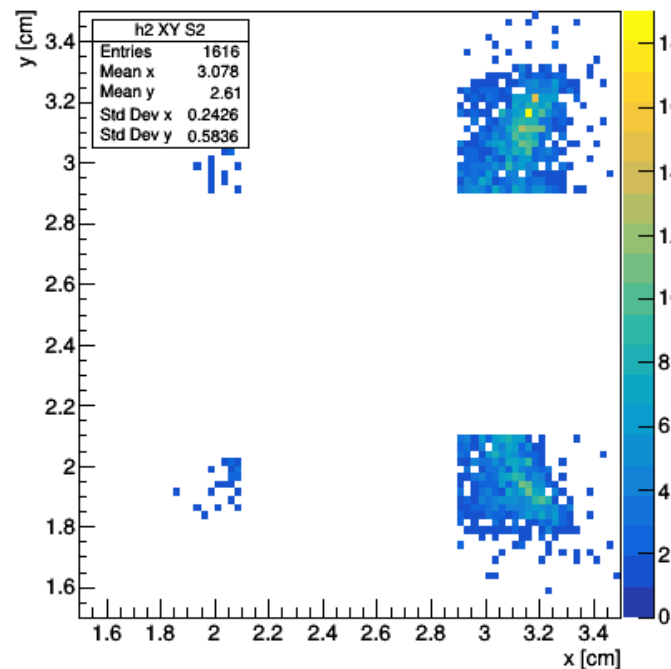


C2.is\_S1

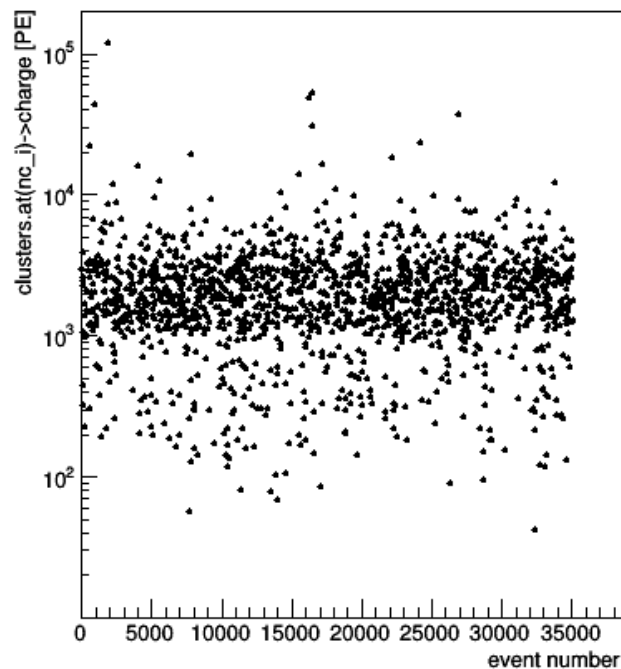


master cut

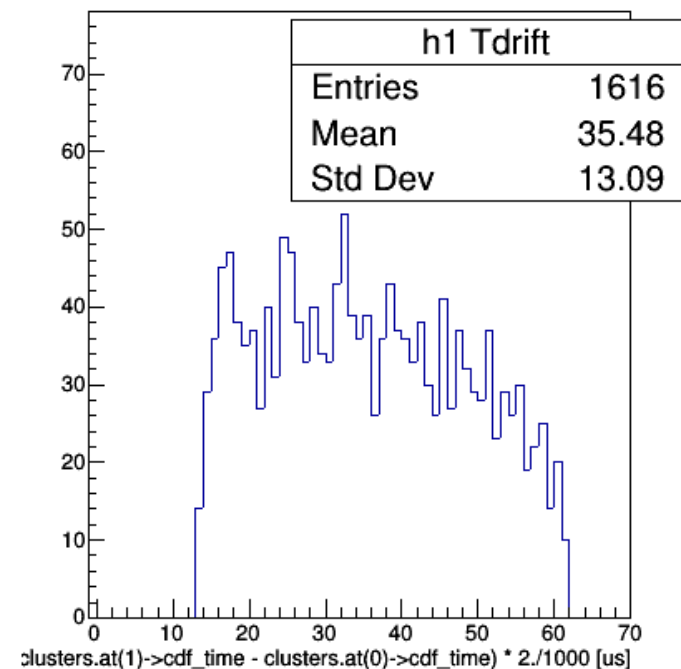
C1.is\_S2 && C1.corners



C1.is\_S2 && C1.corners

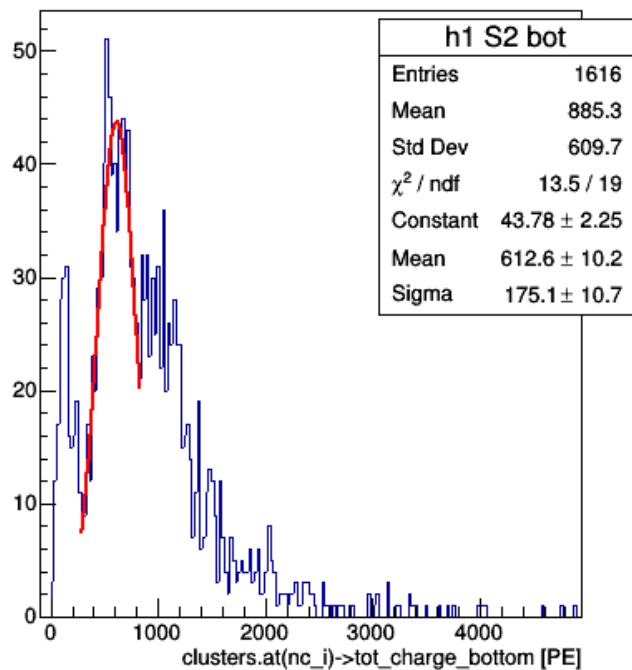


C0.is\_S1\_S2

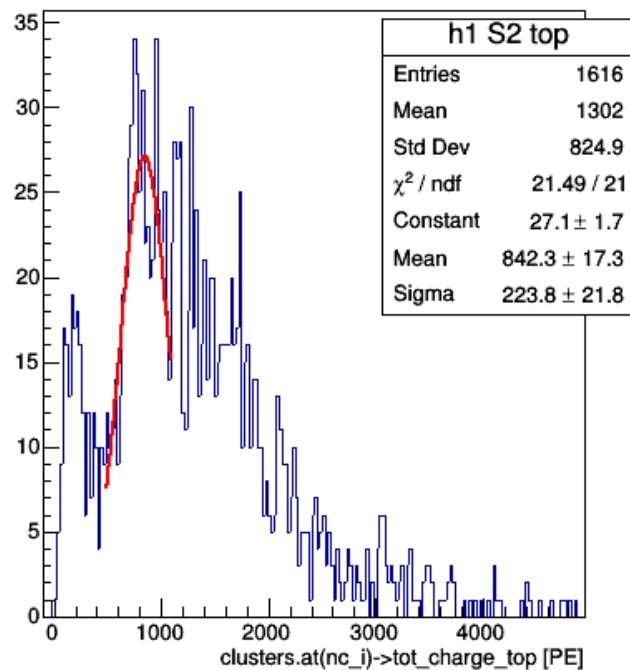


Ph2, Am241, run 537

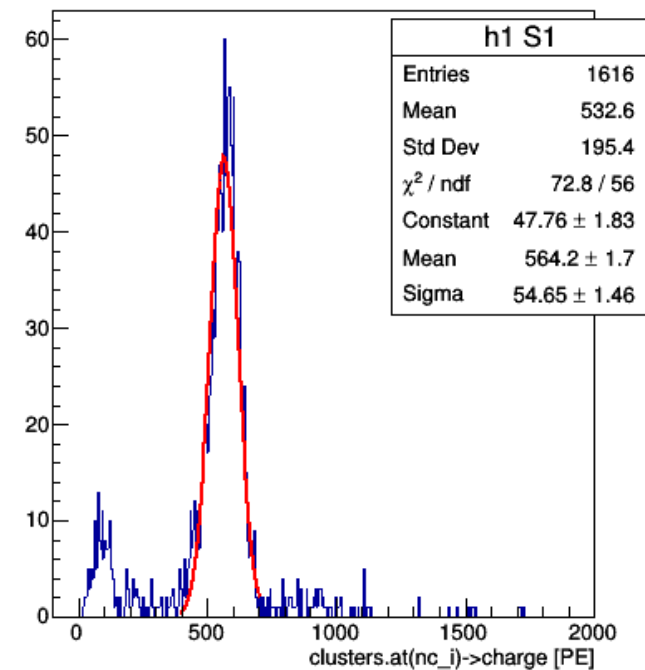
C1.is\_S2 && C1.corners



C1.is\_S2 && C1.corners

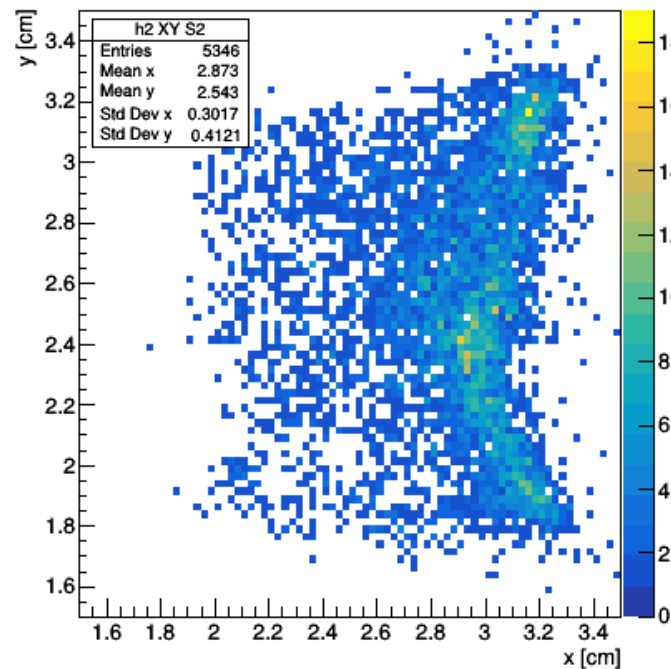


C2.is\_S1

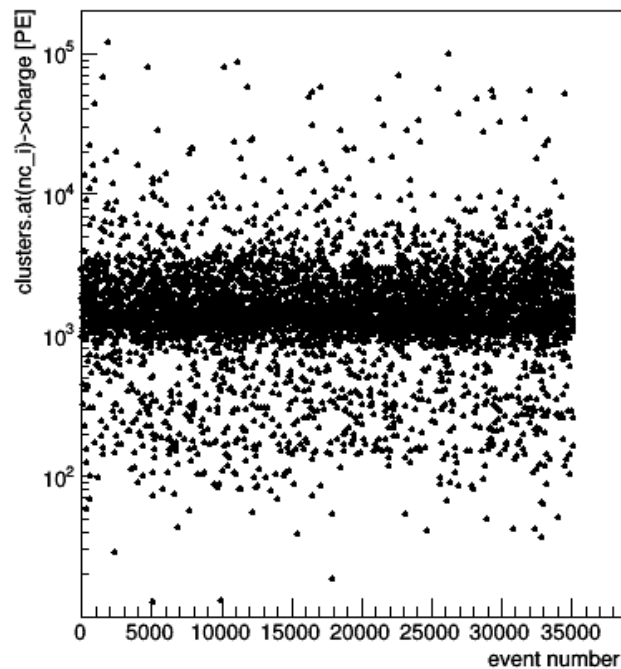




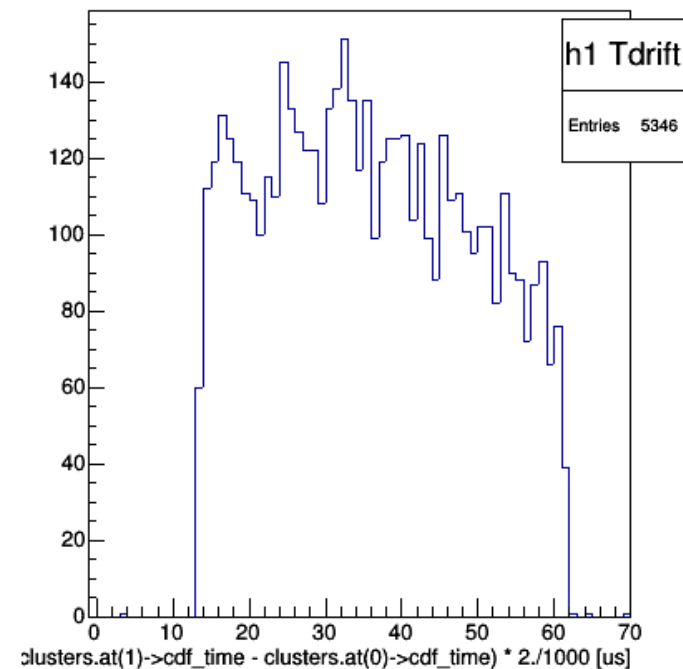
C1.is\_S2



C1.is\_S2



C0.is\_S1\_S2



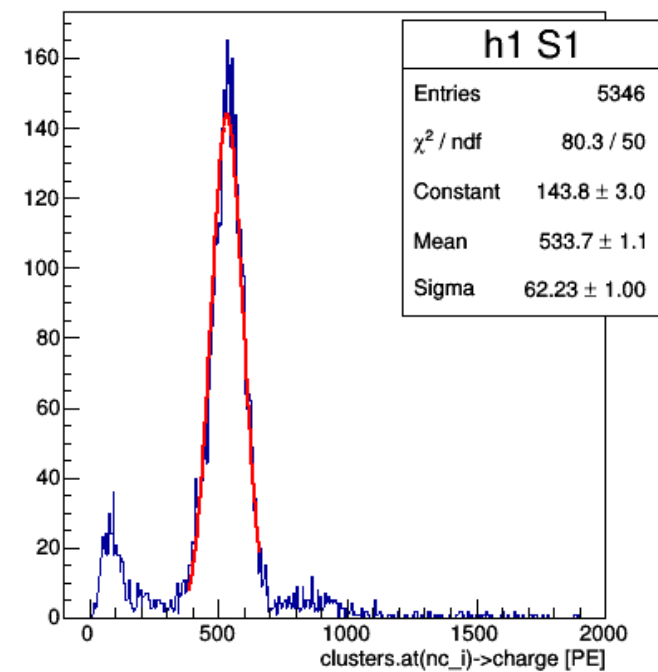
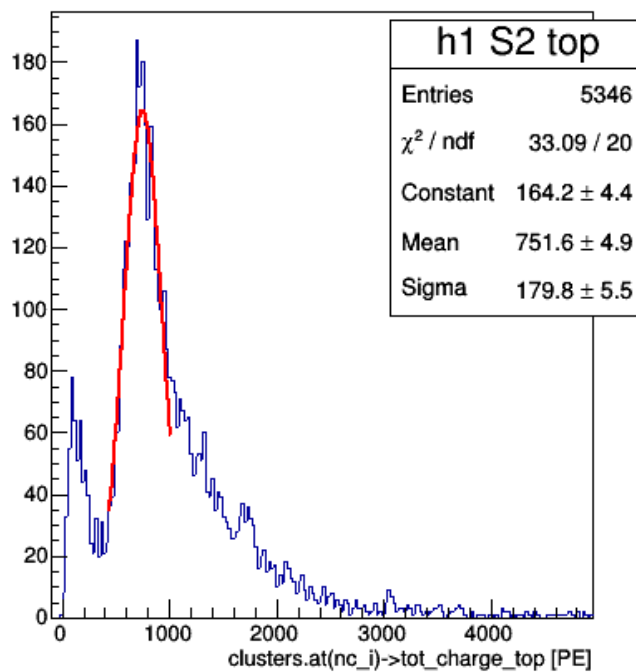
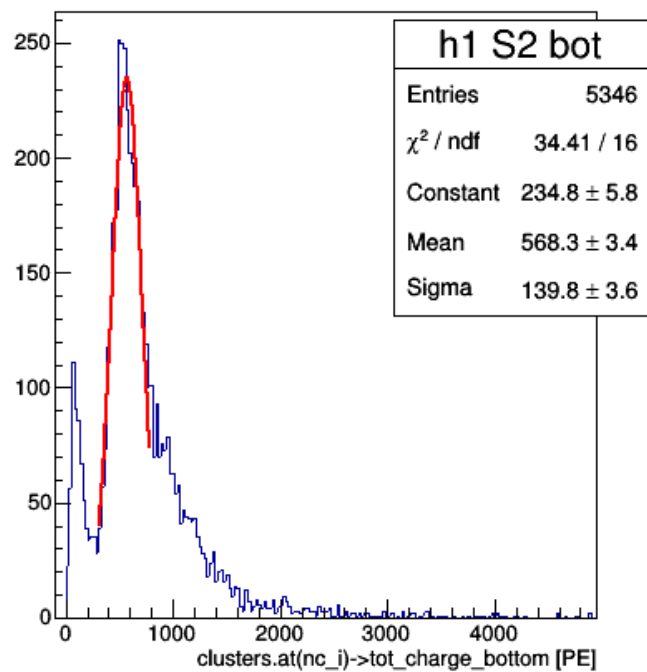
C1.is\_S2

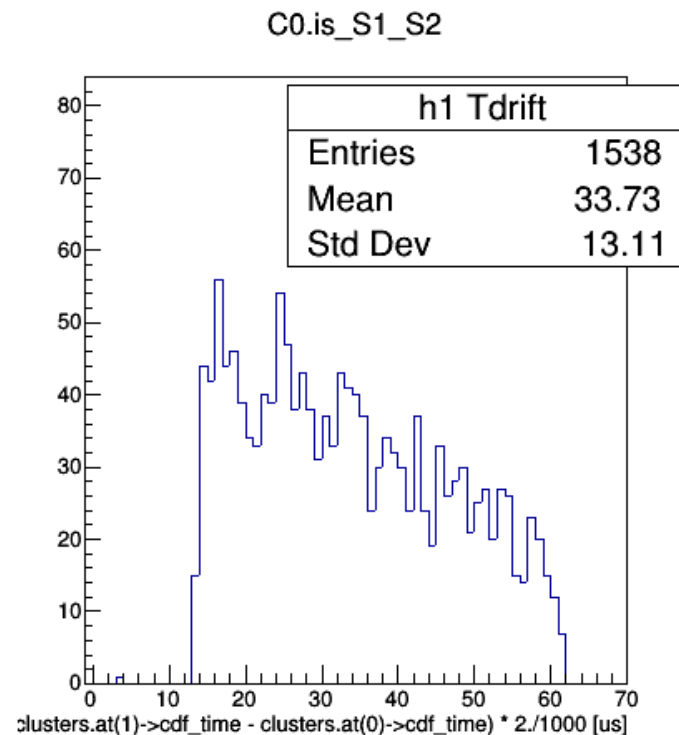
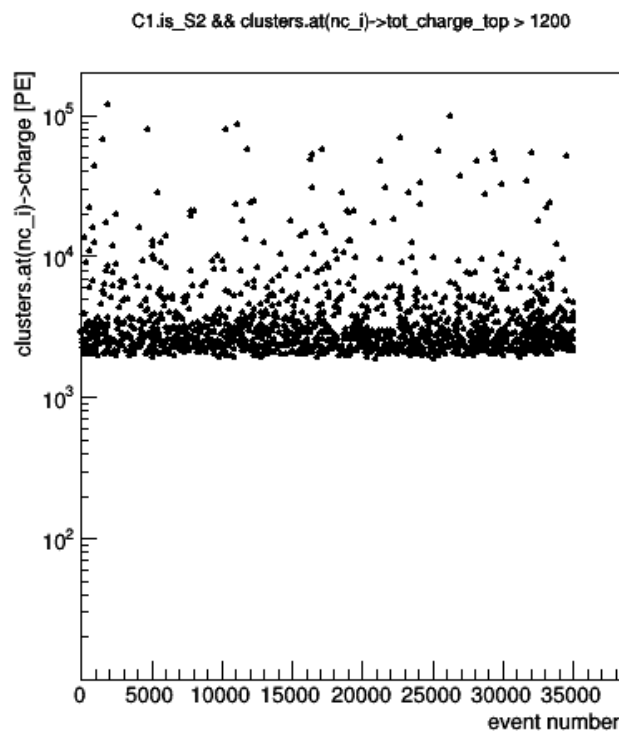
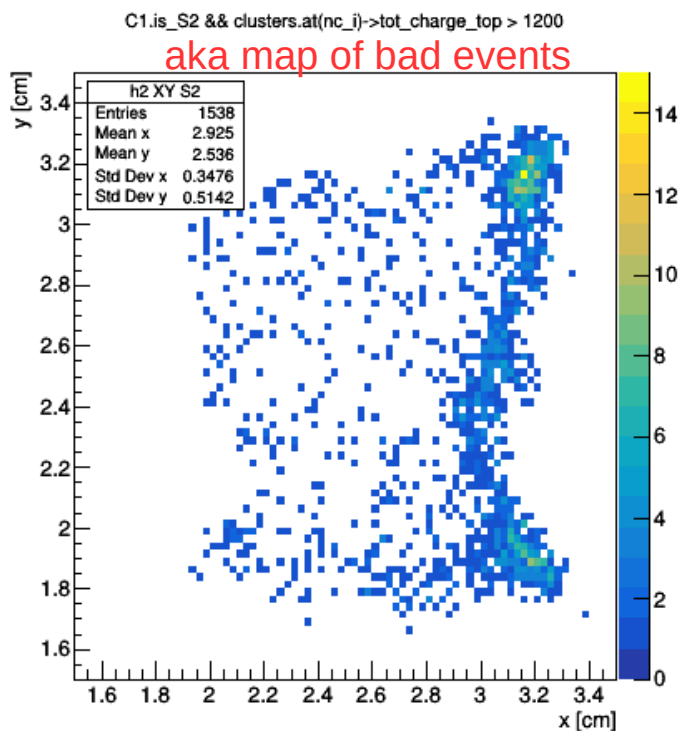
Ph2, Am241, run 537

C1.is\_S2

master cut

C2.is\_S1





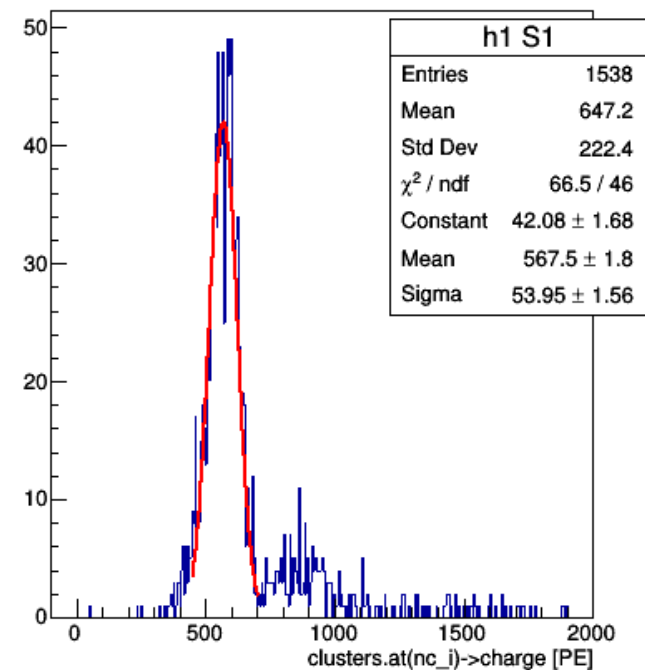
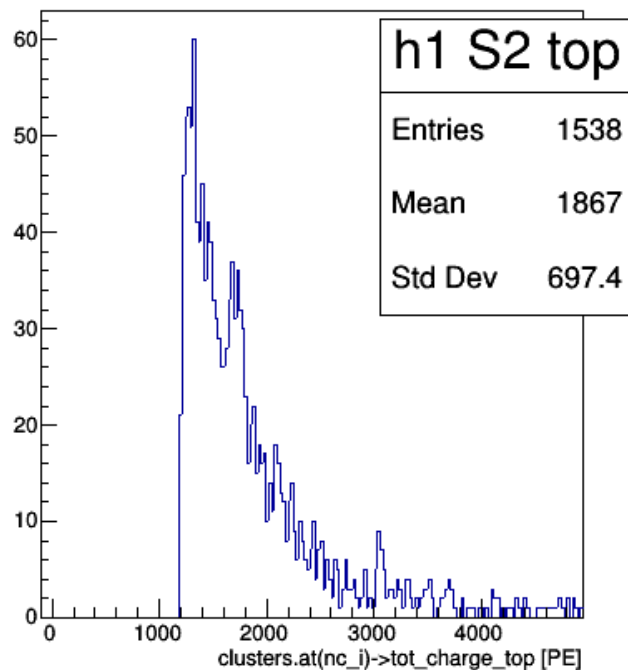
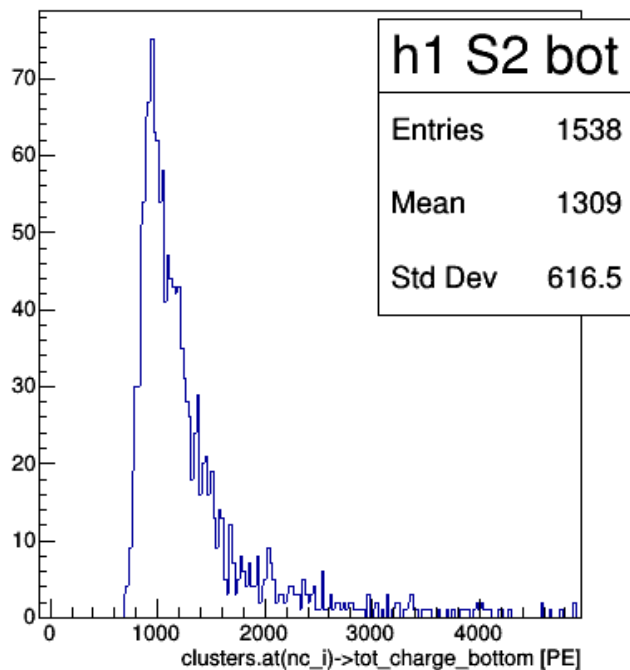
Ph2, Am241, run 537 master cut

C1.is\_S2 && clusters.at(nc\_i)->tot\_charge\_top > 1200

C1.is\_S2 && clusters.at(nc\_i)->tot\_charge\_top > 1200

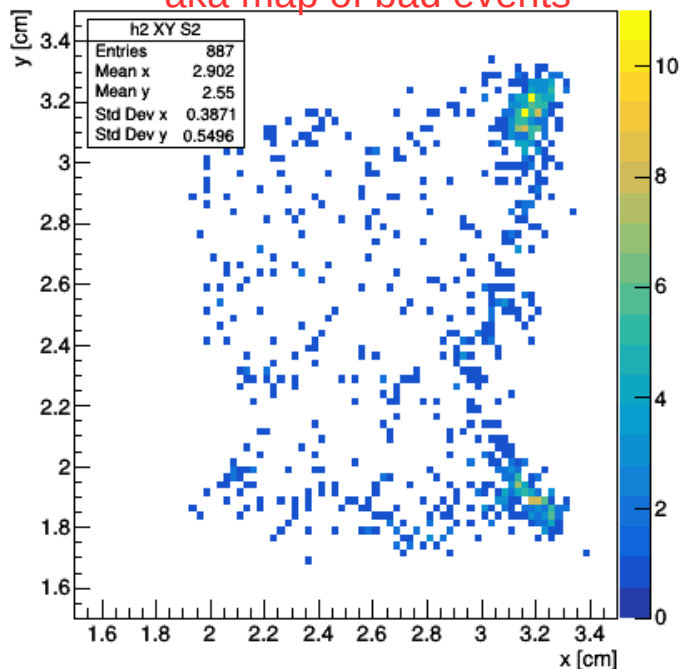
tot\_charge\_top > 1200 [PE]

C2.is\_S1

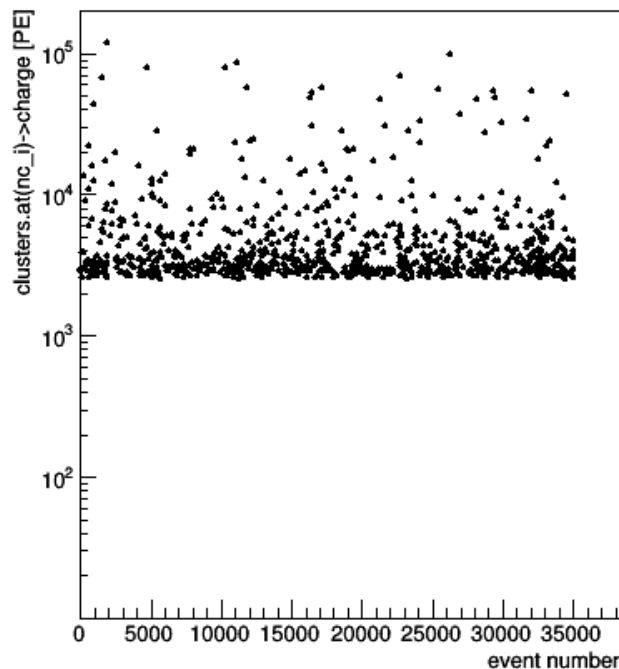


C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1600

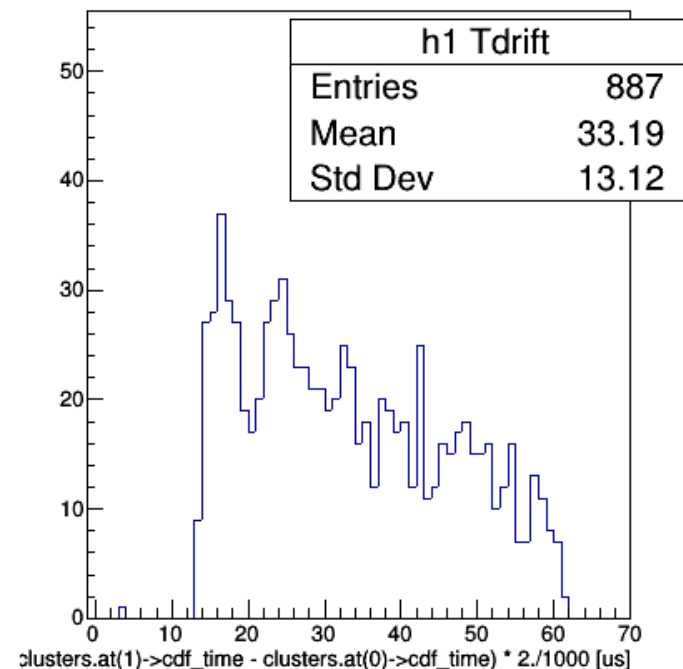
aka map of bad events



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1600



C0.is\_S1\_S2



Ph2, Am241, run 537

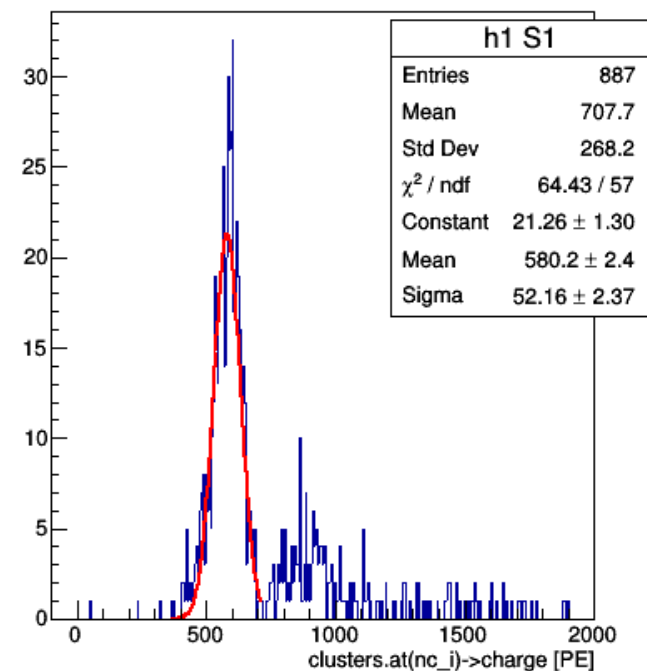
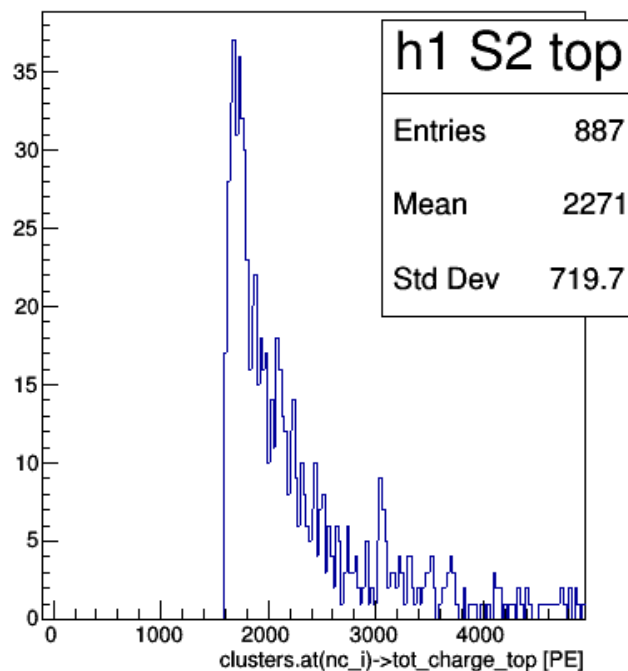
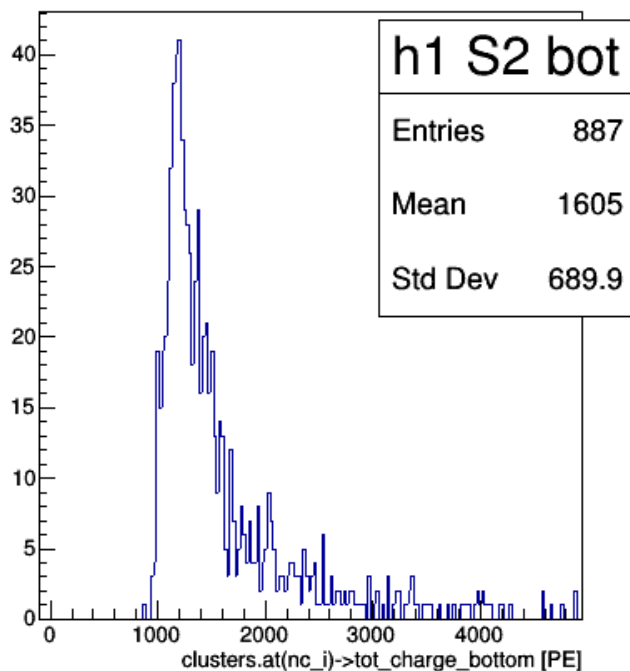
master cut

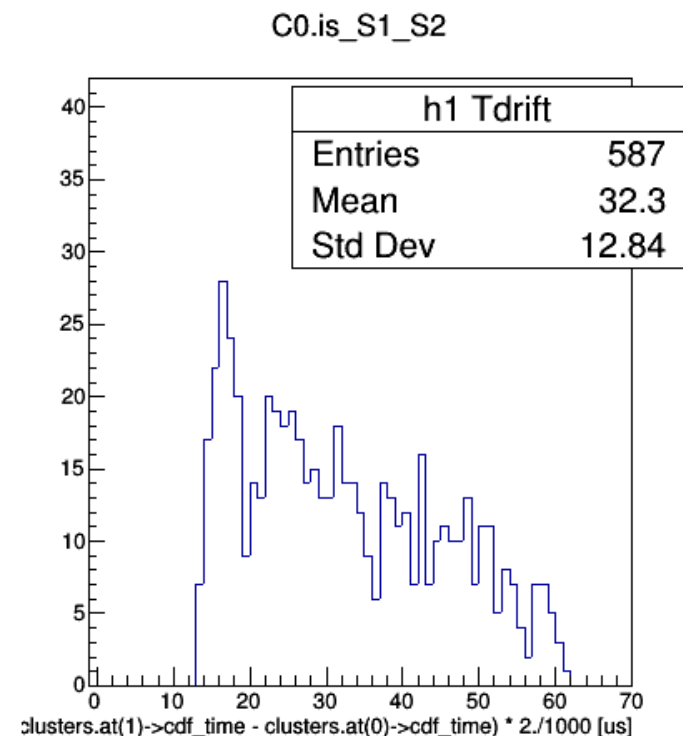
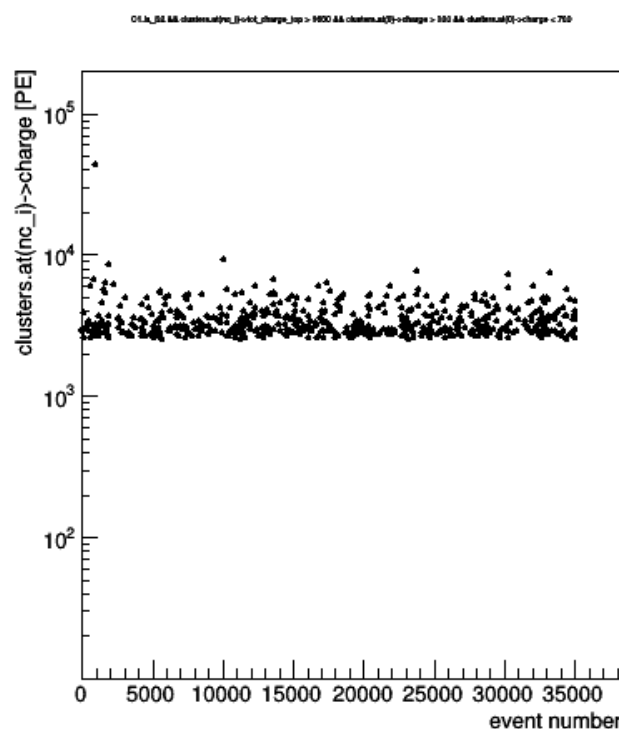
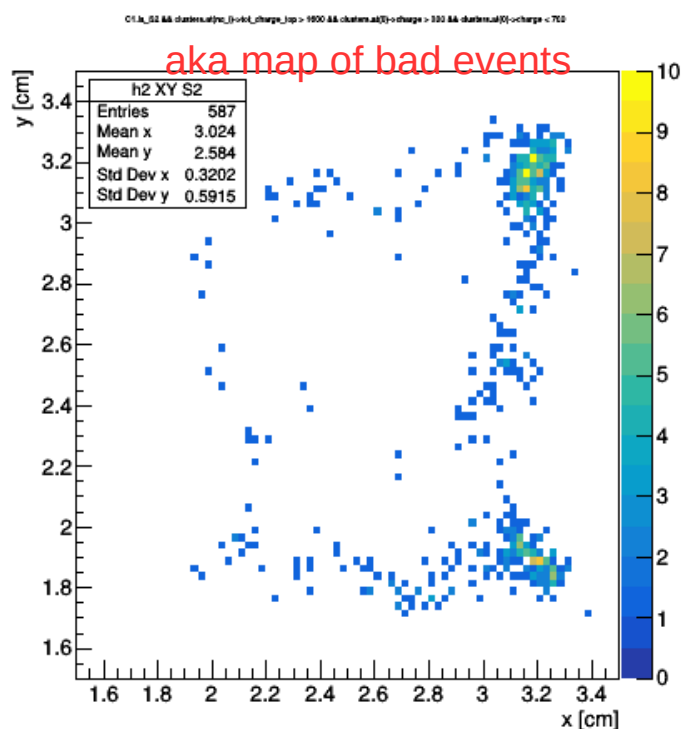
tot\_charge\_top &gt; 1600 [PE]

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1600

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1600

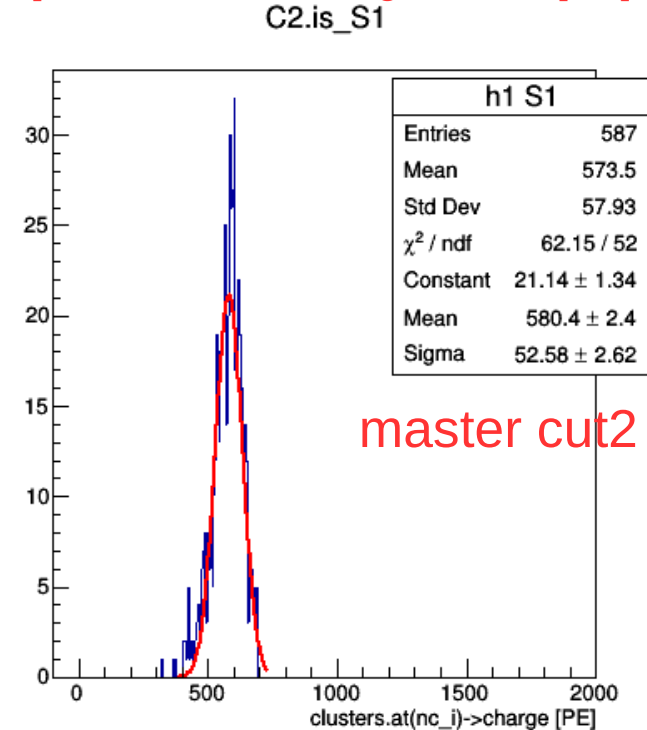
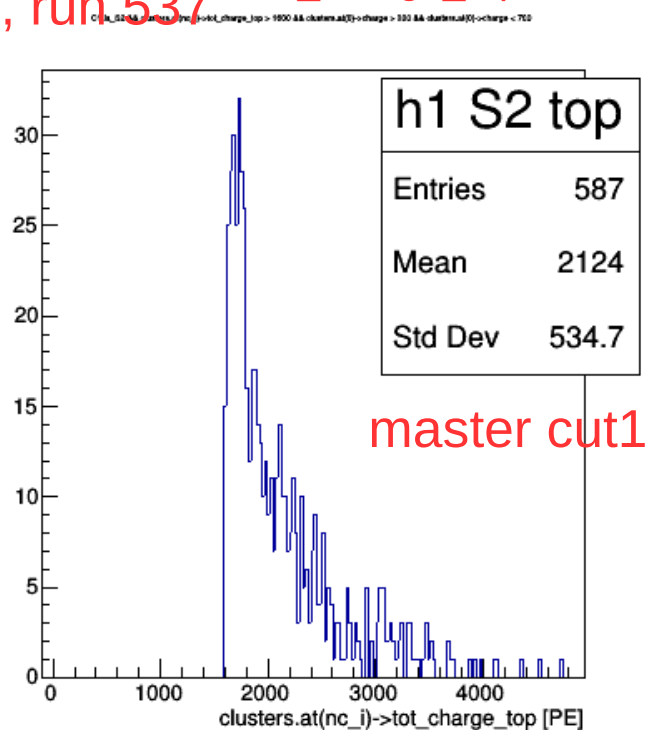
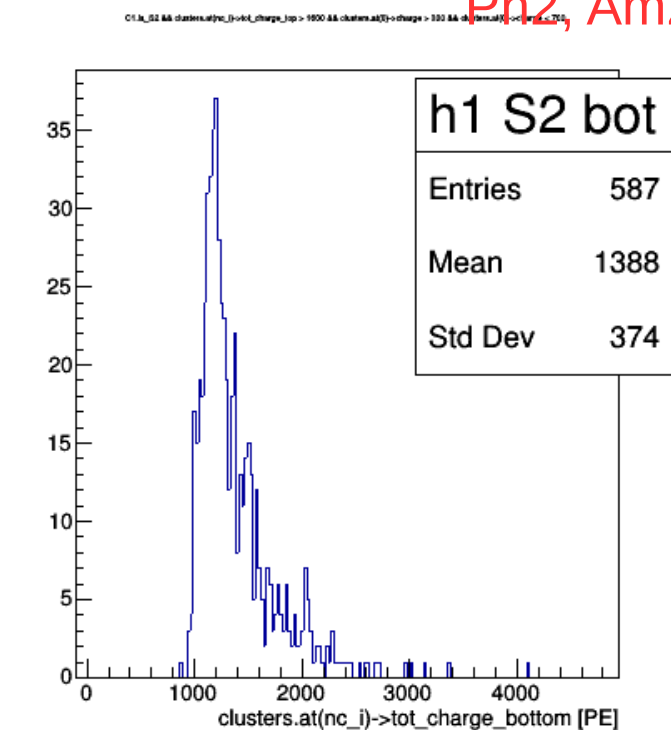
C2.is\_S1



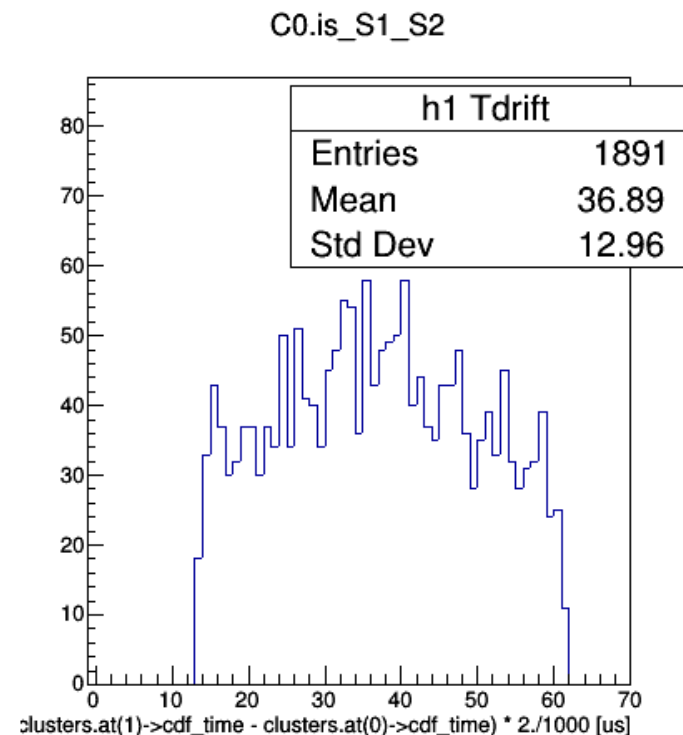
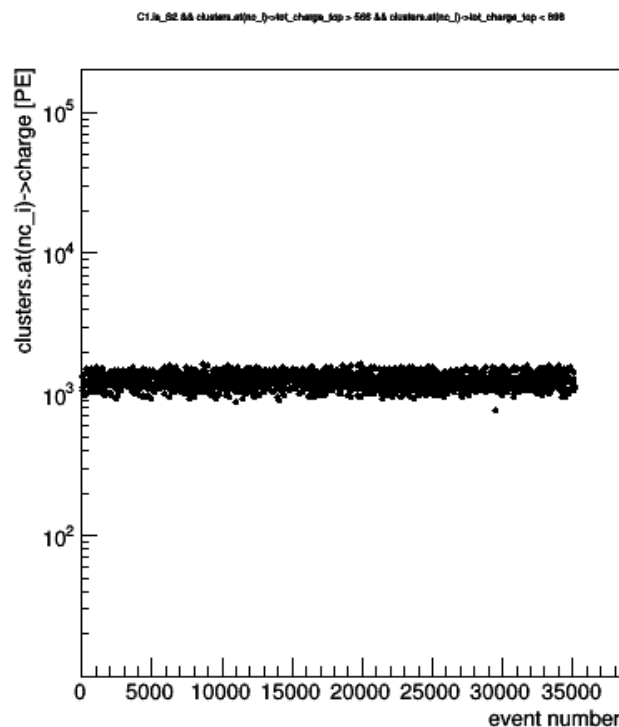
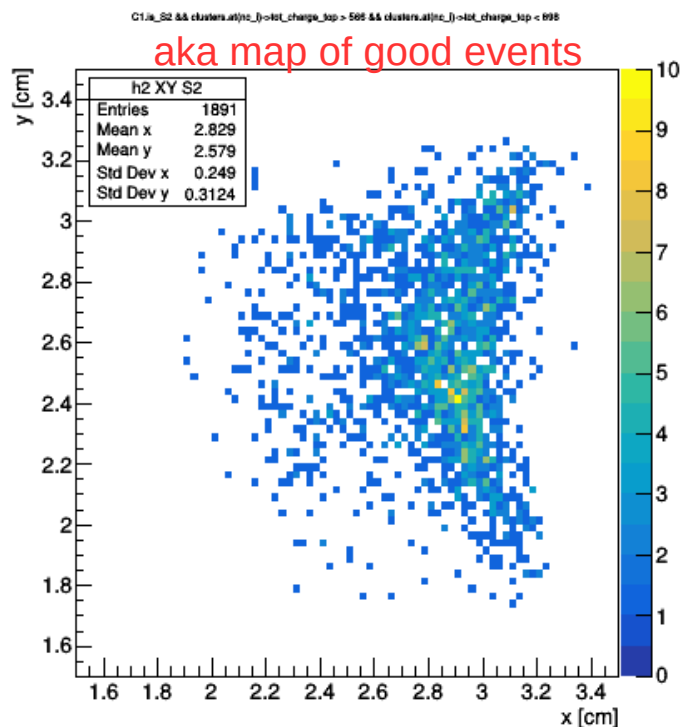


Ph2, Am241, run 537 tot\_charge\_top > 1600 [PE]

300 < S1 charge < 700 [PE]

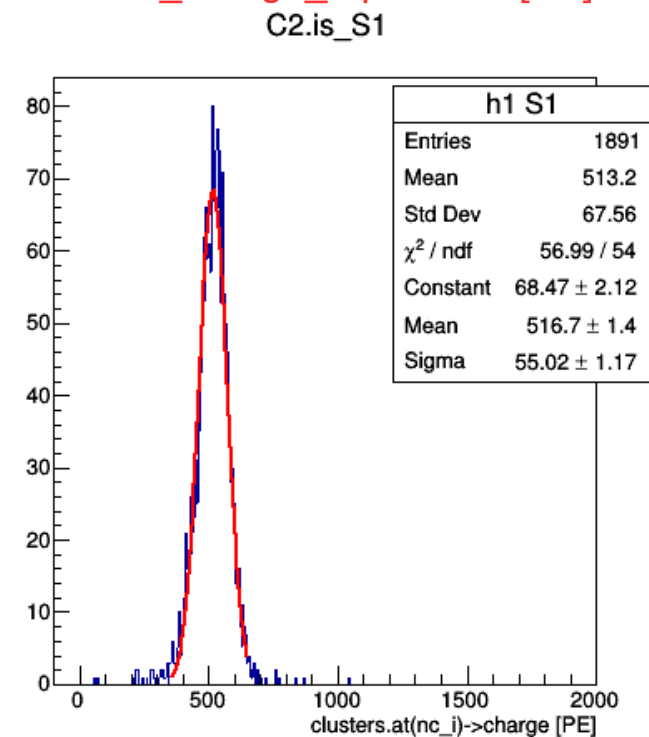
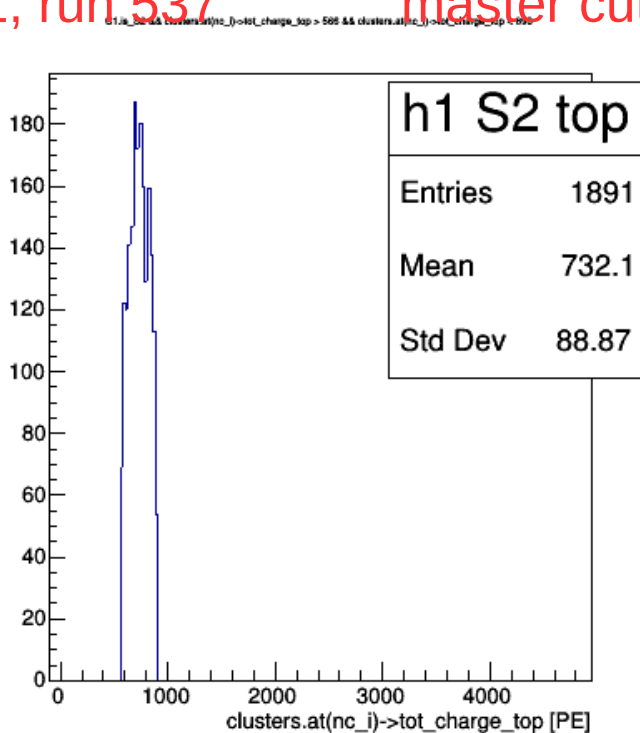
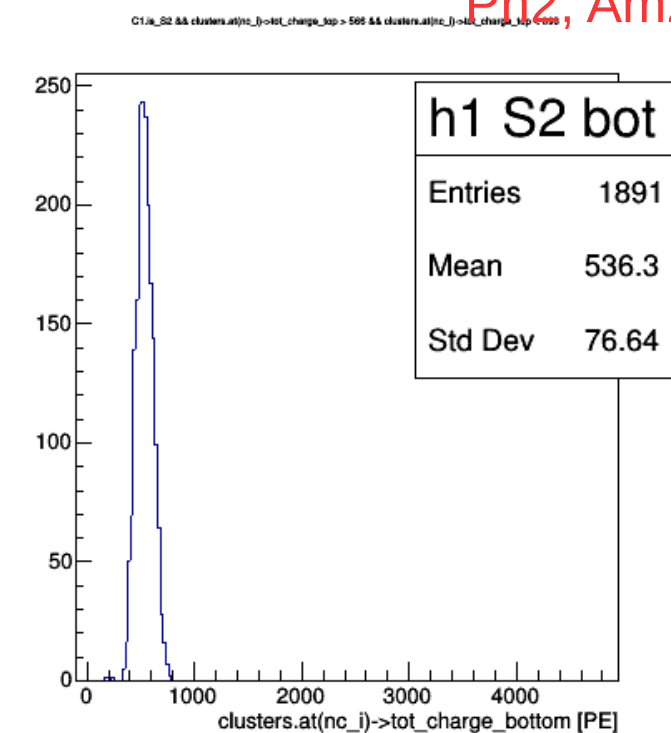






Ph2, Am241, run.537 master cut

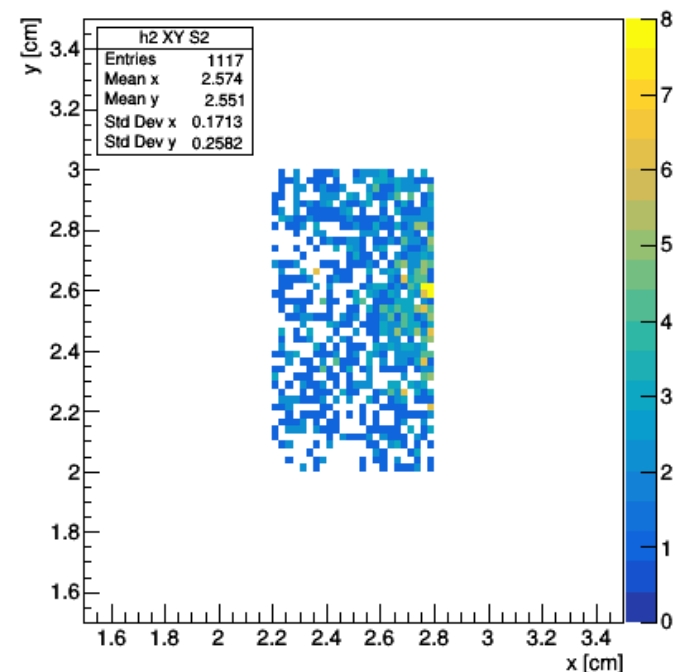
566 < tot\_charge\_top > 898 [PE]



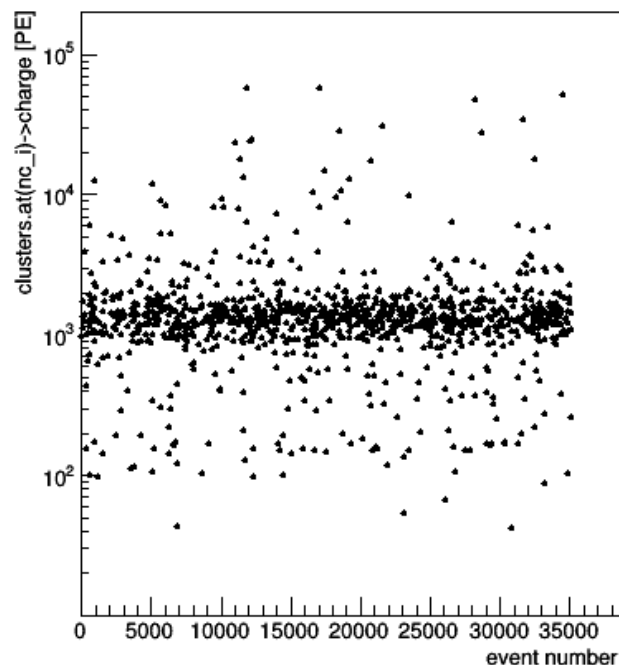


So, I created new cut: region\_of\_S2\_uniformity ( $2.2 < x < 2.8$ ;  $2 < y < 3$ )

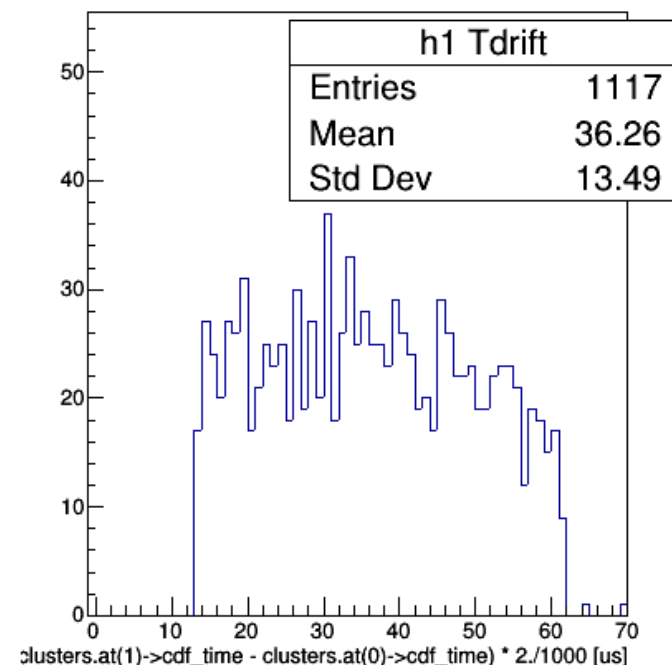
C1.is\_S2 && C1.region\_of\_S2\_uniformity



C1.is\_S2 && C1.region\_of\_S2\_uniformity

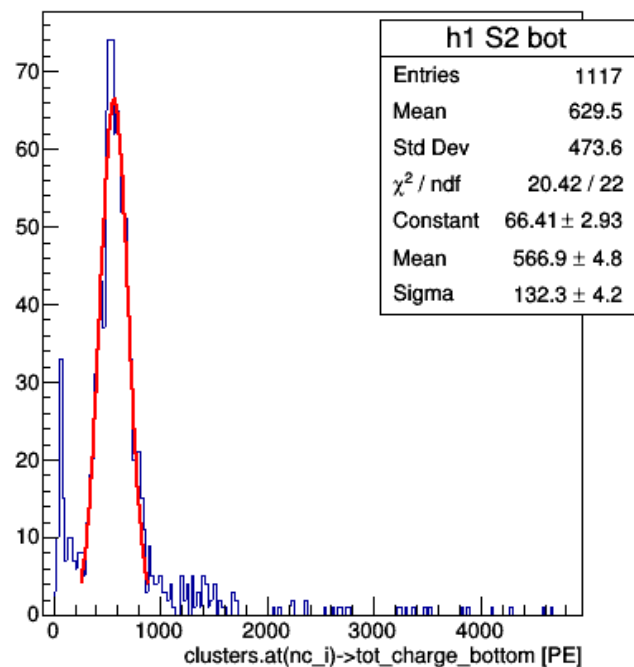


C0.is\_S1\_S2

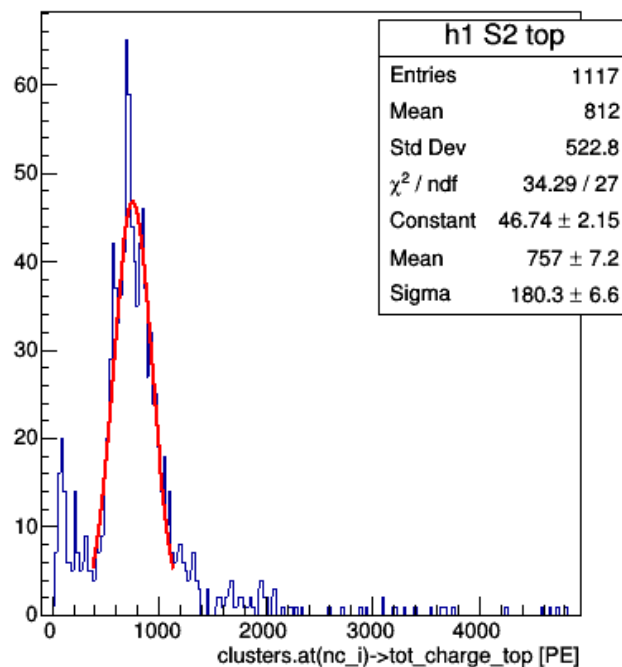


Ph2, Am241, run 537

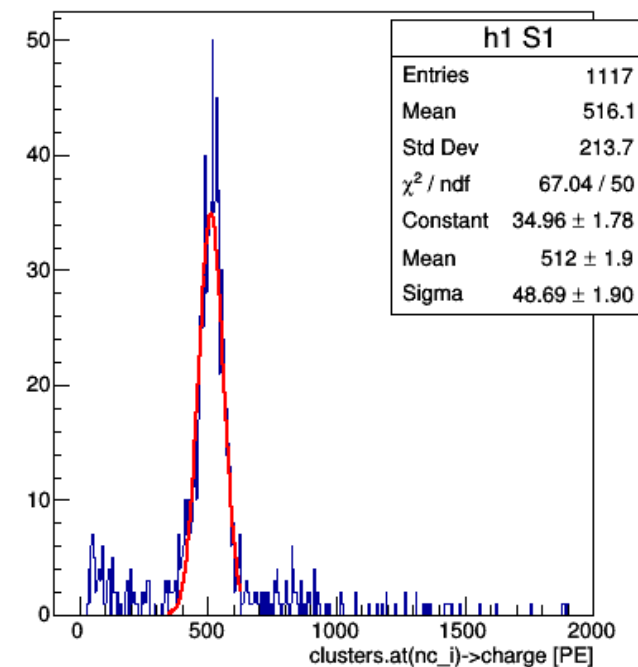
C1.is\_S2 && C1.region\_of\_S2\_uniformity



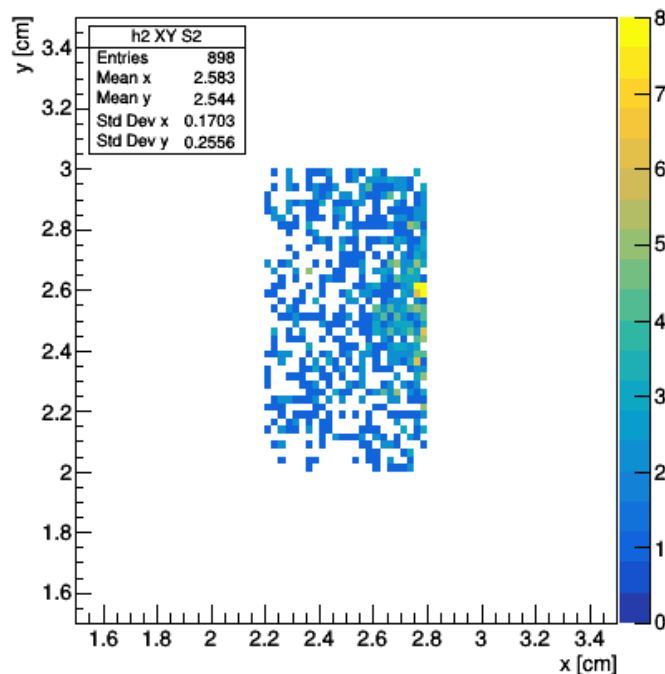
C1.is\_S2 && C1.region\_of\_S2\_uniformity



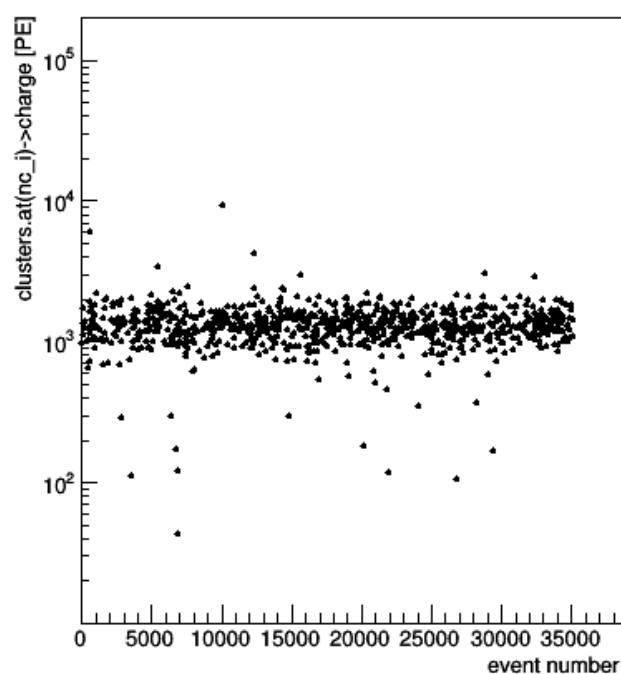
C2.is\_S1



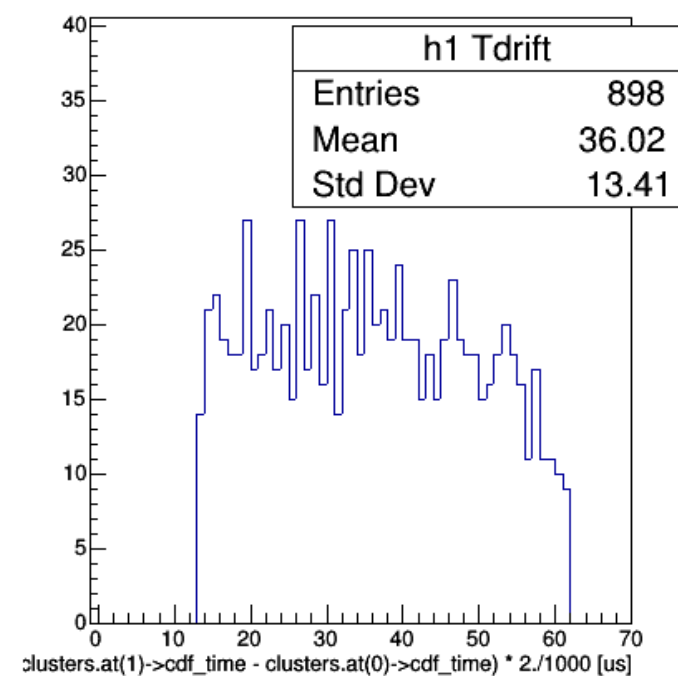
C1.is\_S2 &amp;&amp; C1.region\_of\_S2\_uniformity &amp;&amp; clusters.at(0)-&gt;charge &gt; 300 &amp;&amp; clusters.at(0)-&gt;charge &lt; 700



C1.is\_S2 &amp;&amp; C1.region\_of\_S2\_uniformity &amp;&amp; clusters.at(0)-&gt;charge &gt; 300 &amp;&amp; clusters.at(0)-&gt;charge &lt; 700

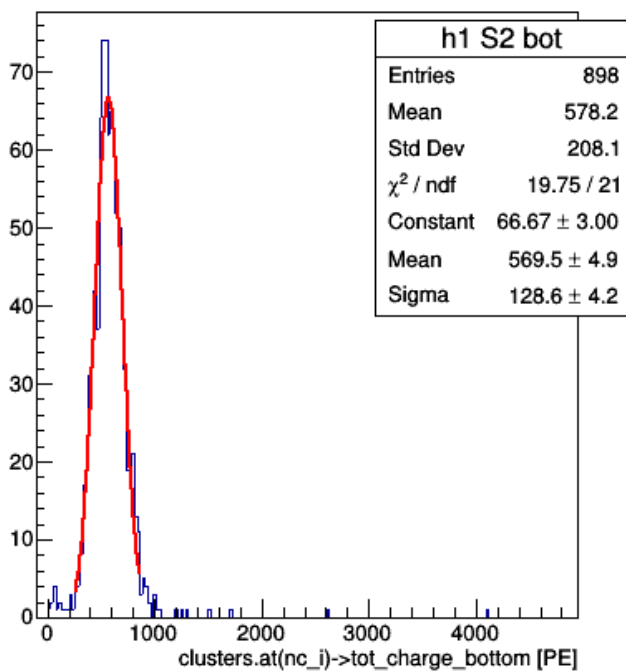


C0.is\_S1\_S2

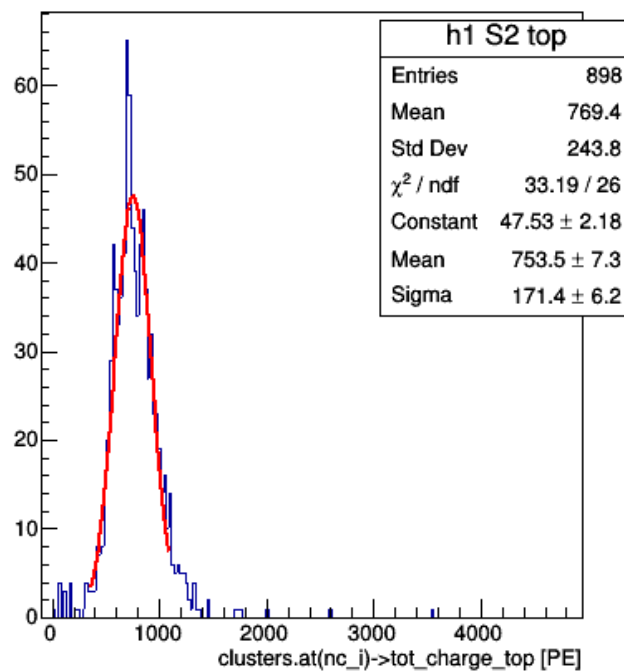


Ph2, Am241, run 537 && region\_of\_S2\_uniformity && 300 < S1\_charge < 700

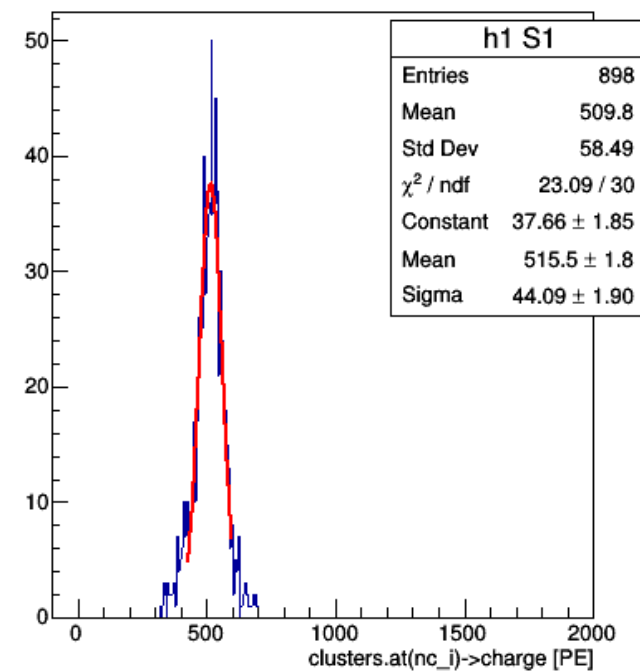
C1.is\_S2 &amp;&amp; C1.region\_of\_S2\_uniformity &amp;&amp; clusters.at(0)-&gt;charge &gt; 300 &amp;&amp; clusters.at(0)-&gt;charge &lt; 700



C1.is\_S2 &amp;&amp; C1.region\_of\_S2\_uniformity &amp;&amp; clusters.at(0)-&gt;charge &gt; 300 &amp;&amp; clusters.at(0)-&gt;charge &lt; 700

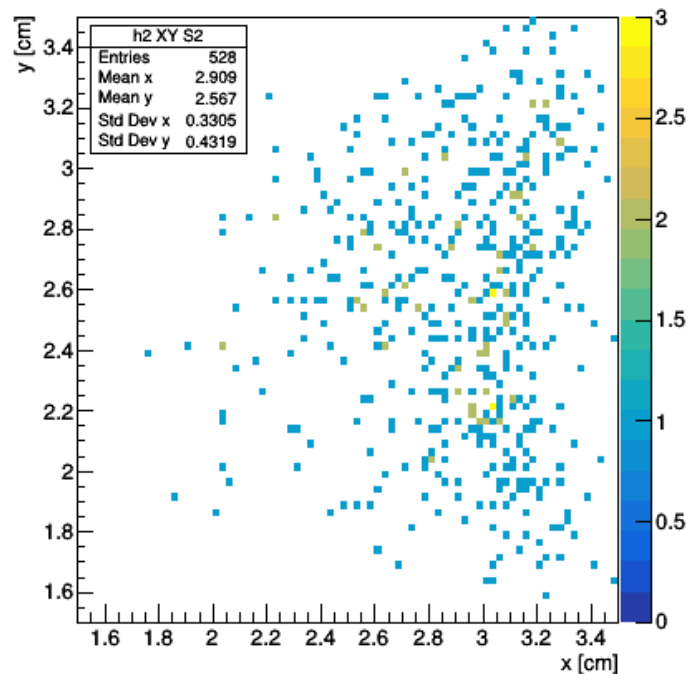


C2.is\_S1

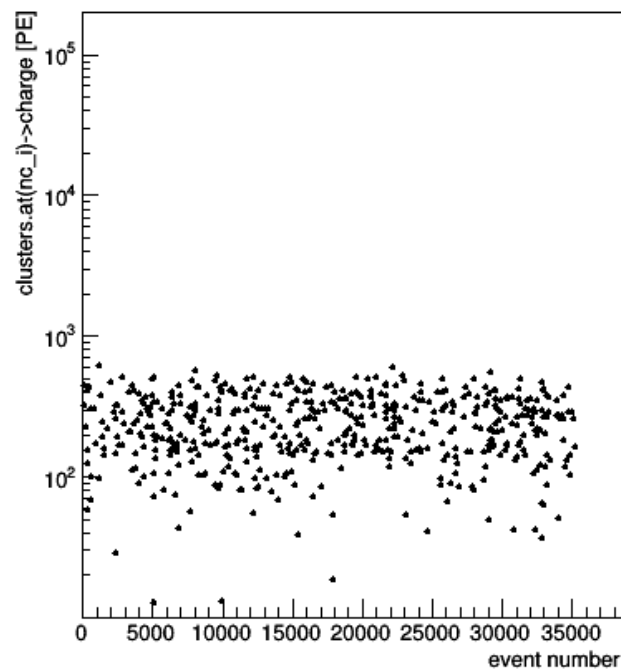




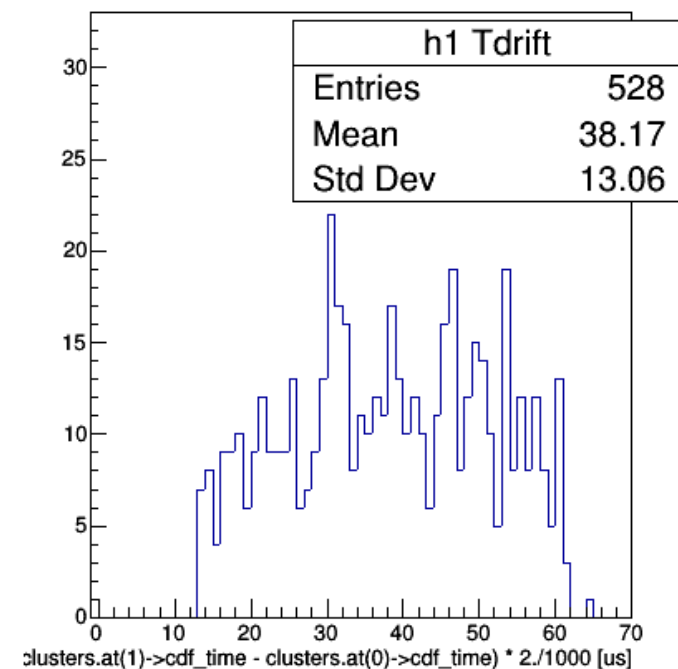
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 0 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 300



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 0 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 300



C0.is\_S1\_S2

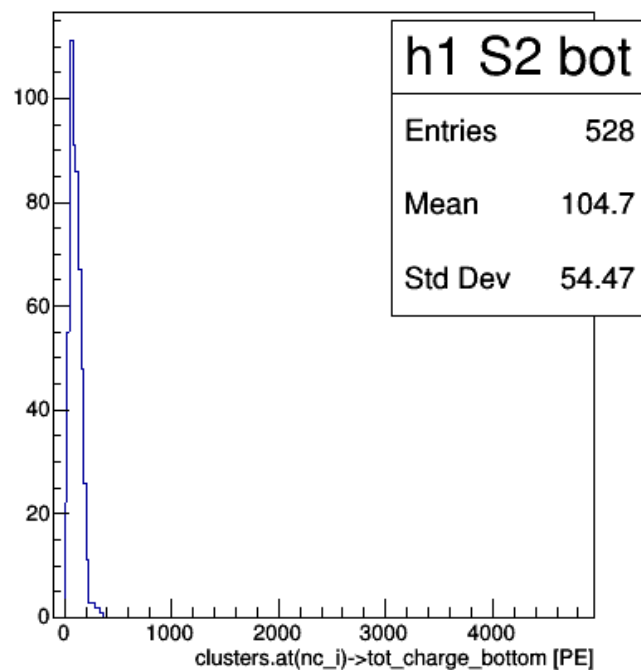


Ph2, Am241, run 537 master cut

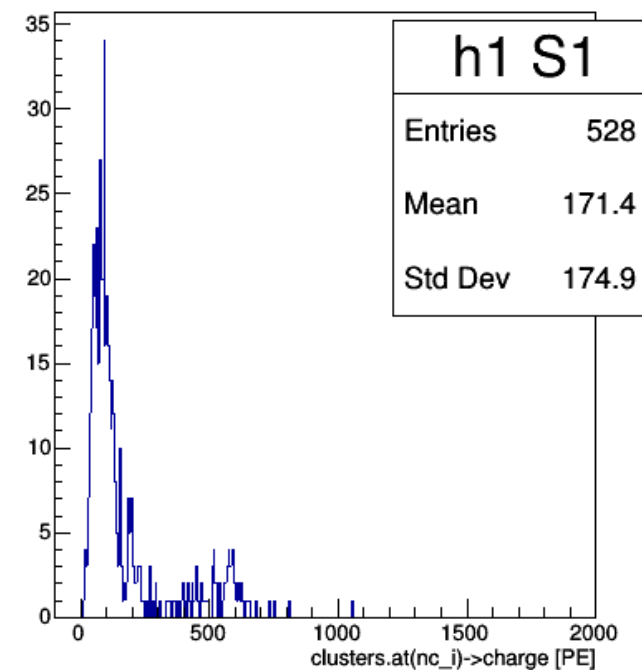
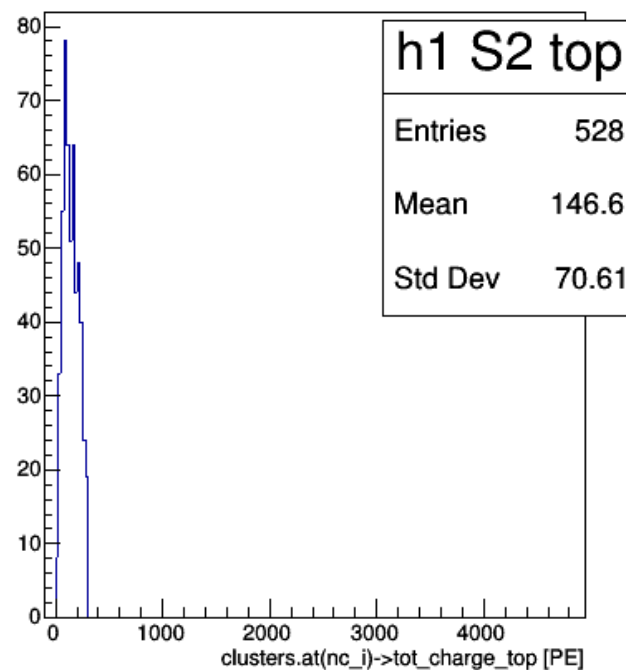
0 &lt; tot\_charge\_top &lt; 300 [pE]

C2.is\_S1

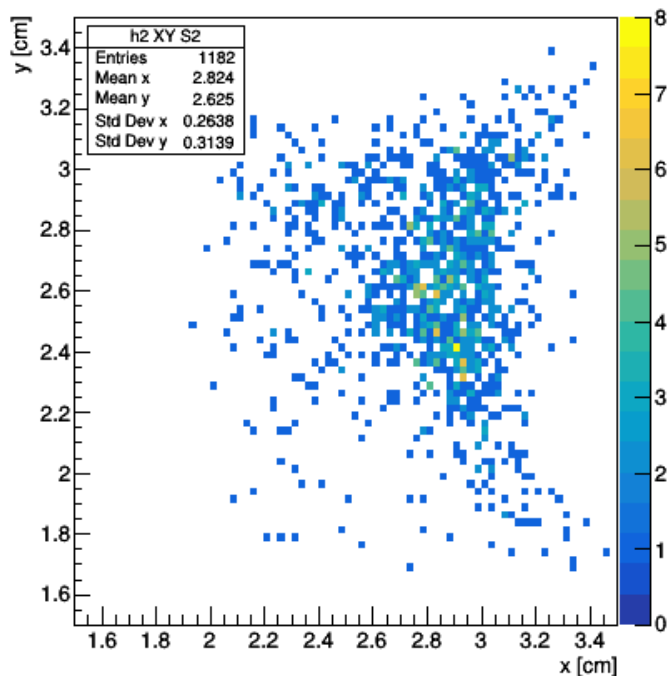
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 0 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 300



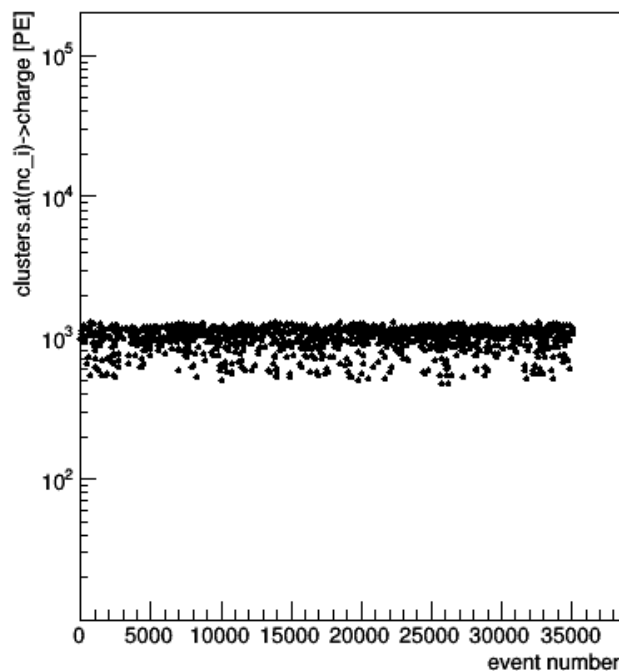
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 0 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 300



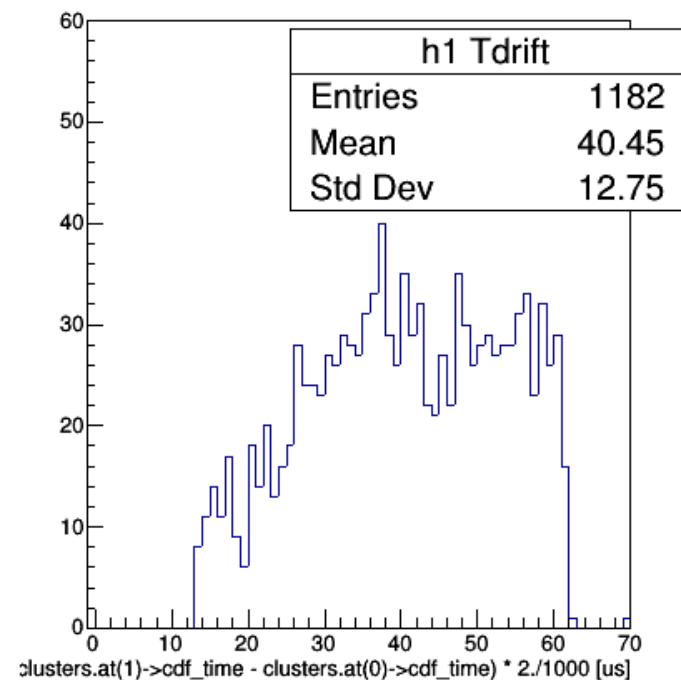
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 0 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 300



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 0 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 300



C0.is\_S1\_S2

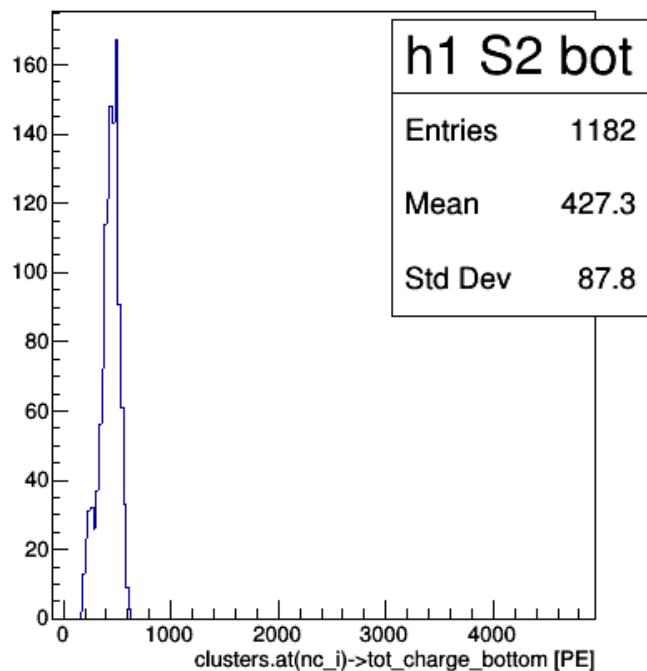


Ph2, Am241, run 537 master cut

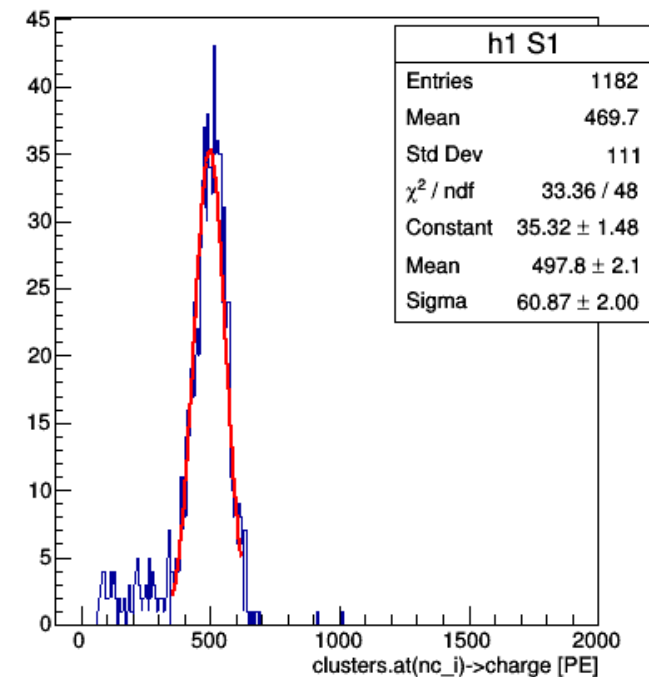
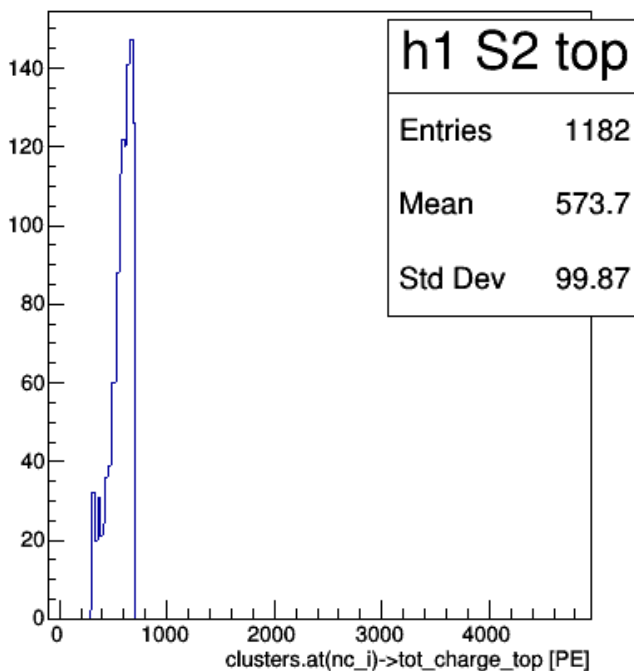
300 &lt; tot\_charge\_top &lt; 700 [PE]

C2.is\_S1

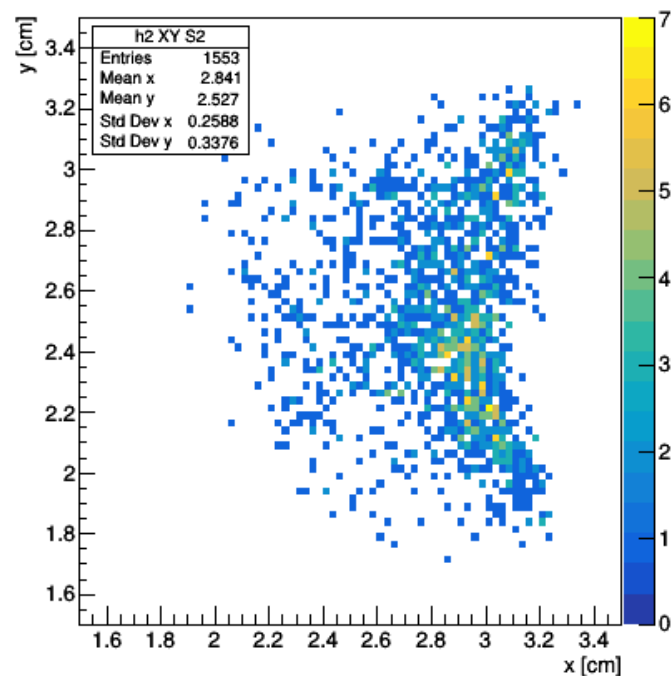
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 0 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 300



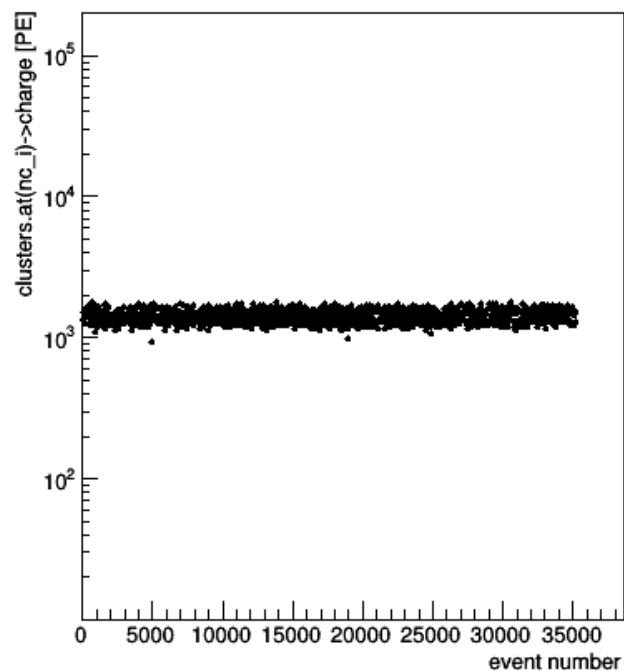
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 0 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 300



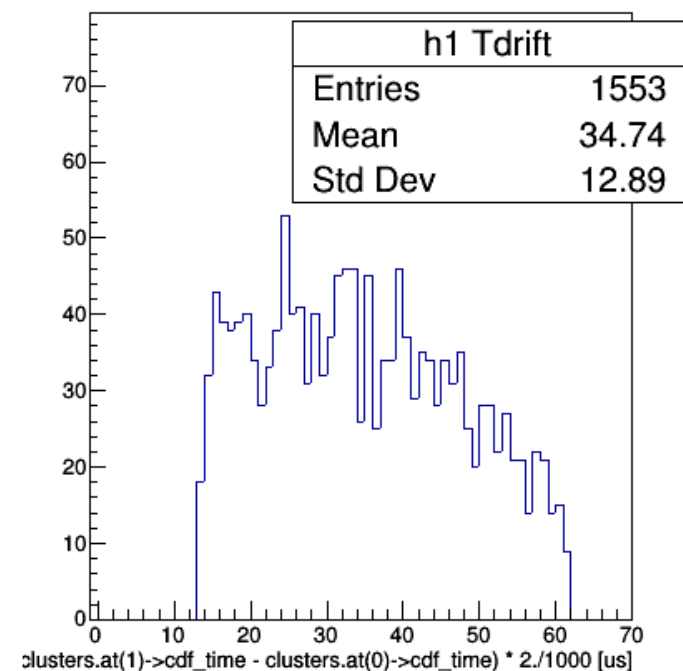
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 700 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1000



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 700 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1000



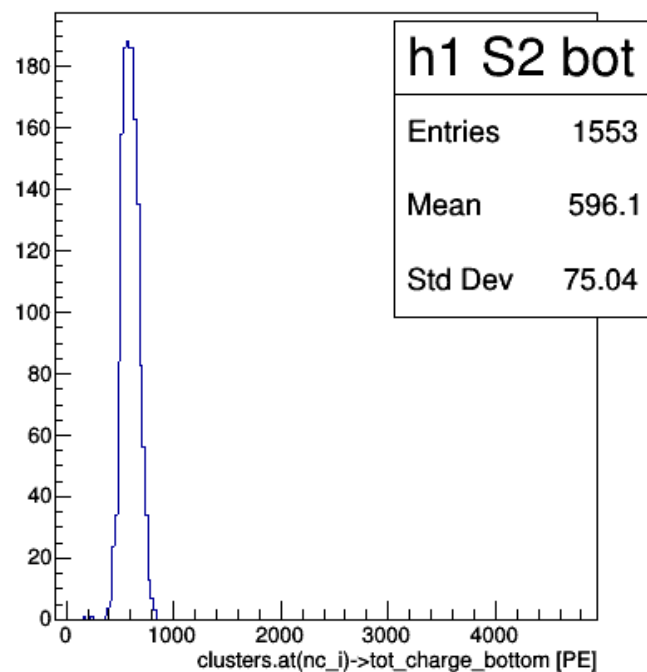
C0.is\_S1\_S2



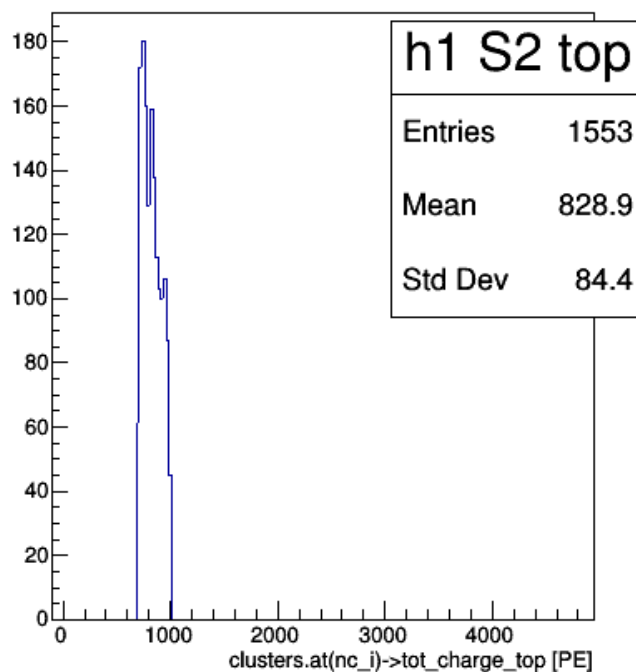
Ph2, Am241, run 537 master cut

700 &lt; tot\_charge\_top &lt; 1000 [PE]

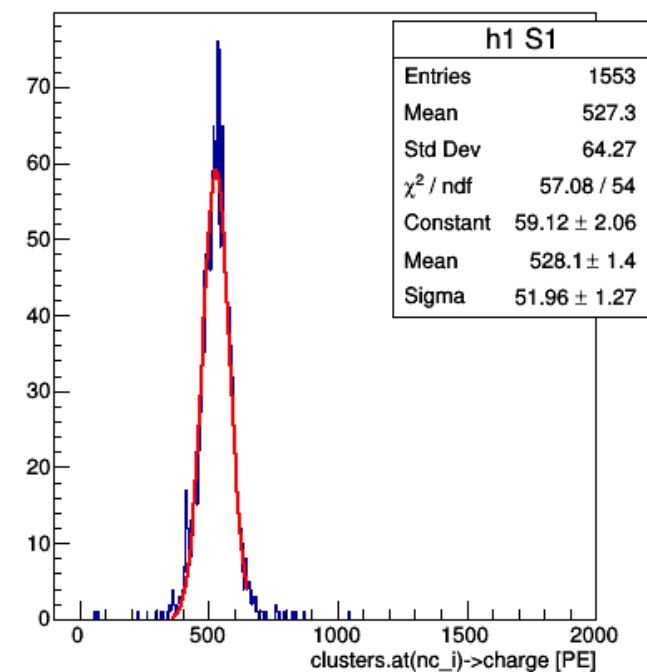
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 700 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1000



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 700 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1000

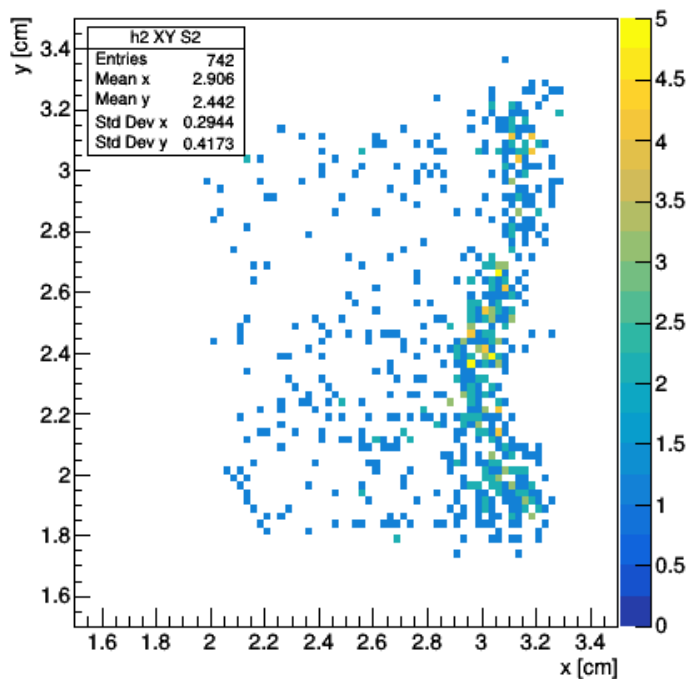


C2.is\_S1

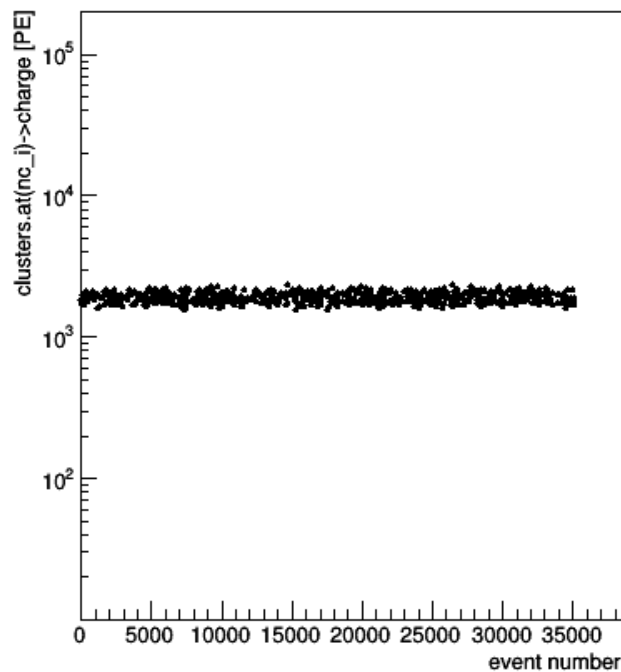




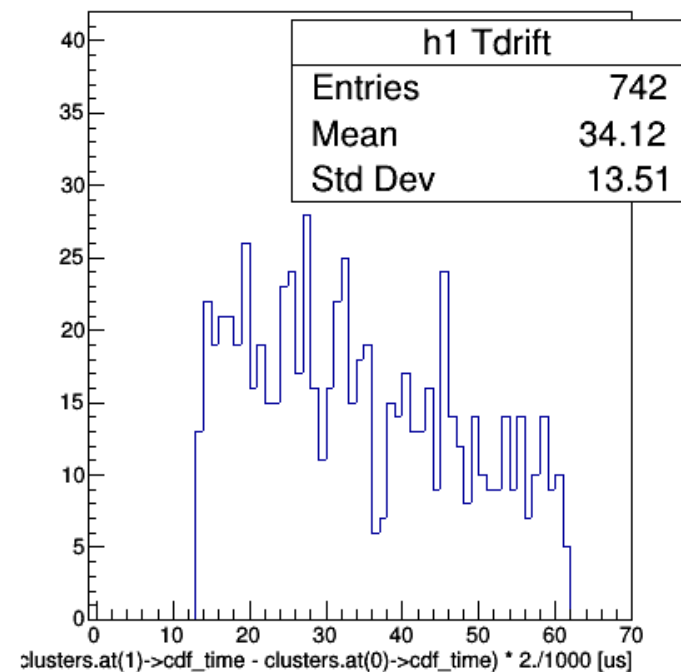
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1300



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1300



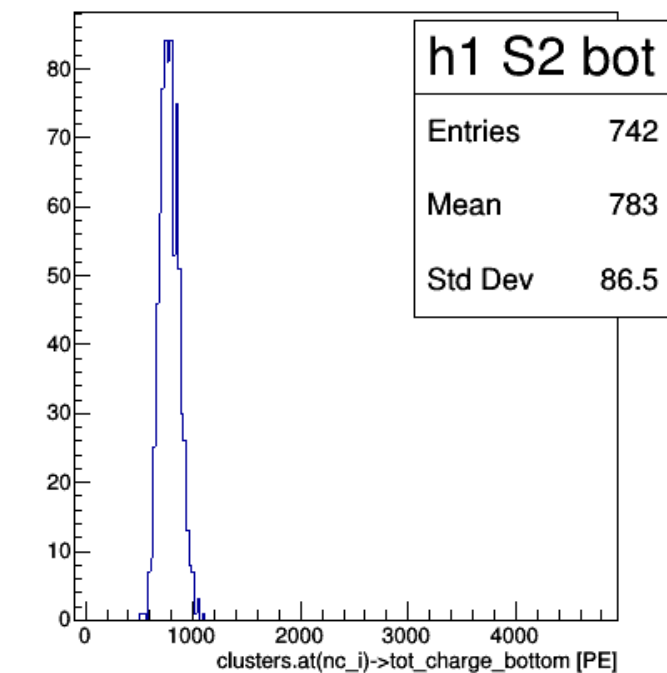
C0.is\_S1\_S2



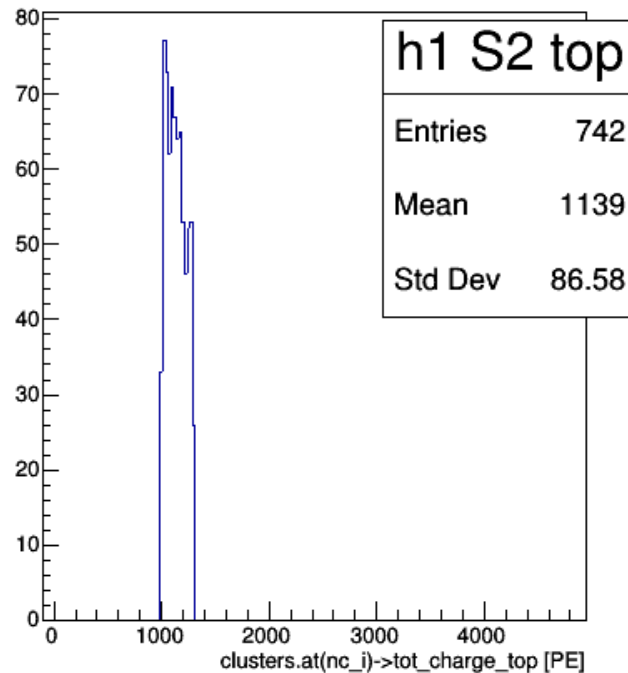
Ph2, Am241, run 537 master cut

1000 &lt; tot\_charge\_top &lt; 1300 [PE]

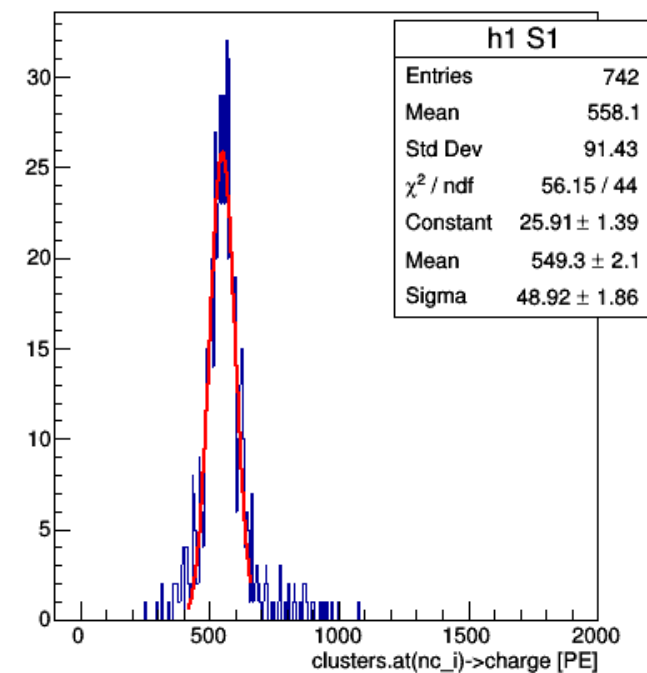
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1300



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1300



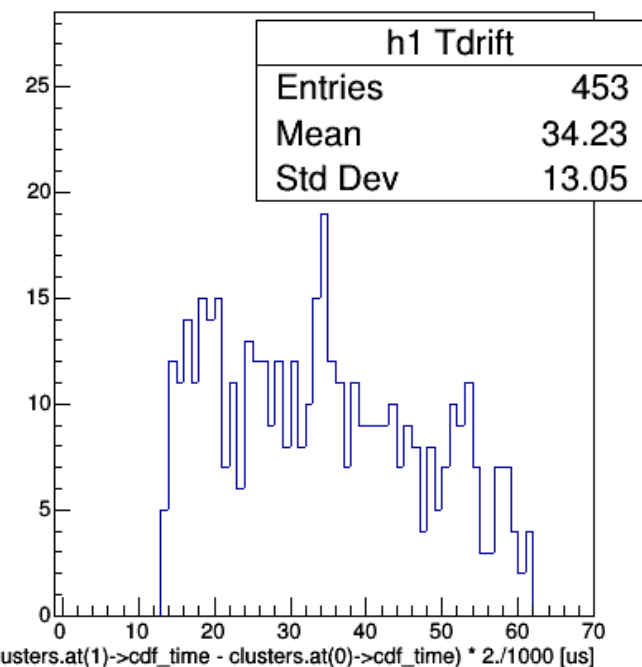
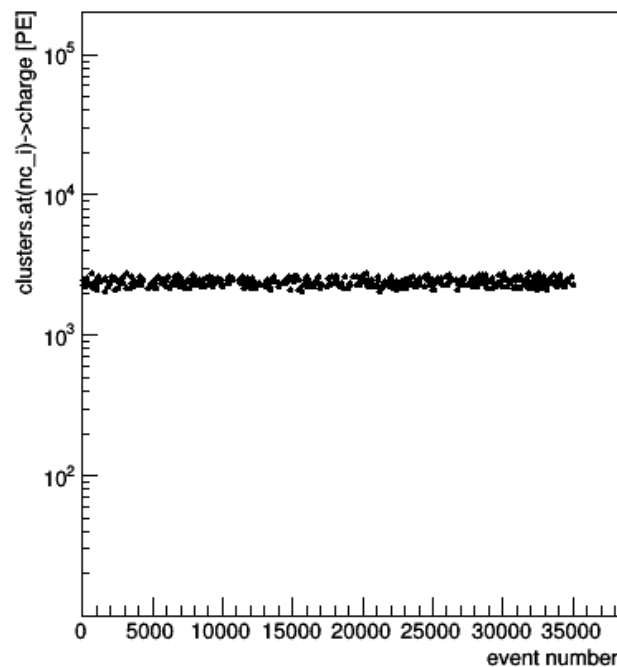
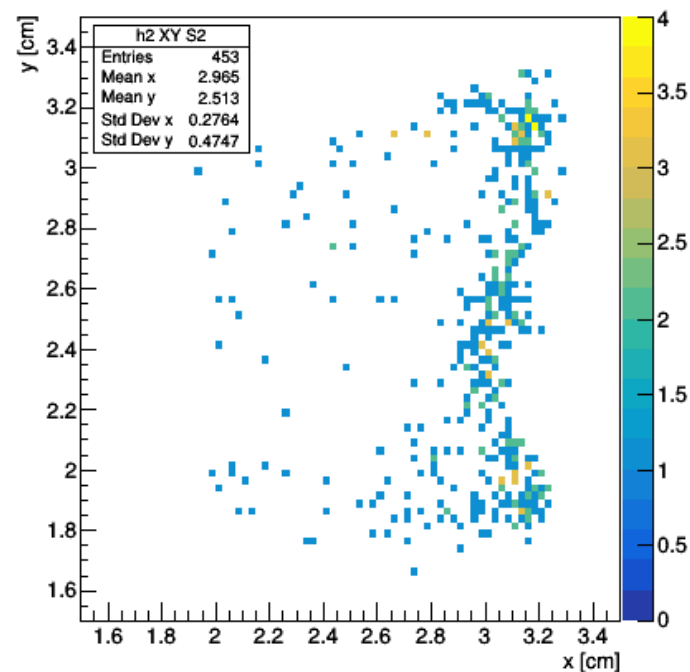
C2.is\_S1



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1300 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1600

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1300 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1600

C0.is\_S1\_S2



Ph2, Am241, run 537

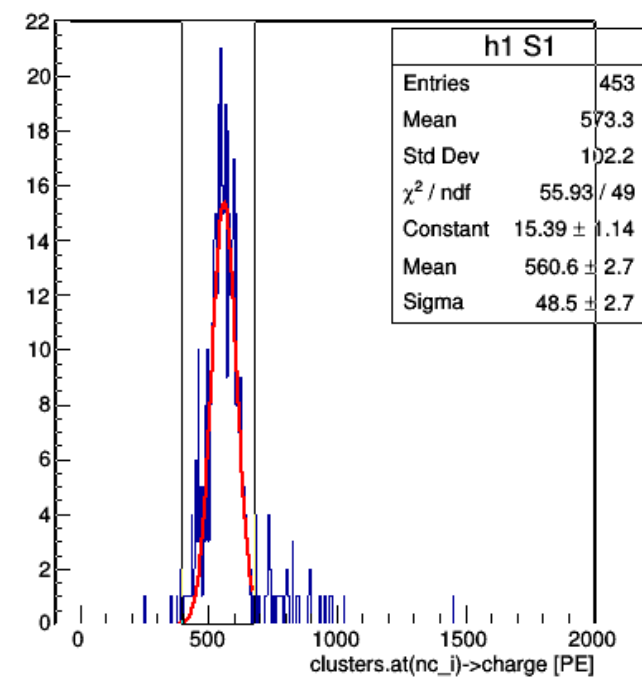
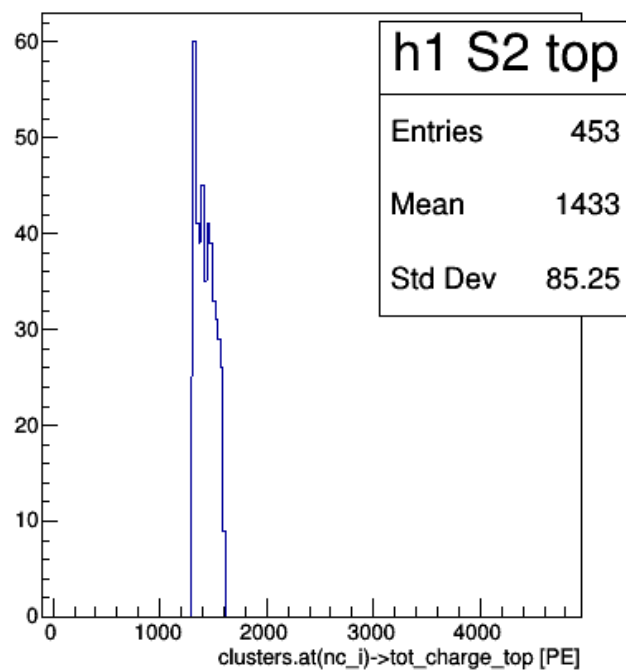
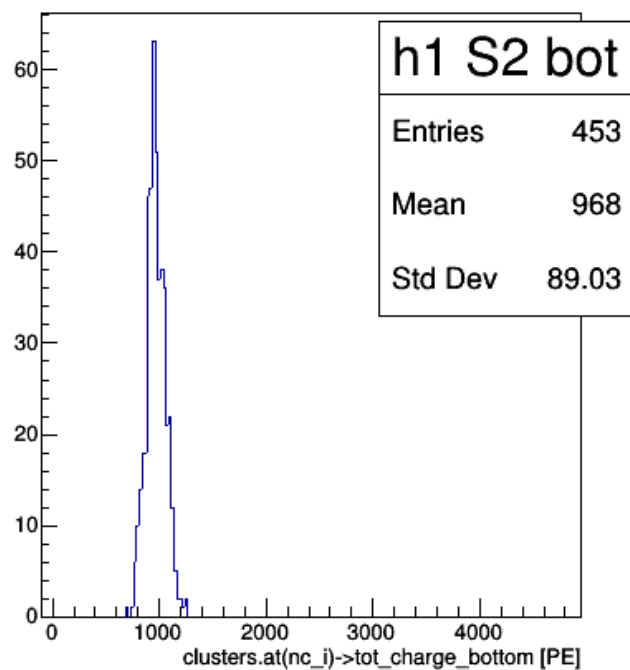
master cut

1300 &lt; tot\_charge\_top &lt; 1600 [PE]

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1300 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1600

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1300 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1600

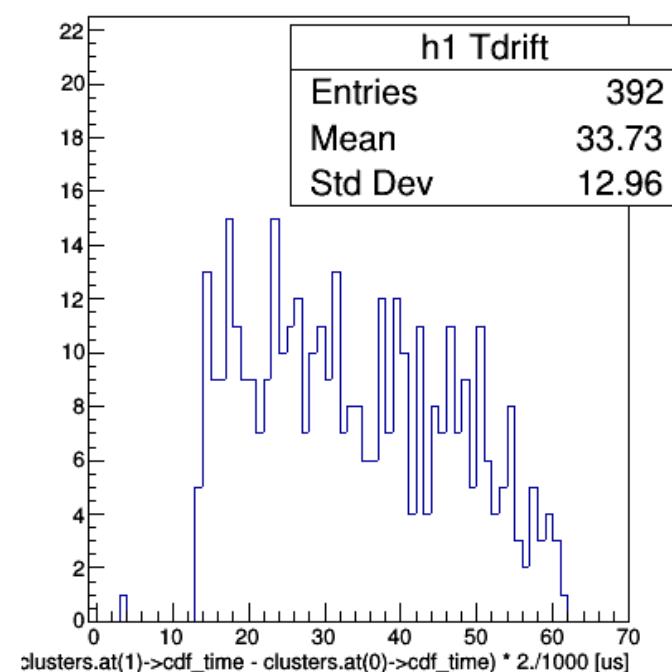
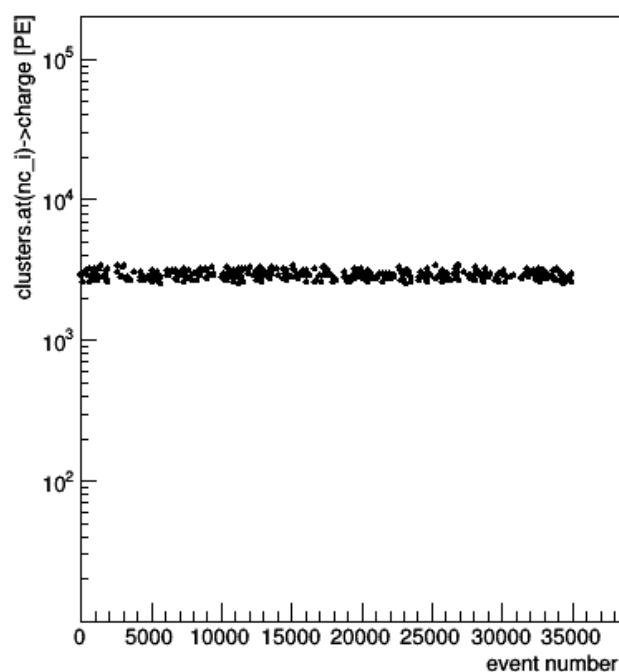
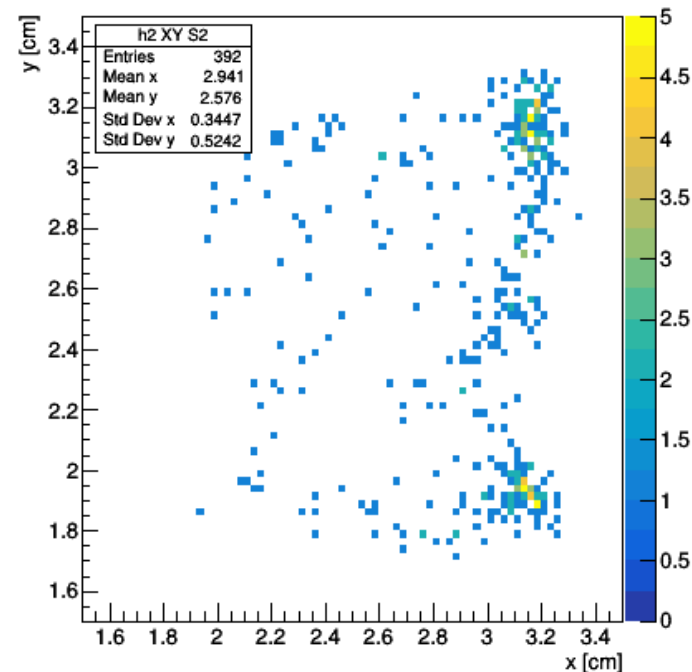
C2.is\_S1



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1600 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2000

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1600 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2000

C0.is\_S1\_S2



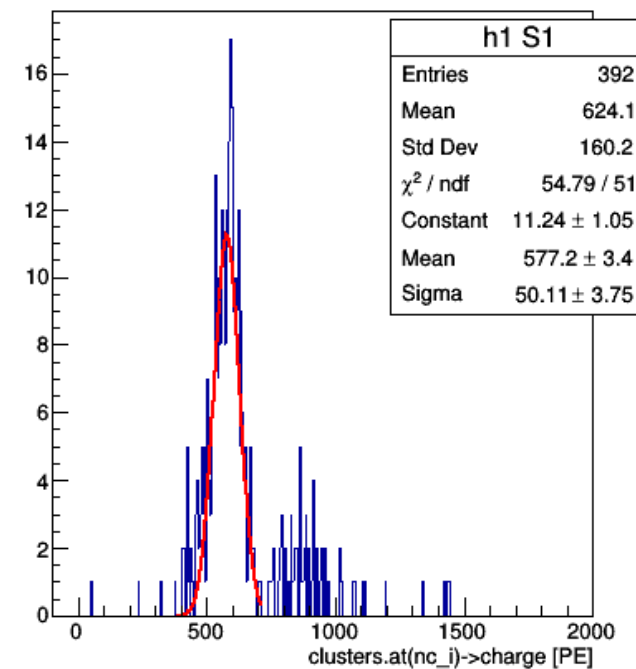
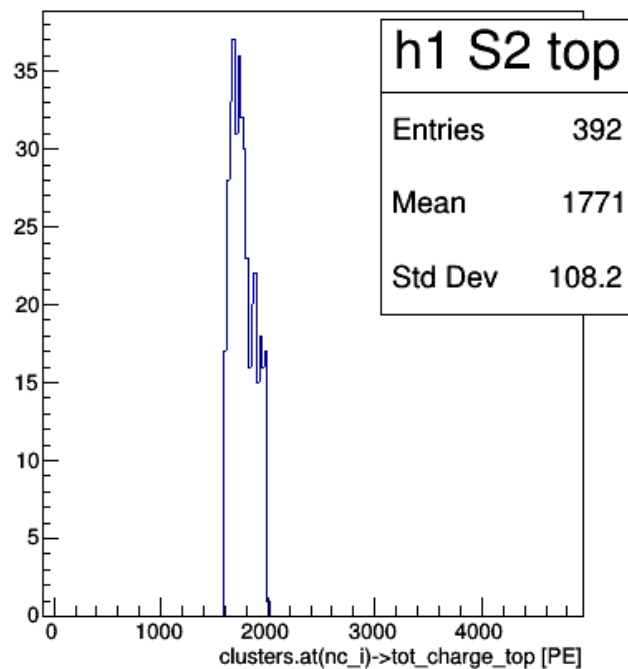
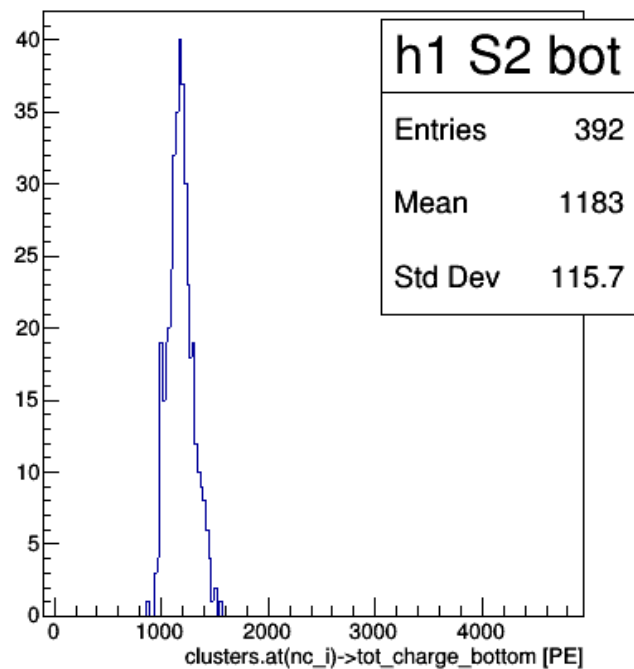
Ph2, Am241, run 537 master cut

1600 &lt; tot\_charge\_top &lt; 2000 [PE]

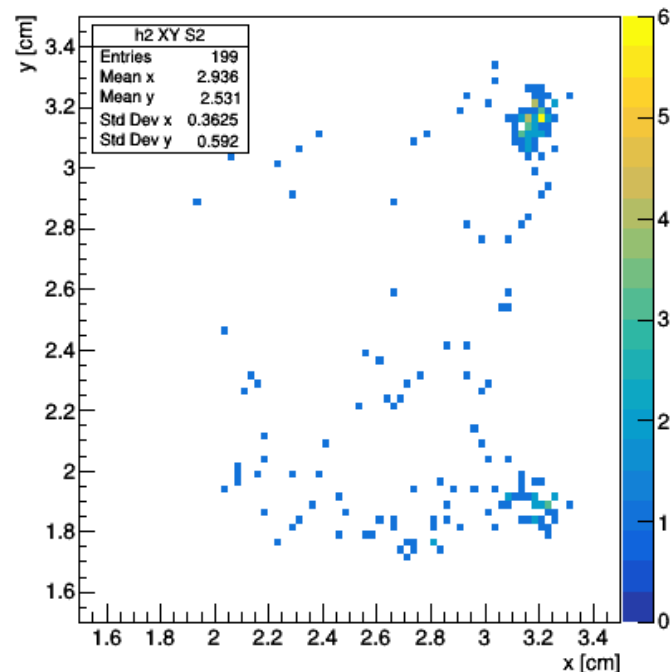
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1600 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2000

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1600 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2000

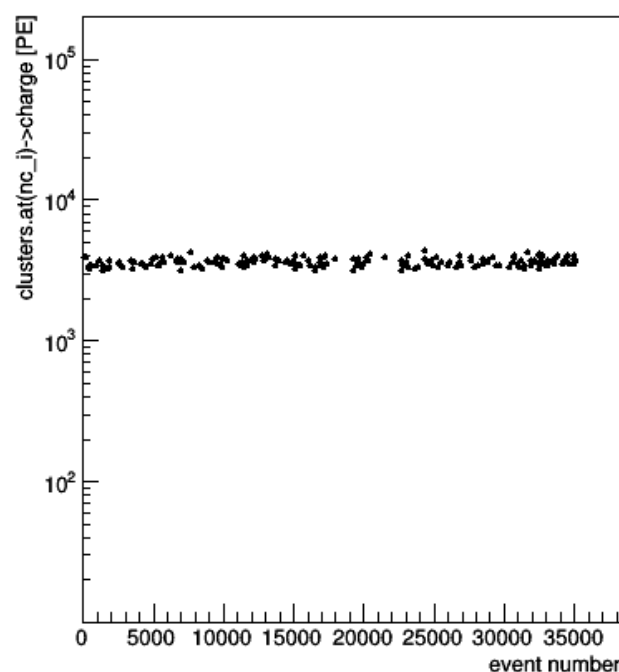
C2.is\_S1



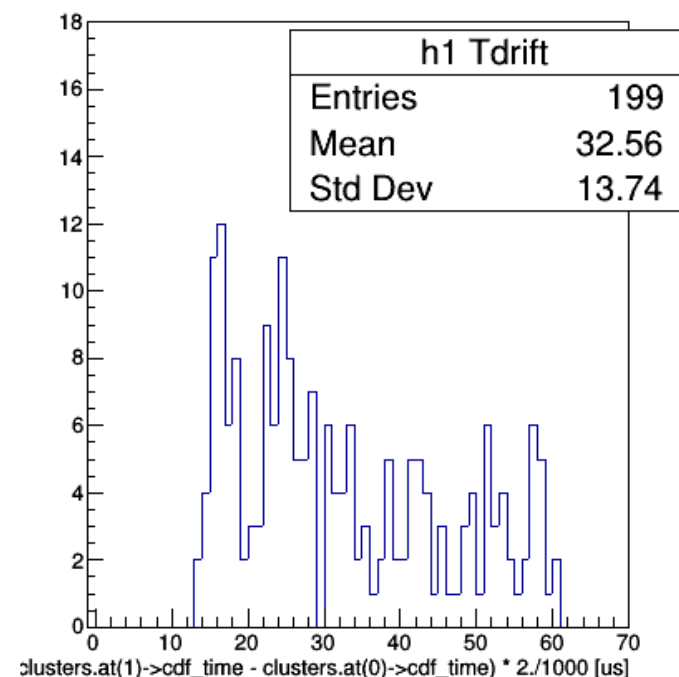
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2500



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2500



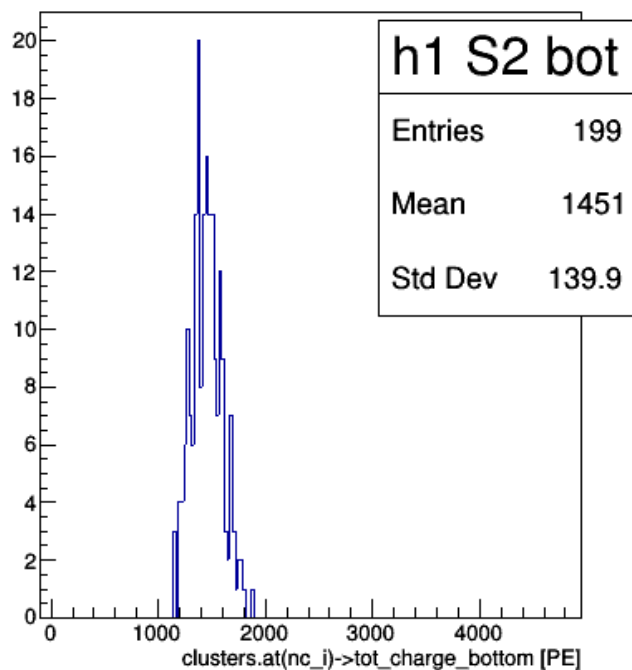
C0.is\_S1\_S2



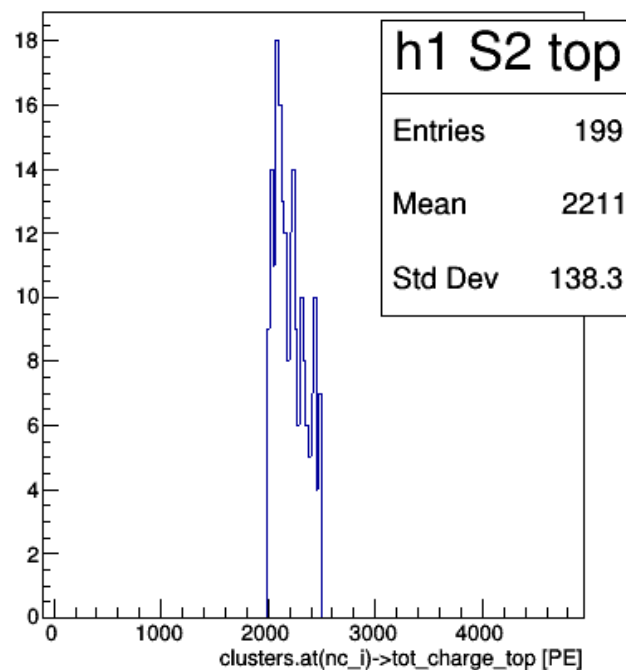
Ph2, Am241, run 537 master cut

2000 &lt; tot\_charge\_top &lt; 2500 [PE]

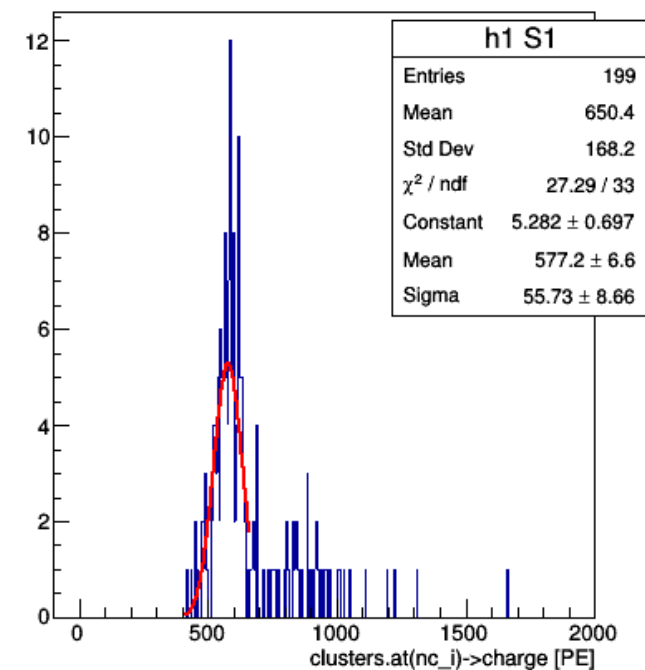
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2500



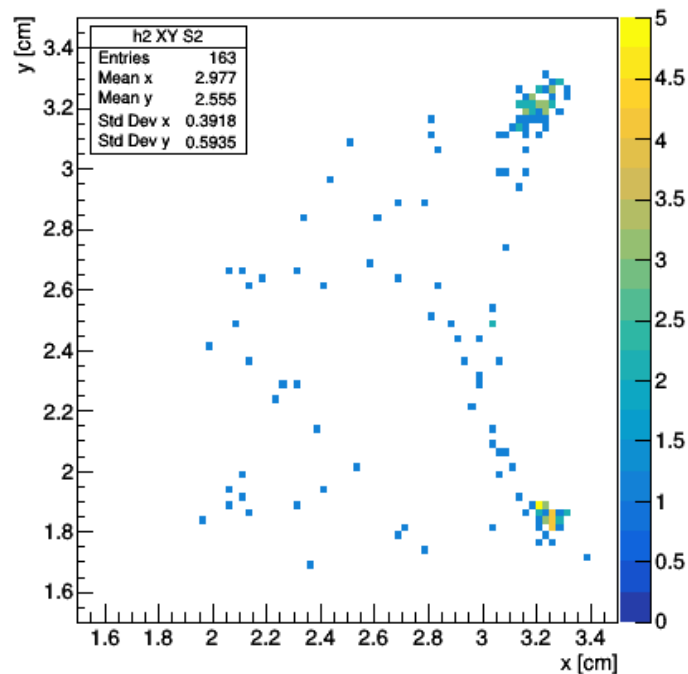
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2500



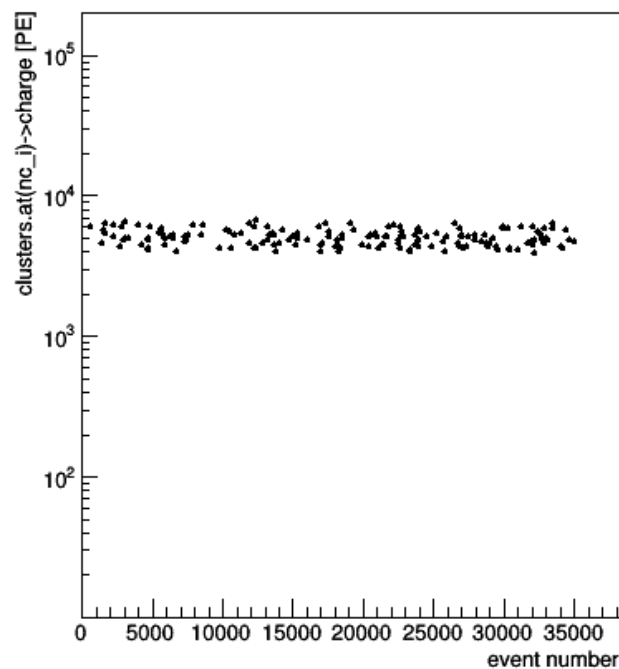
C2.is\_S1



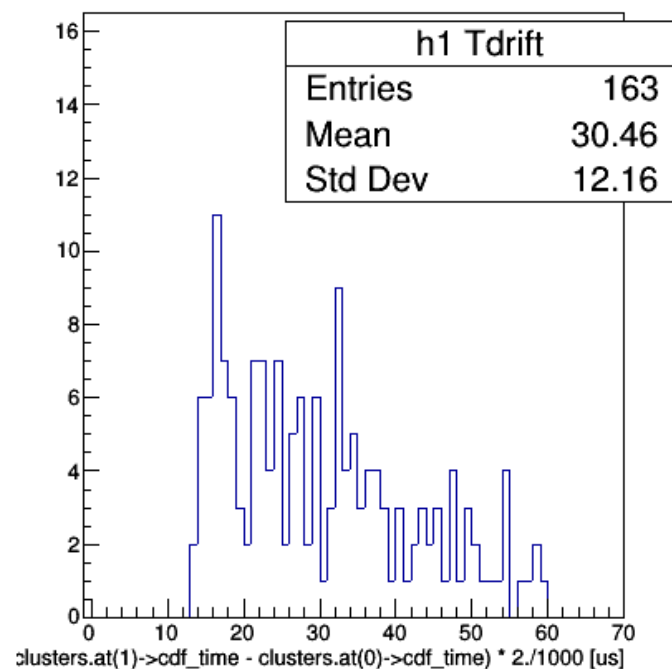
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2500 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 4000



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2500 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 4000



C0.is\_S1\_S2

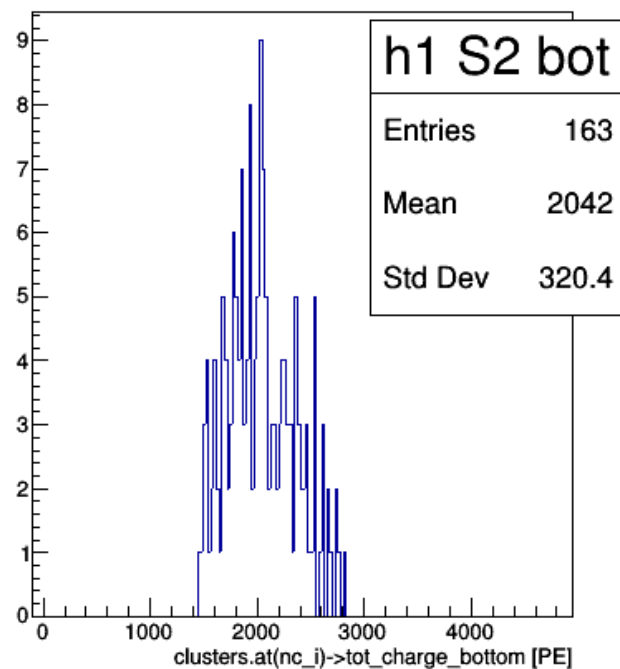


Ph2, Am241, run 537

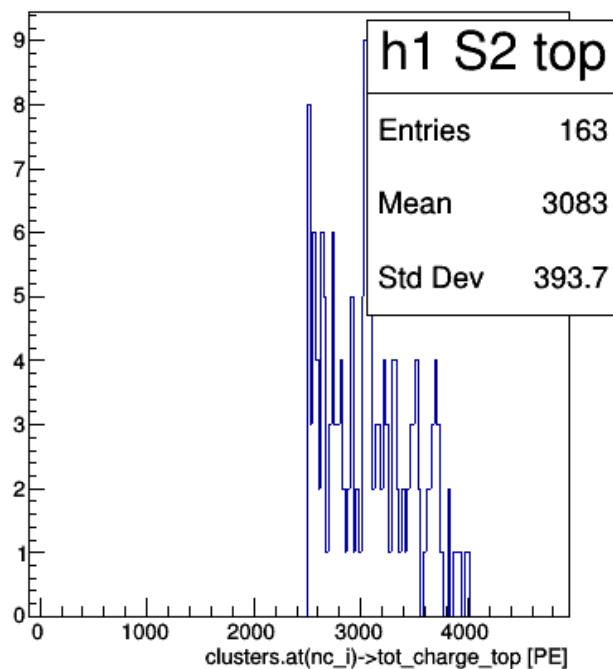
master cut

2500 &lt; tot\_charge\_top &lt; 4000 [PE]

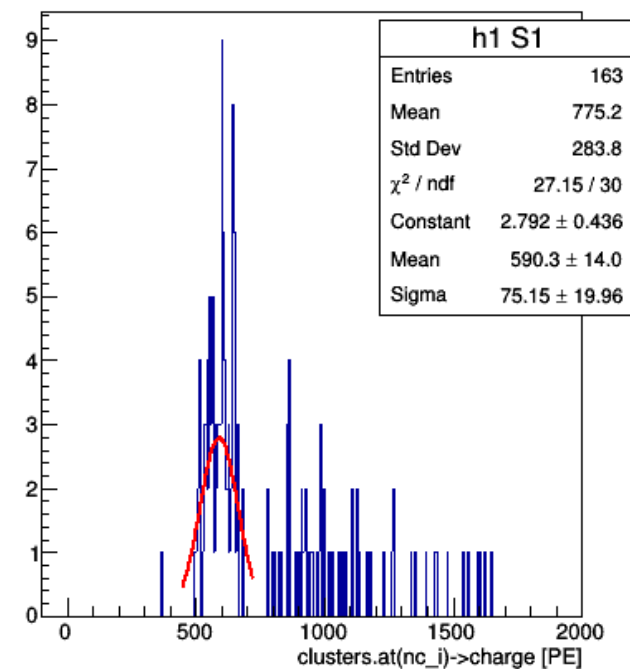
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2500 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 4000



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2500 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 4000



C2.is\_S1

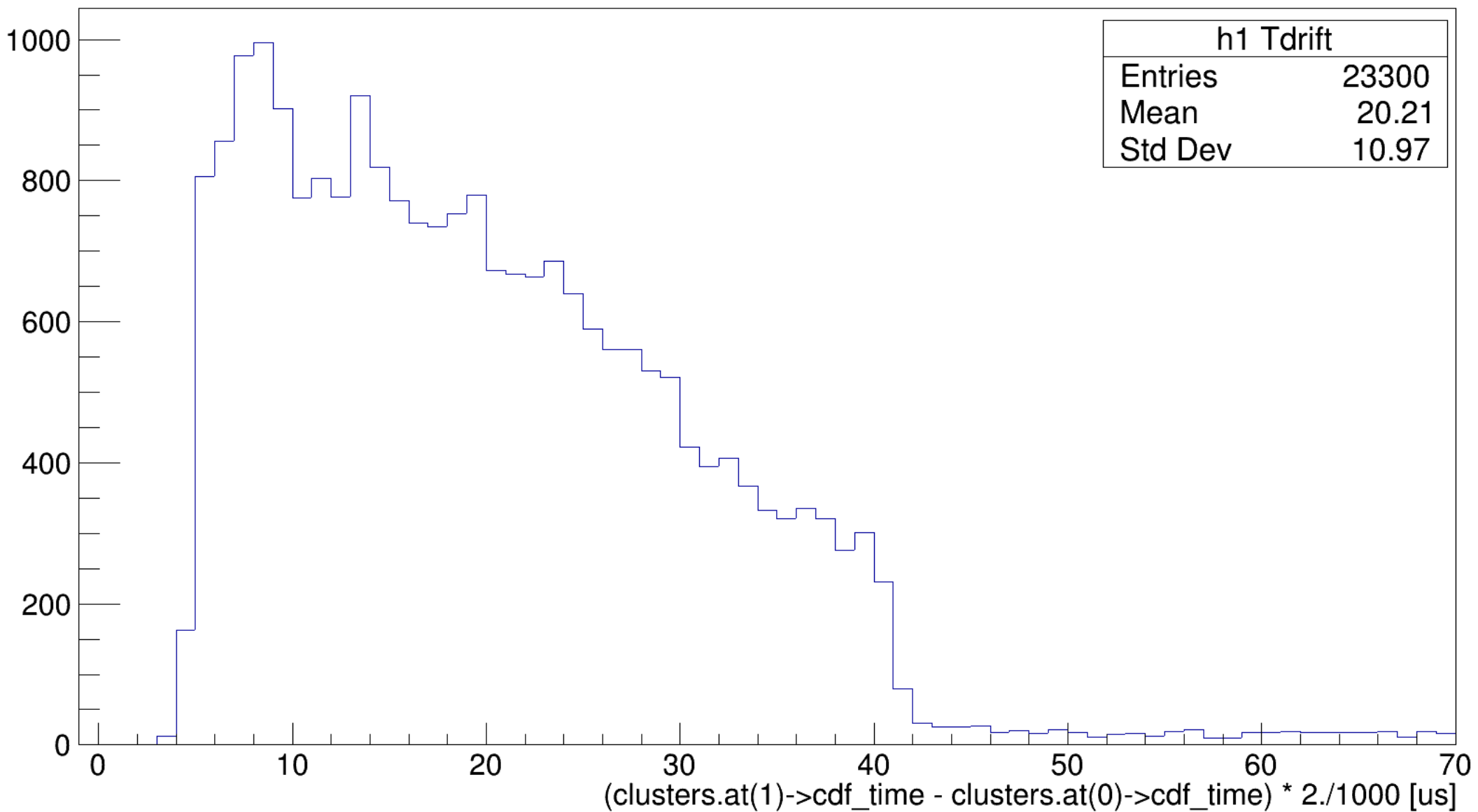




Ph2, Am241, run 542

# Ph2, Am241, run 542

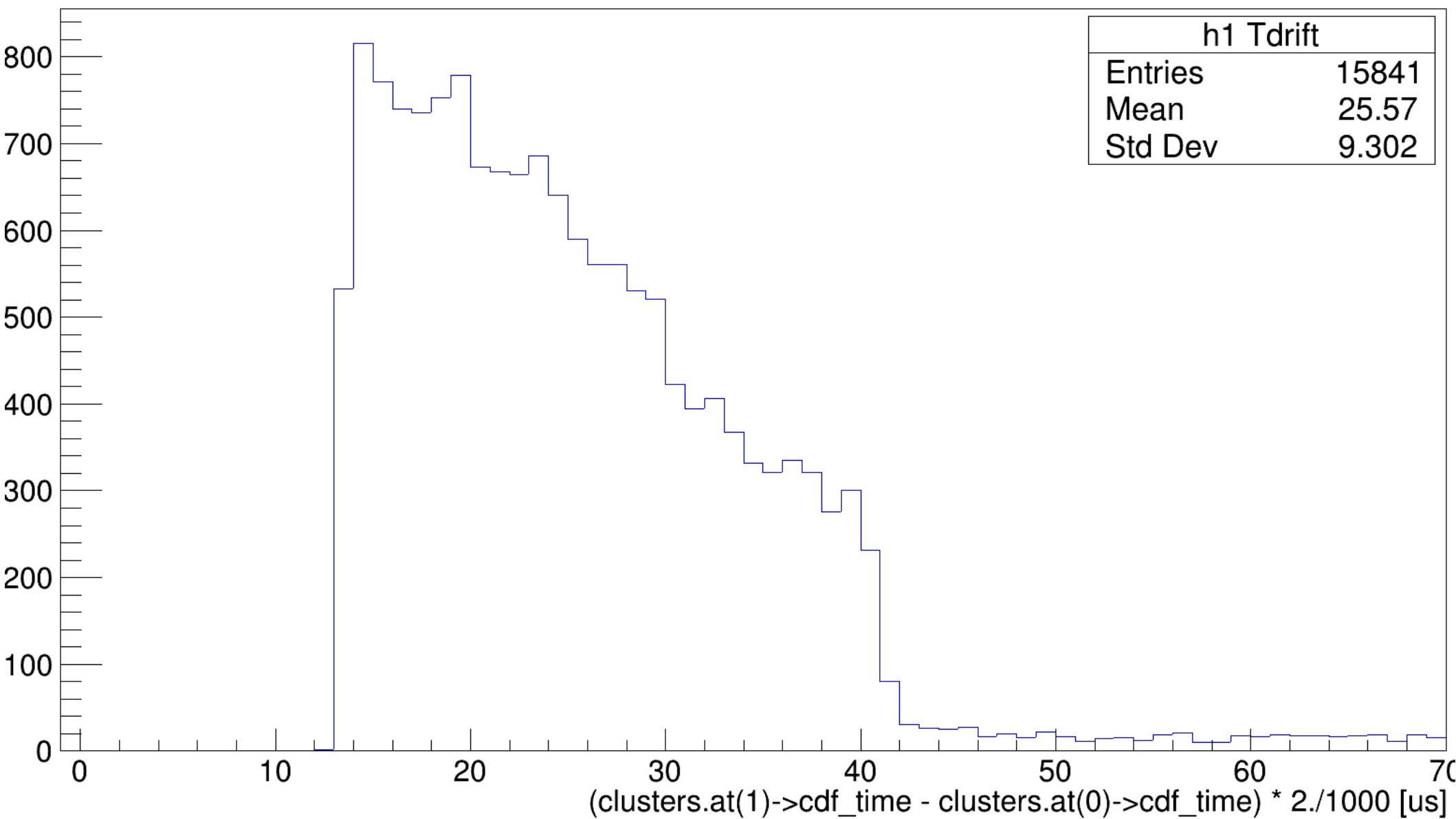
C0.nc == 2





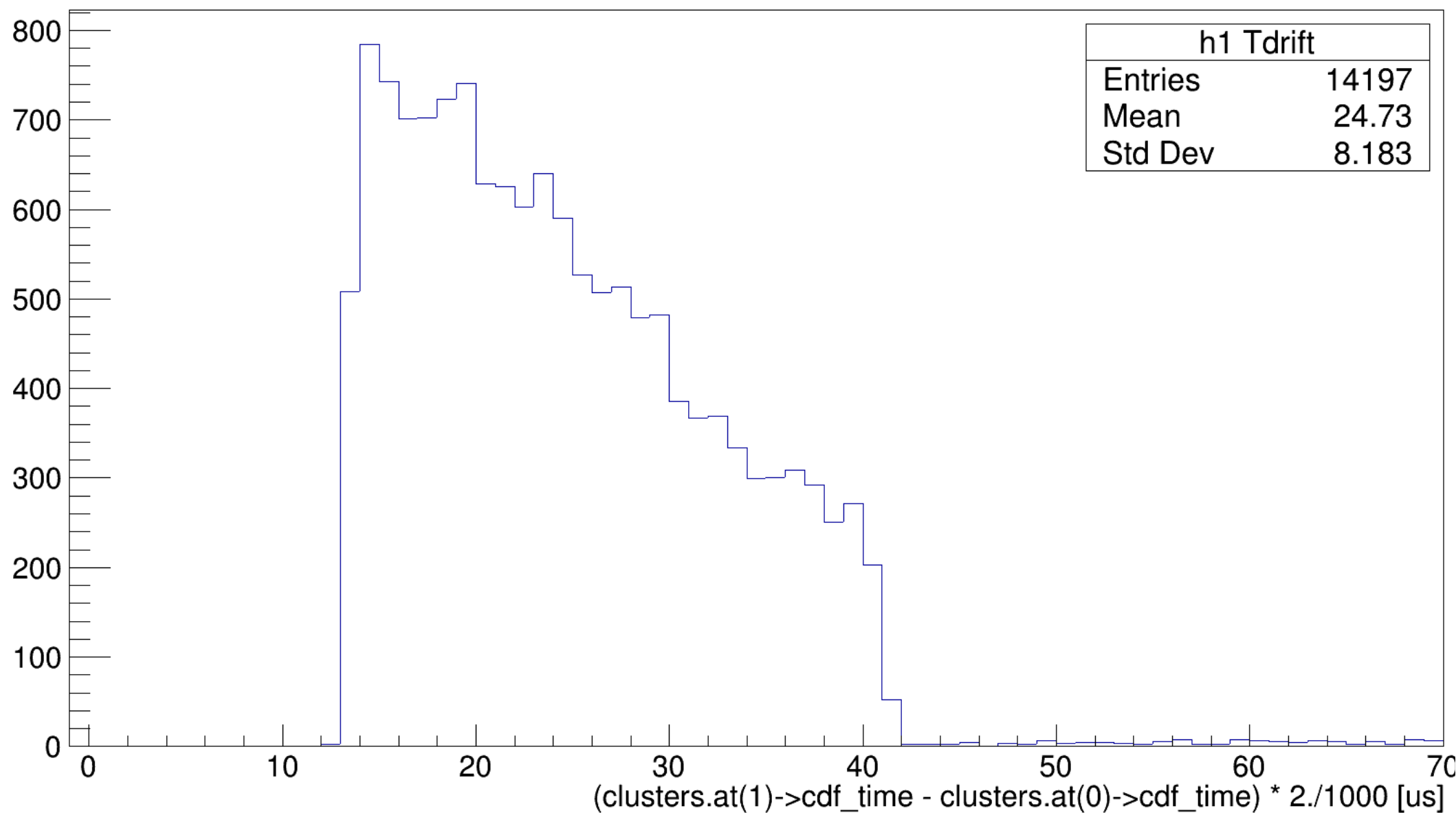
# Ph2, Am241, run 542

C0.nc == 2 && C0.cls0\_is\_full



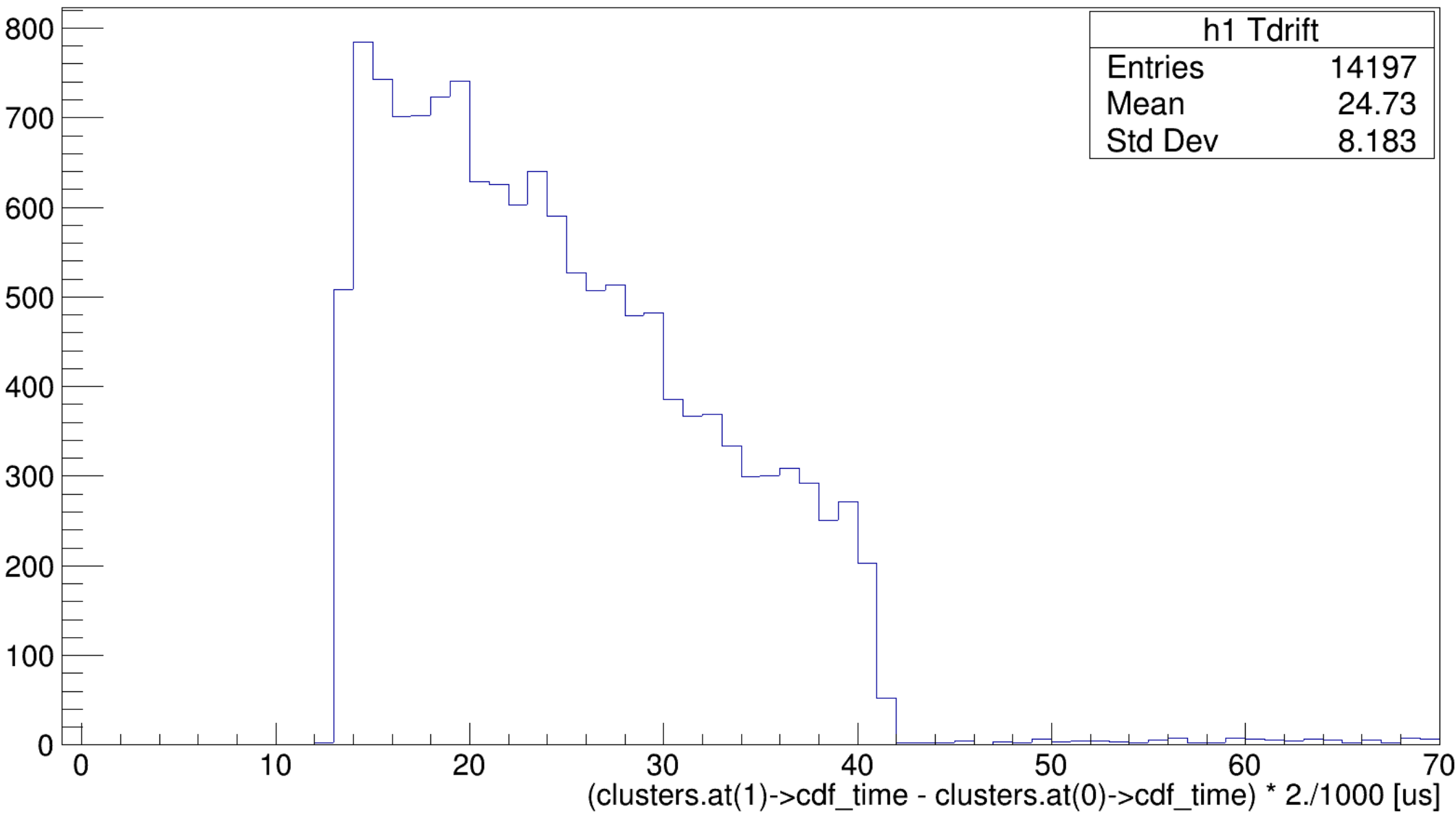
# Ph2, Am241, run 542

C0.nc == 2 && C0.cls0\_is\_full && C0.cls0\_is\_S1



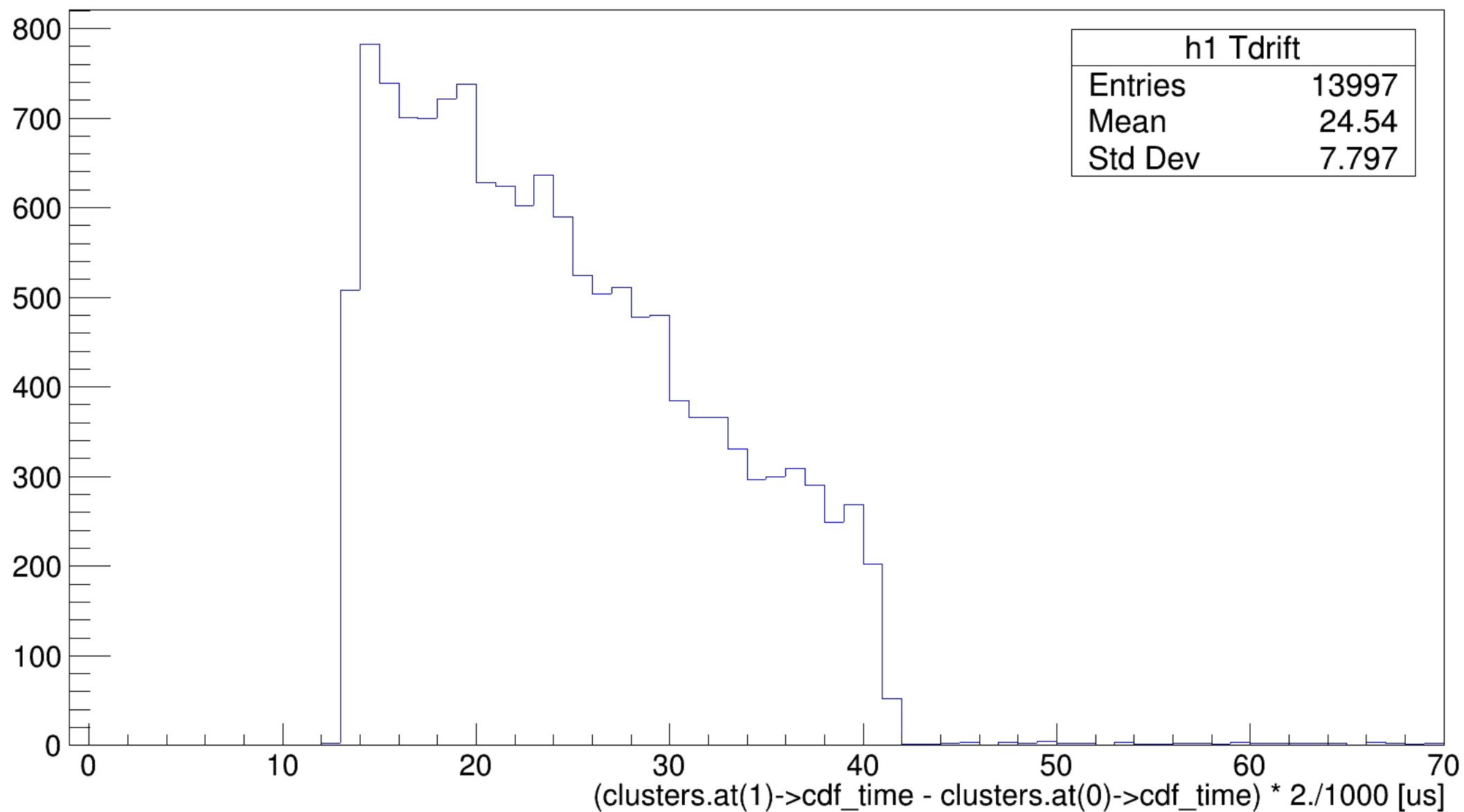
Ph2, Am241, run 542

C0.is\_S1\_S2



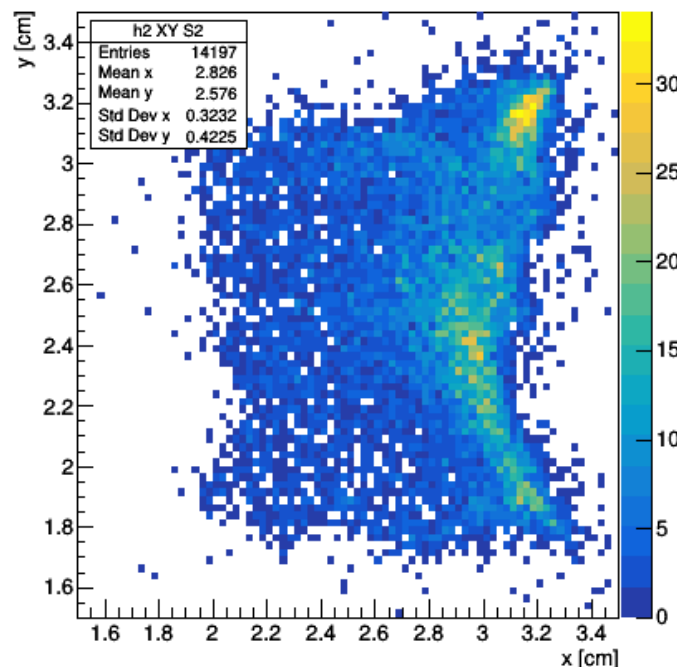
# Ph2, Am241, run 542

C0.is\_S1\_S2 && clusters.at(1)->f90 < 0.2

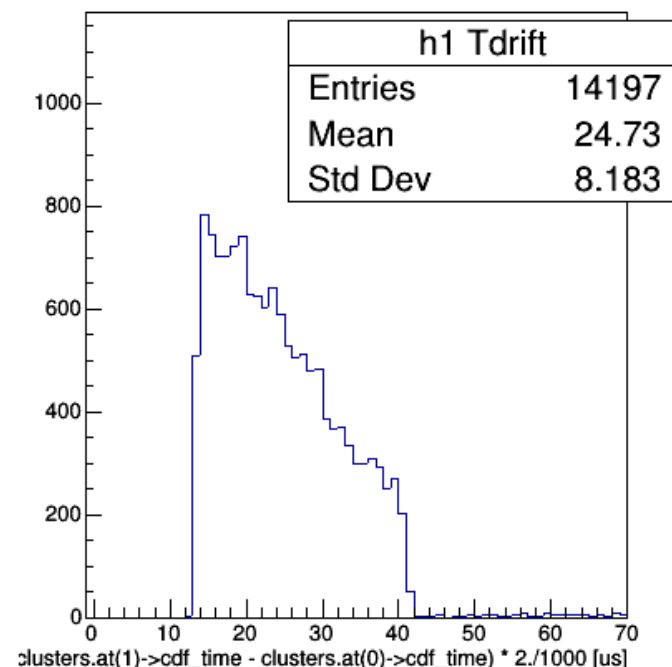
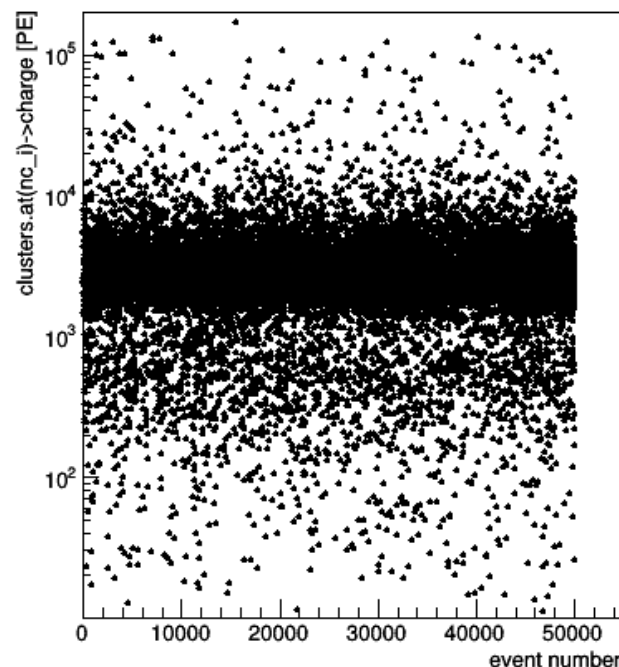


master cut  
C0.nc == 2

C1.is\_S2



C1.is\_S2

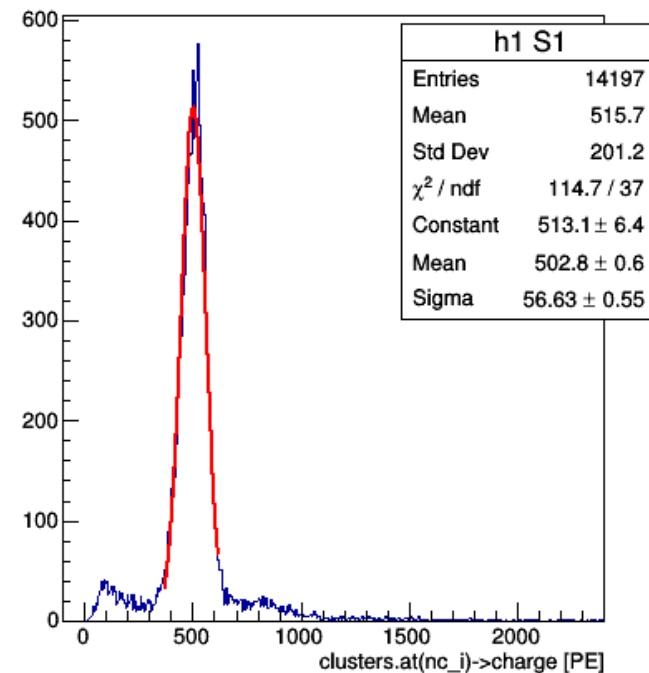
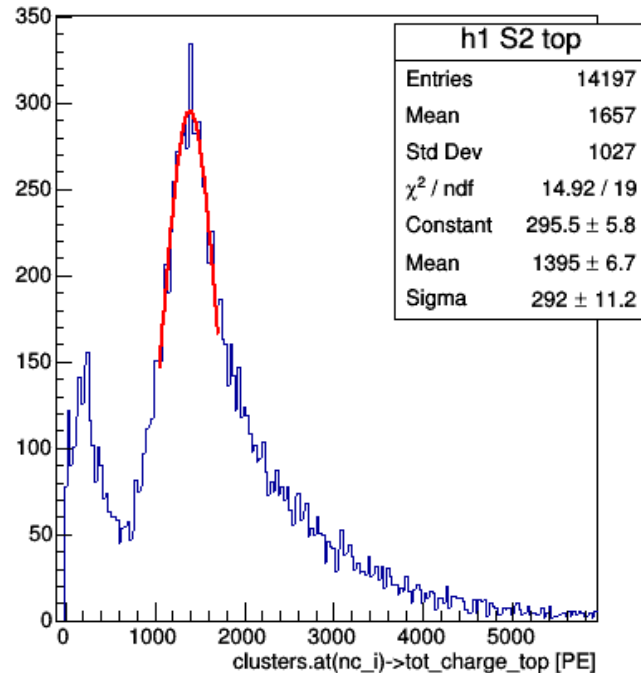
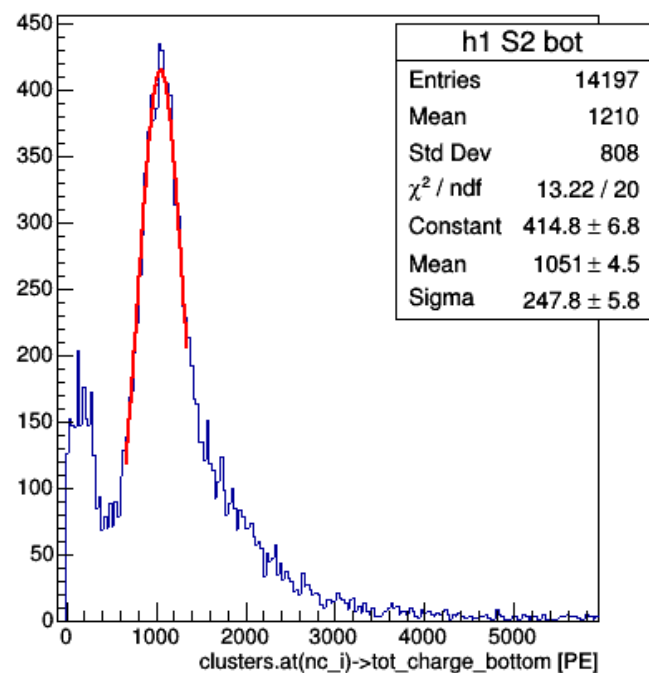


C1.is\_S2

Ph2, Am241, run 542

C1.is\_S2

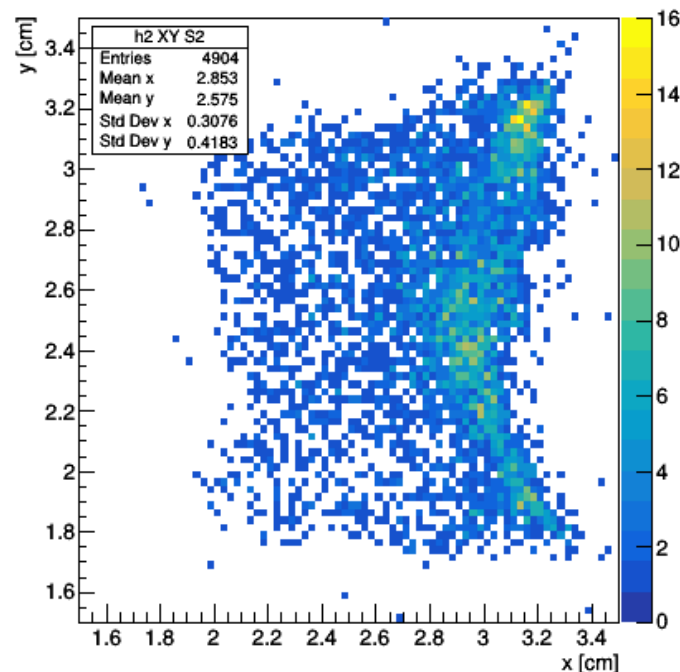
C2.is\_S1



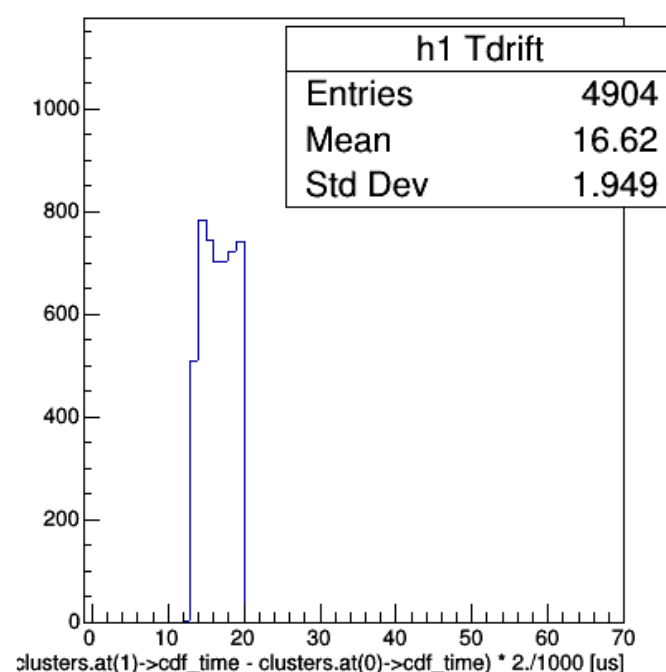
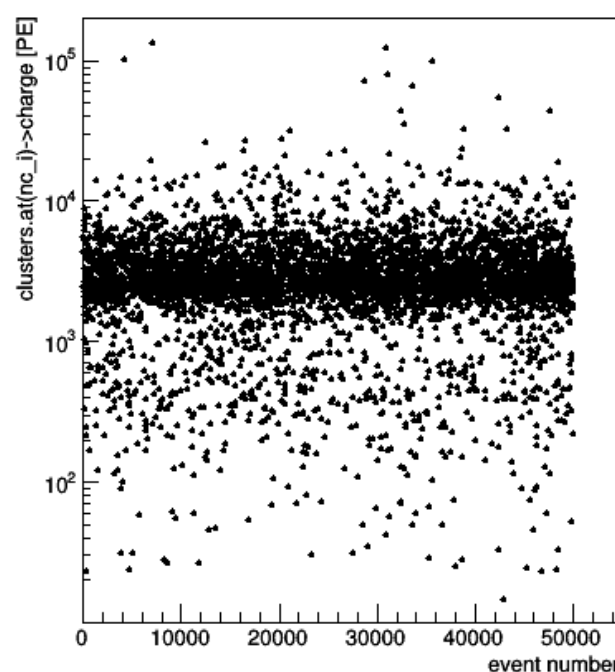
master cut

C0.nc == 2

C1.is\_S2 && Tdrift > 10 && Tdrift < 20

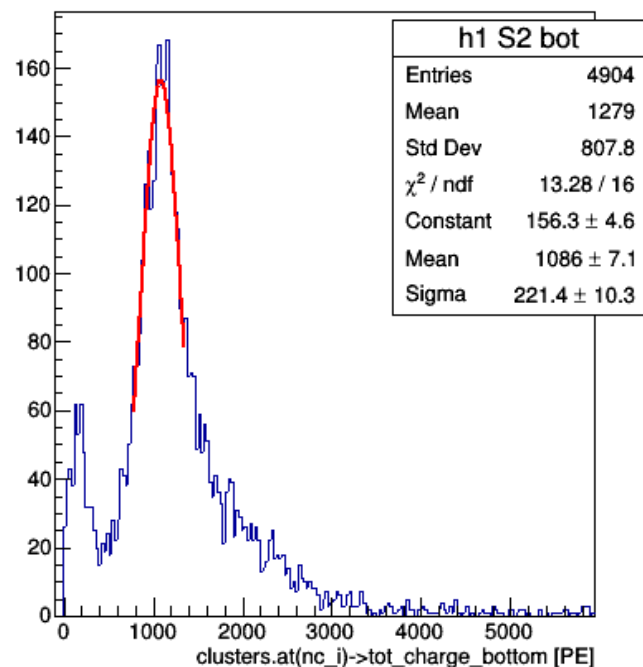


C1.is\_S2 && Tdrift > 10 && Tdrift < 20

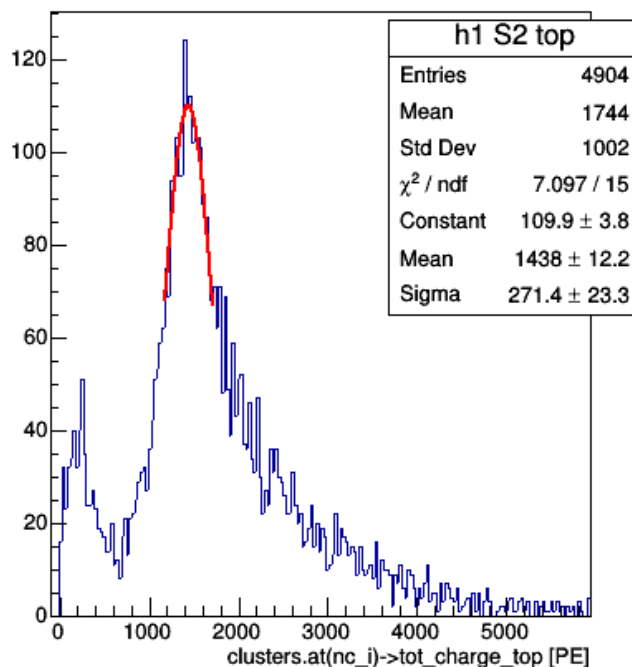


Ph2, Am241, run 542

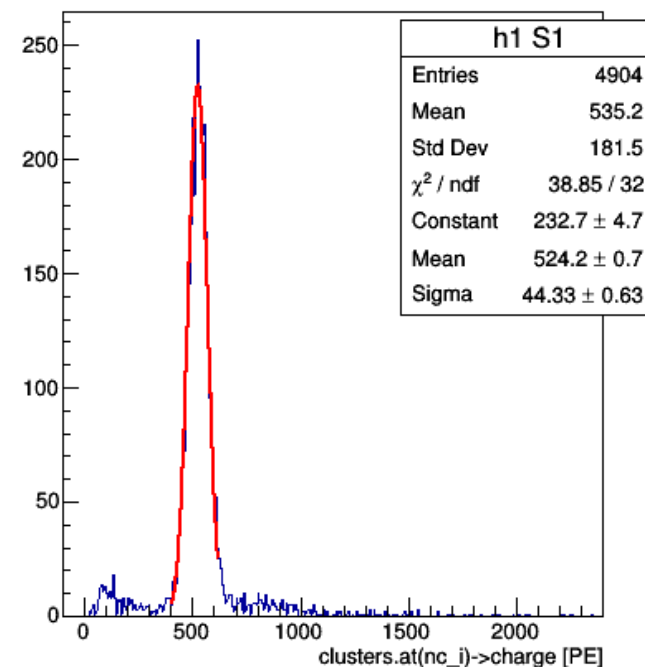
C1.is\_S2 && Tdrift > 10 && Tdrift < 20



C1.is\_S2 && Tdrift > 10 && Tdrift < 20

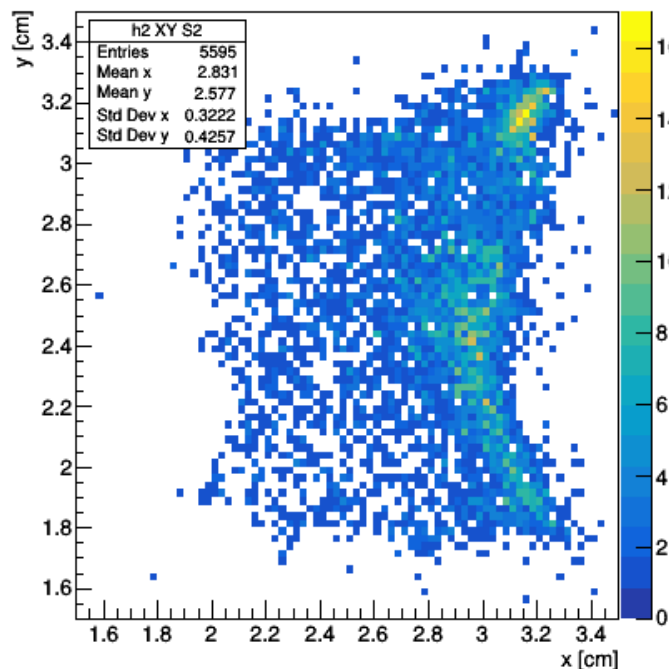


C2.is\_S1

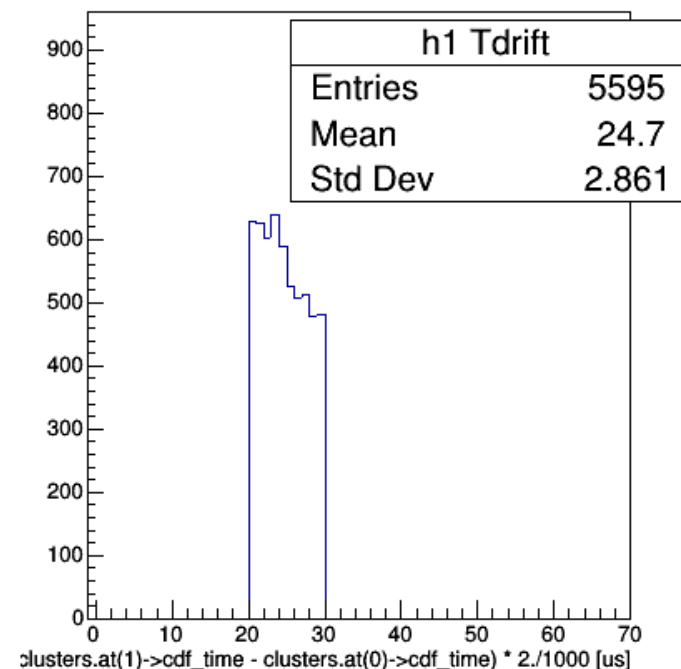
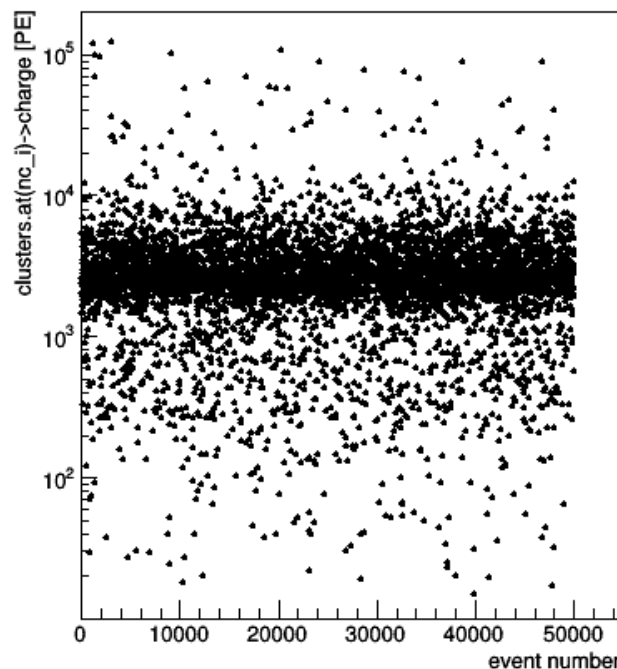


master cut  
C0.nc == 2

C1.is\_S2 && Tdrift > 20 && Tdrift < 30

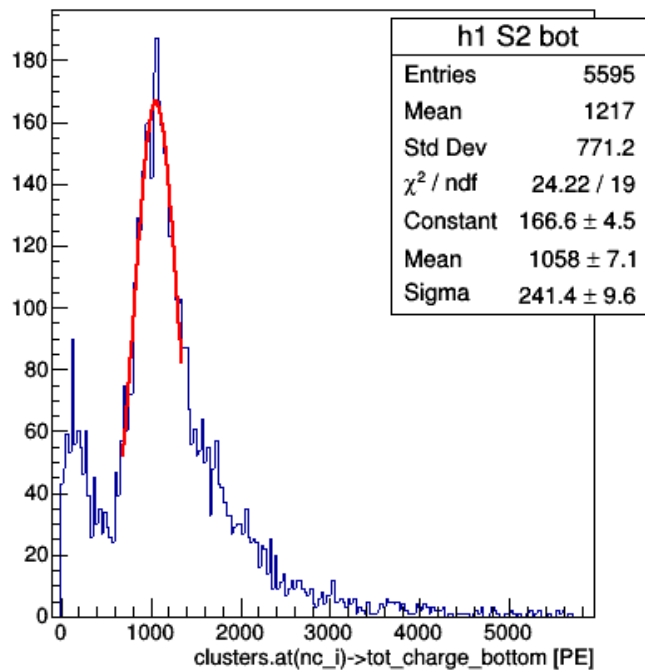


C1.is\_S2 && Tdrift > 20 && Tdrift < 30

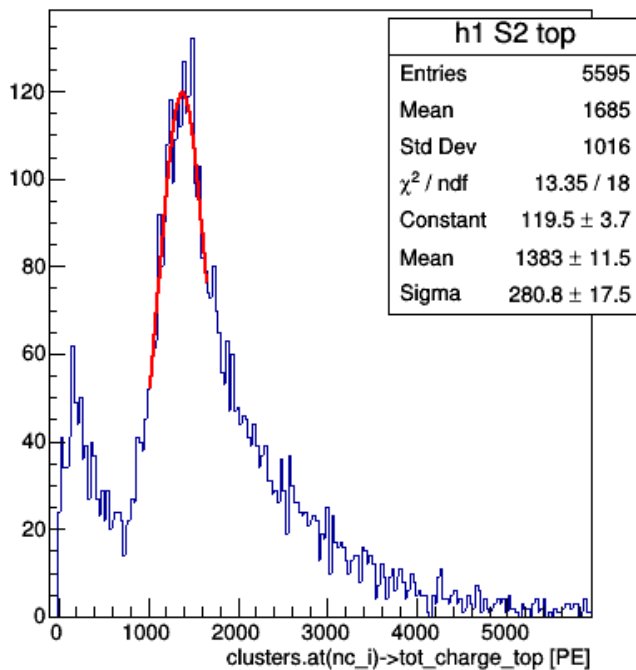


Ph2, Am241, run 542

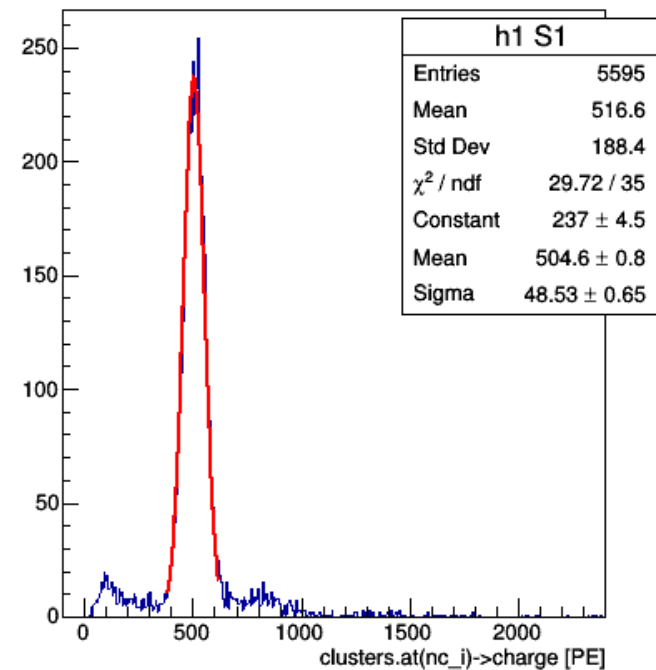
C1.is\_S2 && Tdrift > 20 && Tdrift < 30



C1.is\_S2 && Tdrift > 20 && Tdrift < 30

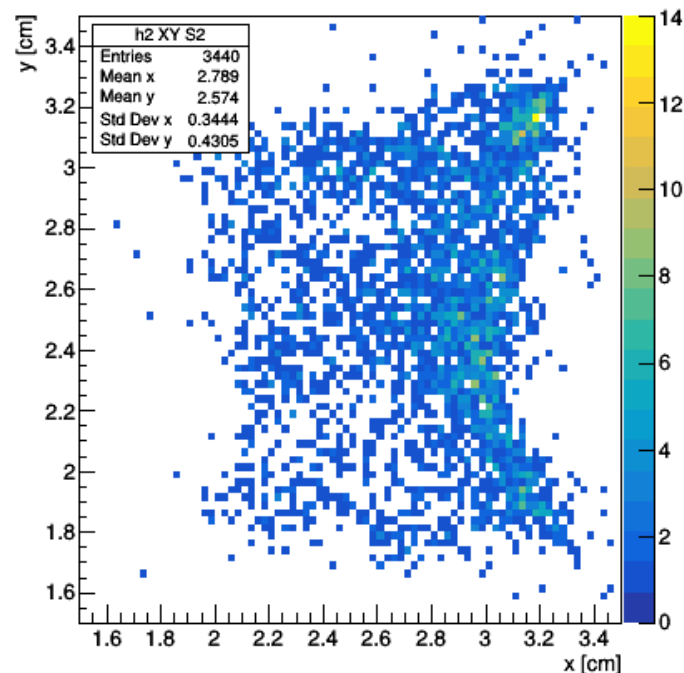


C2.is\_S1

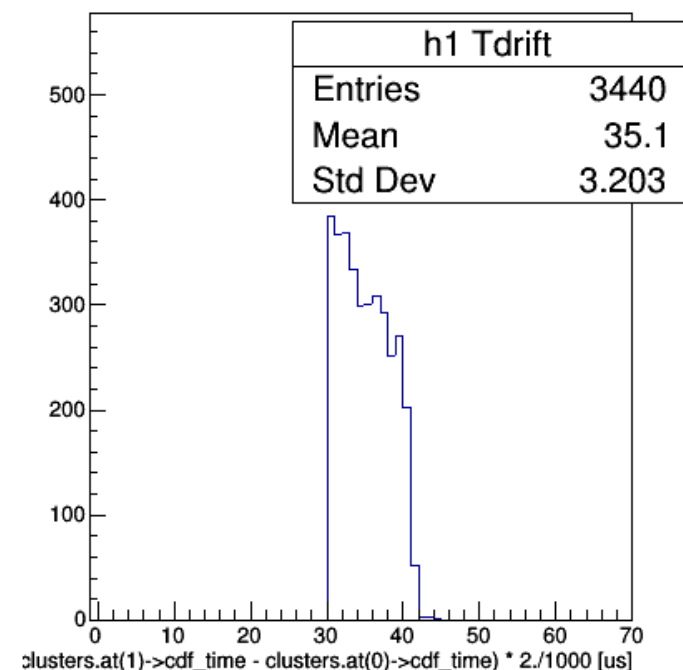
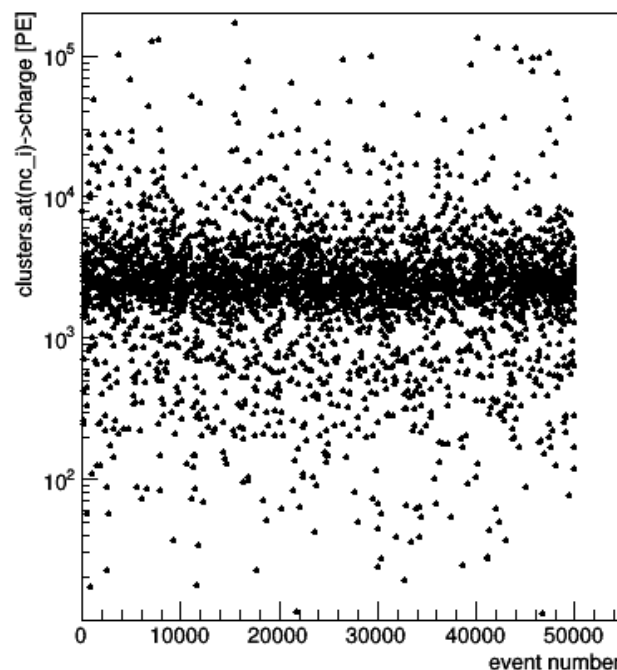


master cut  
C0.nc == 2

C1.is\_S2 && Tdrift > 30 && Tdrift < 45

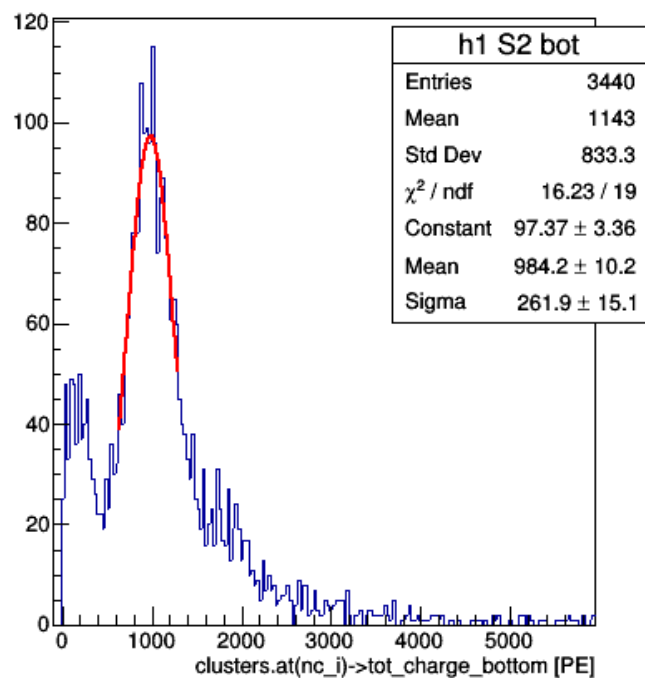


C1.is\_S2 && Tdrift > 30 && Tdrift < 45

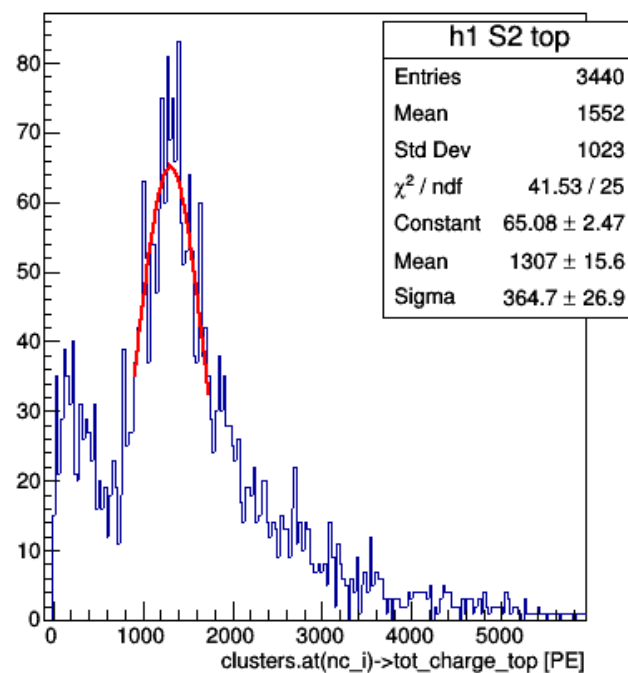


Ph2, Am241, run 542

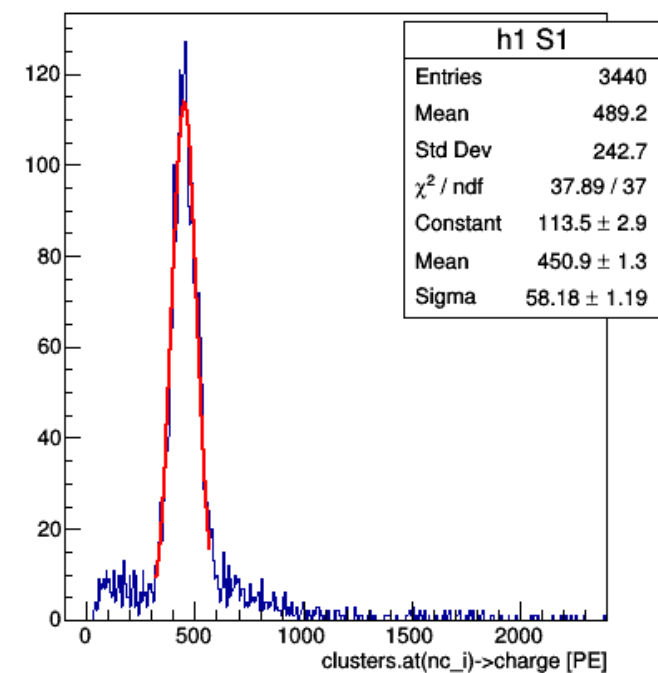
C1.is\_S2 && Tdrift > 30 && Tdrift < 45



C1.is\_S2 && Tdrift > 30 && Tdrift < 45



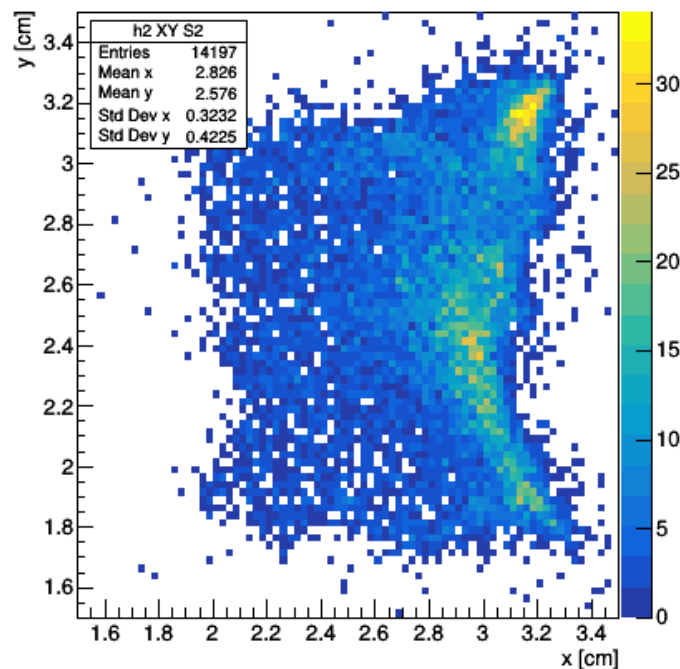
C2.is\_S1



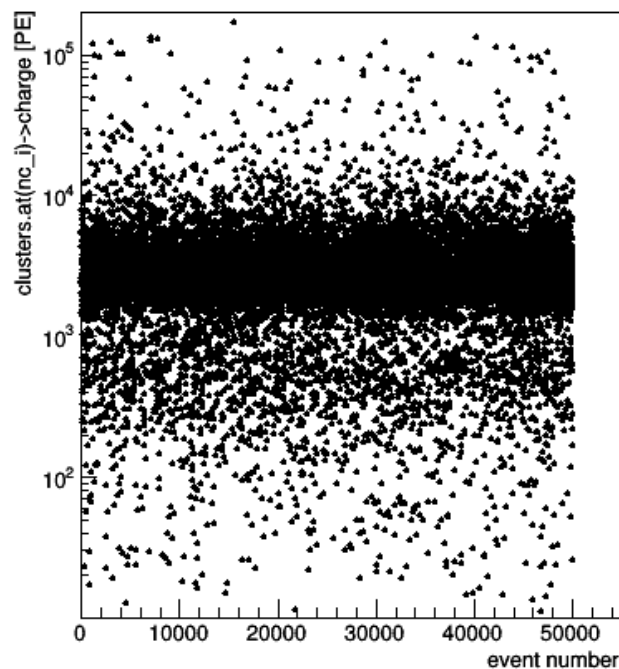




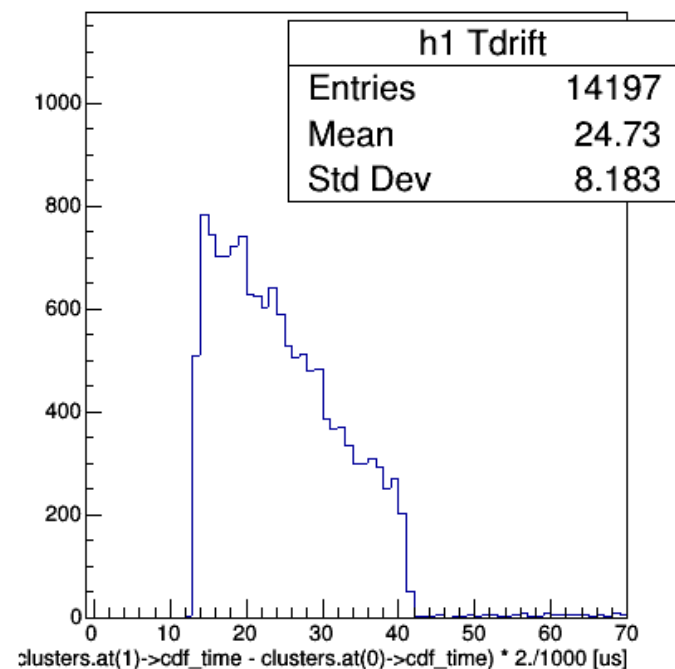
C1.is\_S2



C1.is\_S2



C0.nc == 2

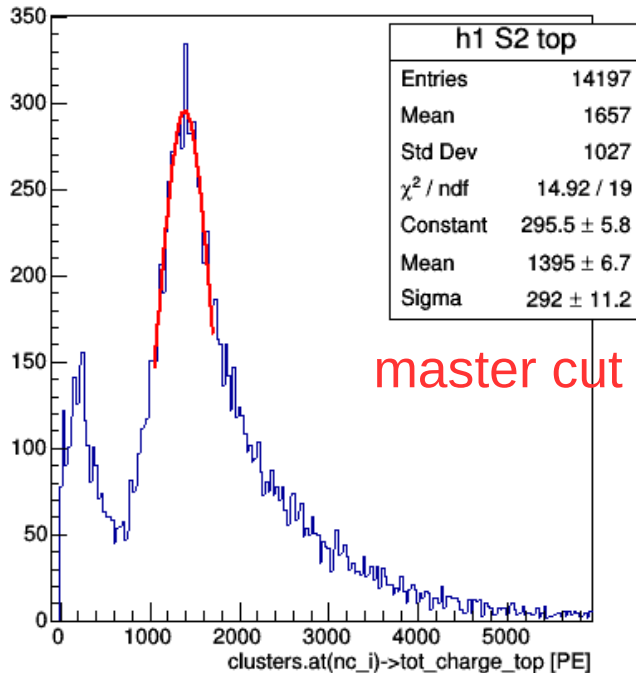
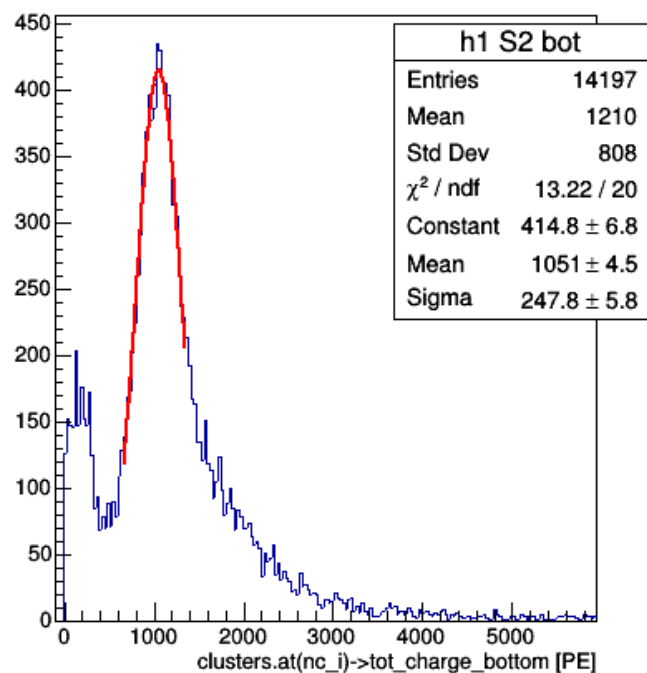


C1.is\_S2

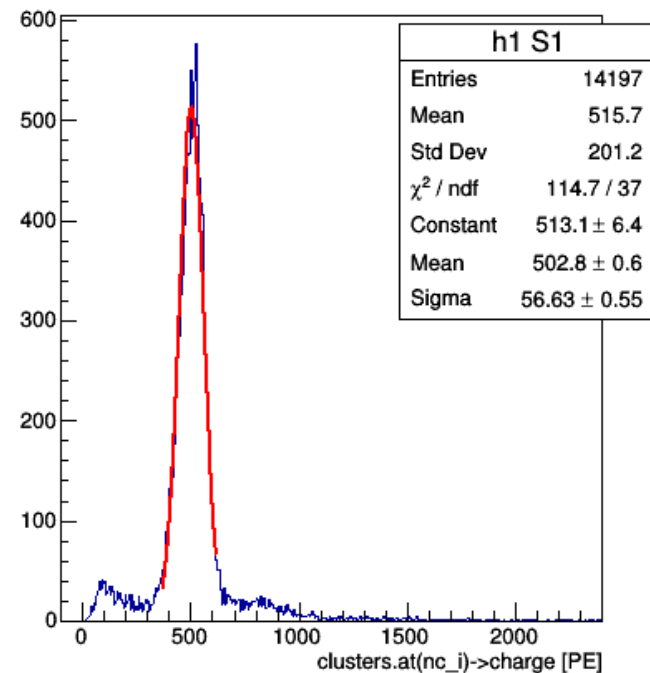
Ph2, Am241, run 542

C1.is\_S2

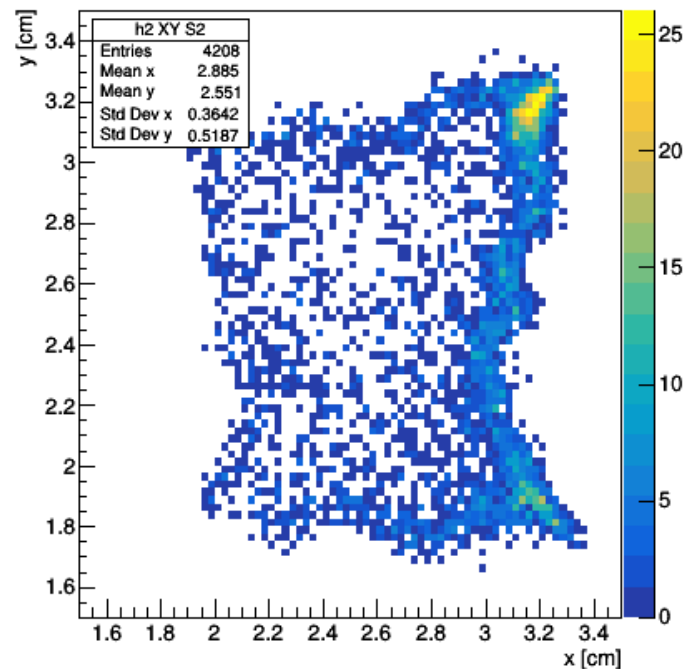
C2.is\_S1



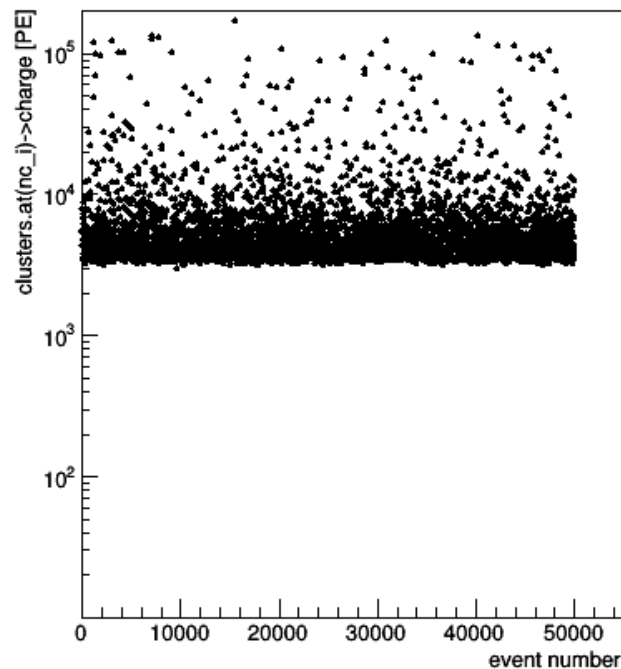
master cut



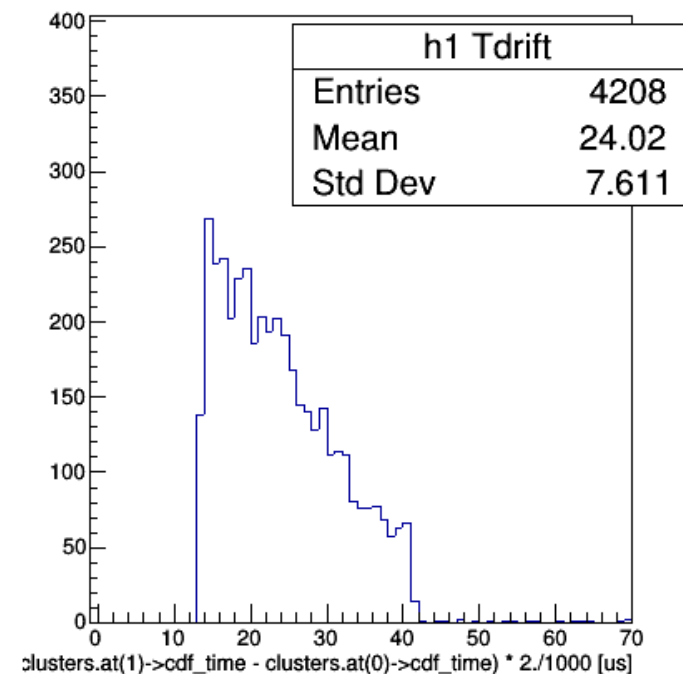
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2000



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2000

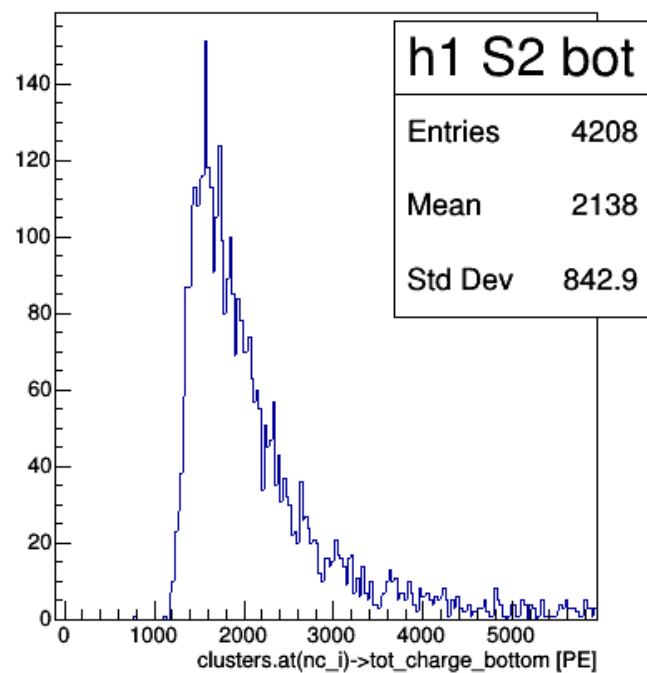


C0.nc == 2

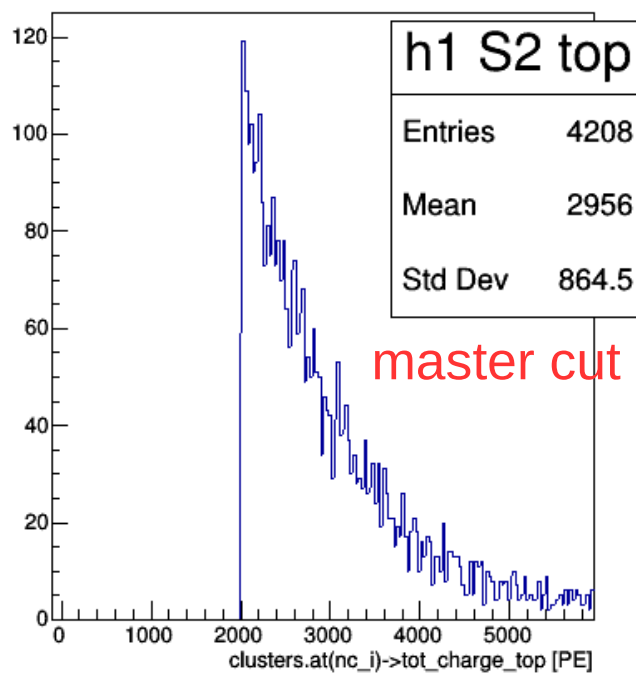


Ph2, Am241, run 542

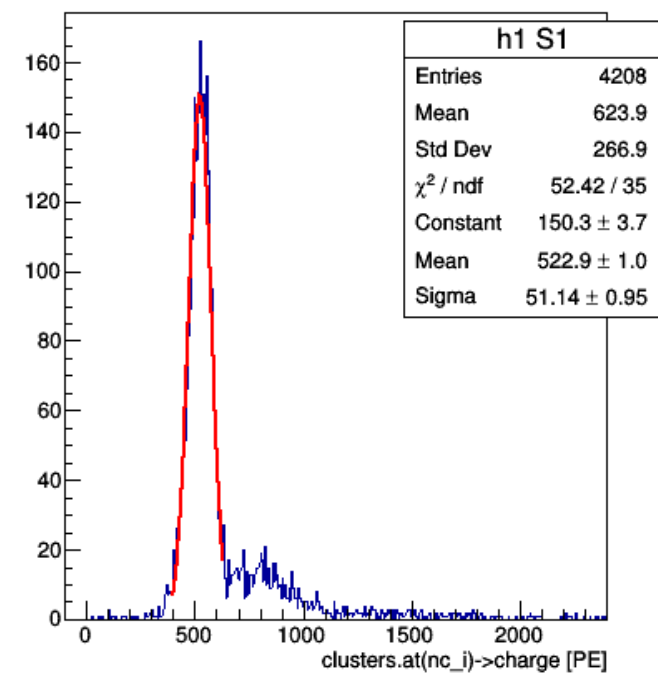
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2000



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2000



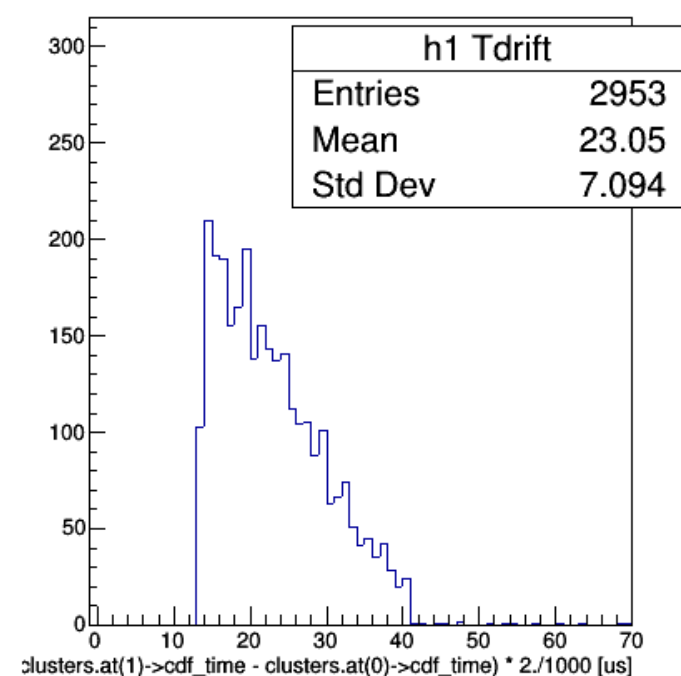
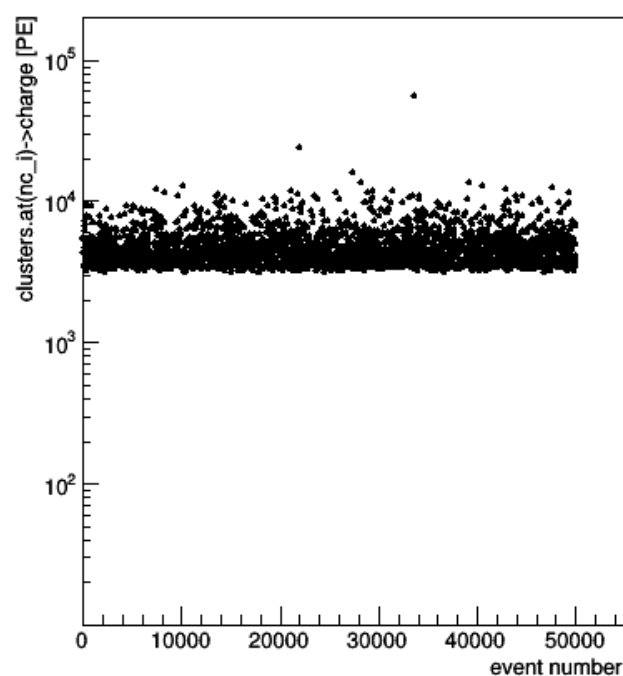
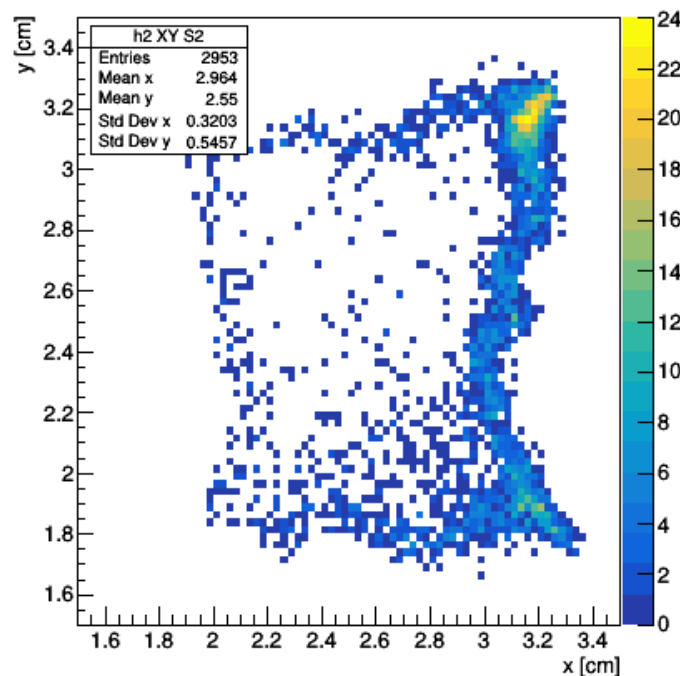
C2.is\_S1



region of S2 uniformity ( $2.2 < x < 2.8$ ;

$2 < y < 3$ )

C0.nc == 2

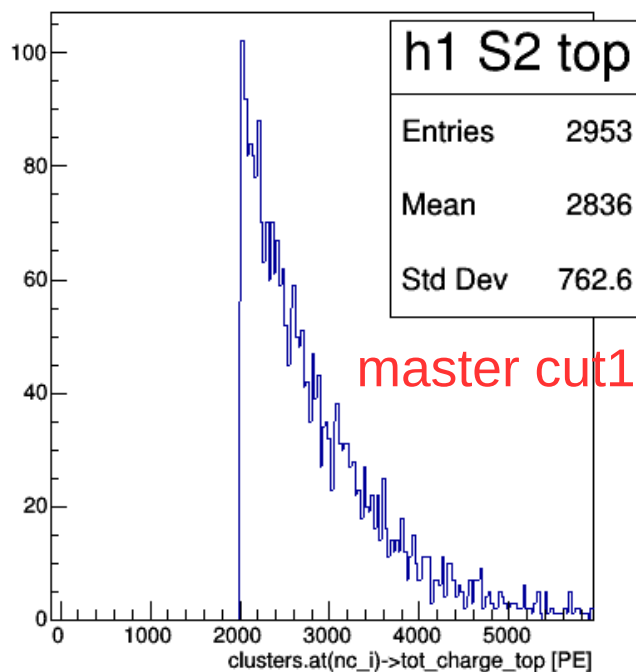
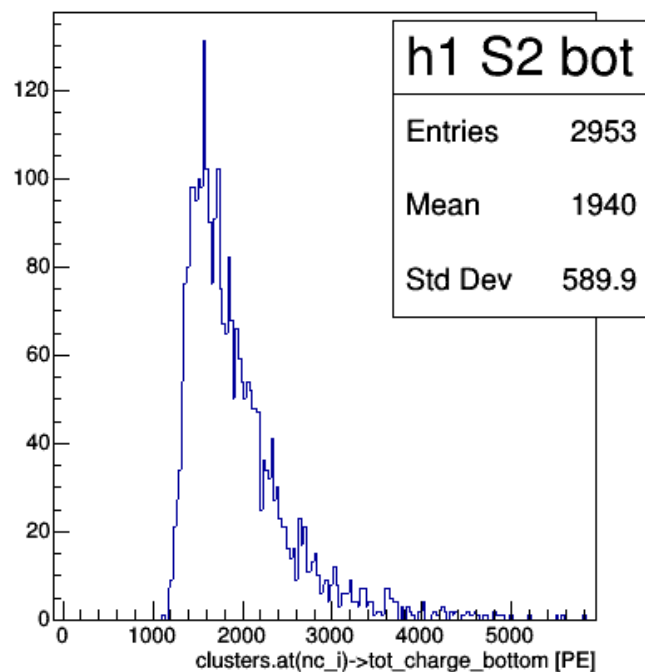


tot\_charge\_top > 2000 [PE]

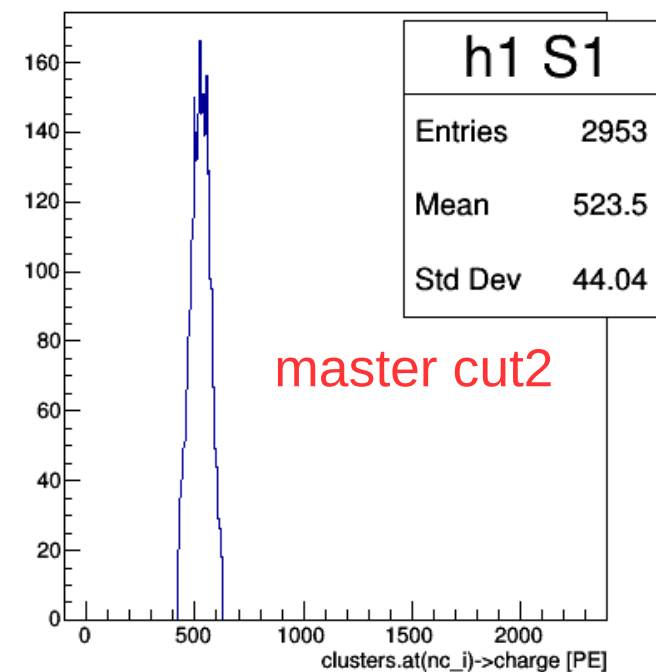
421 < charge < 625 [PE]

Ph2, Am241, run 542

C2.is\_S1



master cut1

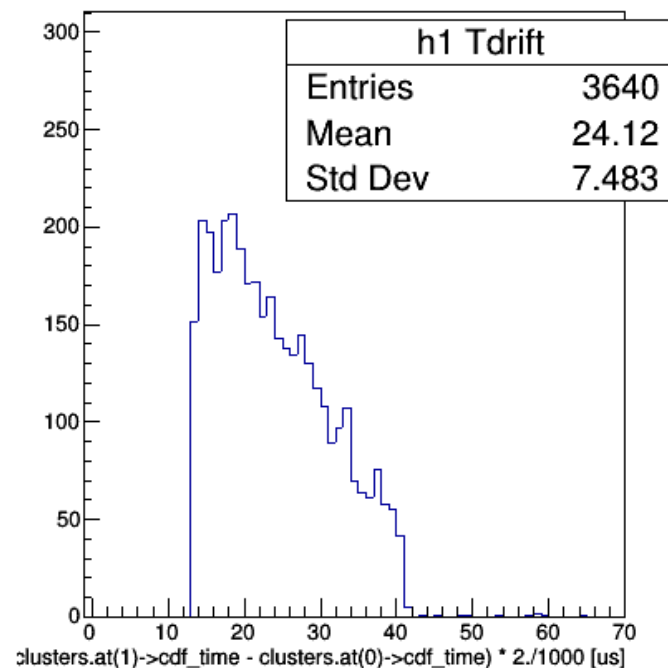
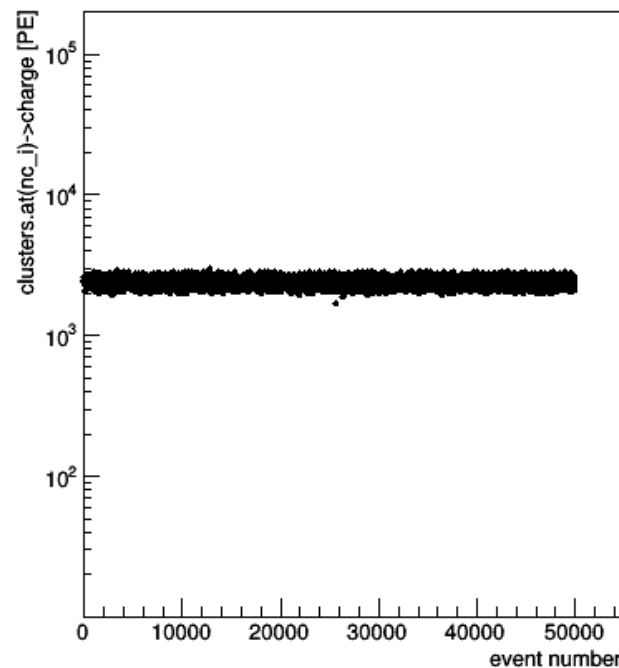
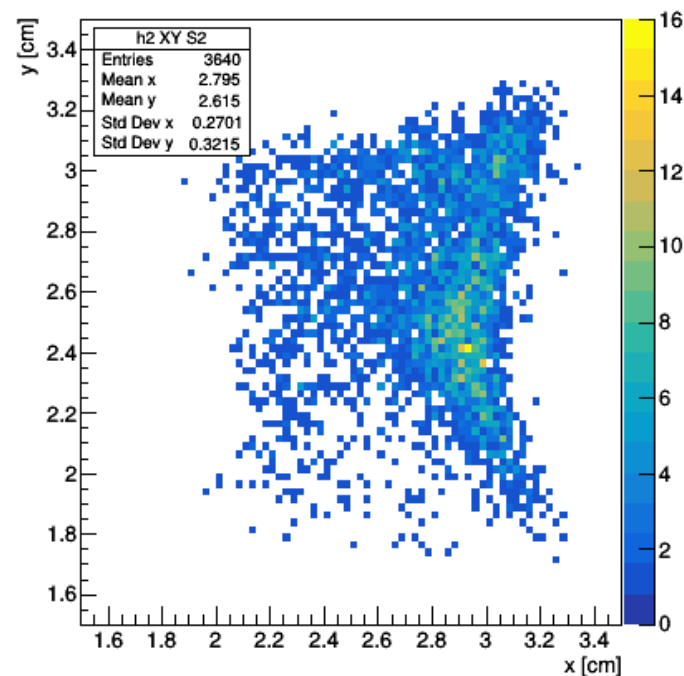


master cut2

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1200 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1600

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1200 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1600

C0.nc == 2



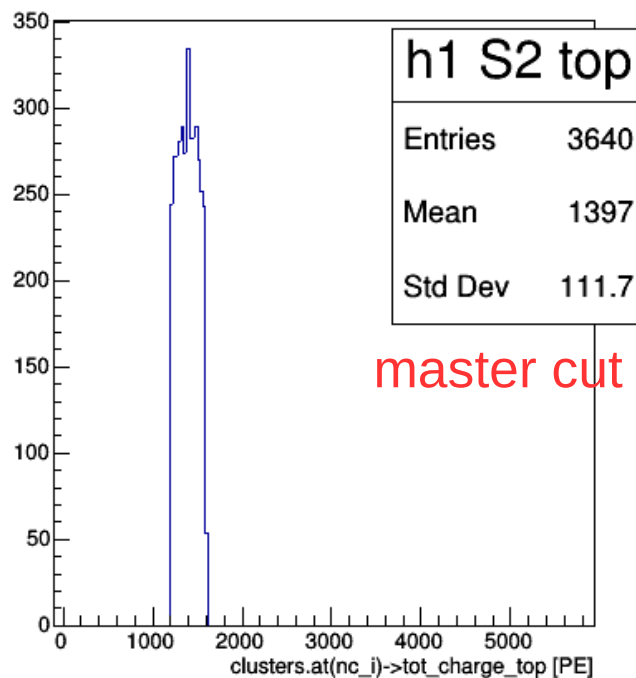
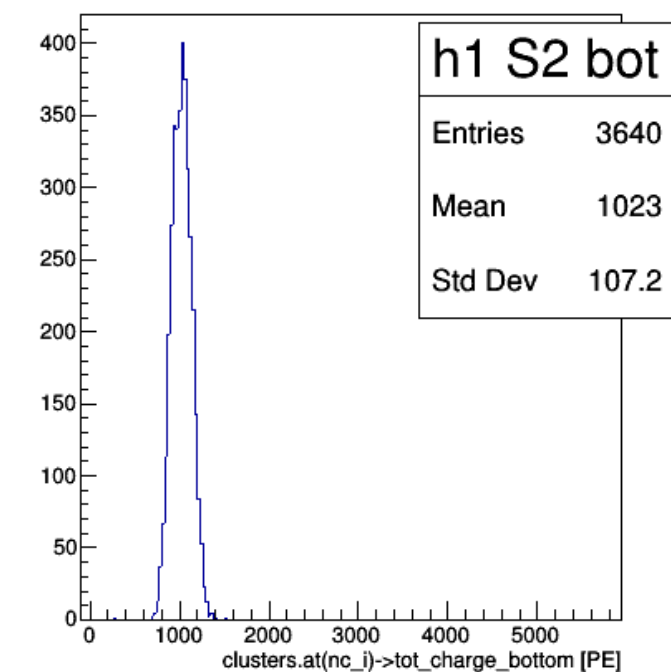
Ph2, Am241, run 542

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1200 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1600

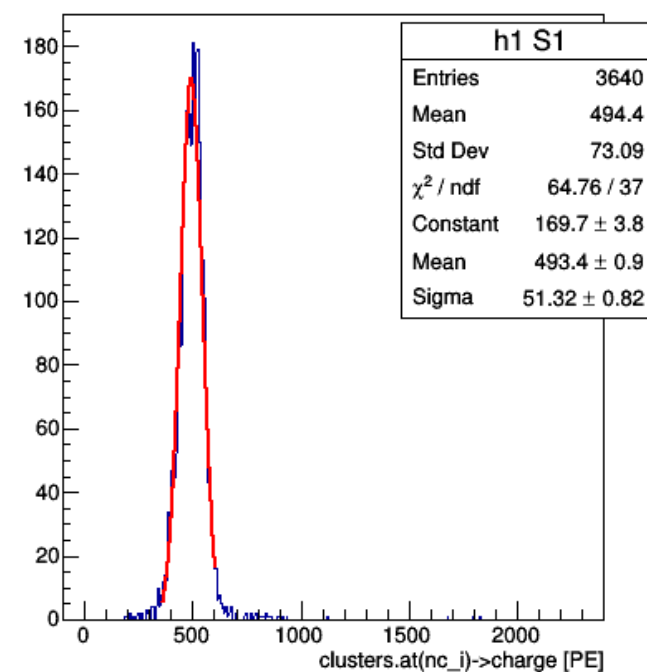
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1200 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 1600

1200 &lt; tot\_charge\_top &lt; 1600 [PE]

C2.is\_S1



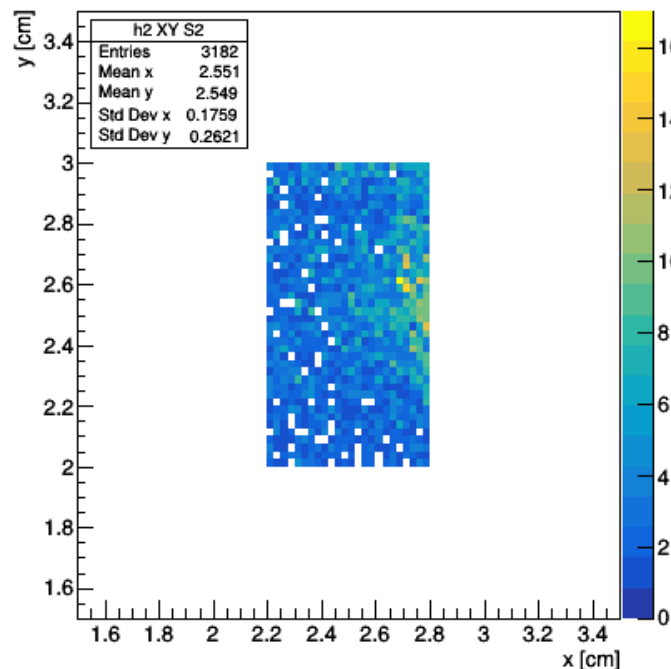
master cut



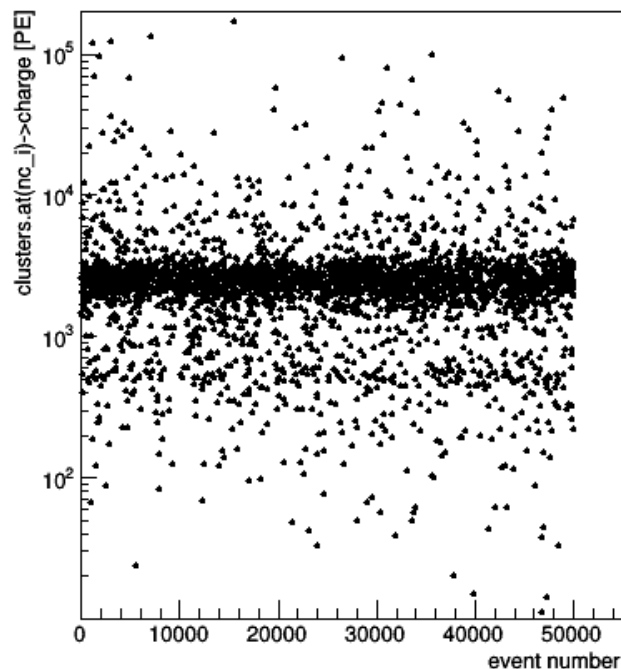


# master cut

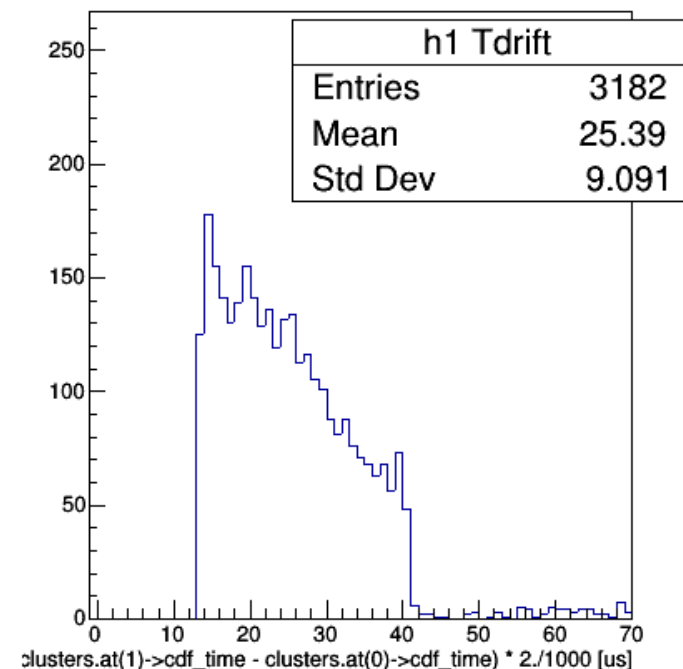
C1.is\_S2 && C1.region\_of\_S2\_uniformity



C1.is\_S2 && C1.region\_of\_S2\_uniformity

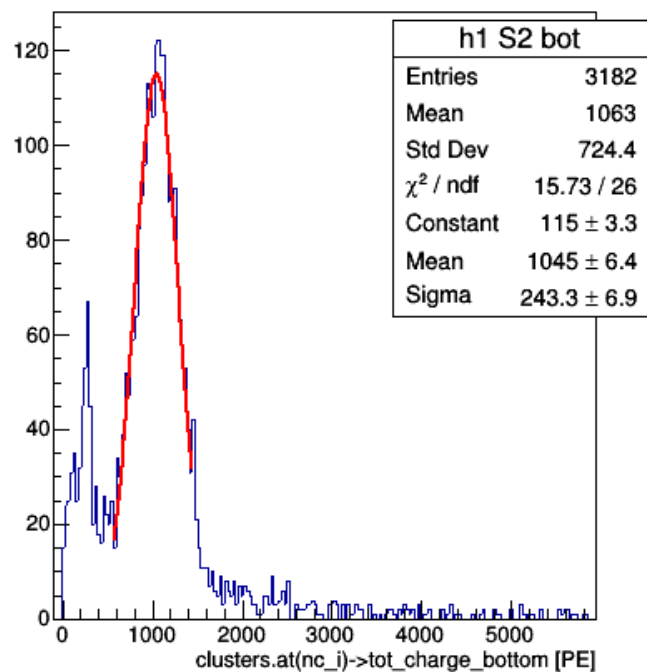


C0.nc == 2

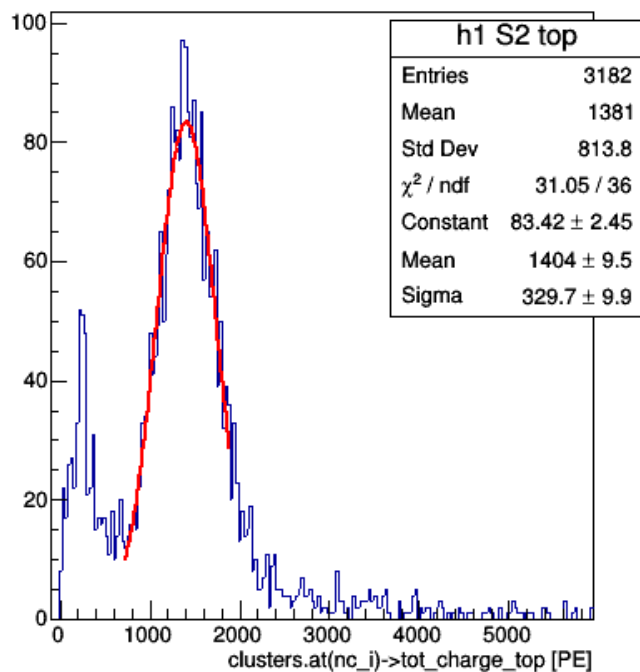


# Ph2, Am241, run 542

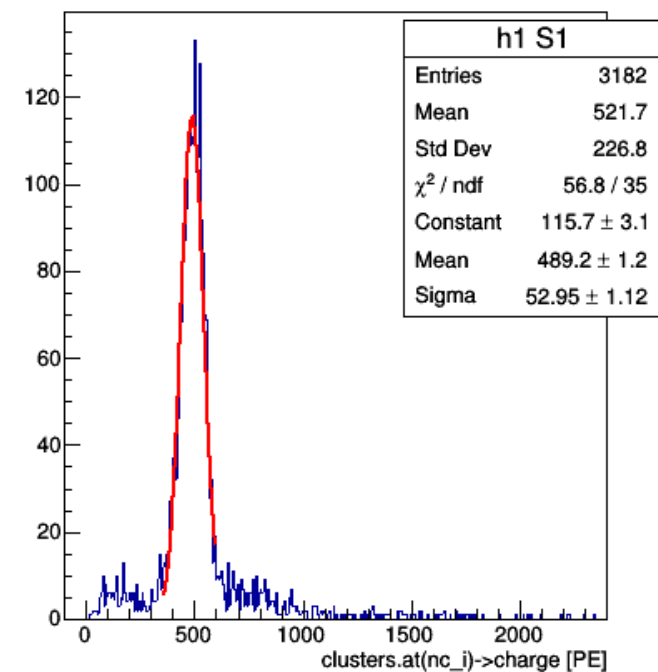
C1.is\_S2 && C1.region\_of\_S2\_uniformity



C1.is\_S2 && C1.region\_of\_S2\_uniformity



C2.is\_S1

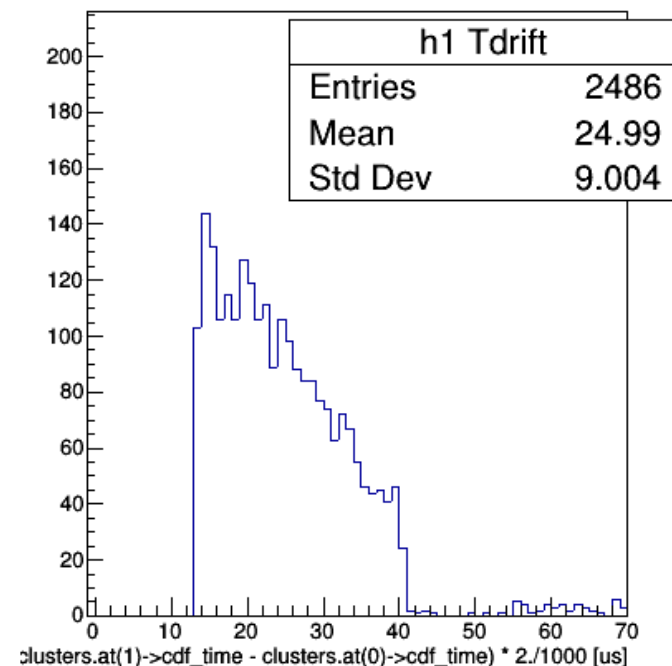
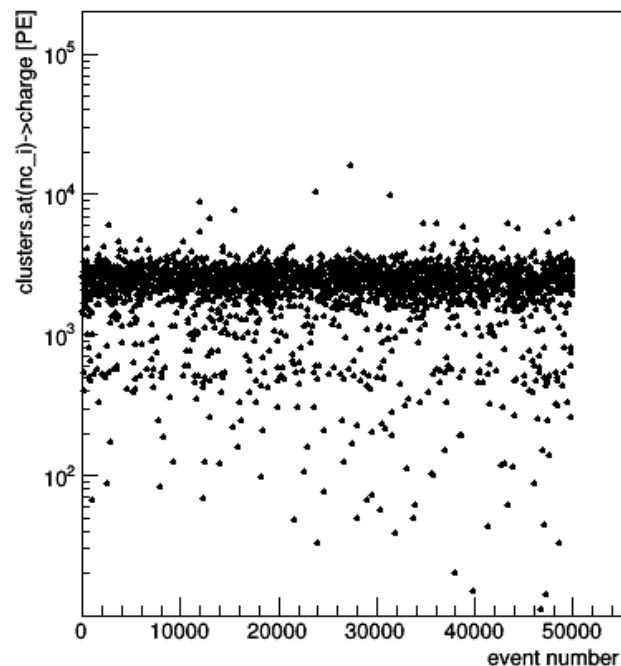
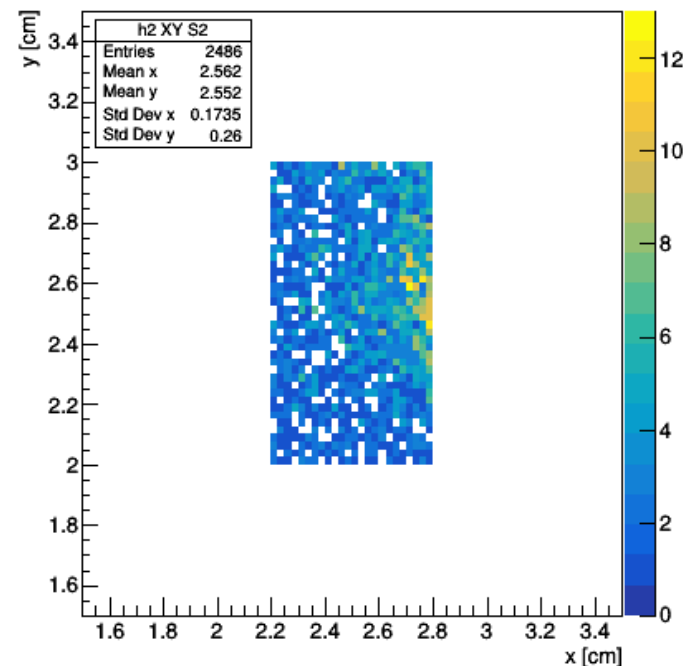


master cut1

C1.is\_S2 && C1.region\_of\_S2\_uniformity && clusters.at(0)->charge > 357 && clusters.at(0)->charge < 622

C1.is\_S2 && C1.region\_of\_S2\_uniformity && clusters.at(0)->charge > 357 && clusters.at(0)->charge < 622

C0.nc == 2



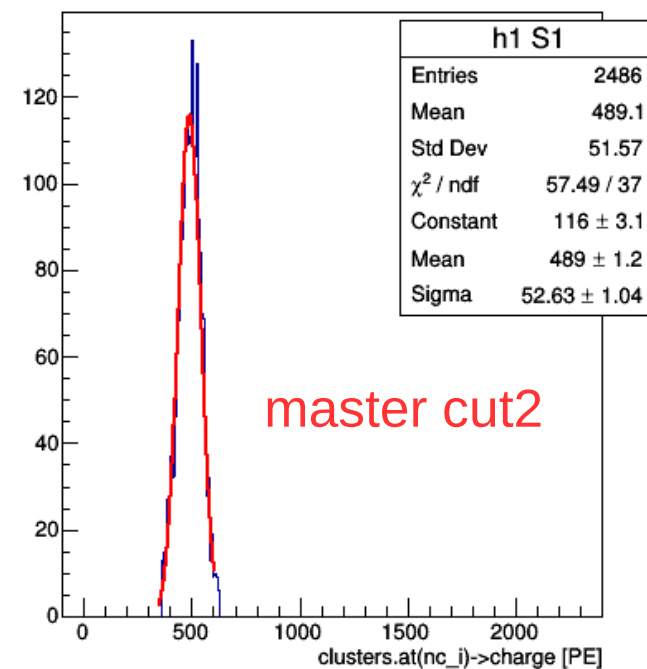
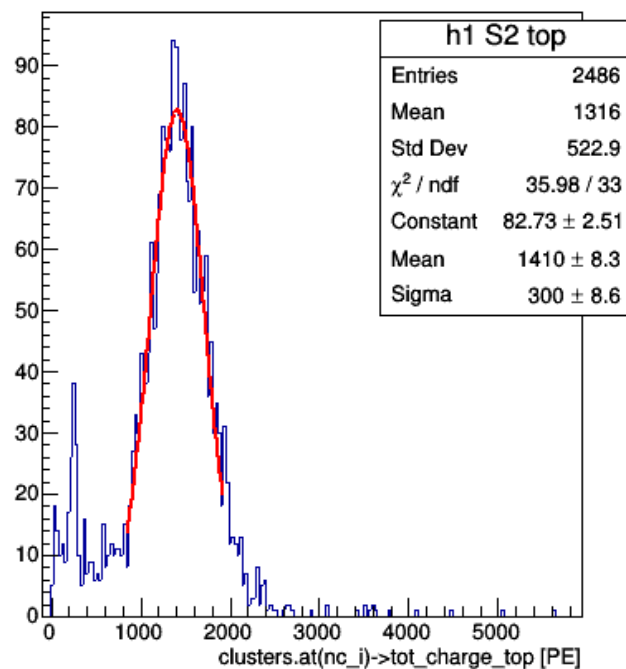
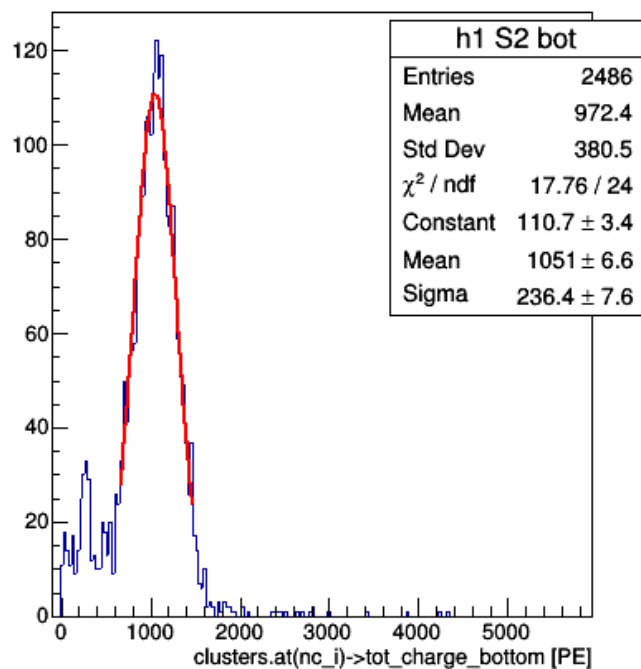
Ph2, Am241, run 542

C1.is\_S2 && C1.region\_of\_S2\_uniformity && clusters.at(0)->charge > 357 && clusters.at(0)->charge < 622

C1.is\_S2 && C1.region\_of\_S2\_uniformity && clusters.at(0)->charge > 357 && clusters.at(0)->charge < 622

357 < charge < 622 [PE]

C2.is\_S1



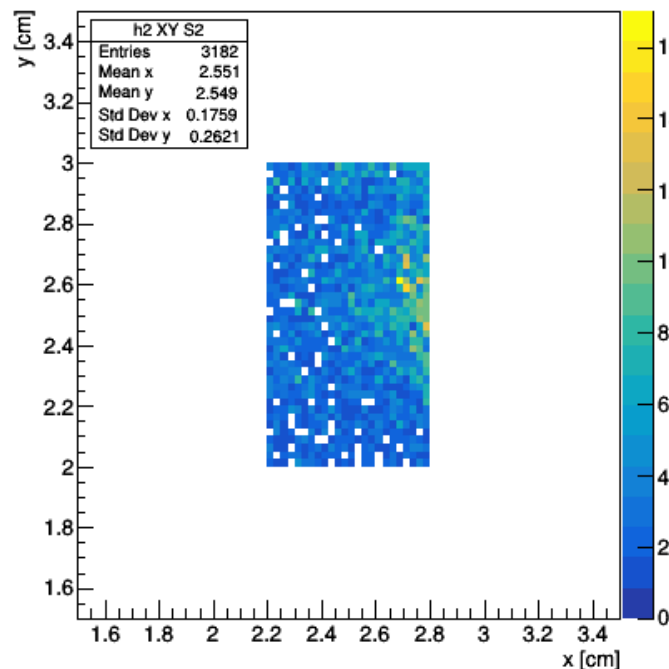
master cut2



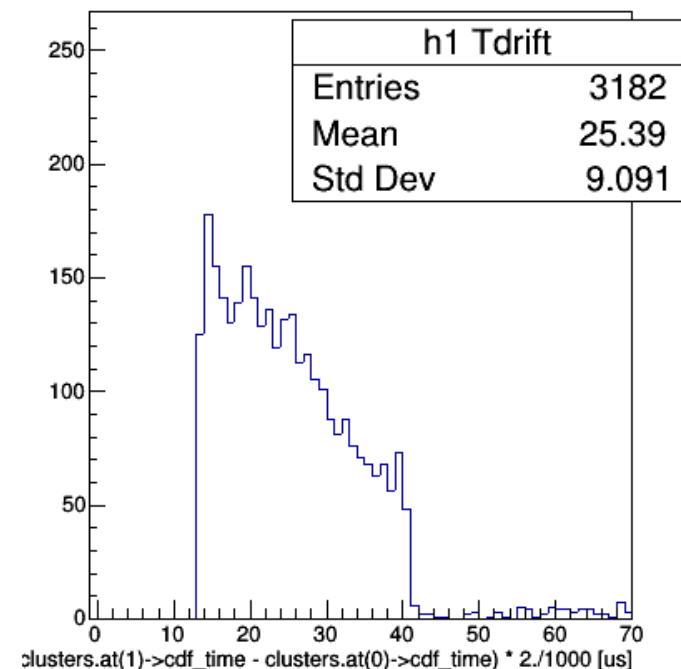
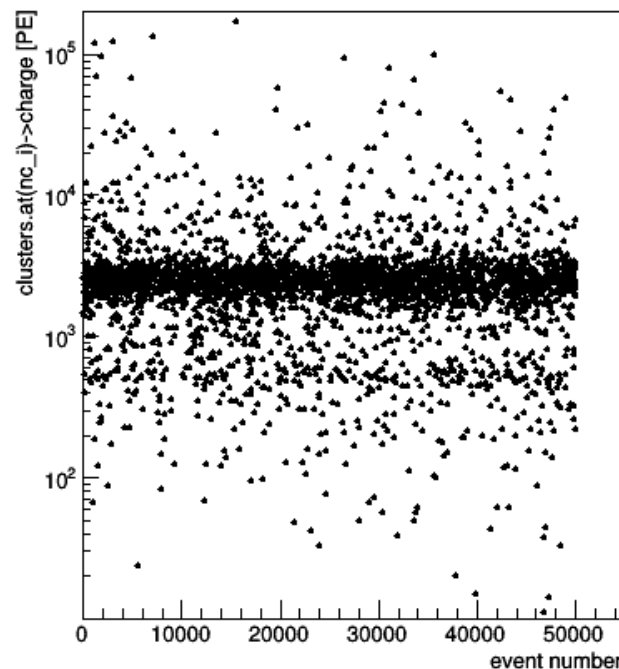


master cut  
C0.nc == 2

C1.is\_S2 && C1.region\_of\_S2\_uniformity

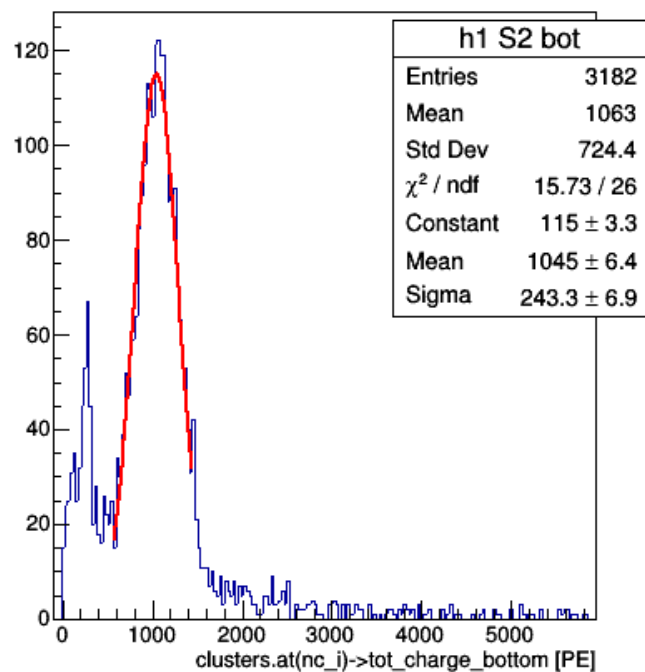


C1.is\_S2 && C1.region\_of\_S2\_uniformity

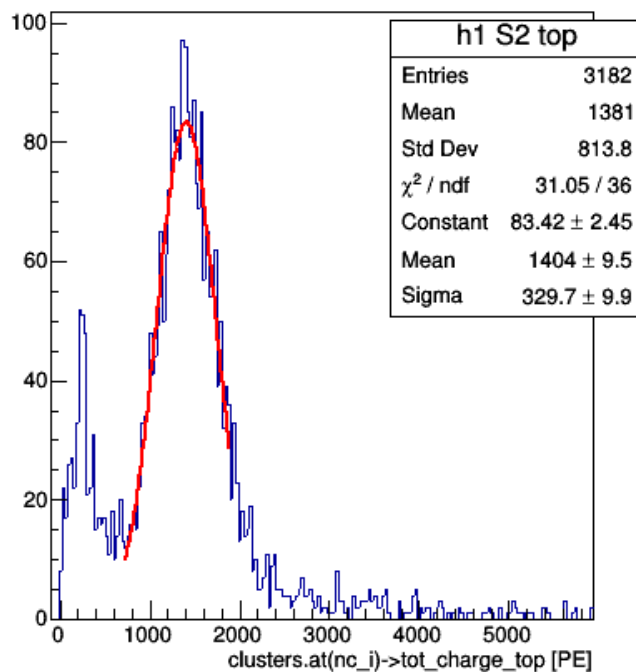


Ph2, Am241, run 542

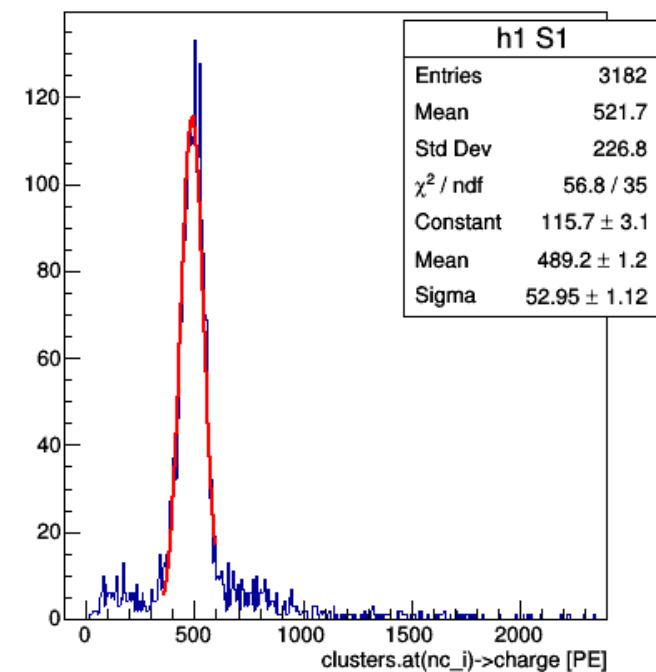
C1.is\_S2 && C1.region\_of\_S2\_uniformity



C1.is\_S2 && C1.region\_of\_S2\_uniformity

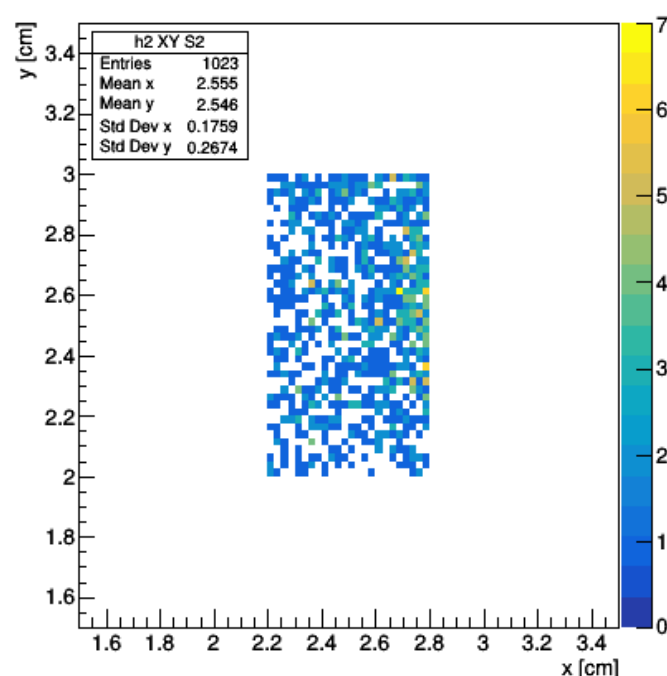


C2.is\_S1

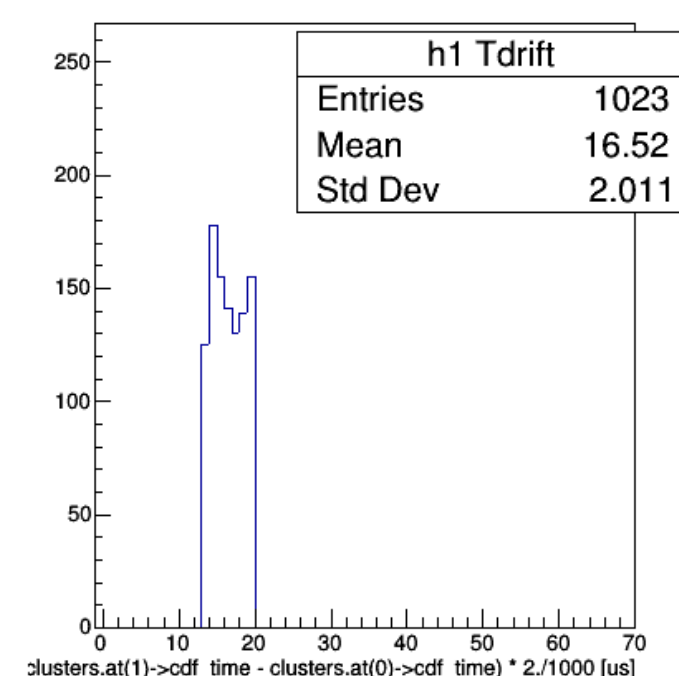
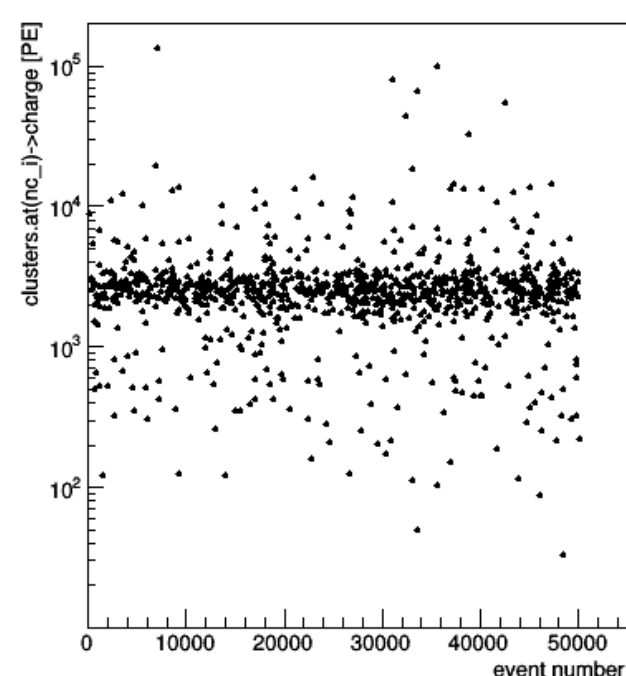


master cut  
C0.nc == 2

C1.is\_S2 && C1.region\_of\_S2\_uniformity && Tdrift > 10 && Tdrift < 20

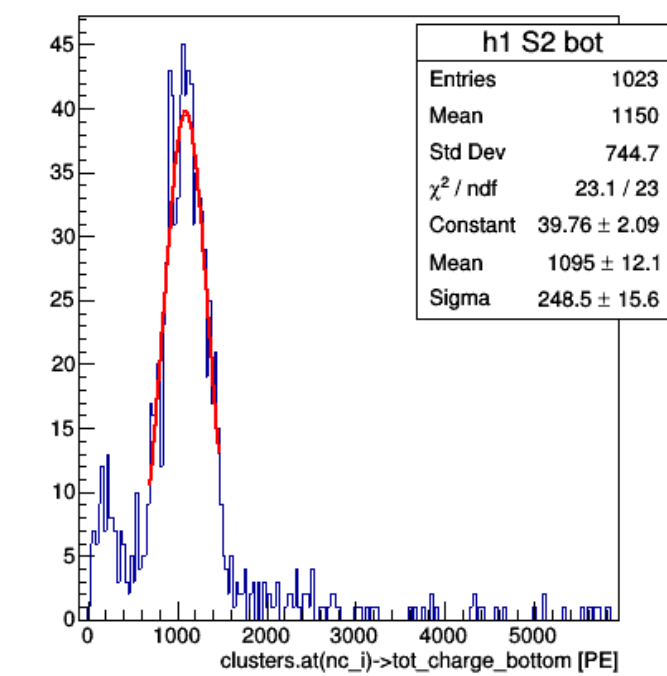


C1.is\_S2 && C1.region\_of\_S2\_uniformity && Tdrift > 10 && Tdrift < 20

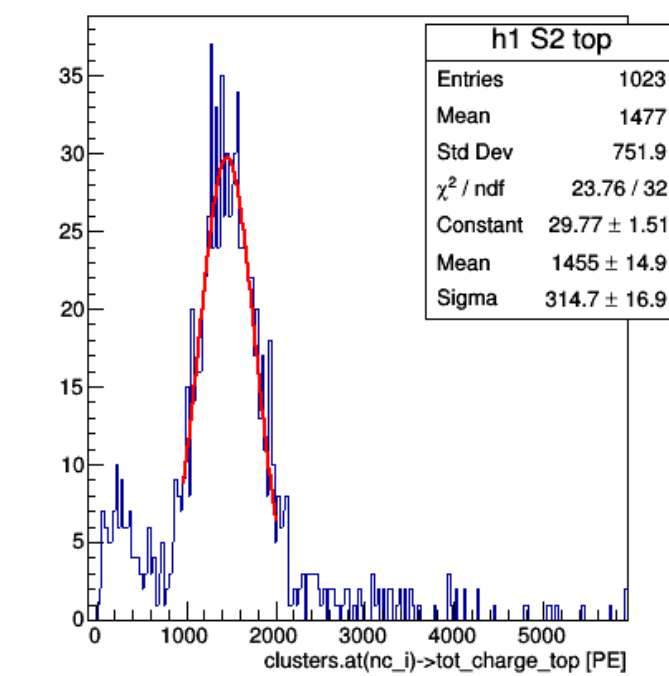


Ph2, Am241, run 542

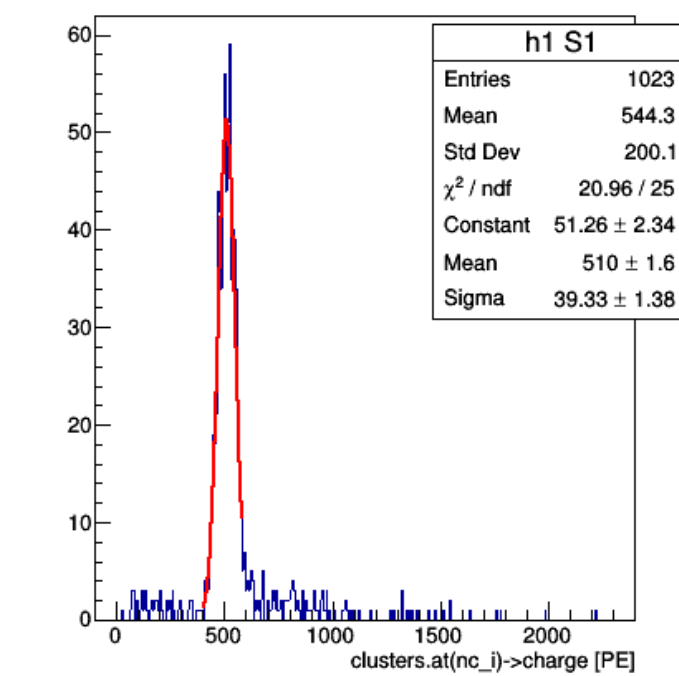
C1.is\_S2 && C1.region\_of\_S2\_uniformity && Tdrift > 10 && Tdrift < 20



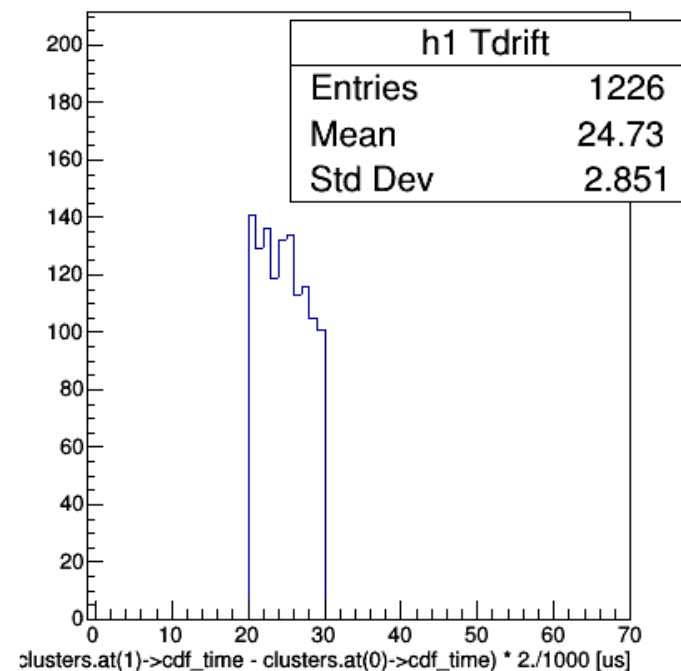
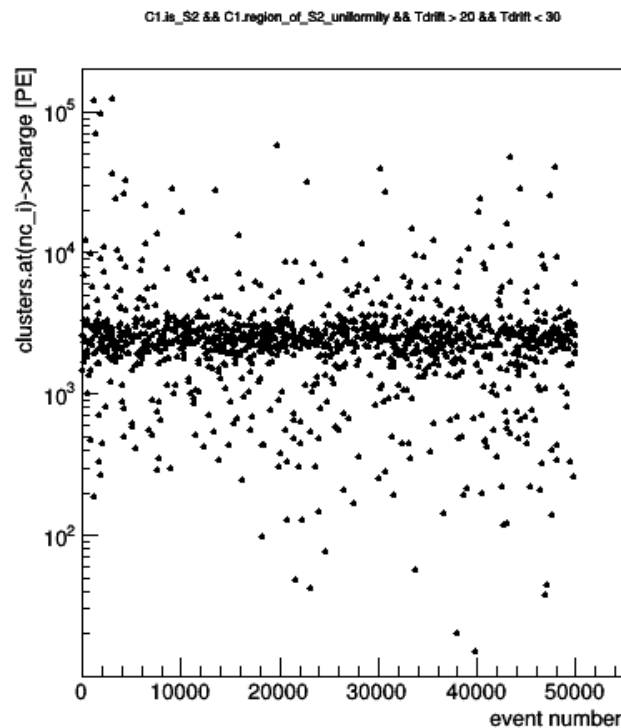
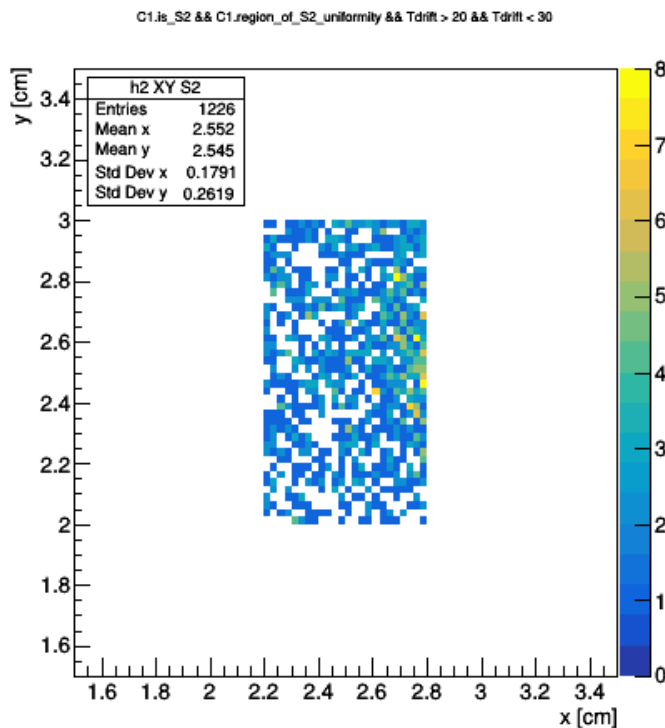
C1.is\_S2 && C1.region\_of\_S2\_uniformity && Tdrift > 10 && Tdrift < 20



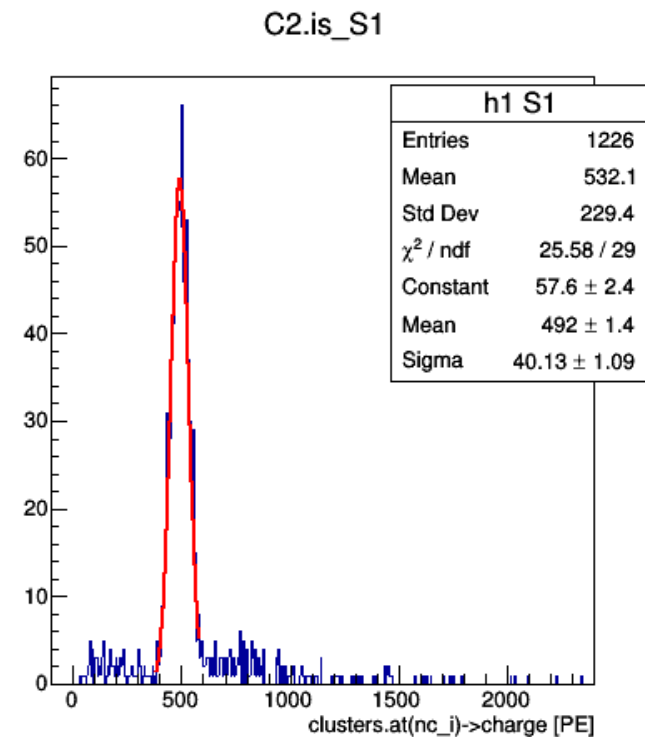
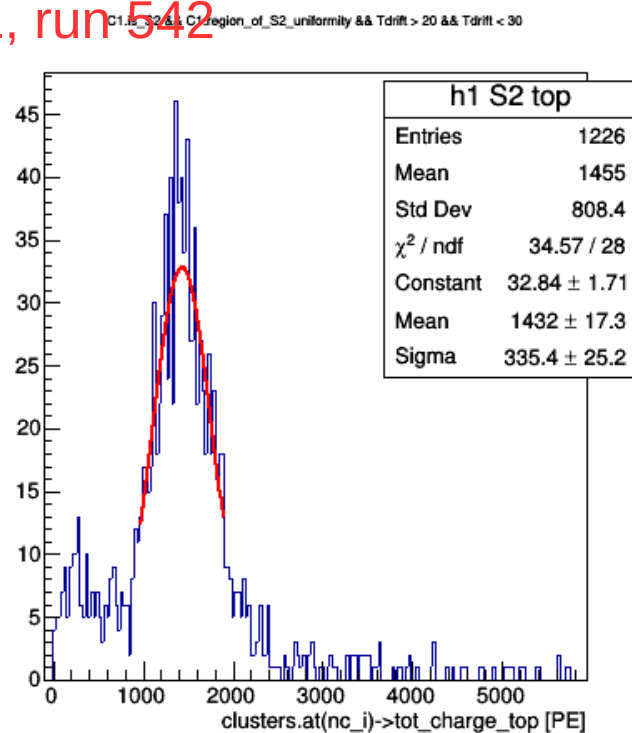
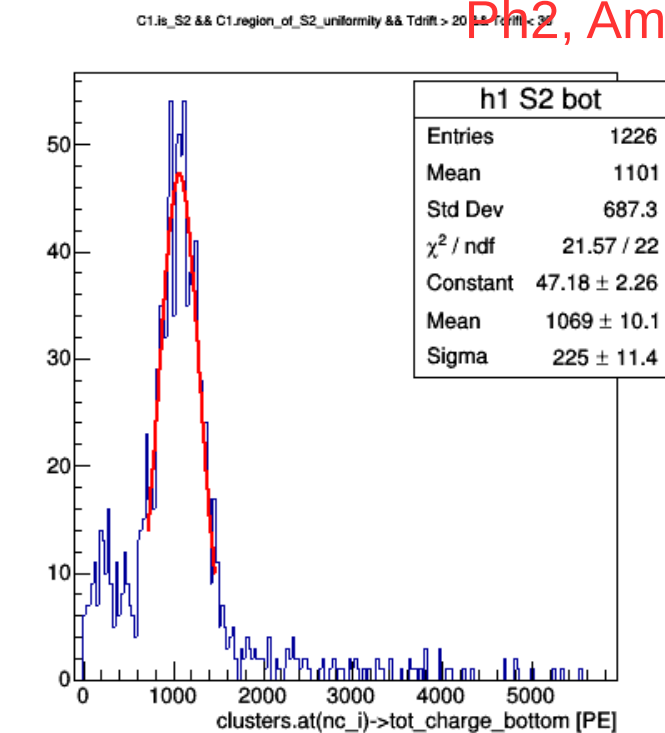
C2.is\_S1



master cut

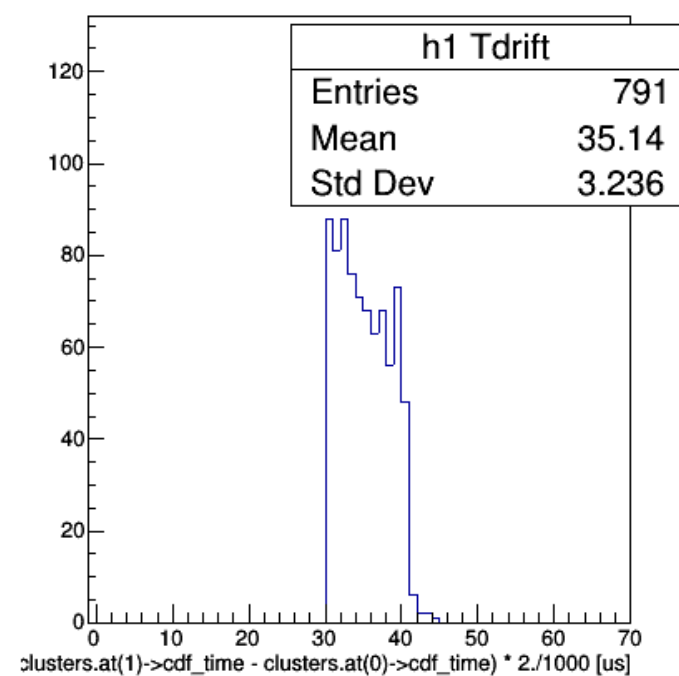
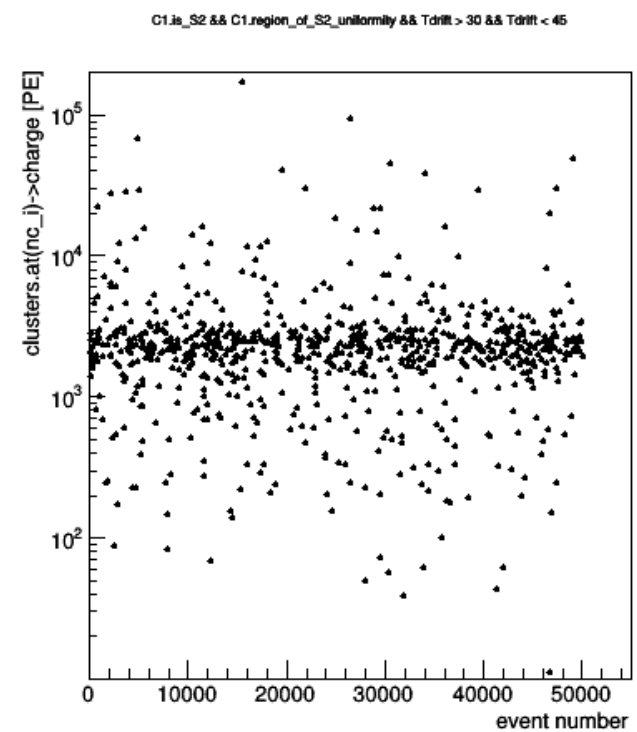
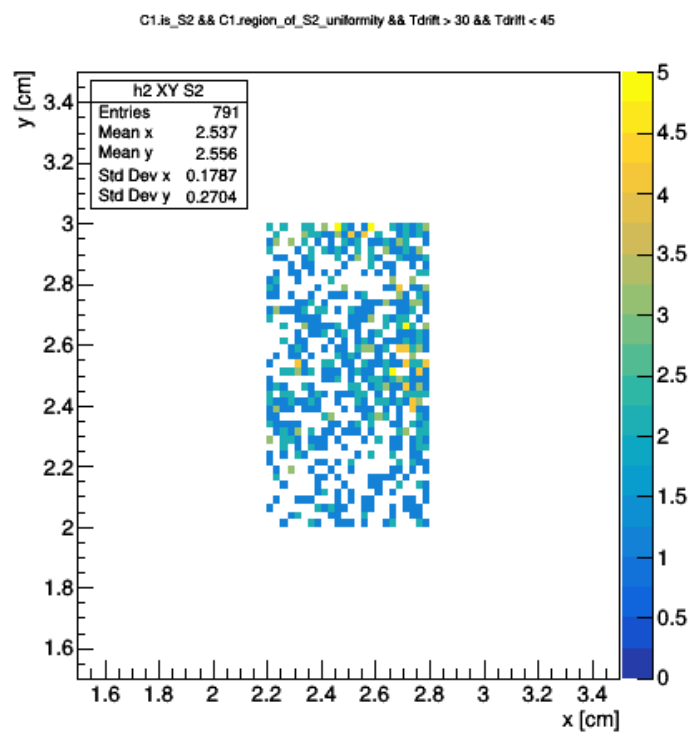


Ph2, Am241, run 542

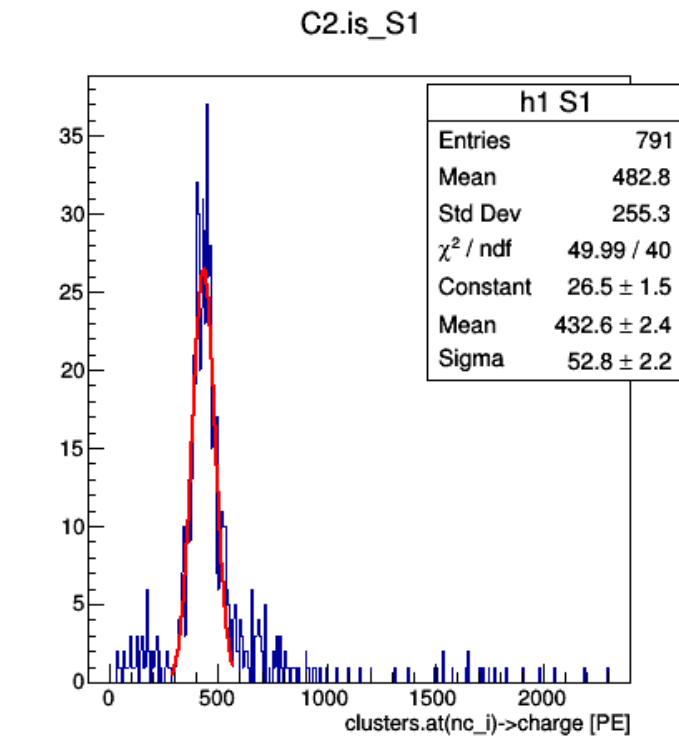
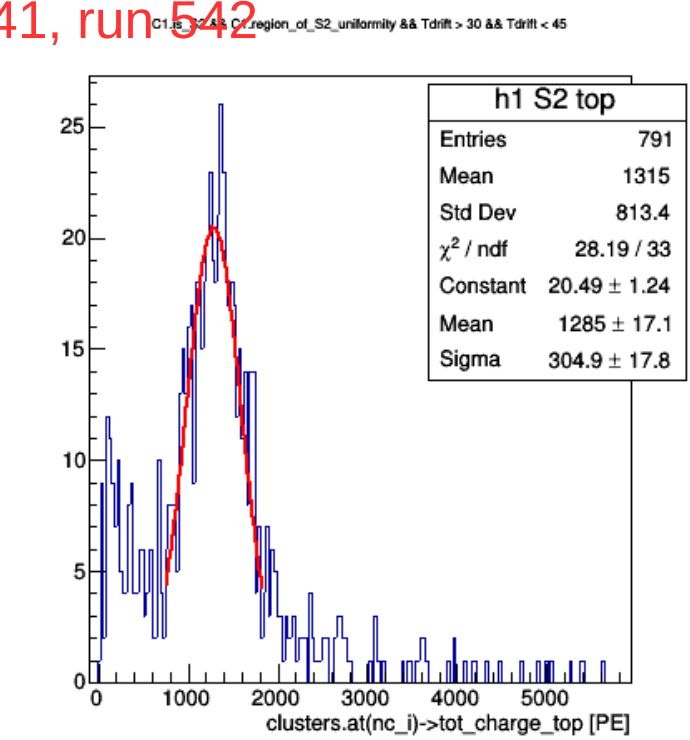
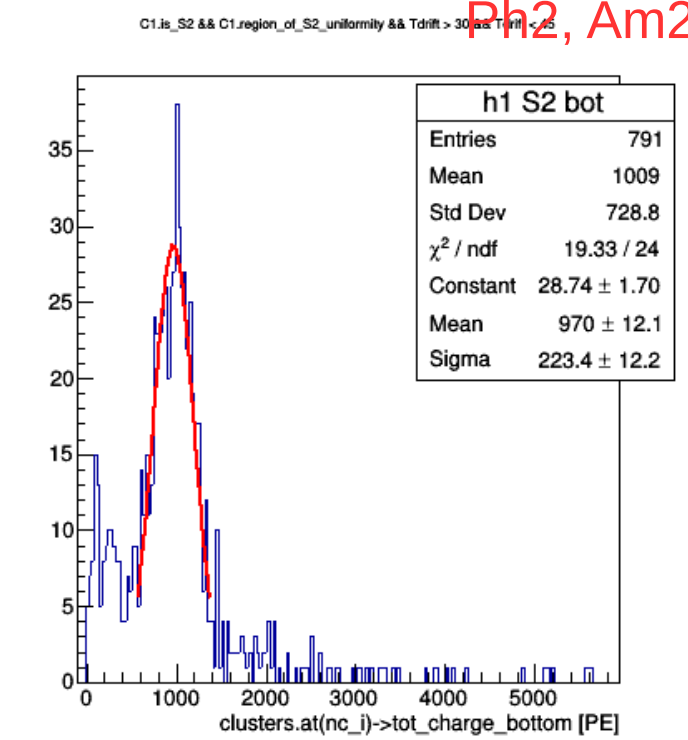


master cut

C0.nc == 2



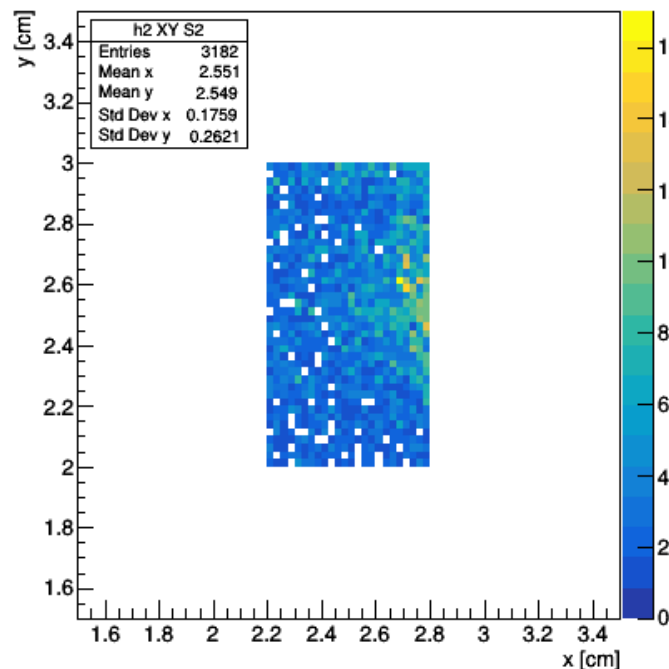
Ph2, Am241, run 542



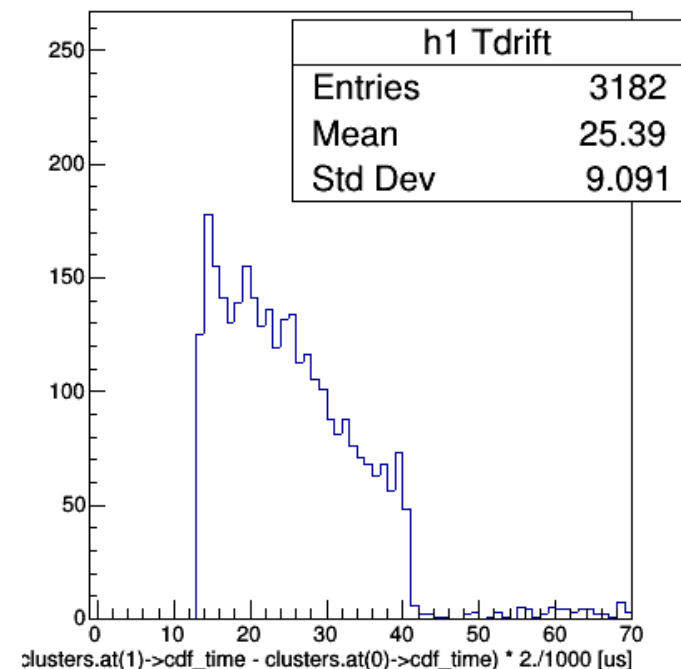
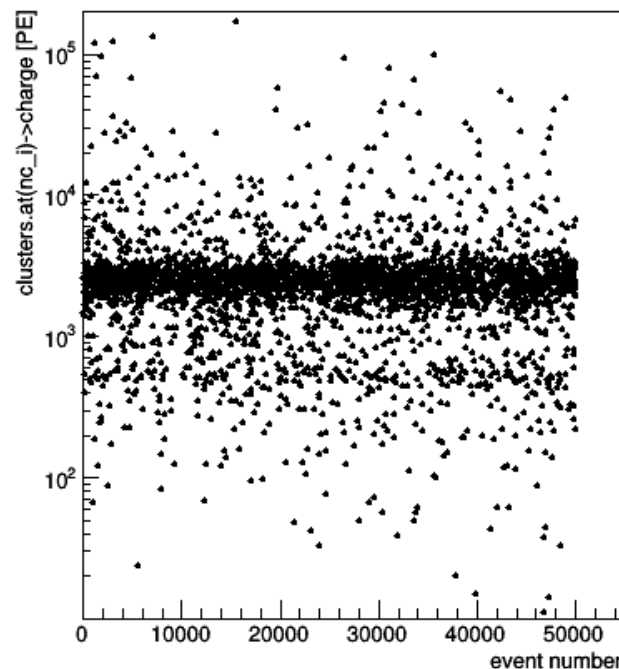


master cut  
C0.nc == 2

C1.is\_S2 && C1.region\_of\_S2\_uniformity

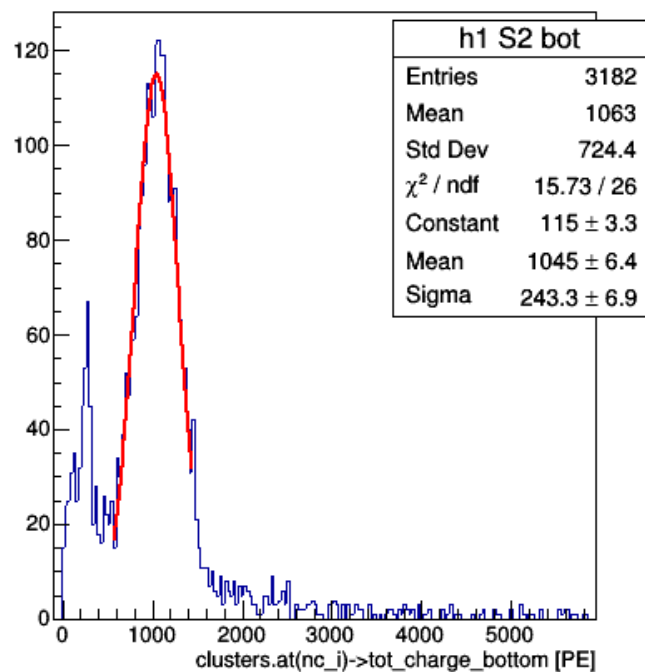


C1.is\_S2 && C1.region\_of\_S2\_uniformity

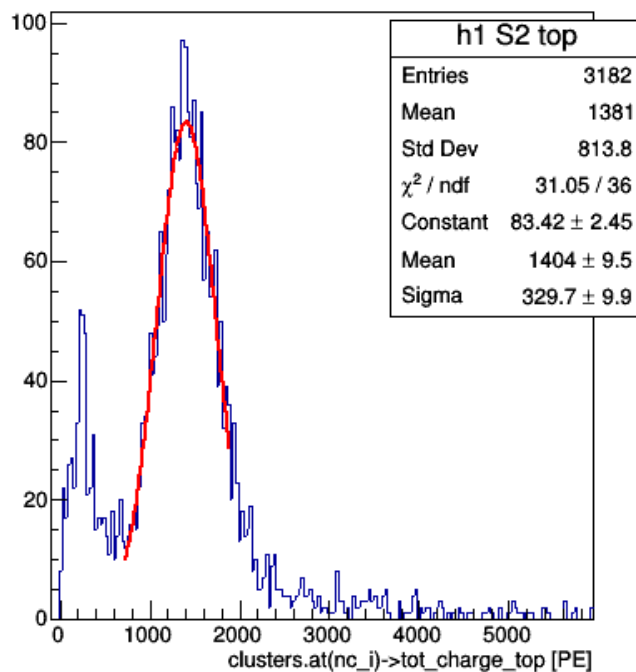


Ph2, Am241, run 542

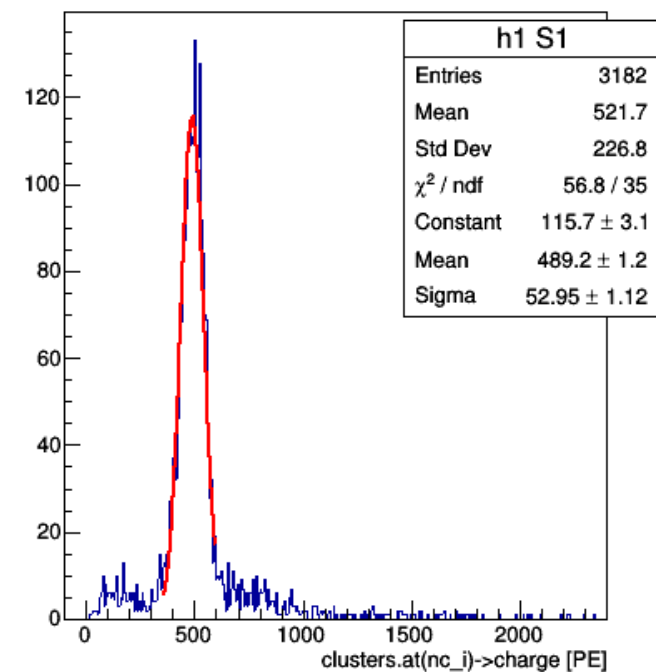
C1.is\_S2 && C1.region\_of\_S2\_uniformity

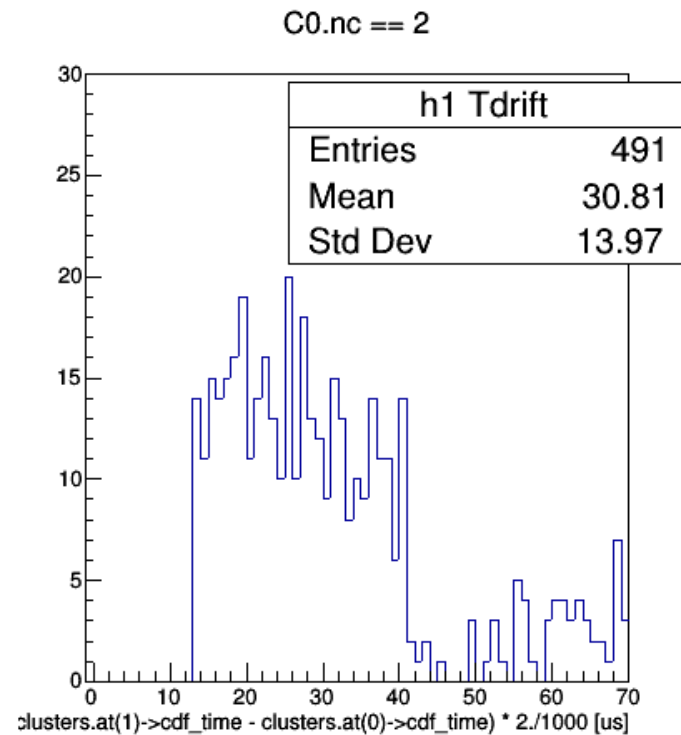
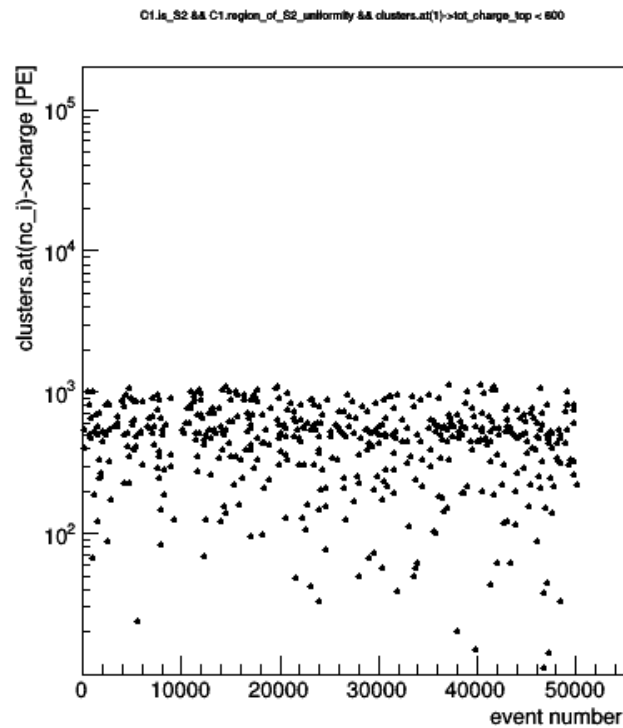
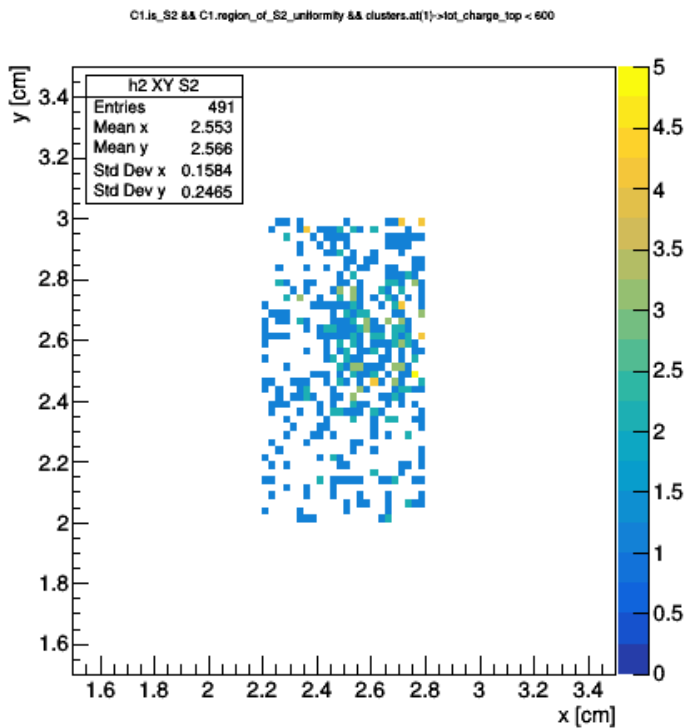


C1.is\_S2 && C1.region\_of\_S2\_uniformity

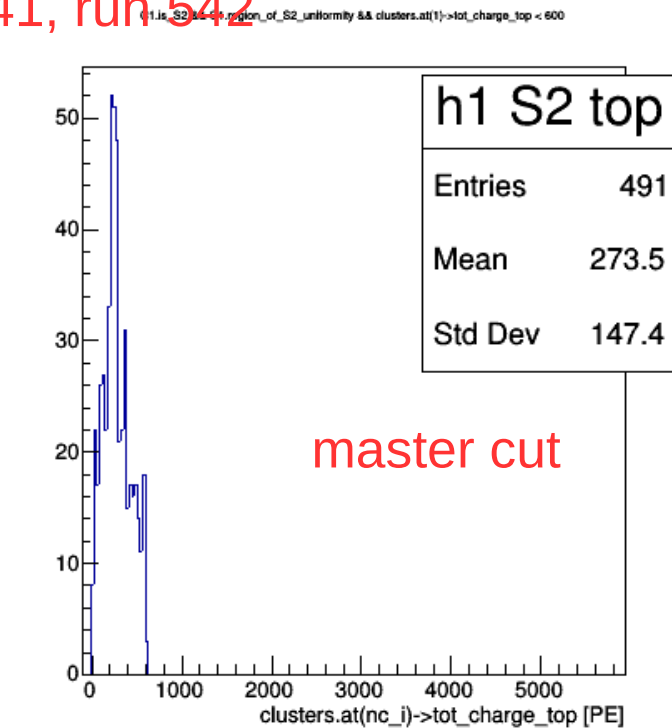
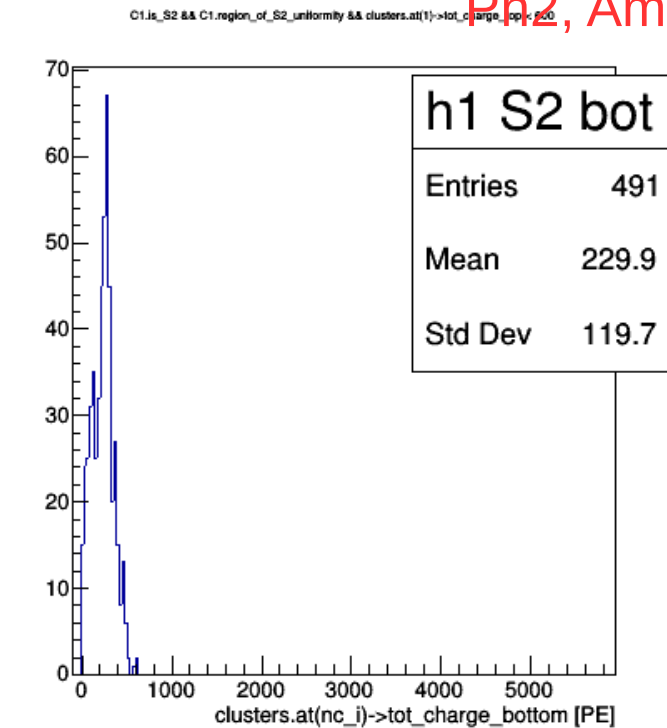


C2.is\_S1

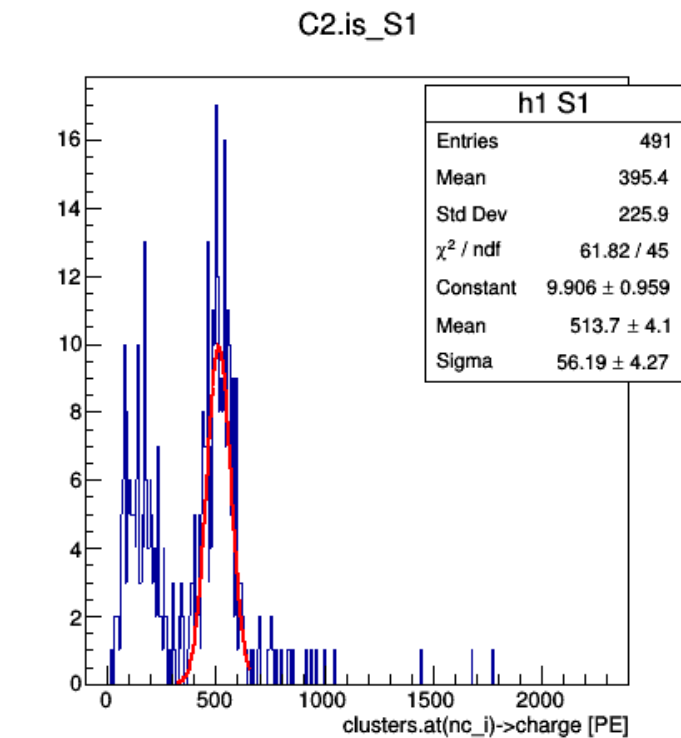




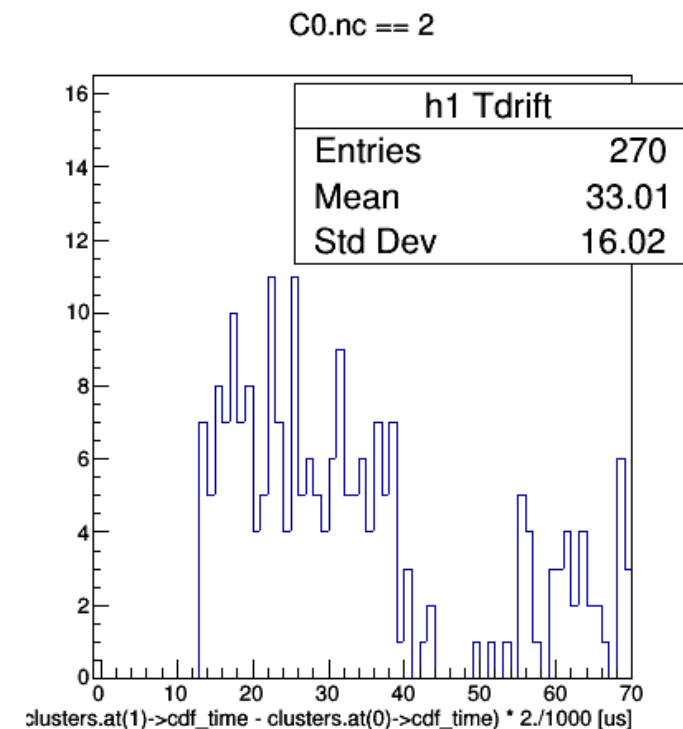
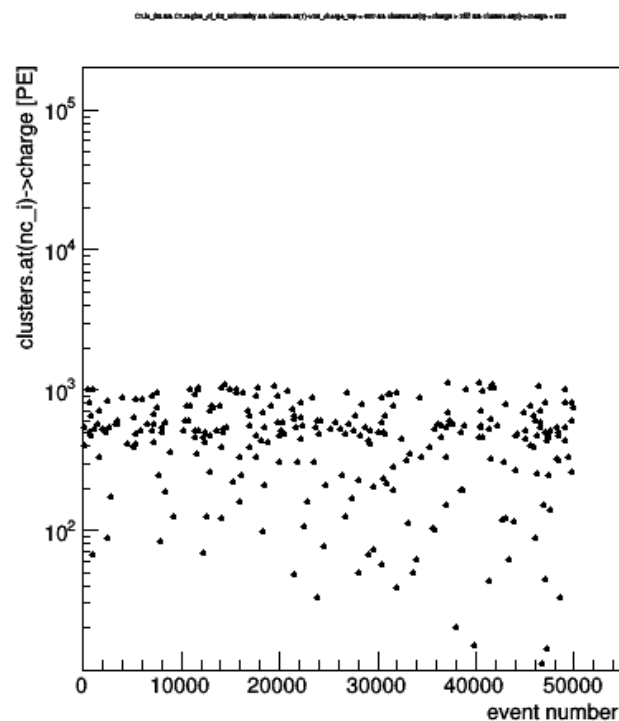
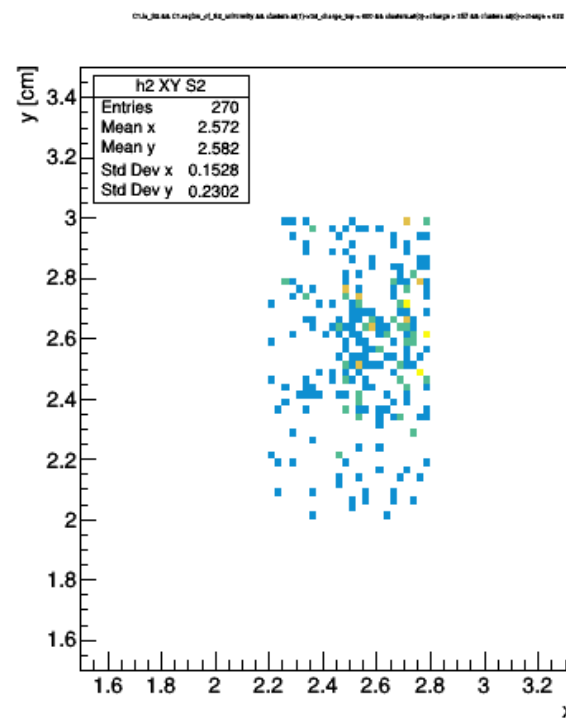
tot\_charge\_top < 600 [PE]  
Ph2, Am241, run 542



master cut

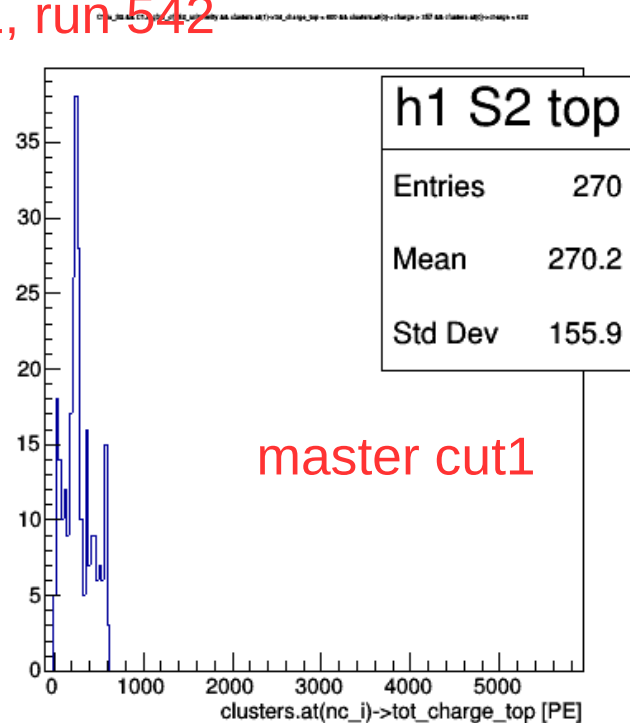
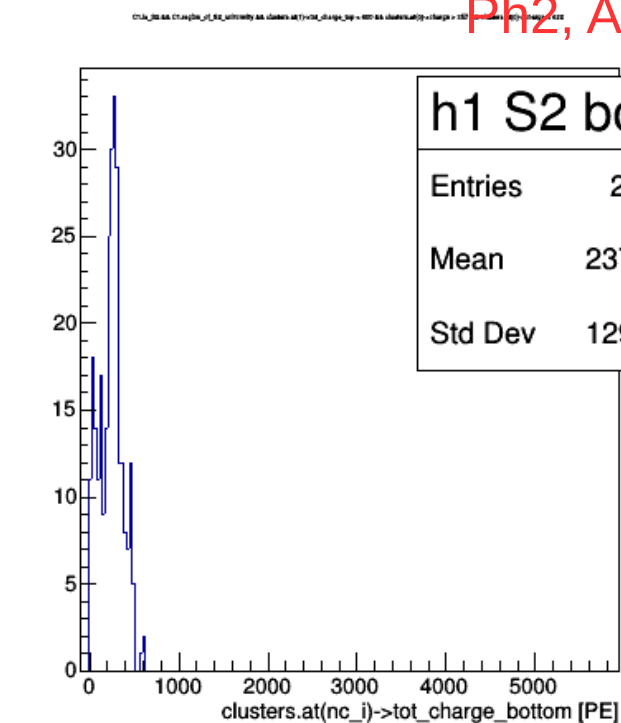




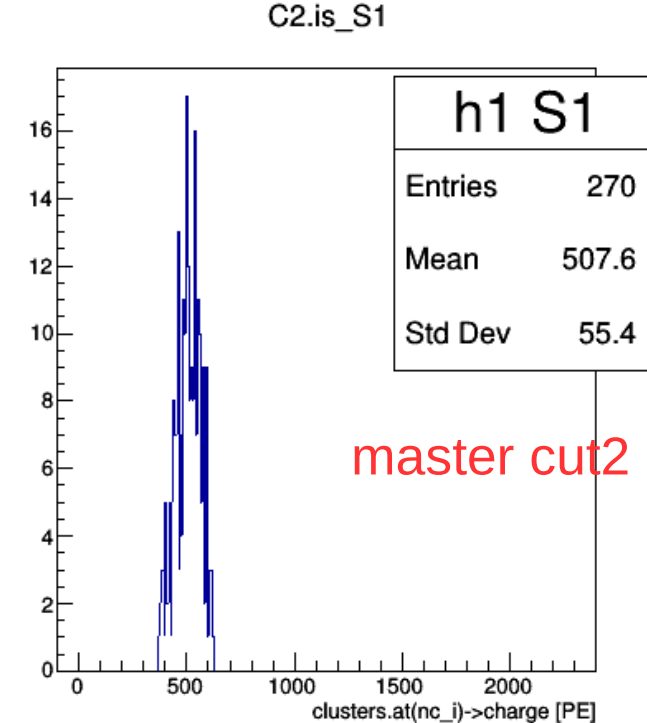


tot\_charge\_top < 600 [PE]  
Ph2, Am241, run 542

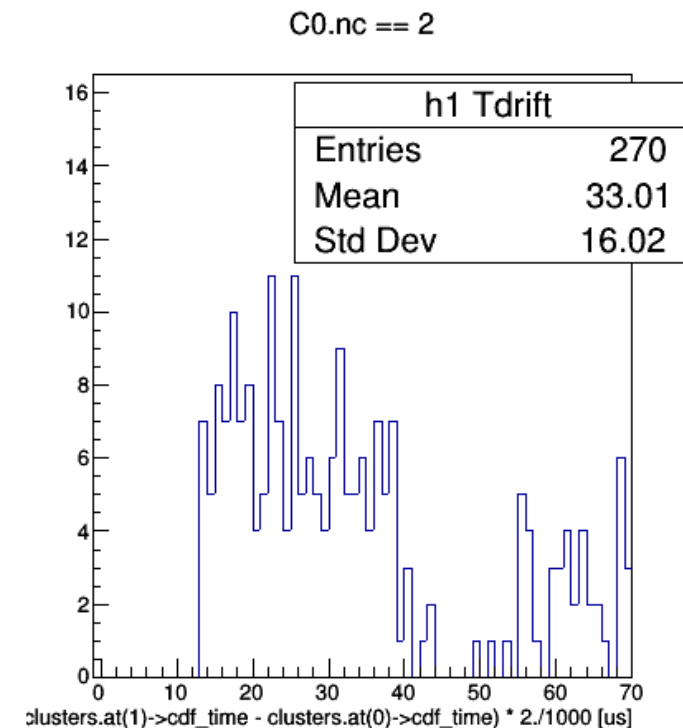
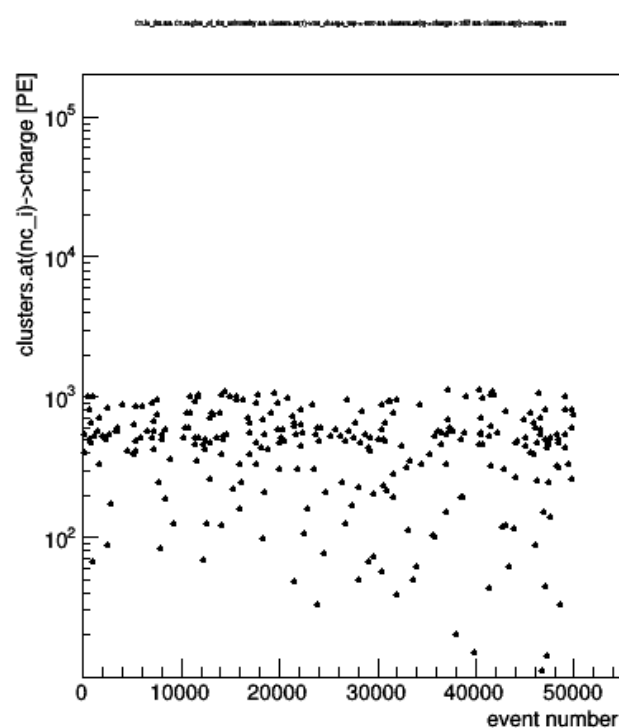
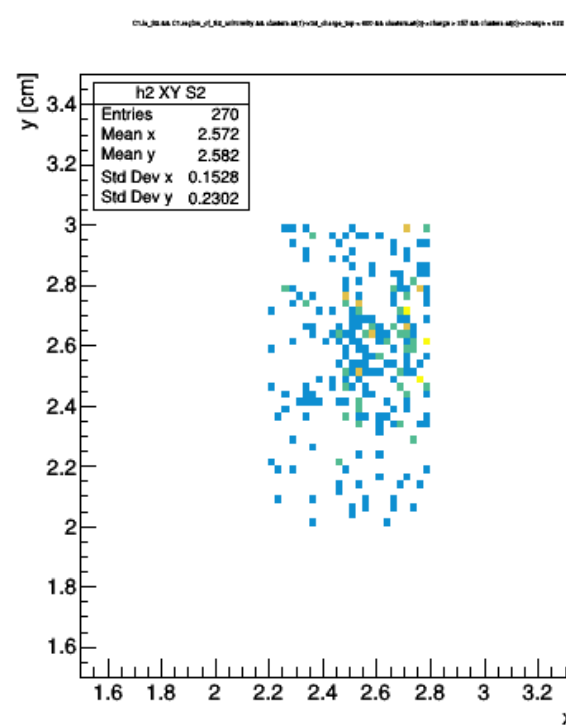
357 < charge < 622 [PE]  
C2.is\_S1



master cut1



master cut2

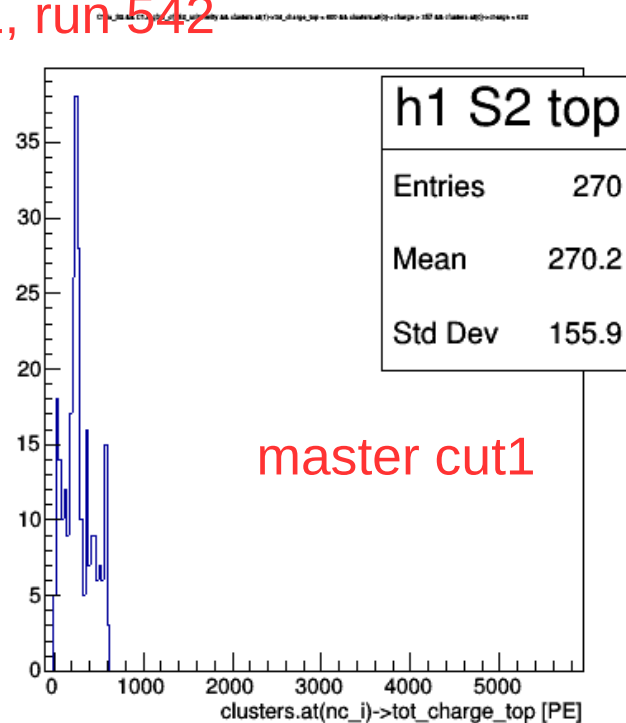
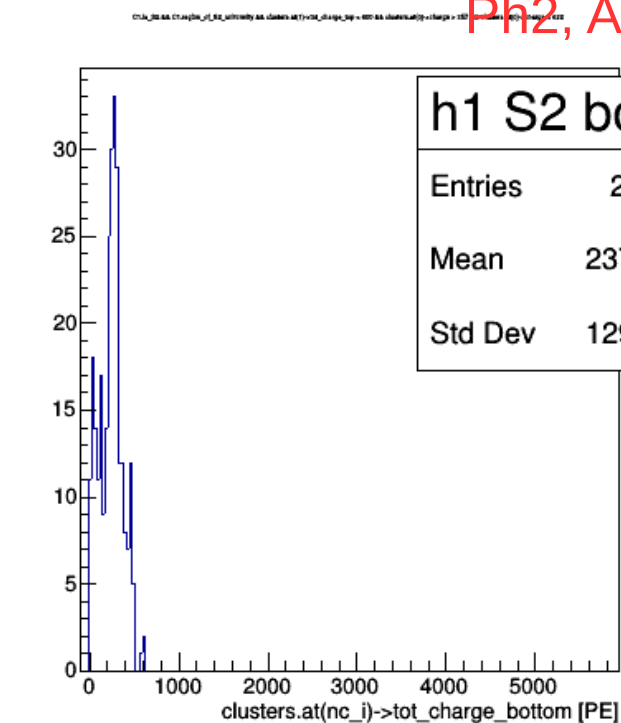


tot\_charge\_top < 600 [PE]

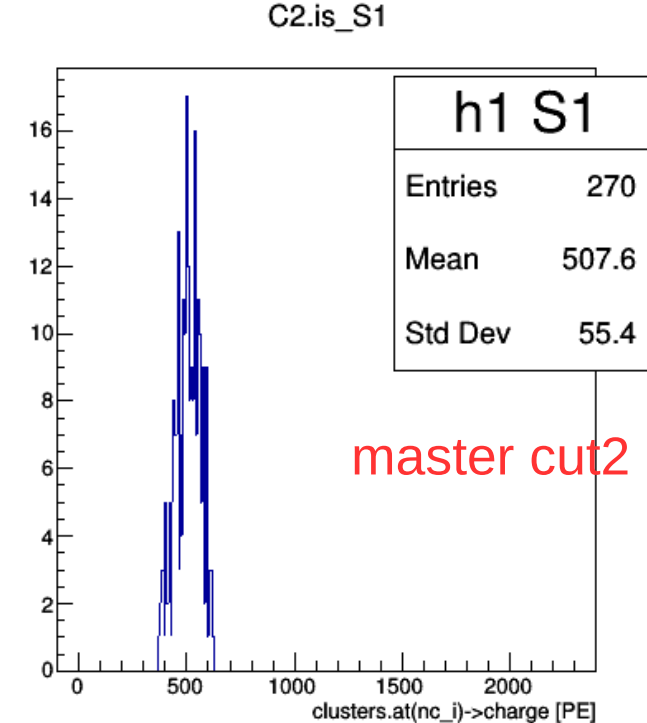
Ph2, Am241, run 542

357 < charge < 622 [PE]

C2.is\_S1

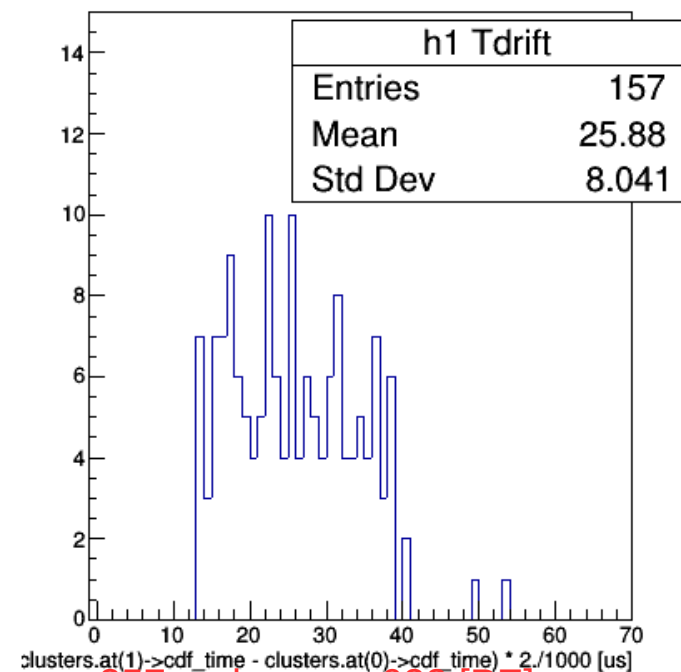
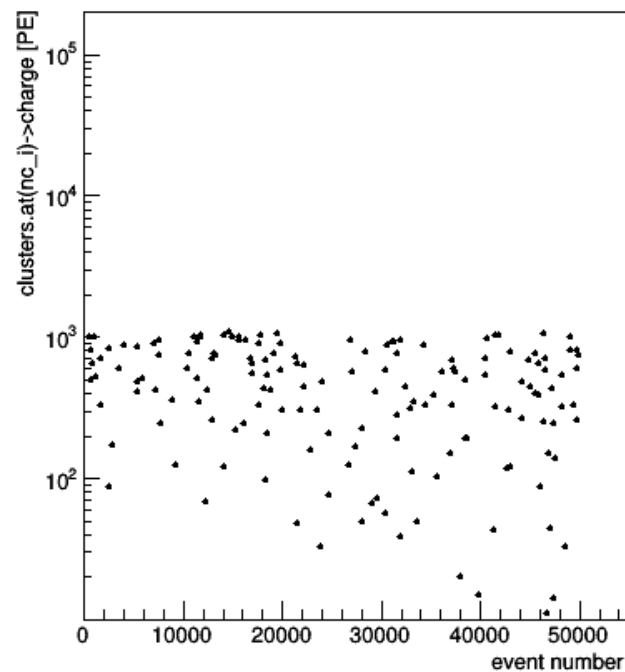
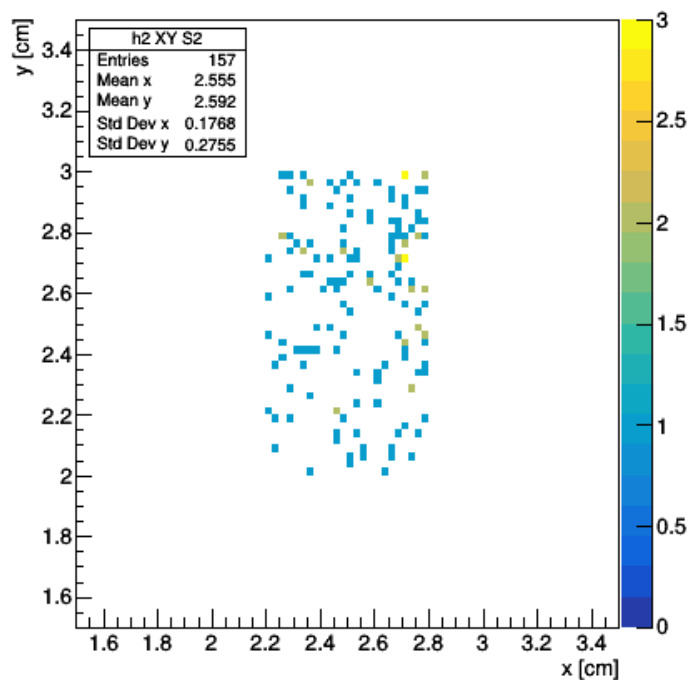


master cut1



master cut2

C0.nc == 2

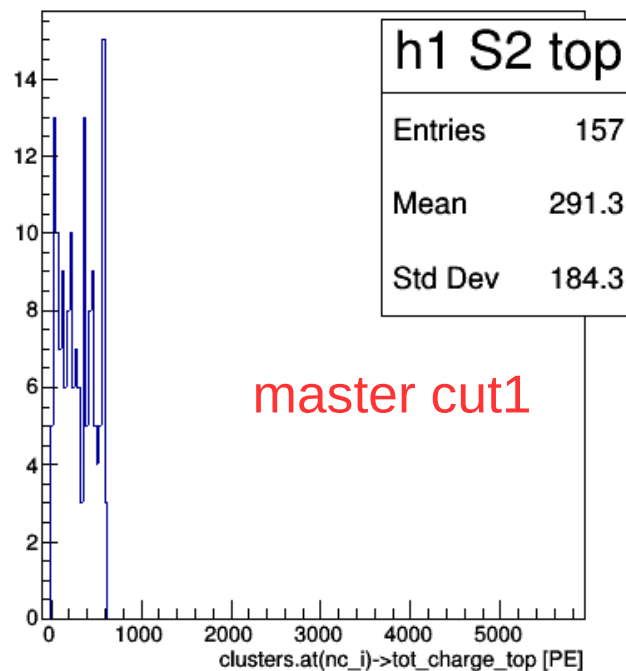
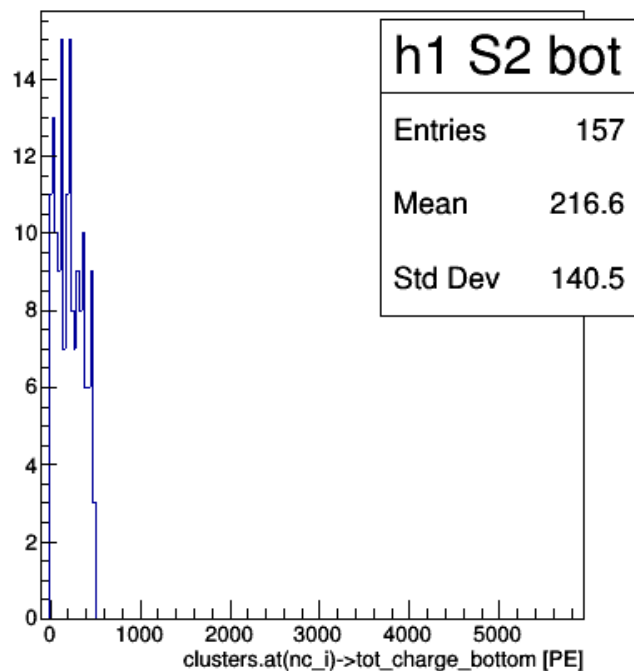


tot\_charge\_top &lt; 600 [PE]

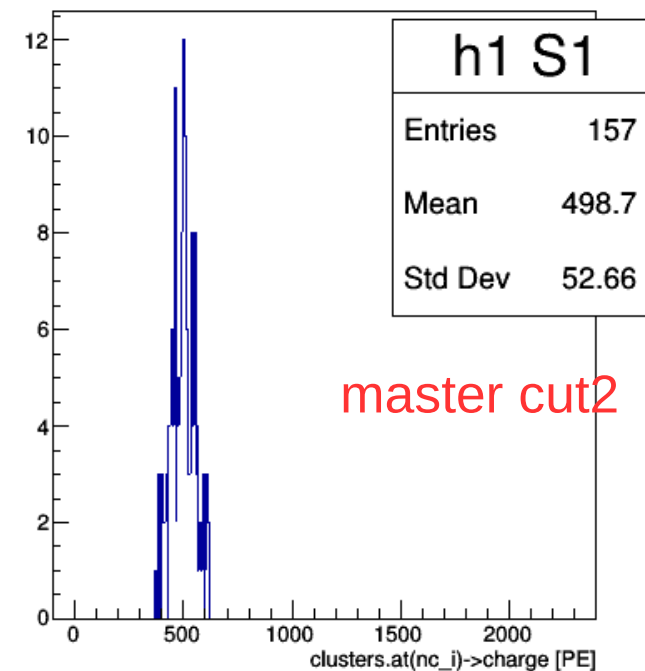
Ph2, Am241, run 542

357 < charge < 622 [PE]  
clusters.at(1)->f90 < 0.2

C2.is\_S1



master cut1

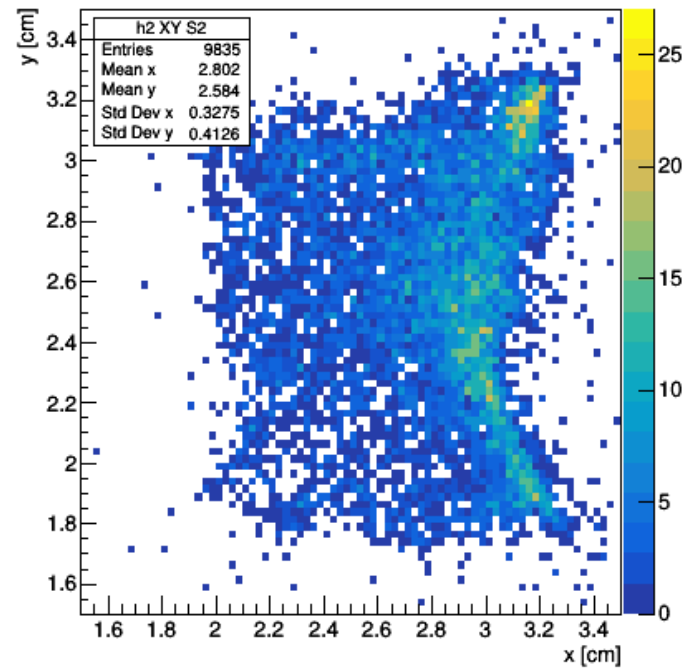


master cut2

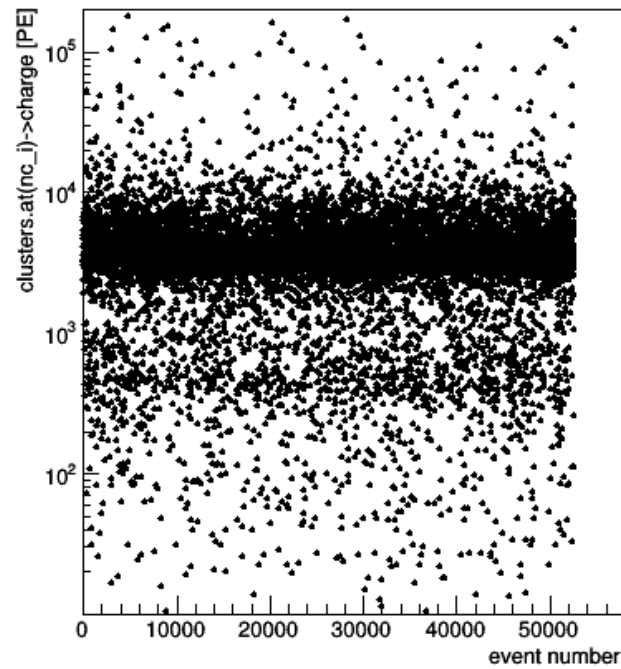


Ph2, Am241, run 544

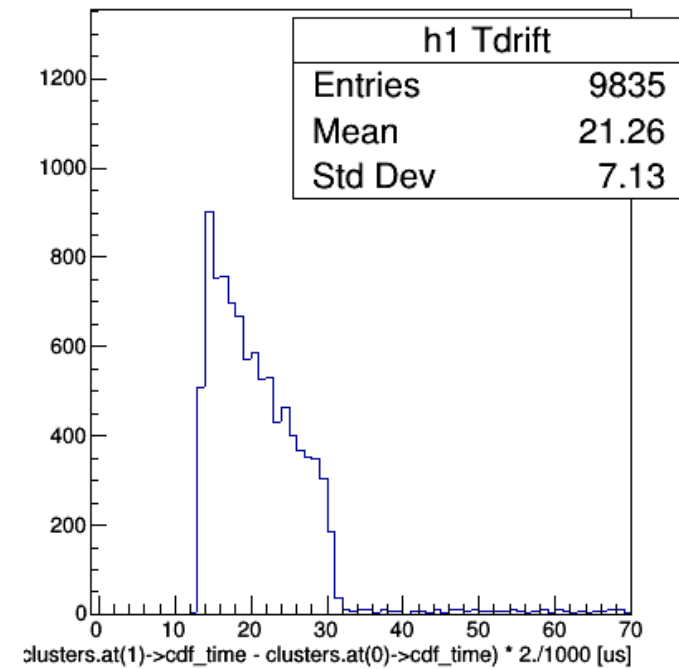
C1.is\_S2



C1.is\_S2



C0.nc == 2

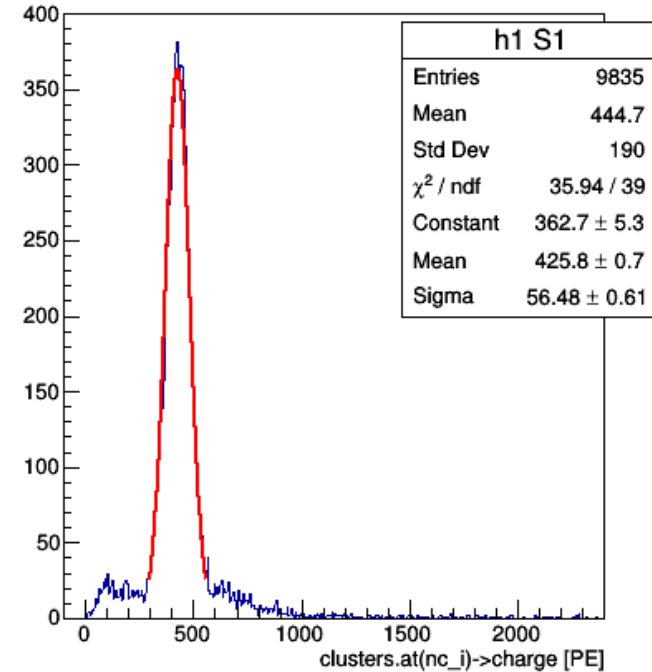
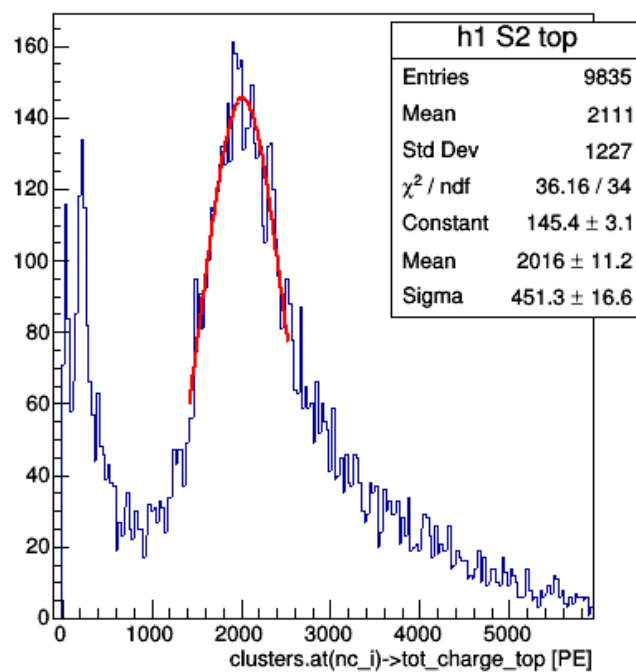
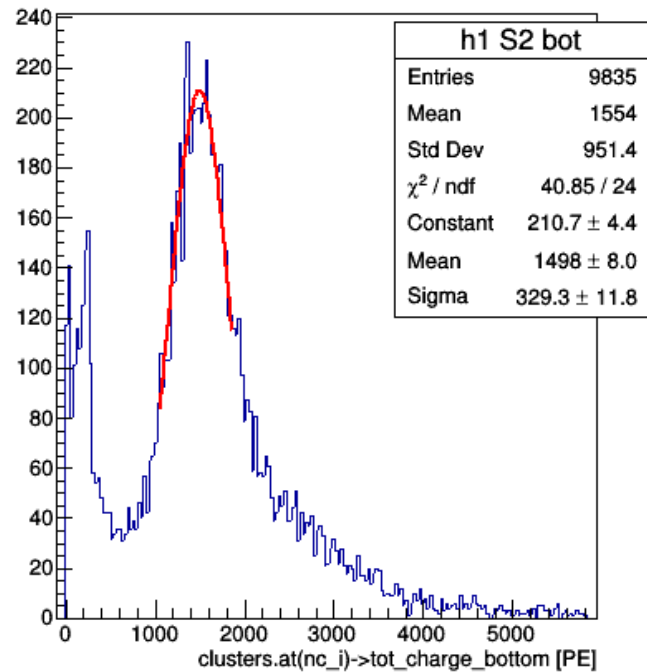


C1.is\_S2

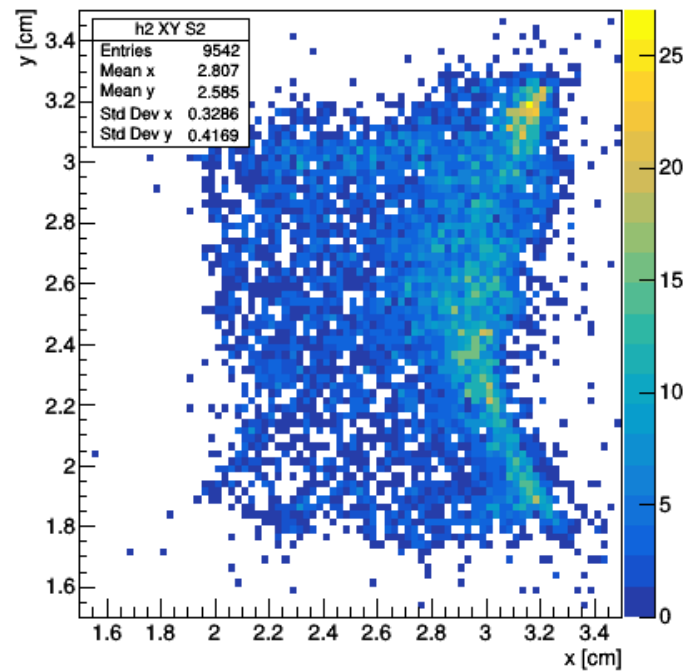
Ph2, Am241, run 544

C1.is\_S2

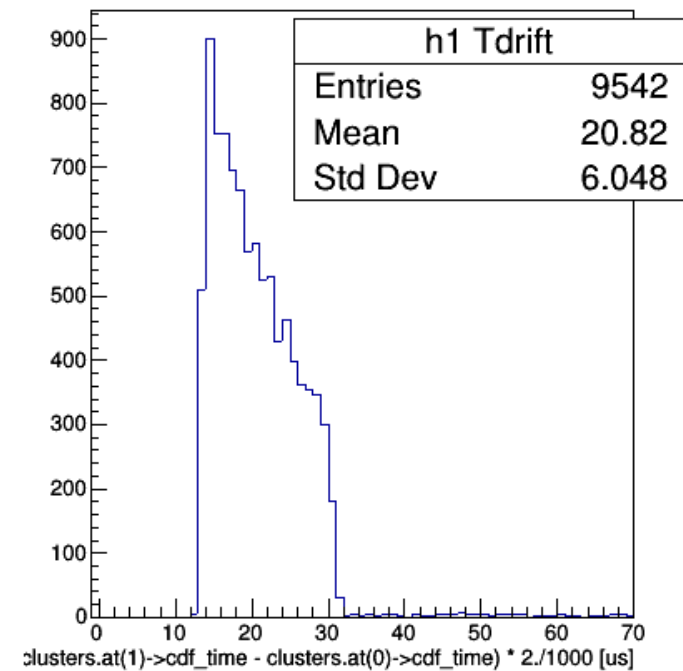
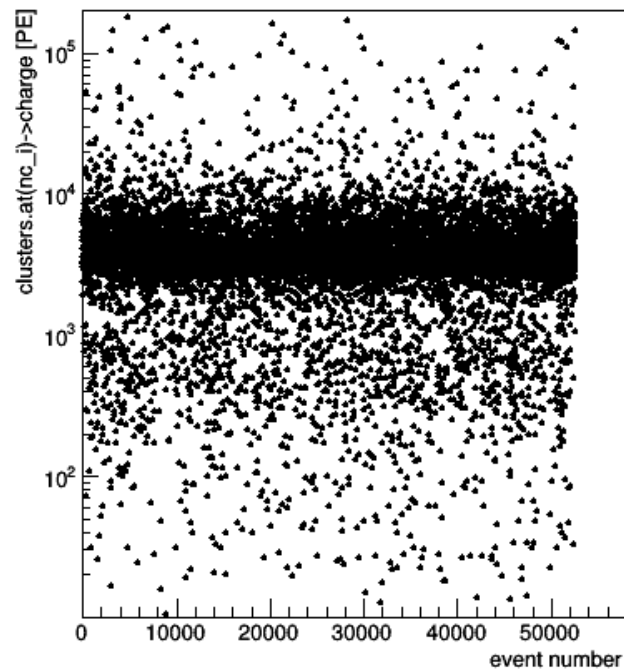
C2.is\_S1



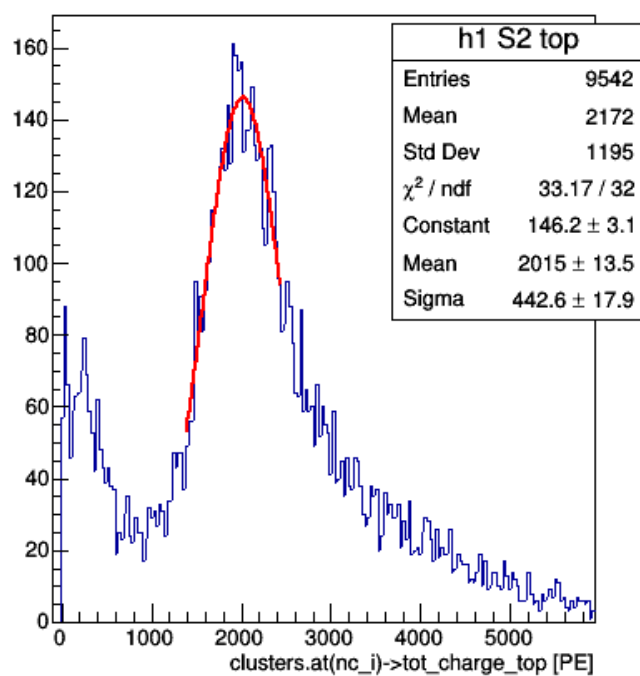
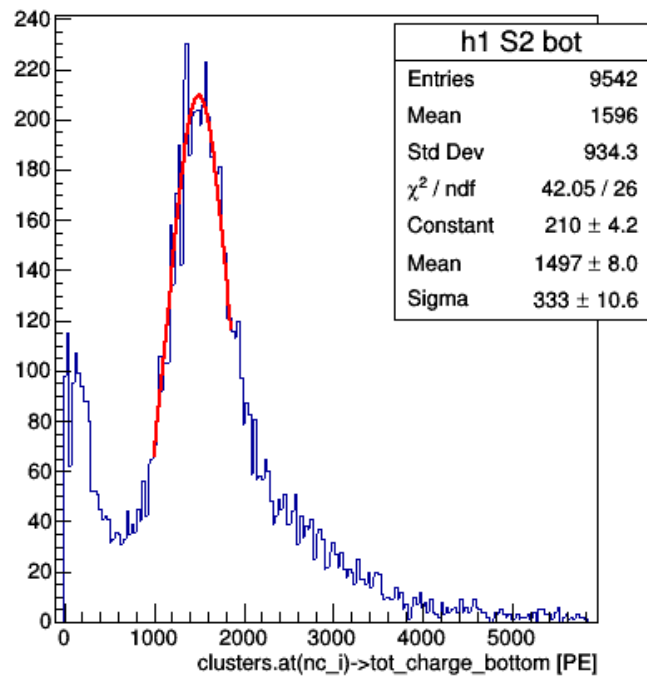
C1.is\_S2\_v2



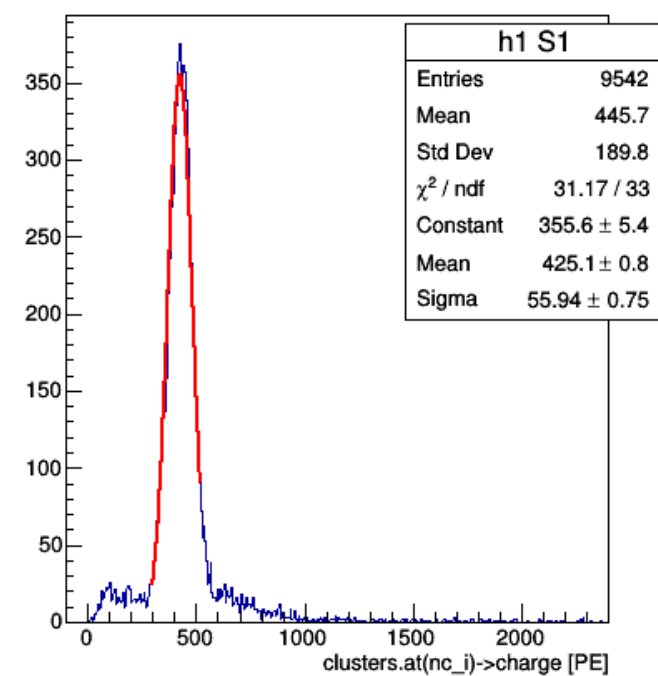
C1.is\_S2\_v2



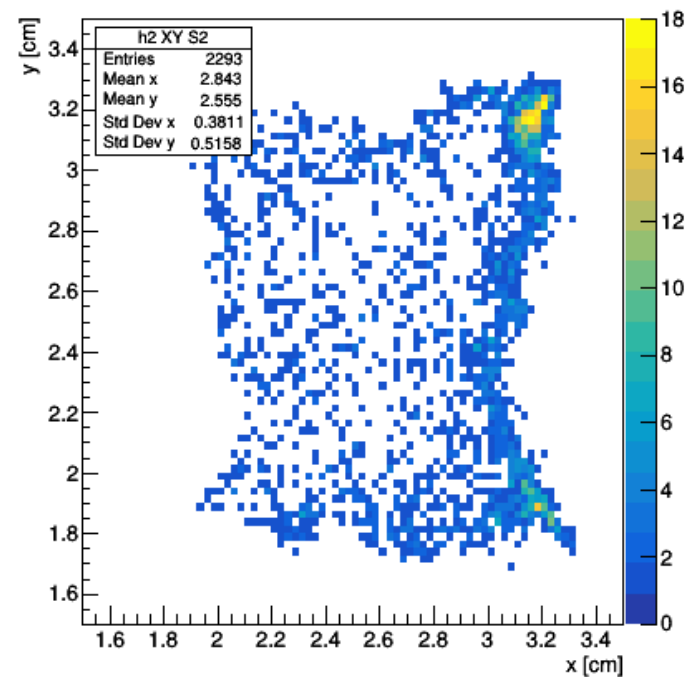
C1.is\_S2\_v2 Ph2, Am241, run 544 C1.is\_S2\_v2



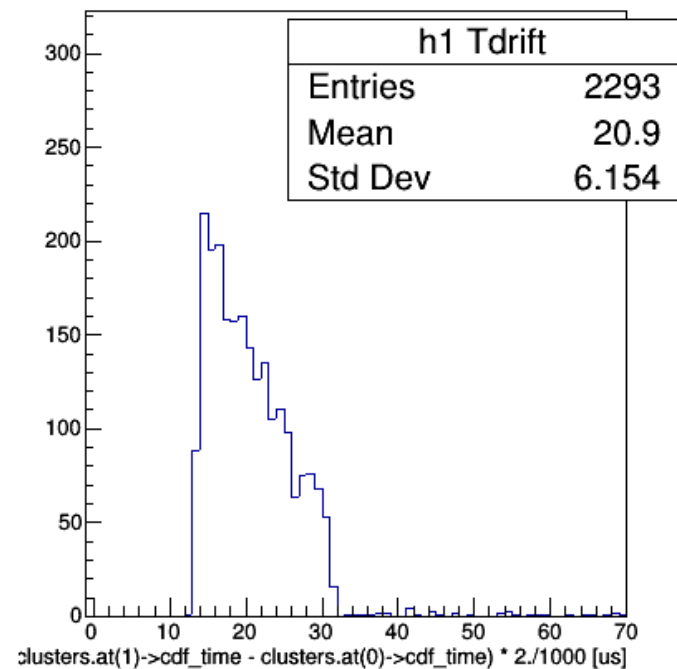
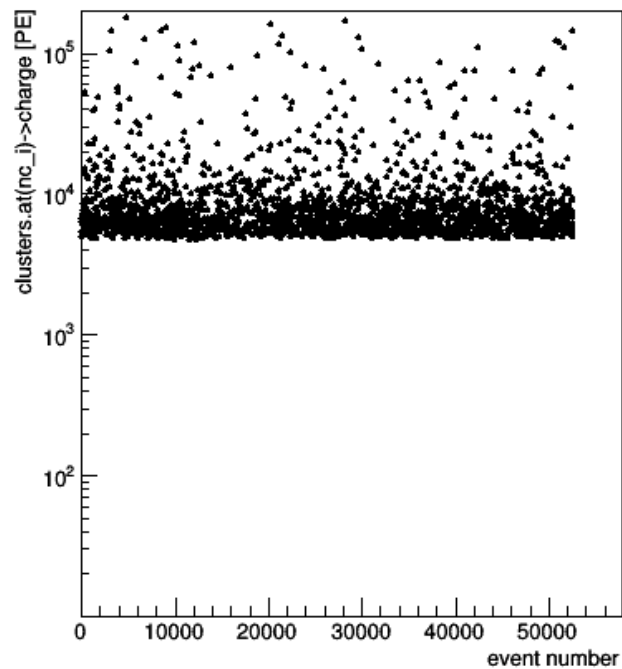
C2.is\_S1



C1.is\_S2\_v2 &amp;&amp; clusters.at(1)-&gt;tot\_charge\_top &gt; 3000



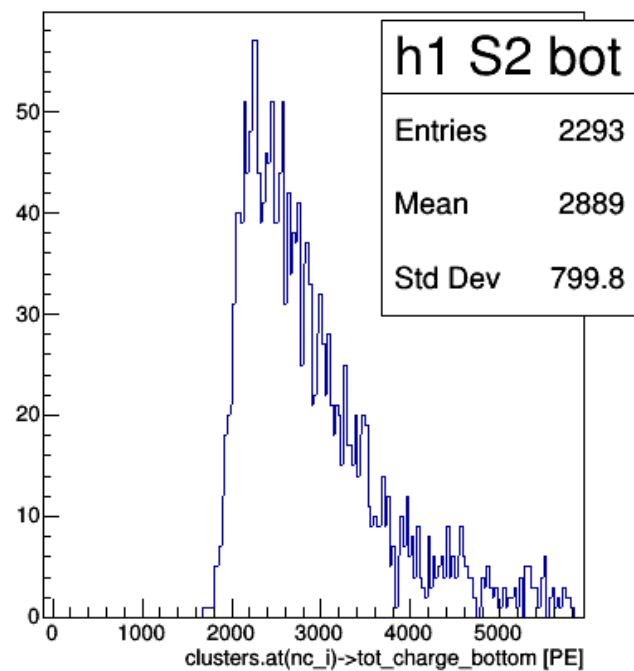
C1.is\_S2\_v2 &amp;&amp; clusters.at(1)-&gt;tot\_charge\_top &gt; 3000



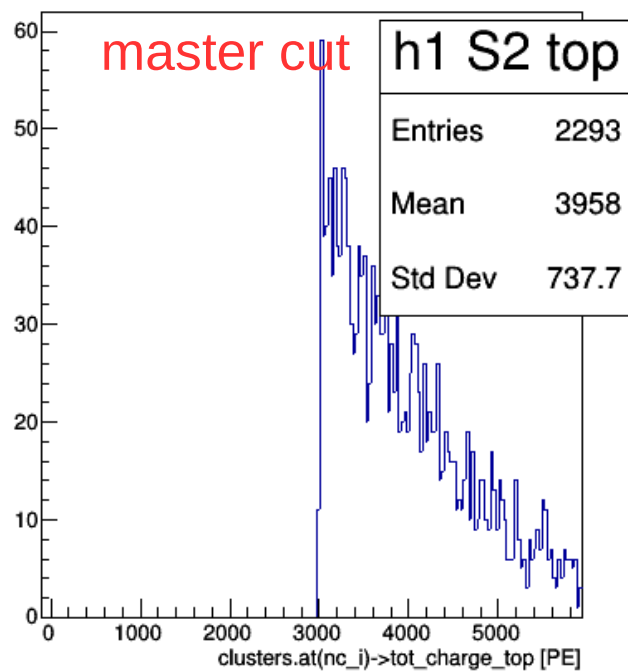
tot\_charge\_top &gt; 3000 [PE]

Ph2, Am241, run 544

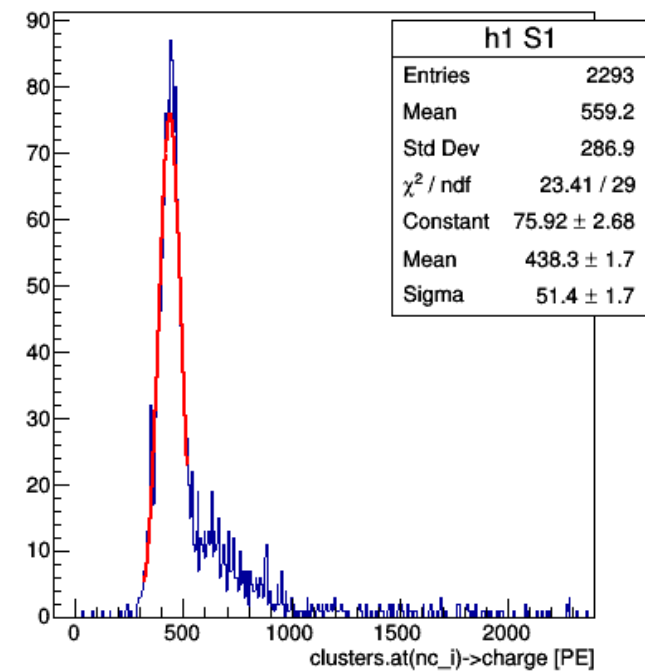
C1.is\_S2\_v2 &amp;&amp; clusters.at(1)-&gt;tot\_charge\_top &gt; 3000



C1.is\_S2\_v2 &amp;&amp; clusters.at(1)-&gt;tot\_charge\_top &gt; 3000



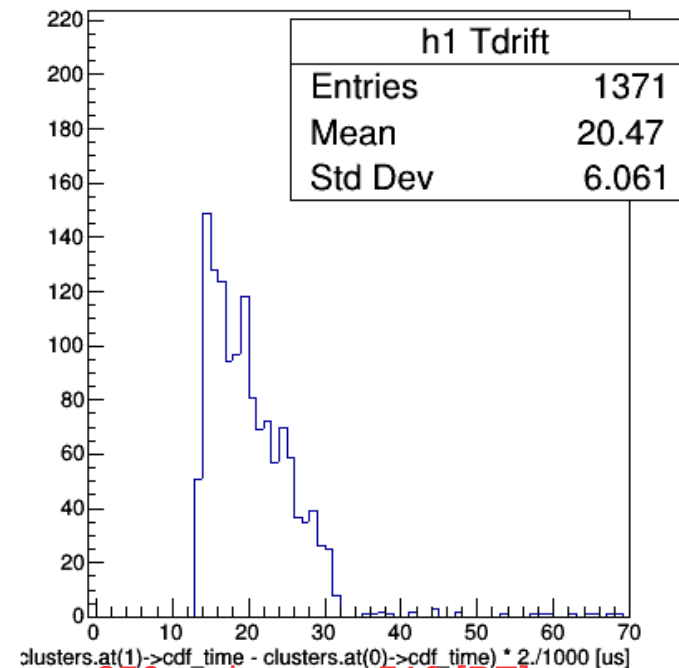
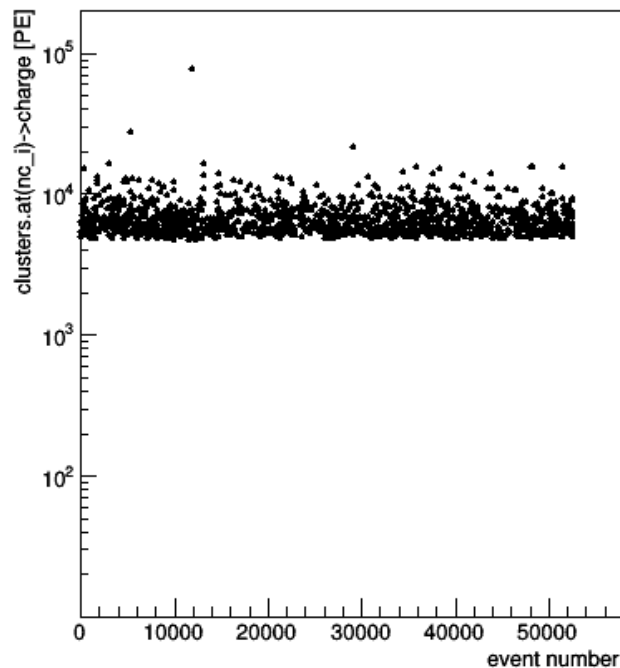
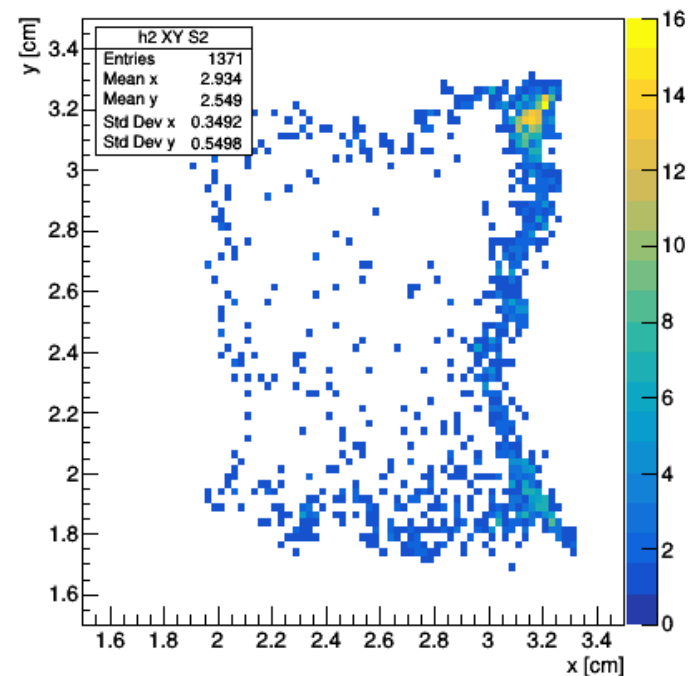
C2.is\_S1





C1A\_S2\_s2 &amp;&amp; clusters.at(1)-&gt;tot\_charge\_top &gt; 3000 &amp;&amp; clusters.at(2)-&gt;charge &gt; 350 &amp;&amp; clusters.at(3)-&gt;charge &lt; 510

C1A\_S2\_s2 &amp;&amp; clusters.at(1)-&gt;tot\_charge\_top &gt; 3000 &amp;&amp; clusters.at(2)-&gt;charge &gt; 350 &amp;&amp; clusters.at(3)-&gt;charge &lt; 510



tot\_charge\_top &gt; 3000 [PE]

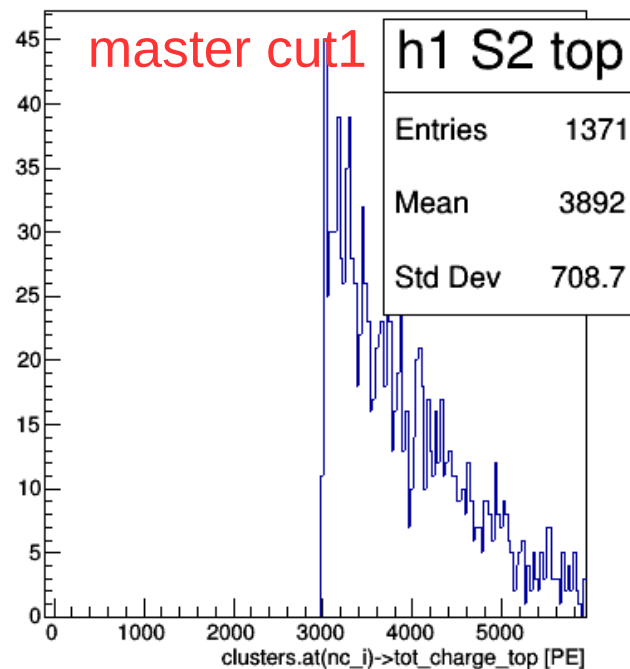
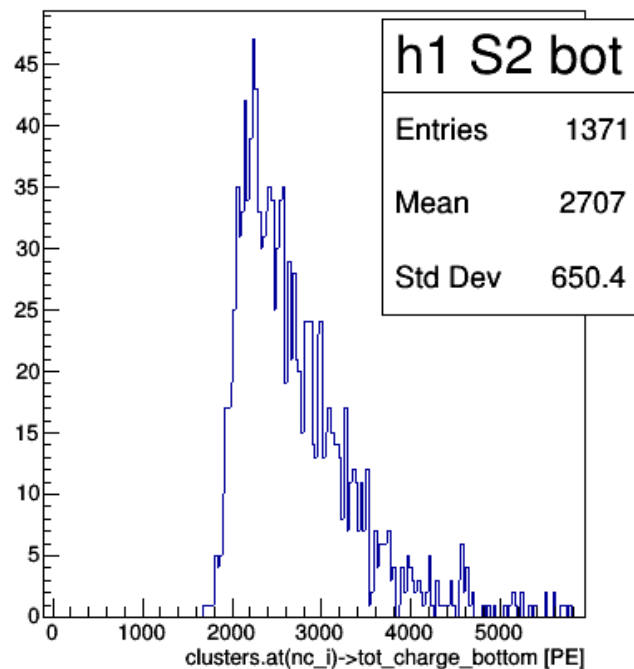
350 &lt; charge &lt; 510 [PE]

Ph2, Am241, run 544

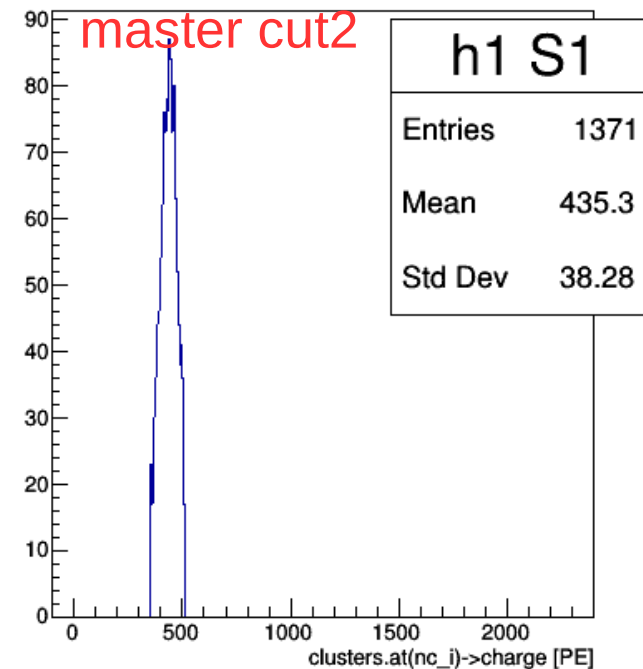
C1A\_S2\_s2 &amp;&amp; clusters.at(1)-&gt;tot\_charge\_top &gt; 3000 &amp;&amp; clusters.at(2)-&gt;charge &gt; 350 &amp;&amp; clusters.at(3)-&gt;charge &lt; 510

C1A\_S2\_s2 &amp;&amp; clusters.at(1)-&gt;tot\_charge\_top &gt; 3000 &amp;&amp; clusters.at(2)-&gt;charge &gt; 350 &amp;&amp; clusters.at(3)-&gt;charge &lt; 510

C2.is\_S1

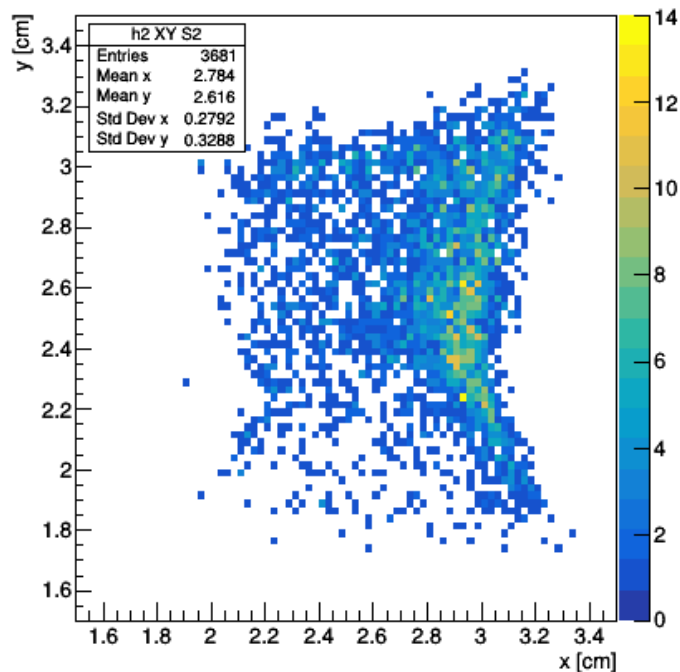


master cut1

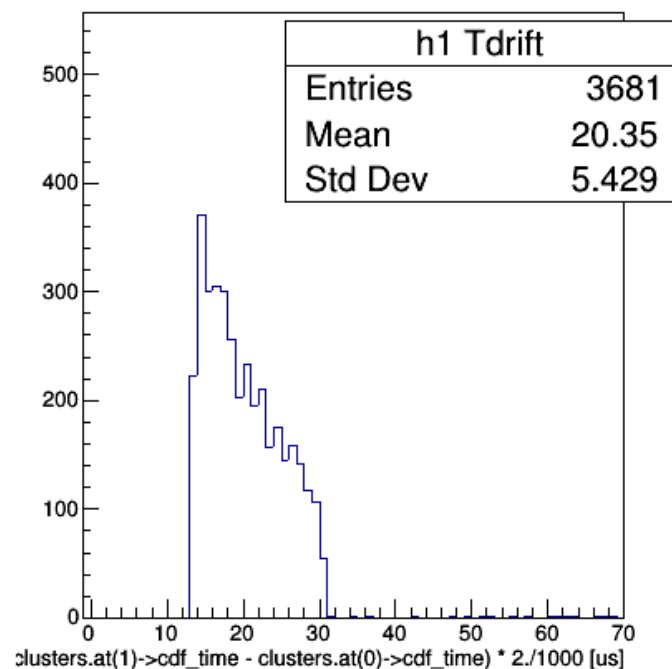
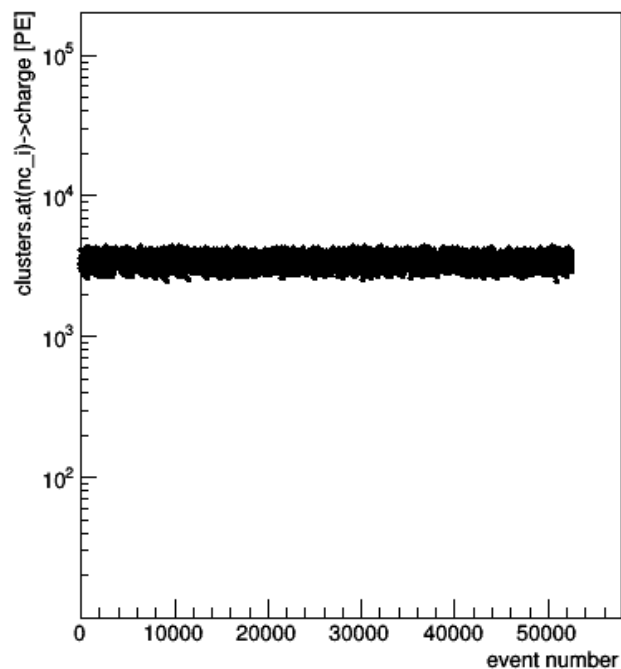


master cut2

C1.is\_S2\_v2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1573 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2457

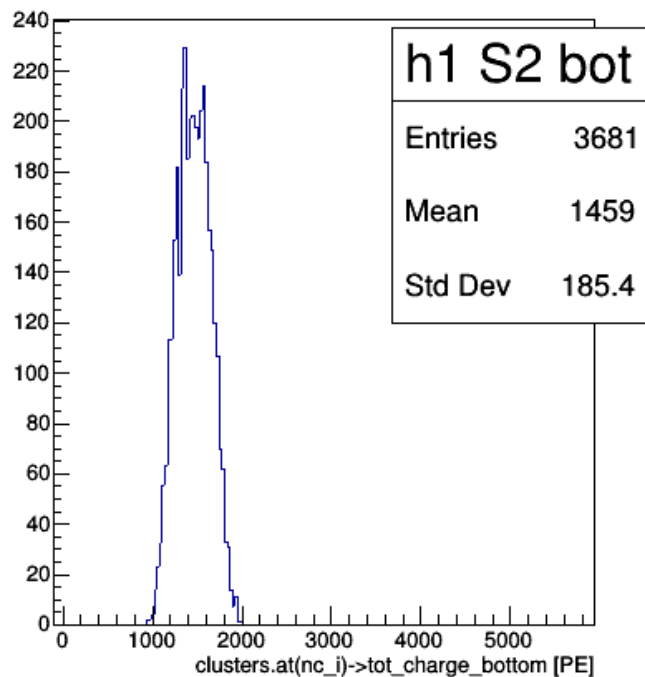


C1.is\_S2\_v2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1573 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2457

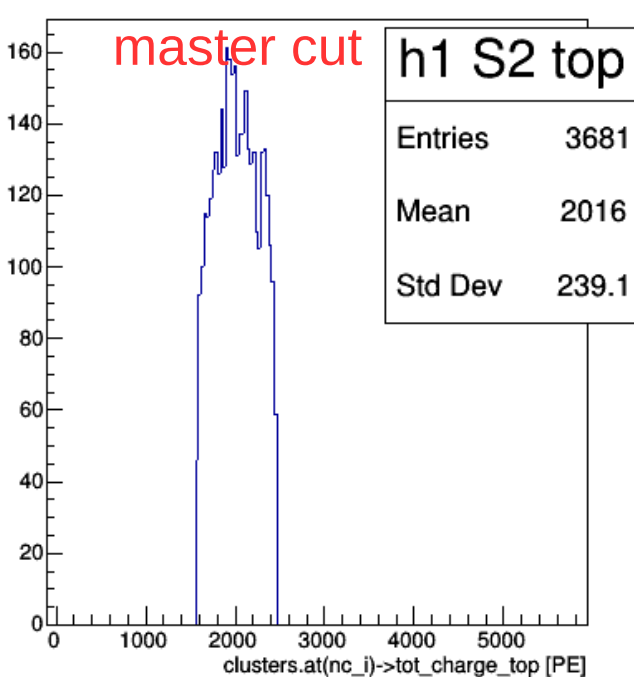


1573 < tot\_charge\_top < 2457 [PE]  
Ph2, Am241, run 544

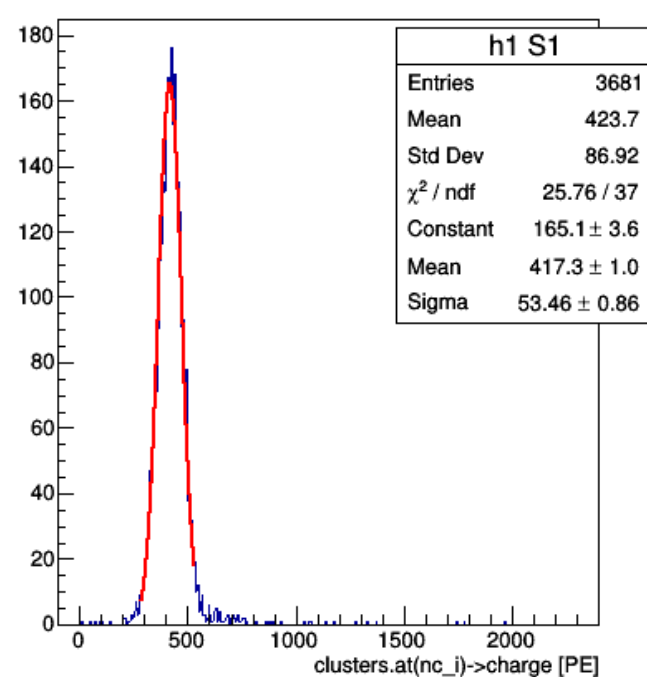
C1.is\_S2\_v2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1573 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2457



master cut



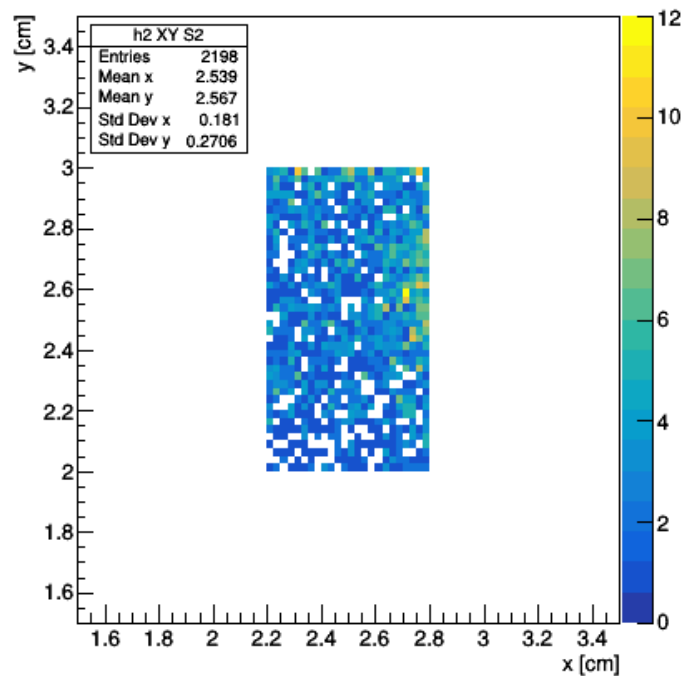
C2.is\_S1



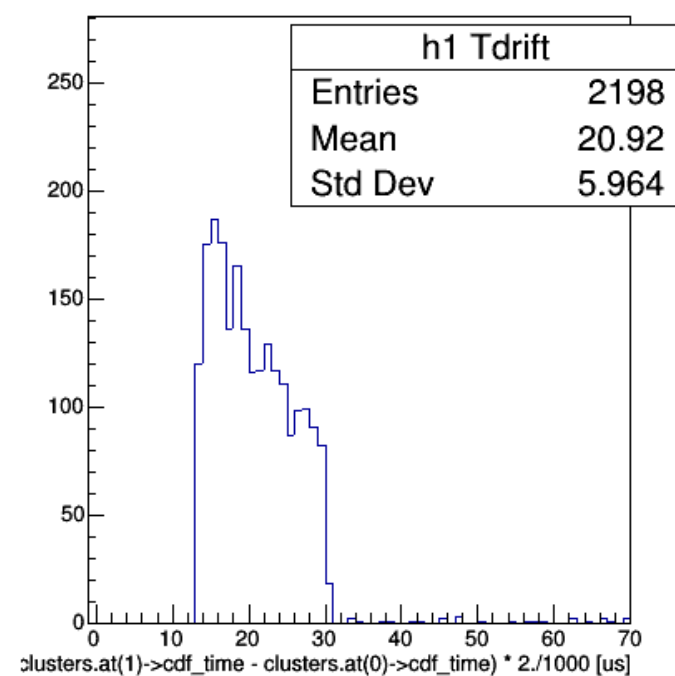
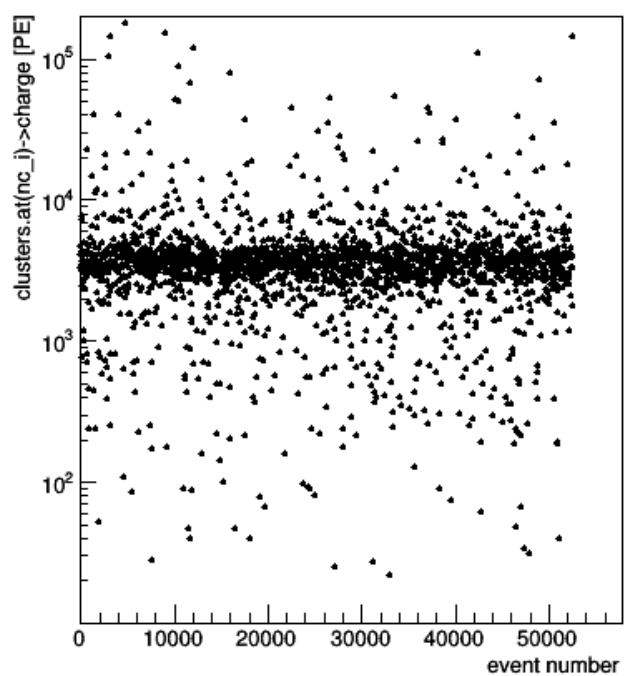


master cut

C1.is\_S2\_v2 && C1.region\_of\_S2\_uniformity



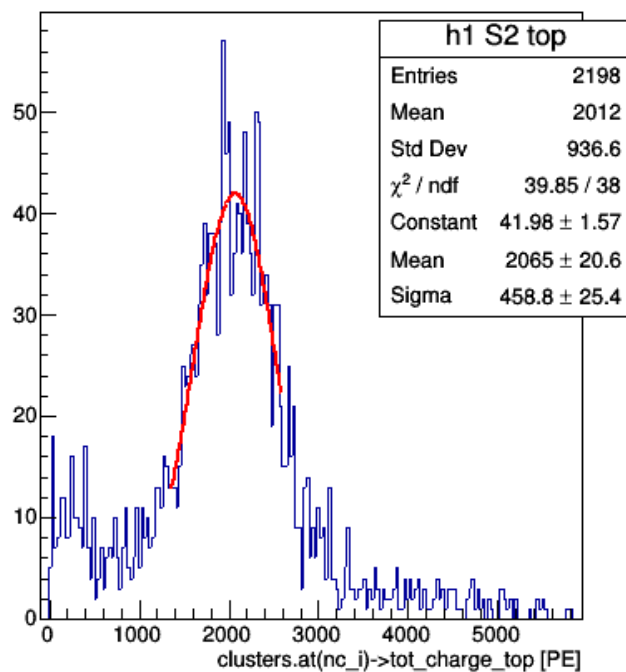
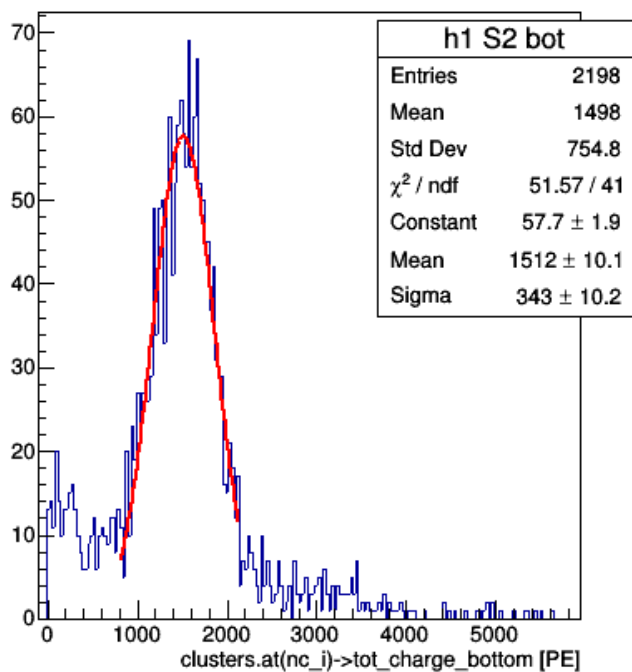
C1.is\_S2\_v2 && C1.region\_of\_S2\_uniformity



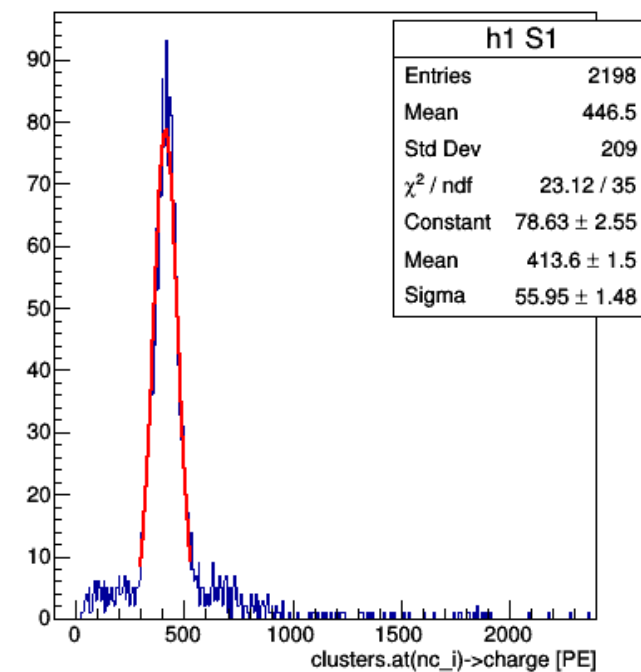
C1.is\_S2\_v2 && C1.region\_of\_S2\_uniformity

Ph2, Am241, run 544

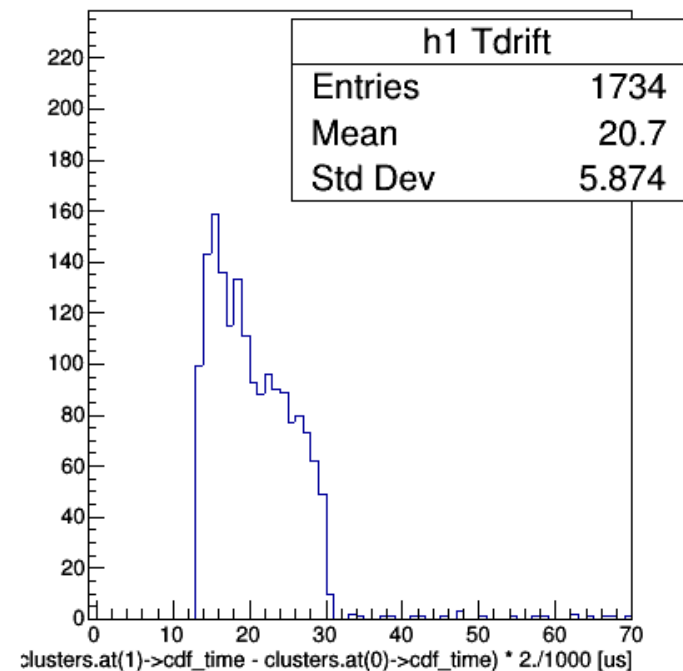
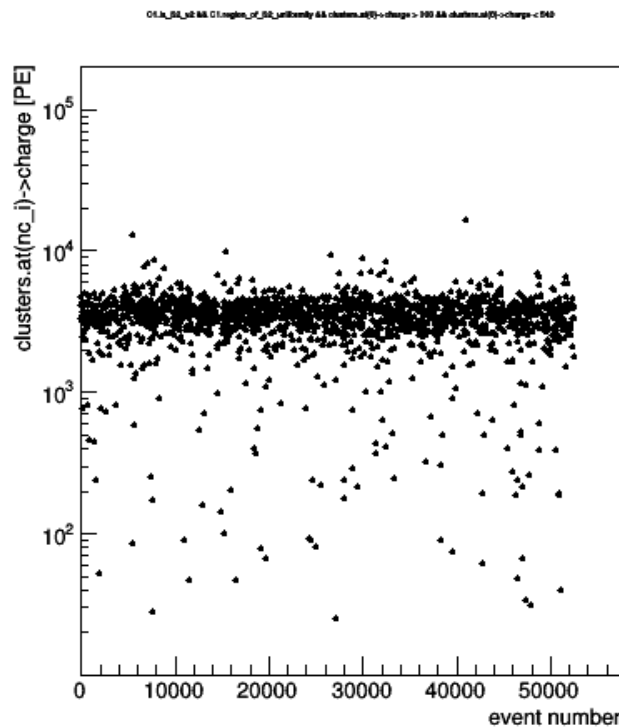
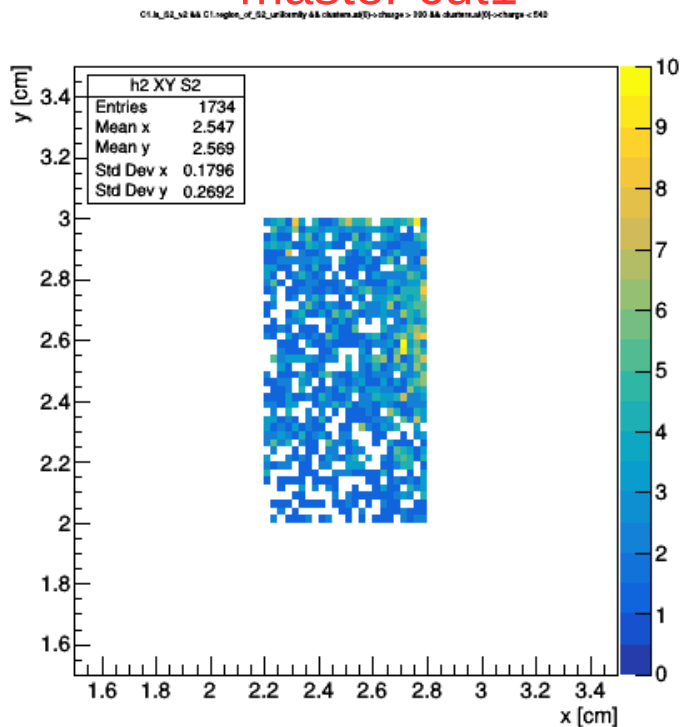
C1.is\_S2\_v2 && C1.region\_of\_S2\_uniformity



C2.is\_S1



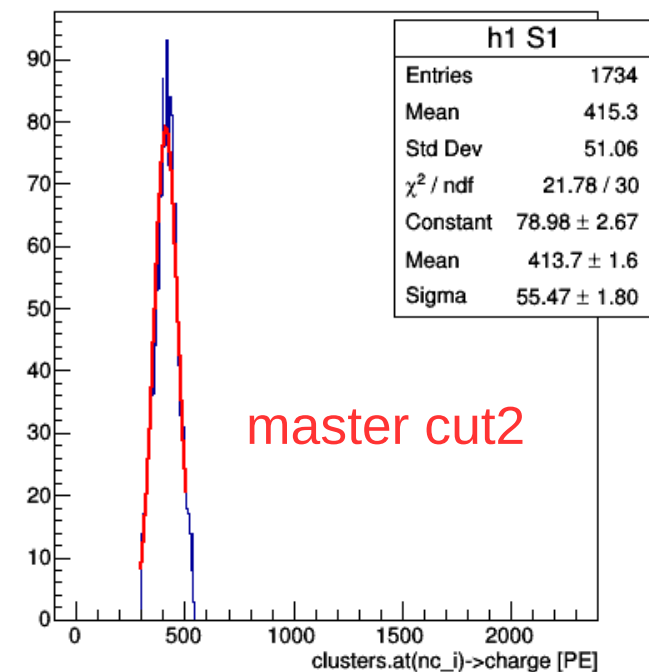
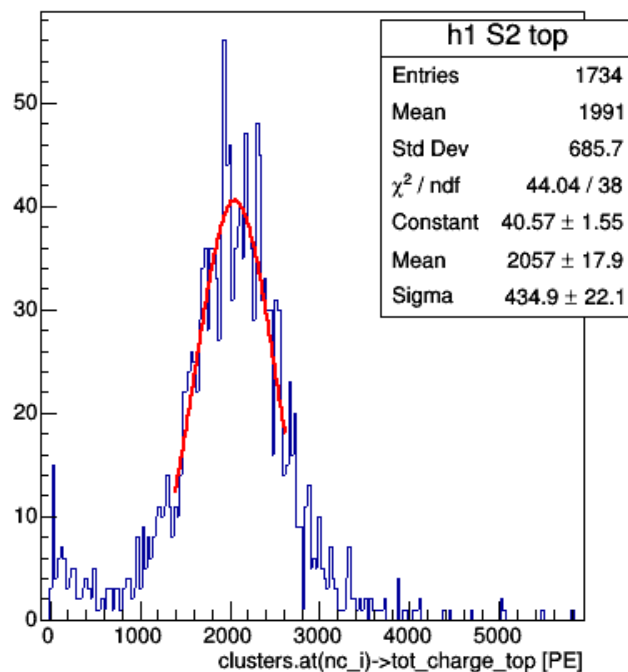
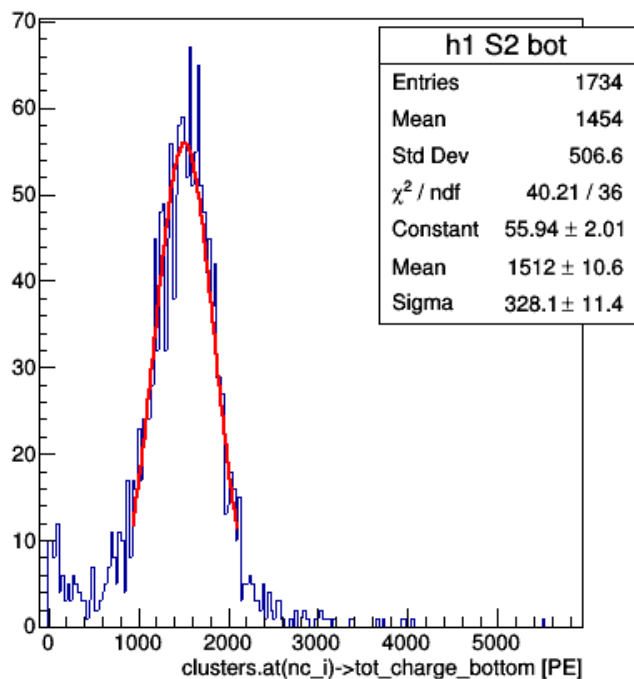
master cut1



Ph2, Am241, run 544

300 < charge < 510 [PE]

C2.is\_S1



master cut2





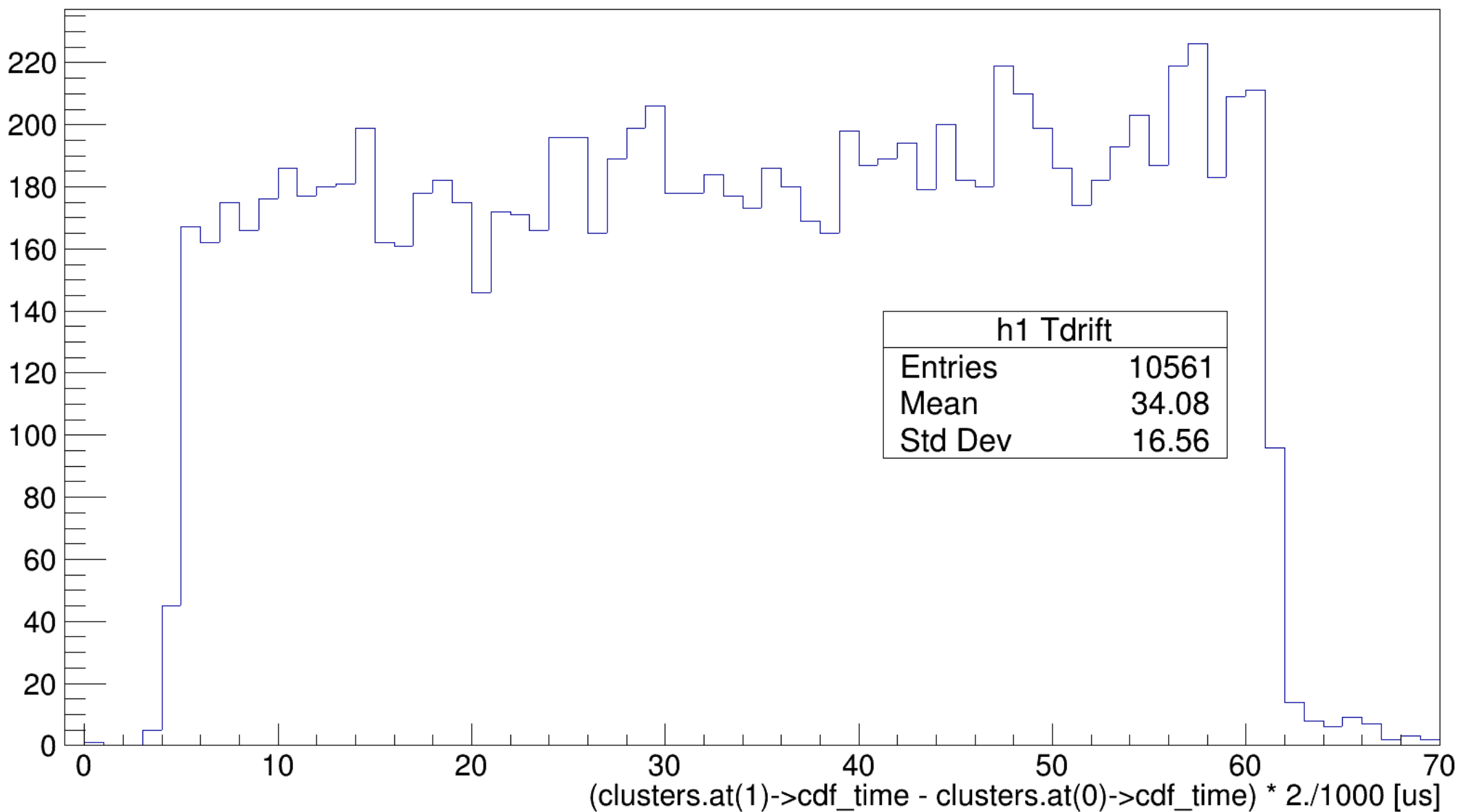




Ph2, bkg, run 534

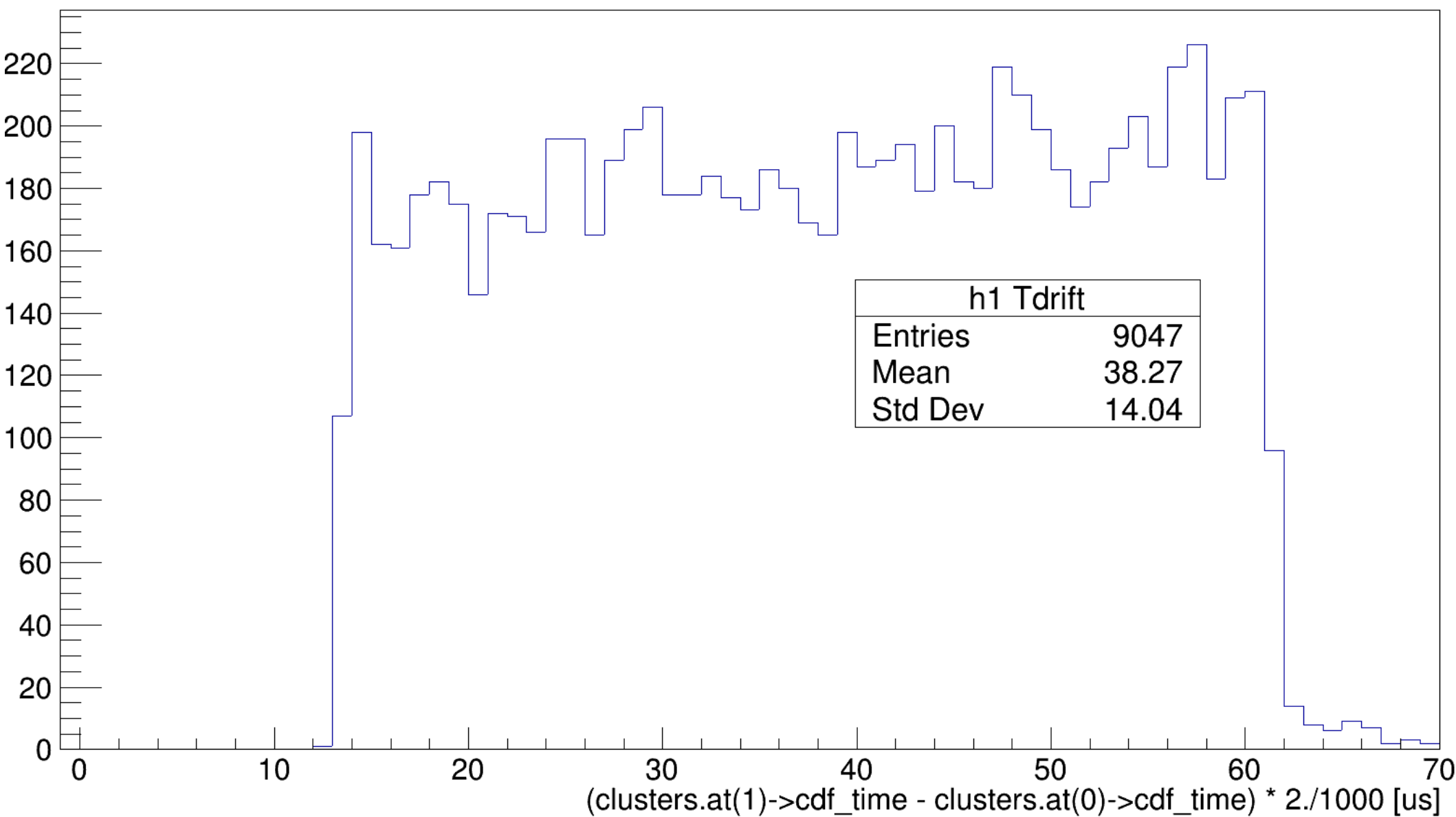
Ph2, bkg, run 534

C1.nc == 2 && C1.cls1



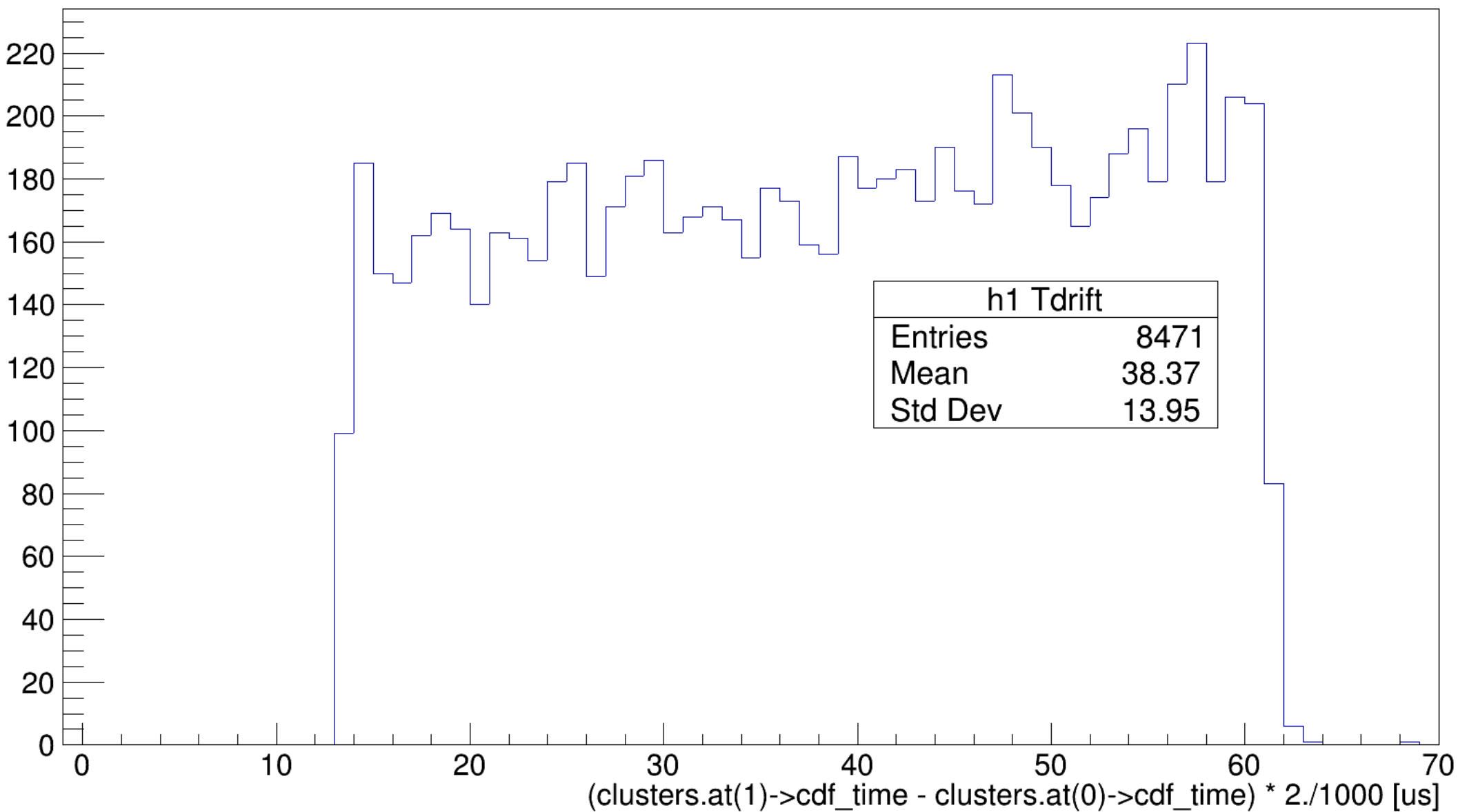
Ph2, bkg, run 534

C1.nc == 2 && C1.cls1 && C1.cls0\_is\_full



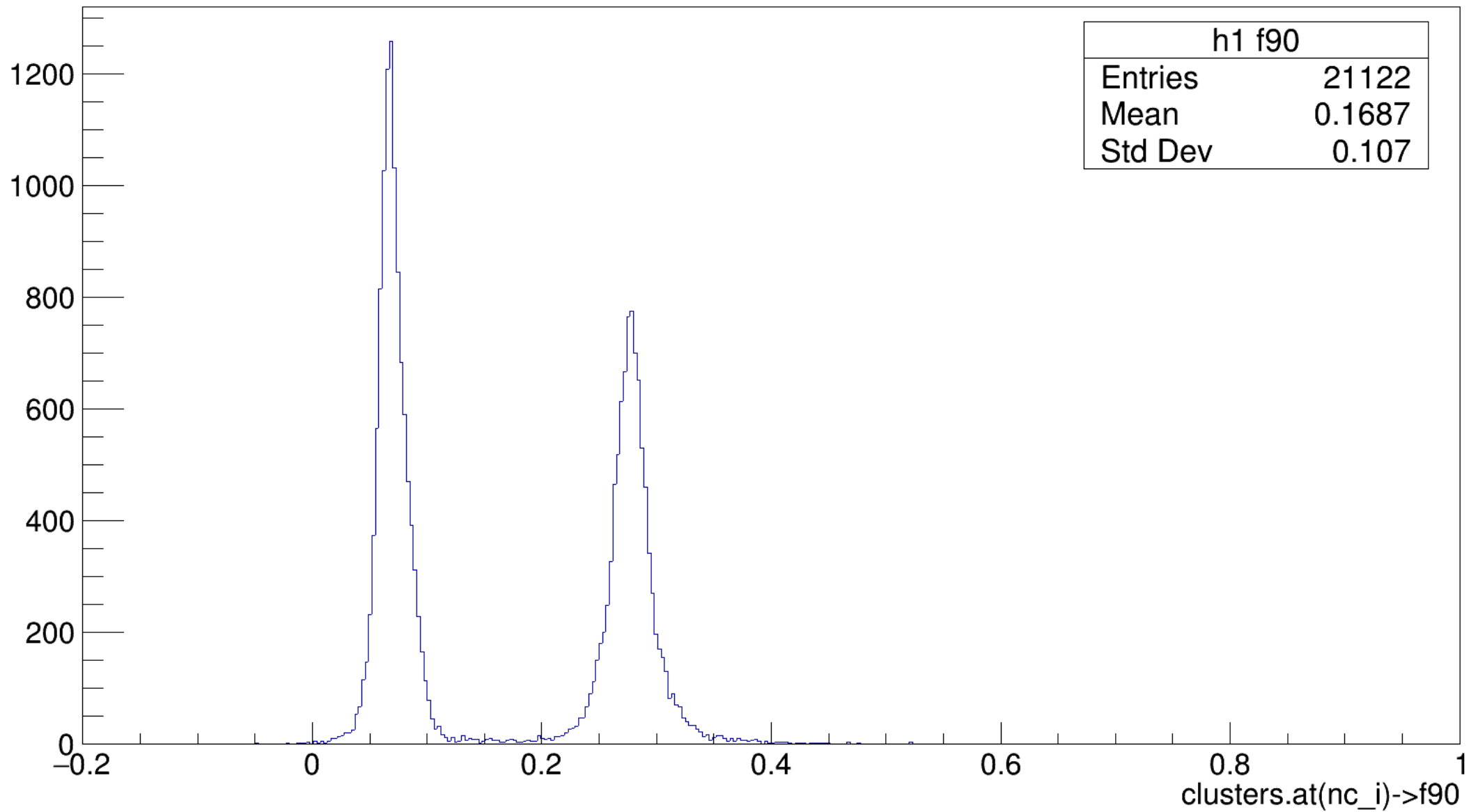
Ph2, bkg, run 534

C1.nc == 2 && C1.cls1 && C1.cls0\_is\_full && C1.cls0\_is\_S1



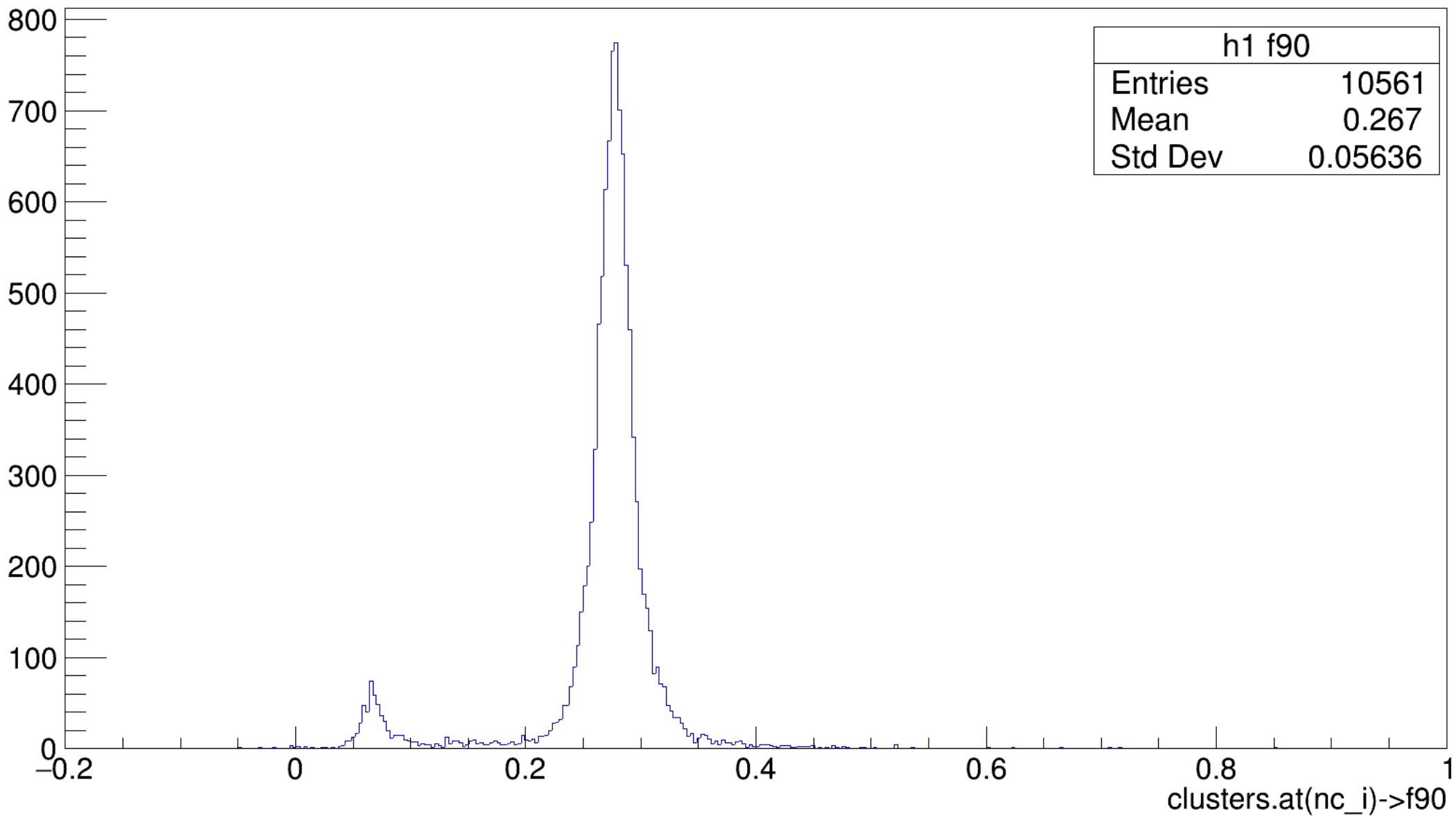
Ph2, bkg, run 534

C1.nc == 2



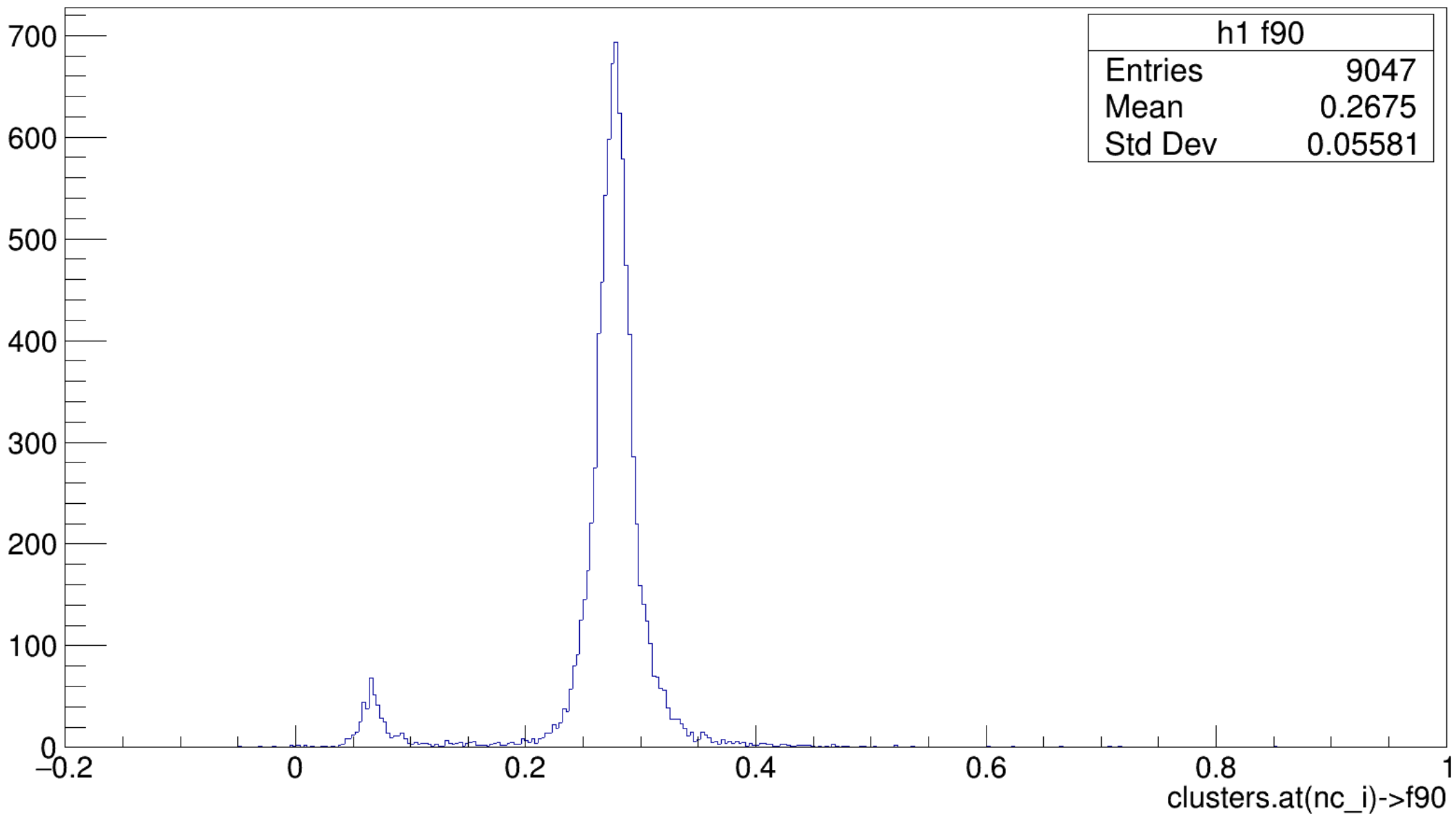
Ph2, bkg, run 534

C1.nc == 2 && C1.cls0

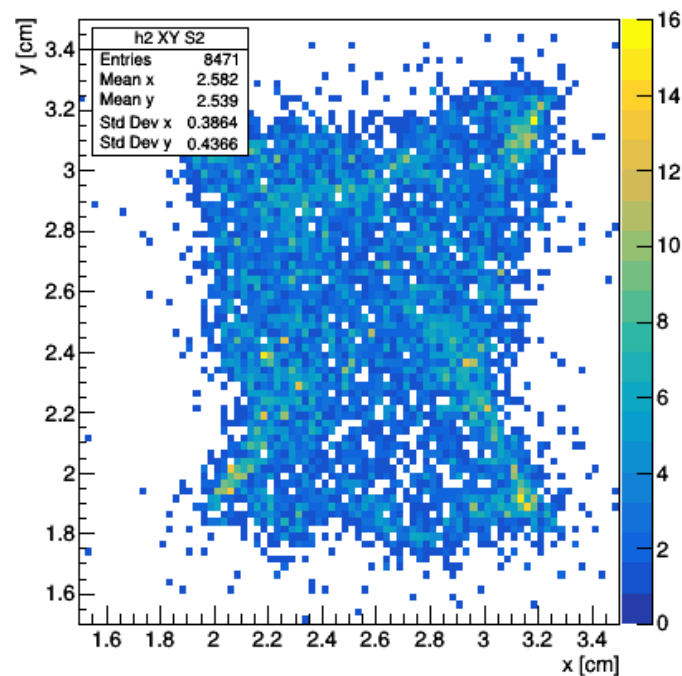


Ph2, bkg, run 534

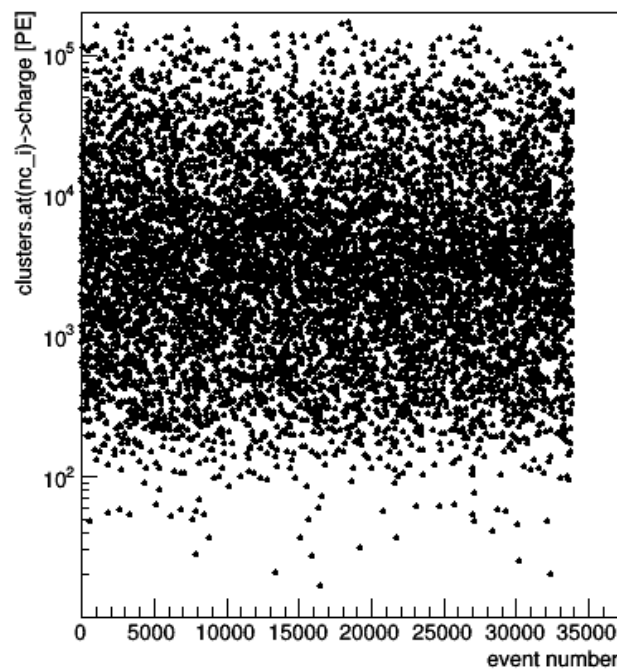
C1.nc == 2 && C1.cls0 && C1.cls0\_is\_full



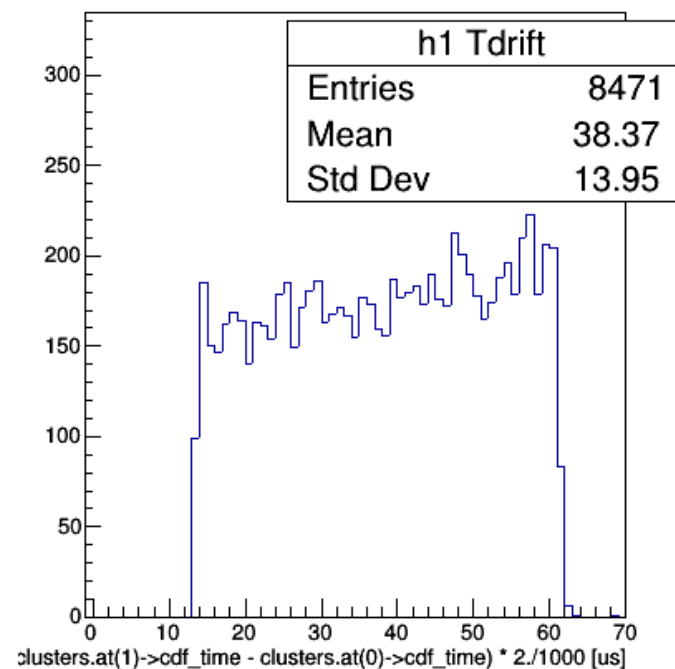
C1.is\_S2



C1.is\_S2



C0.is\_S1\_S2



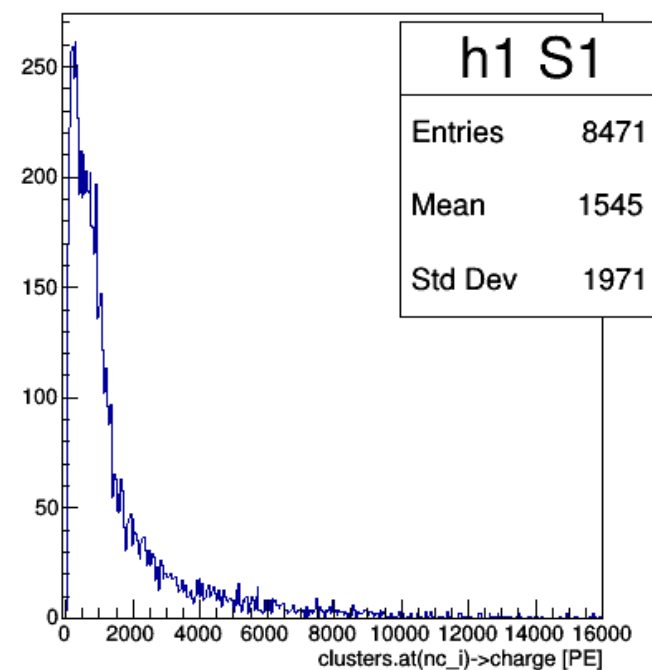
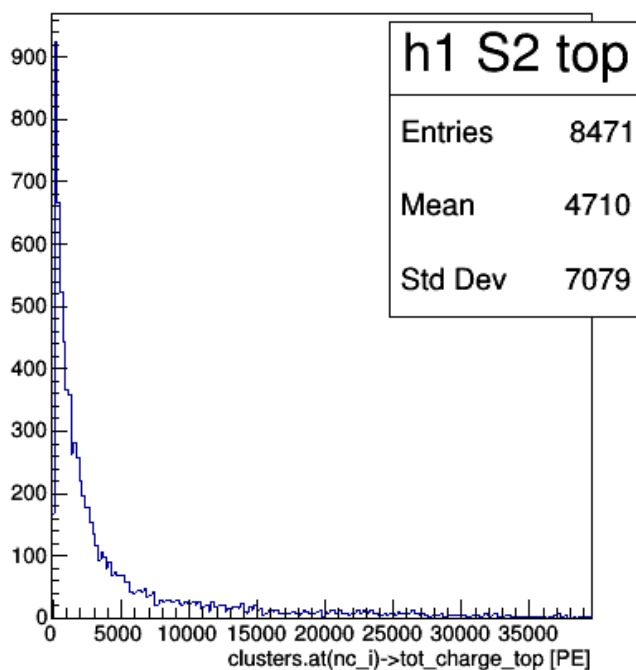
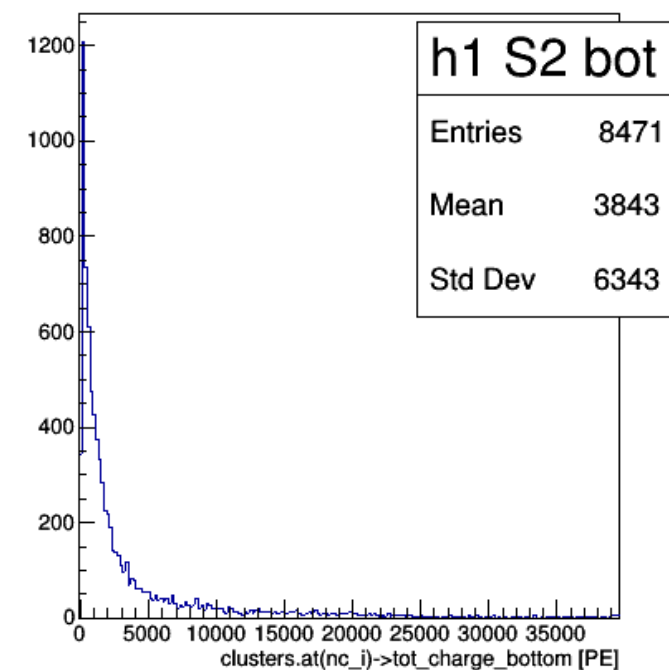
C1.is\_S2

Ph2, bkg, run 534

C1.is\_S2

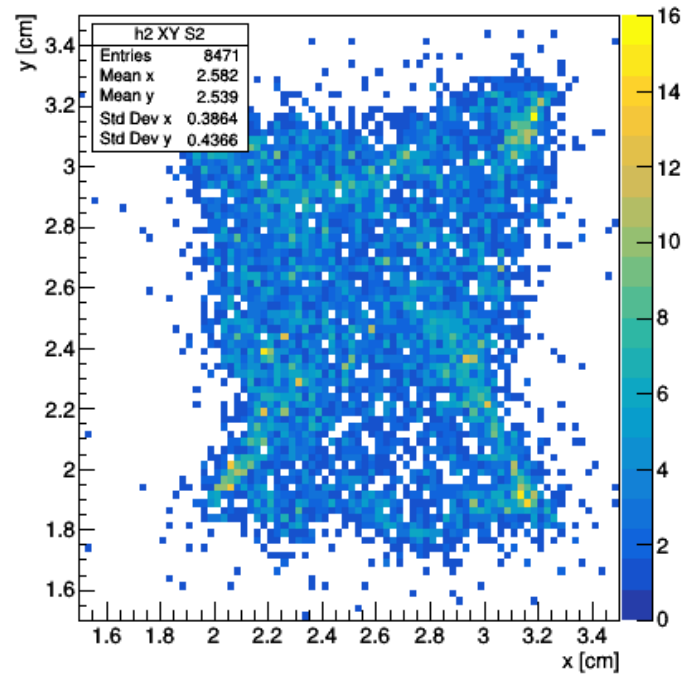
master cut

C2.is\_S1

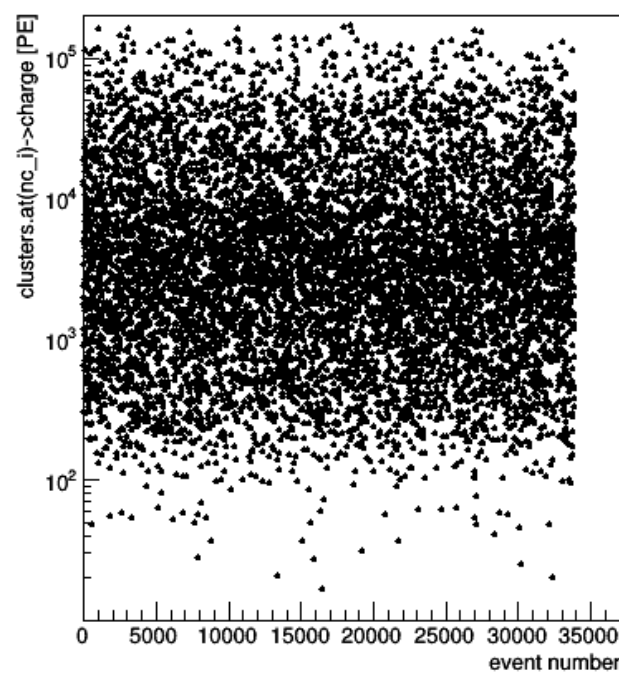




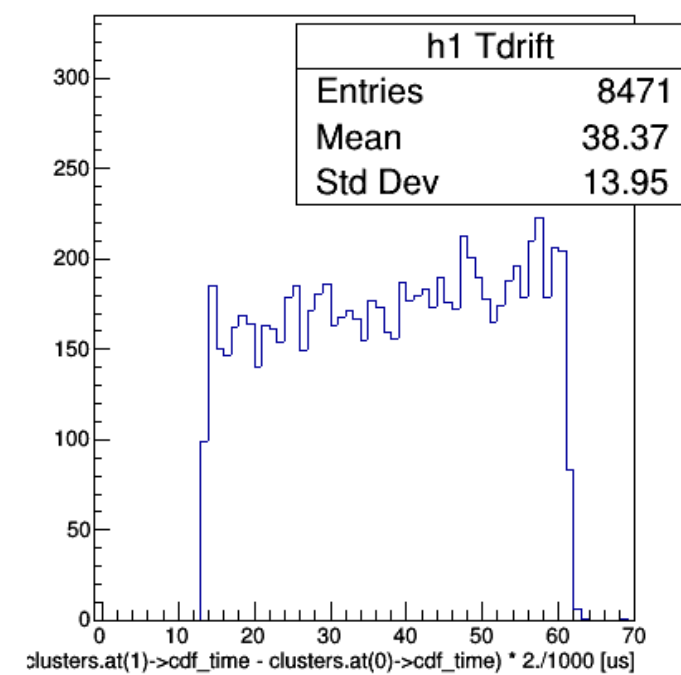
C1.is\_S2



C1.is\_S2



C0.is\_S1\_S2



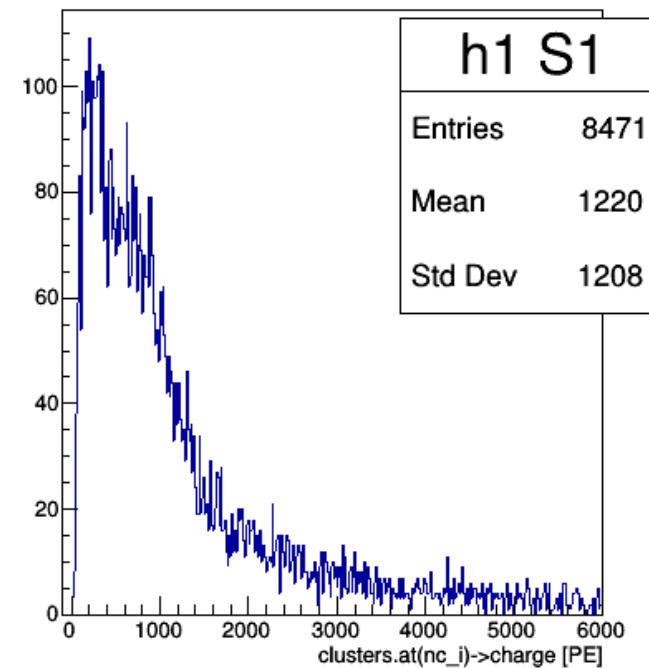
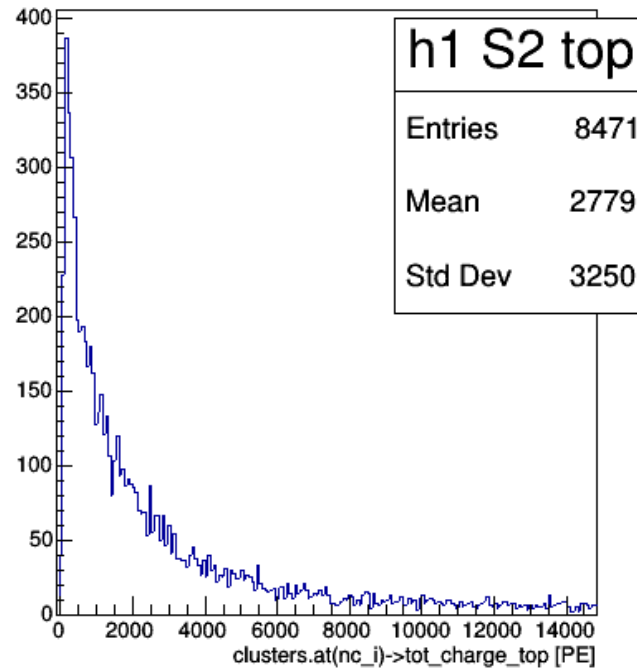
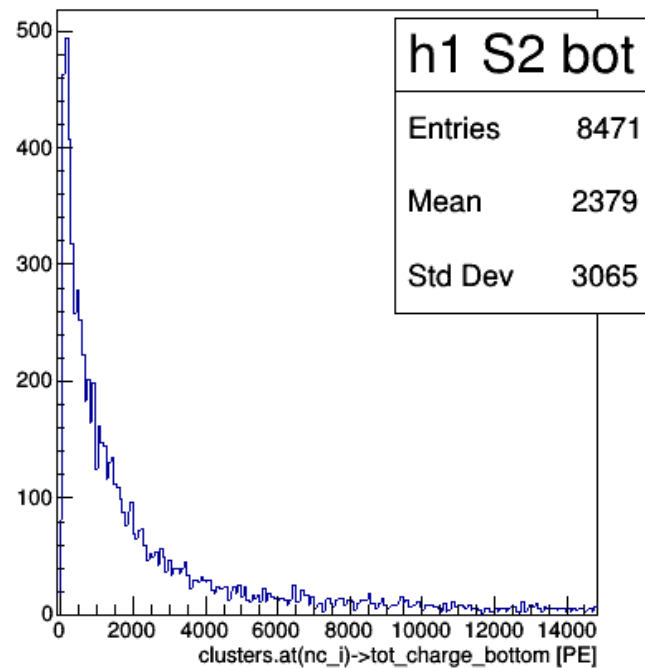
C1.is\_S2

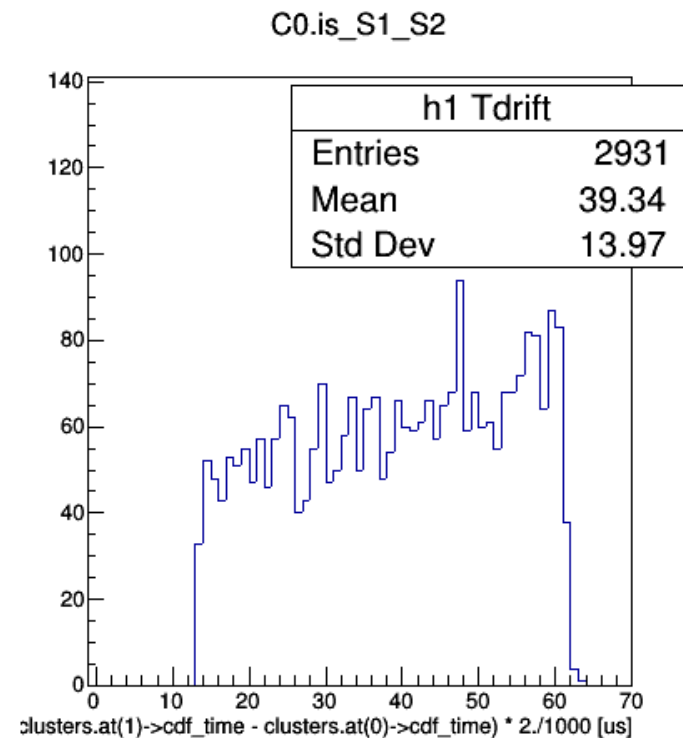
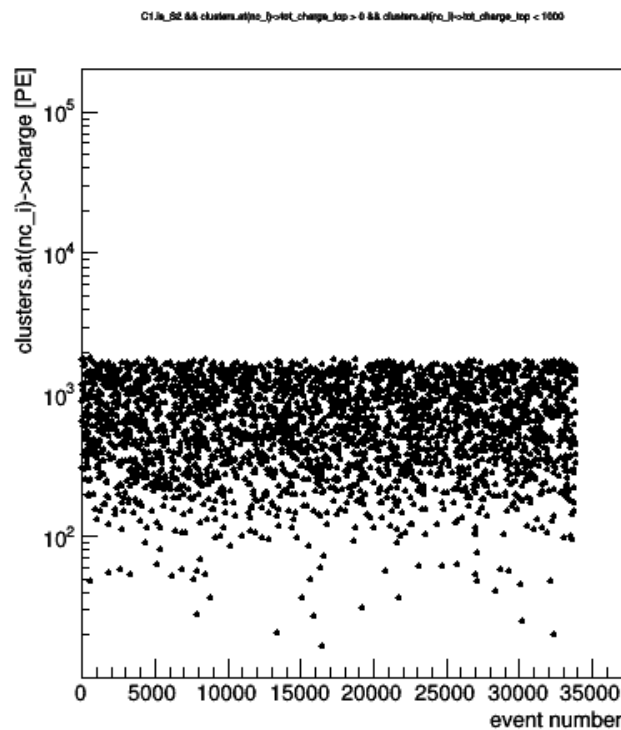
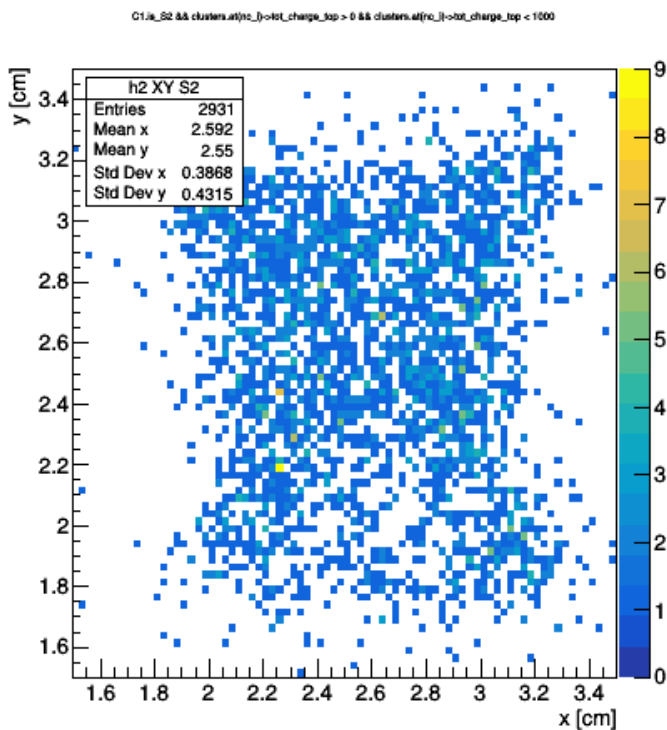
Ph2, bkg, run 534

C1.is\_S2

master cut

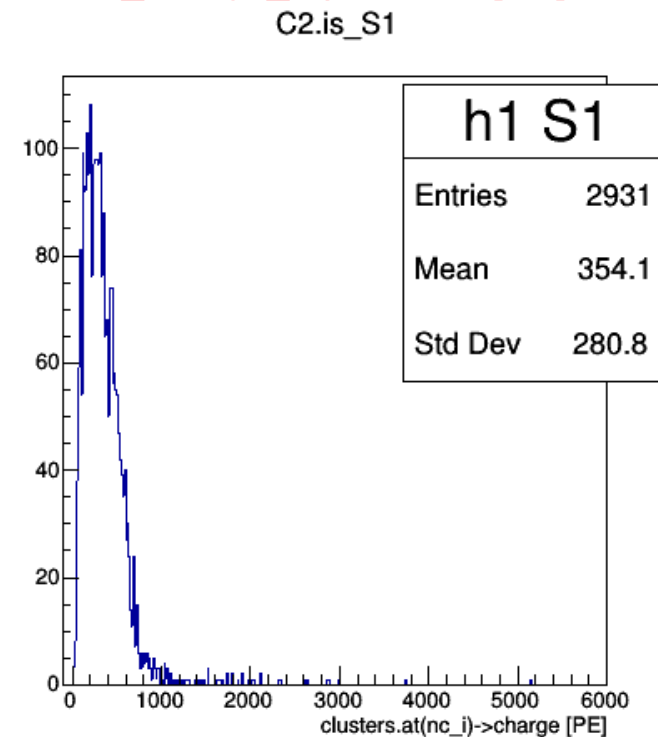
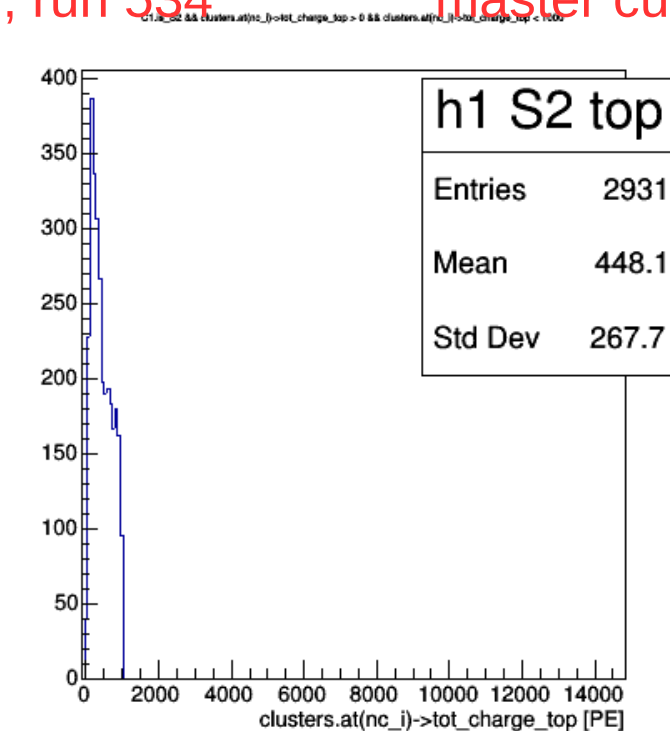
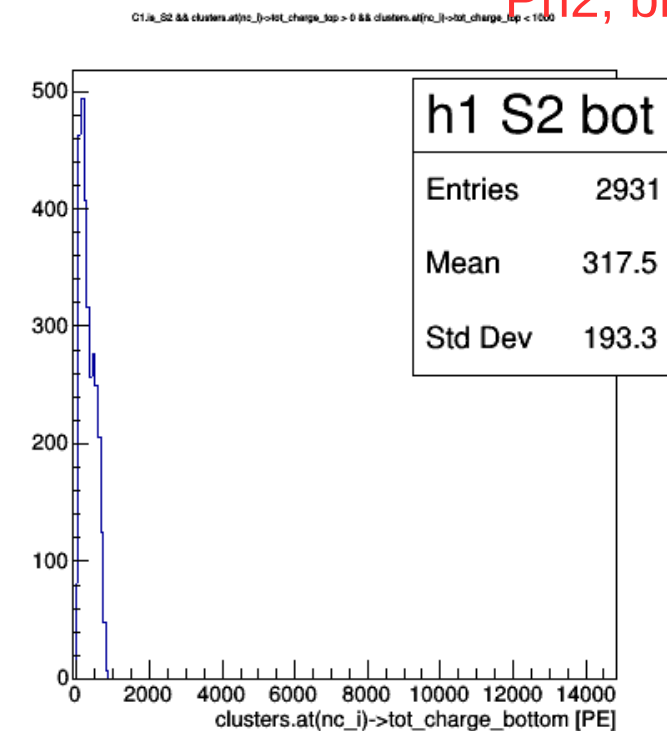
C2.is\_S1



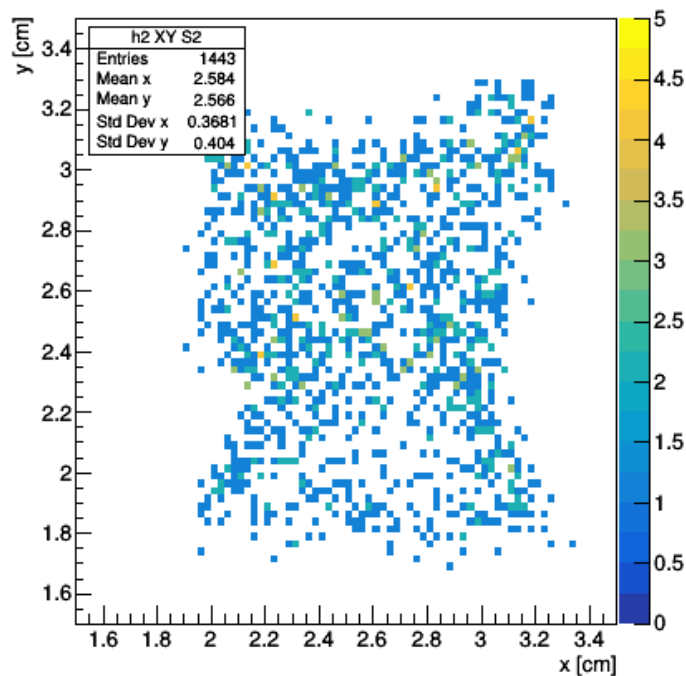


Ph2, bkg, run 534 master cut

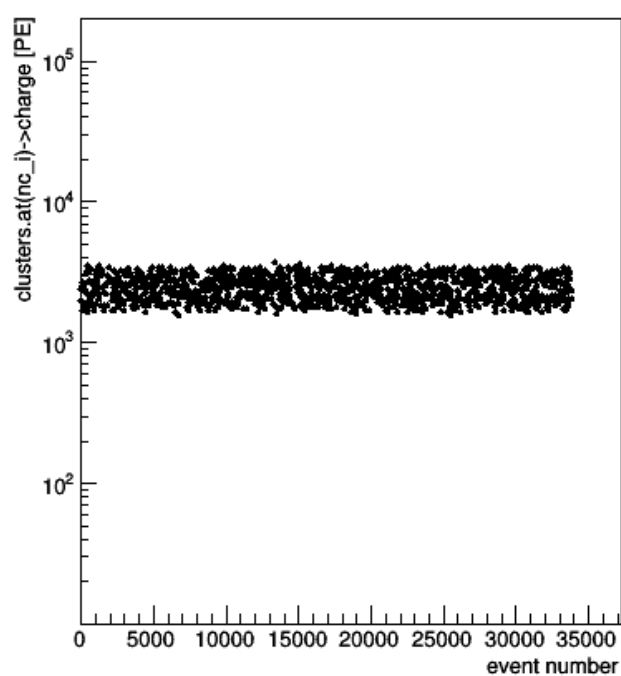
$0 < \text{tot\_charge\_top} < 1000$  [PE]



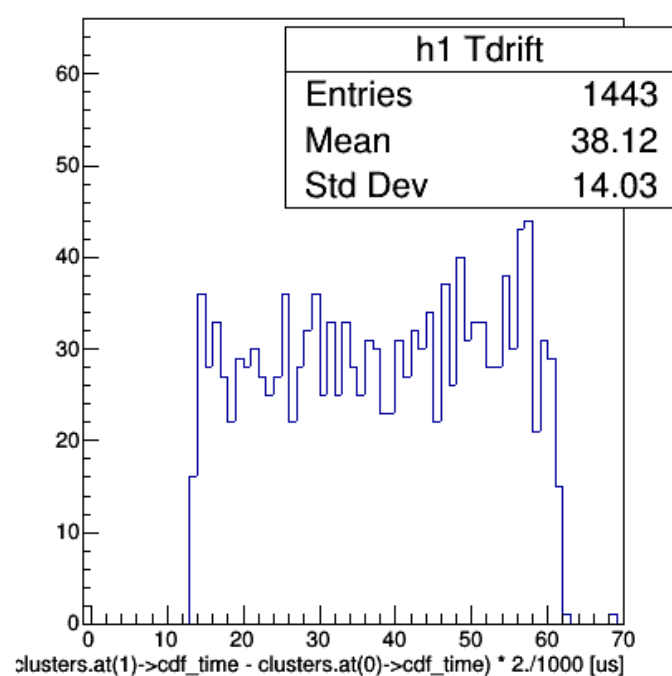
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2000



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2000



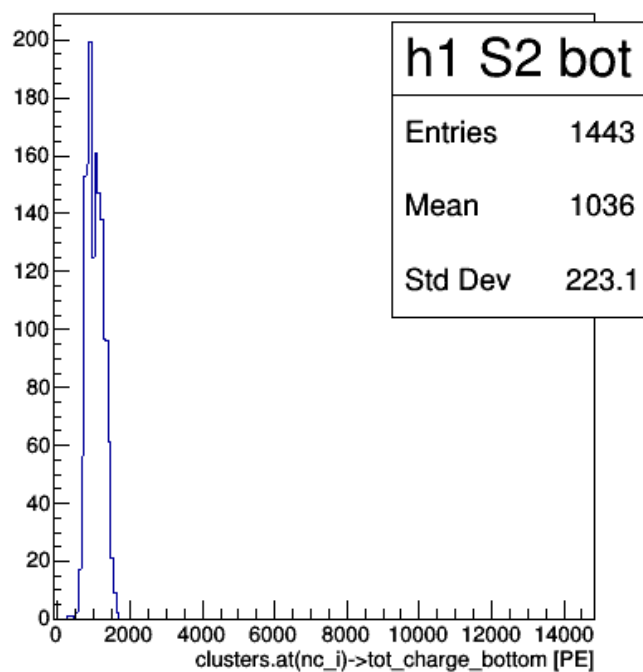
C0.is\_S1\_S2



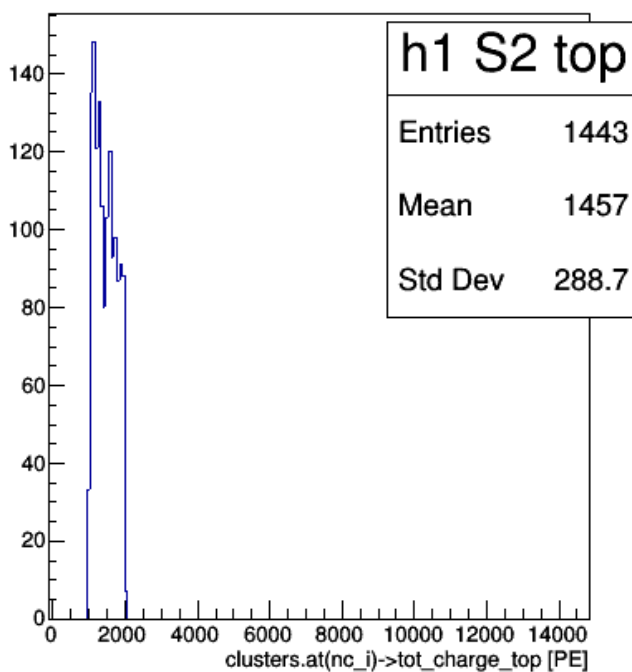
Ph2, bkg, run 534 master cut

1000 &lt; tot\_charge\_top &lt; 2000 [PE]

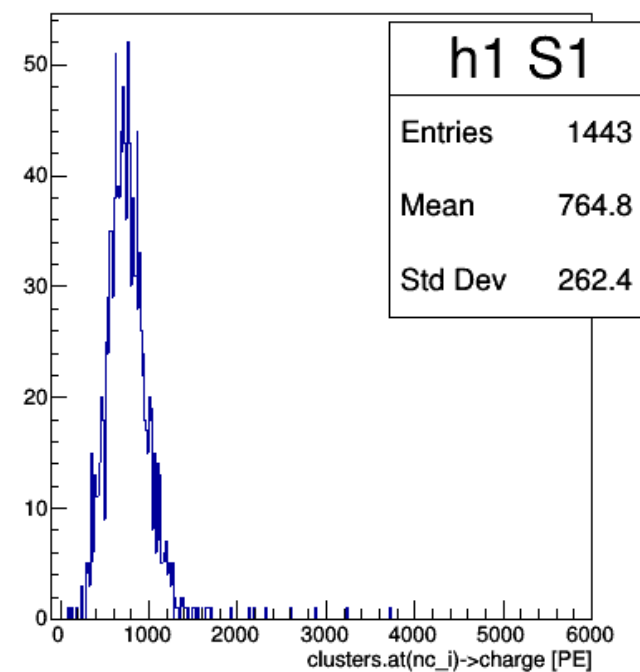
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2000



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 1000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 2000



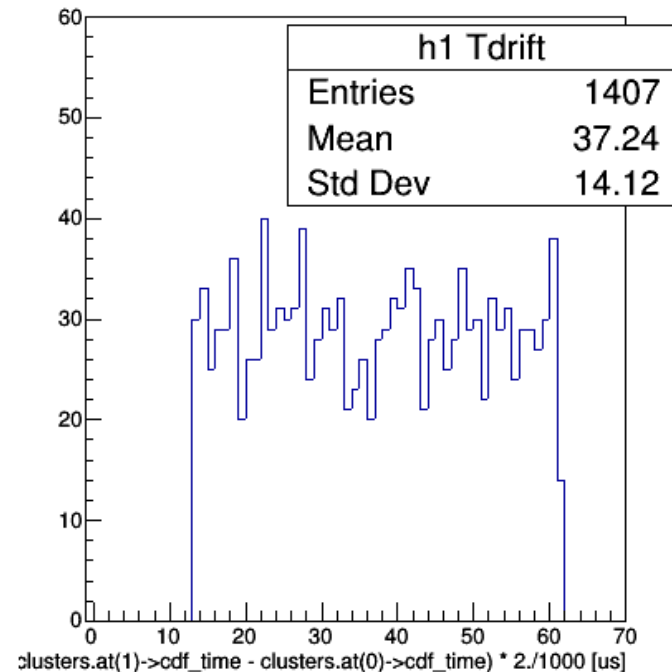
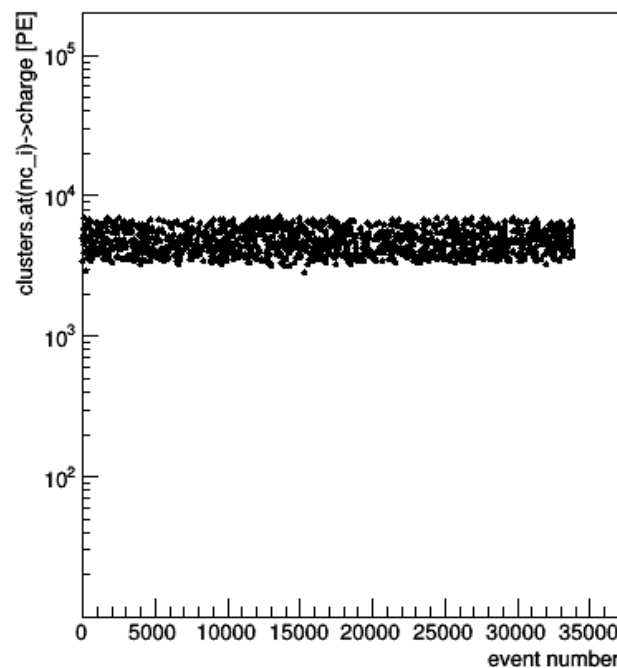
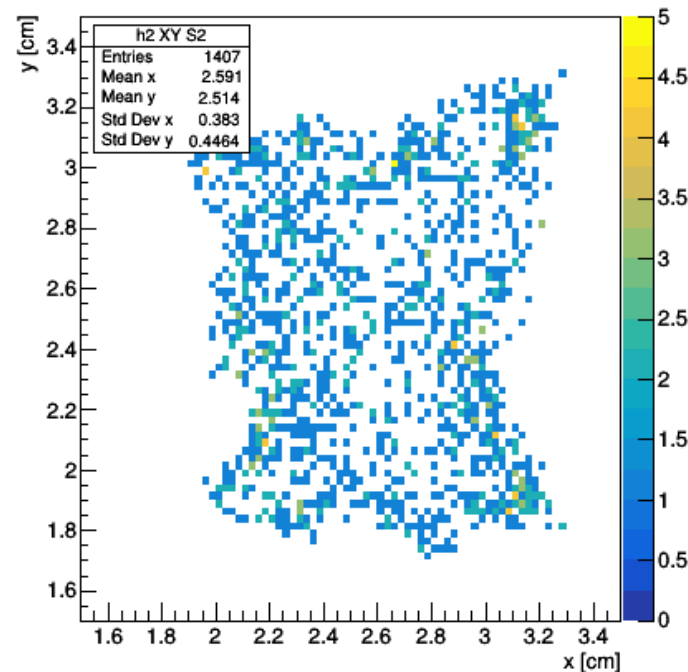
C2.is\_S1



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 4000

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 4000

C0.is\_S1\_S2



Ph2, bkg, run 534

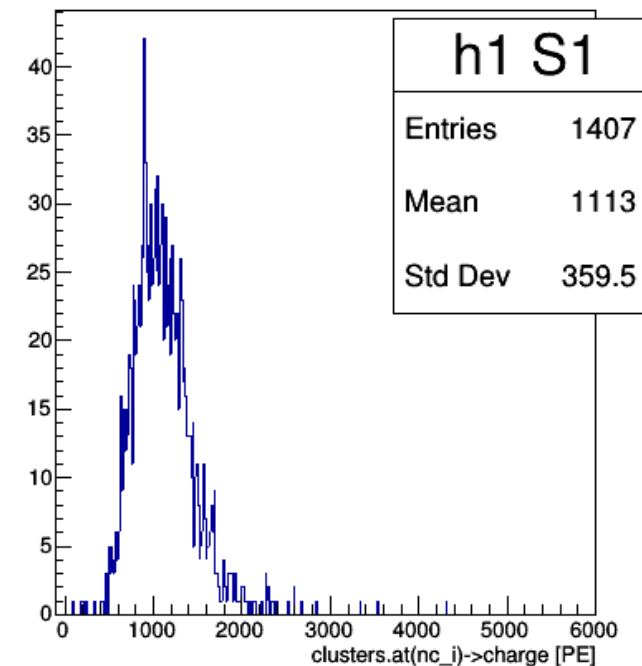
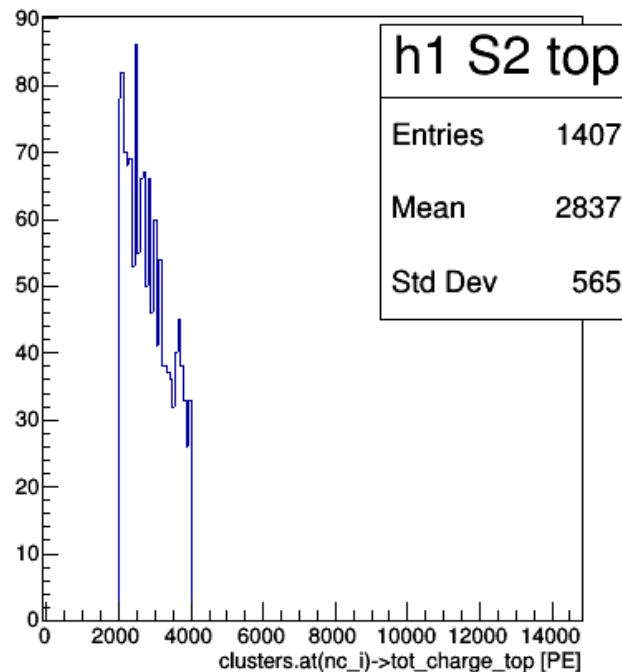
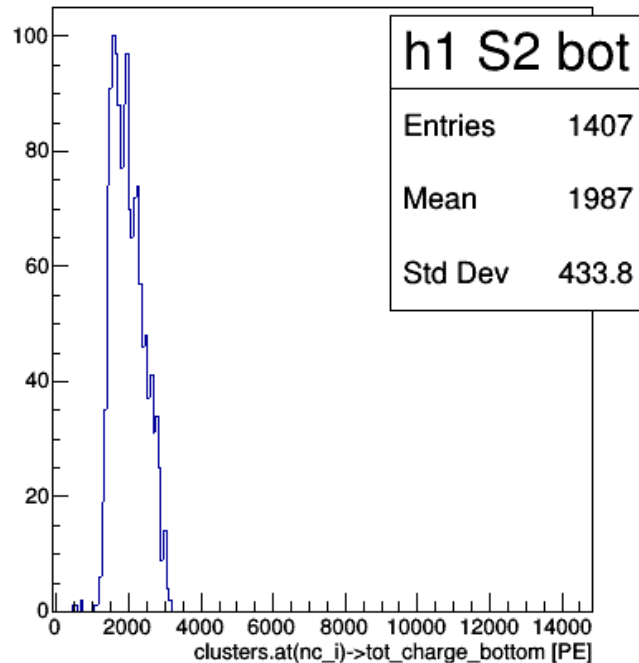
master cut

2000 &lt; tot\_charge\_top &lt; 4000 [PE]

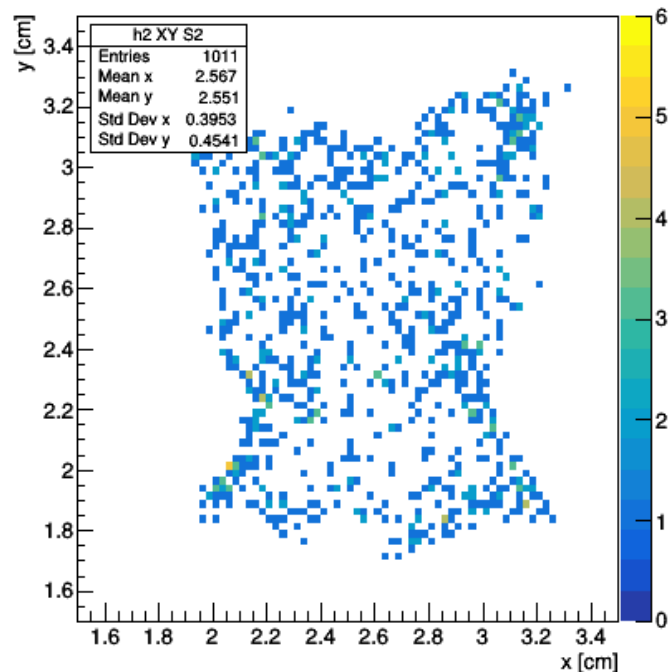
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 4000

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 2000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 4000

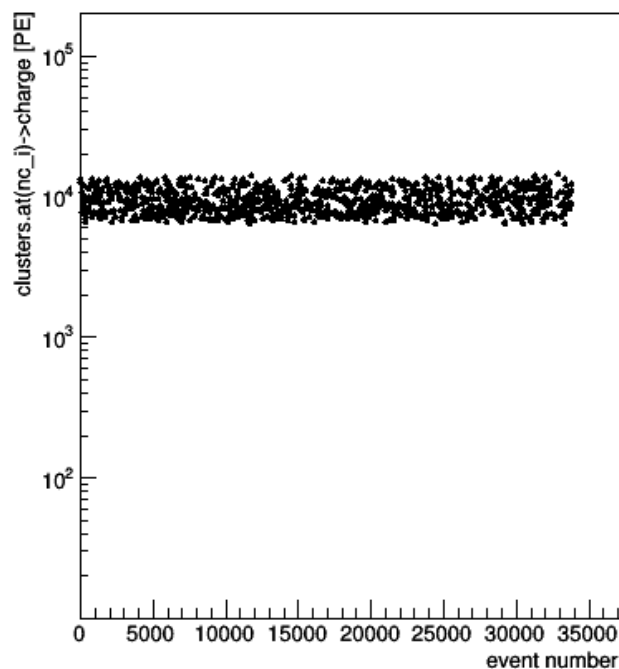
C2.is\_S1



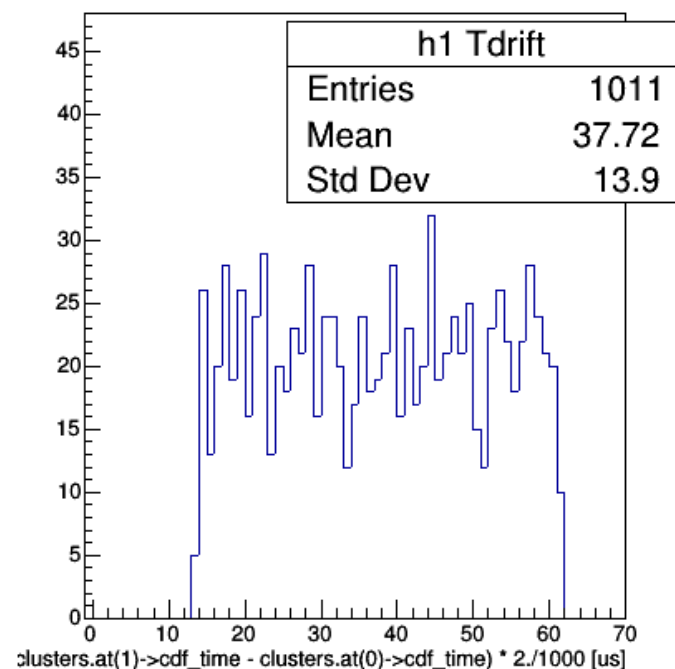
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 4000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 8000



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 4000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 8000



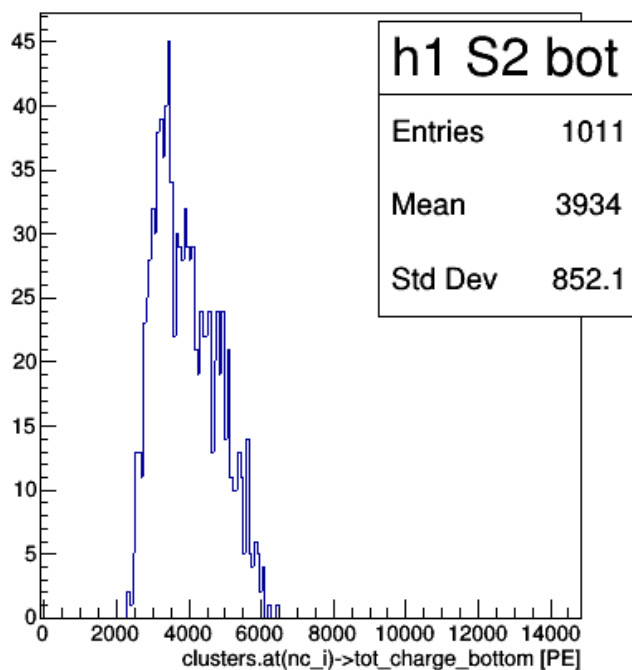
C0.is\_S1\_S2



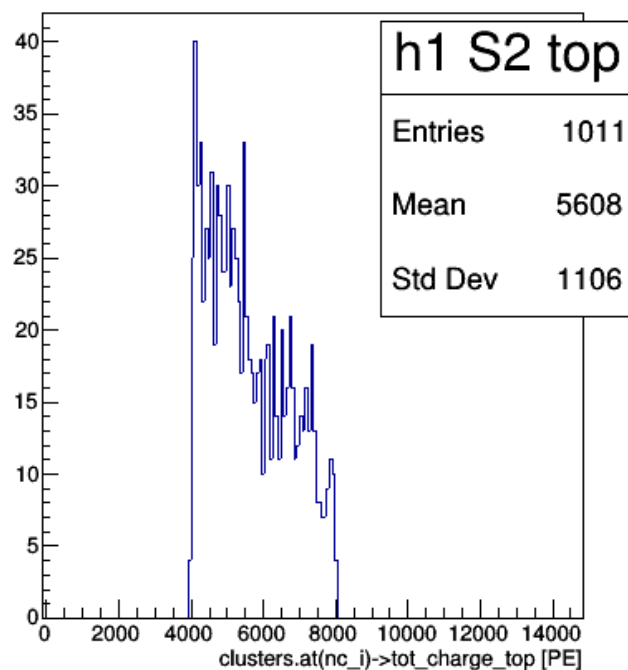
Ph2, bkg, run 534 master cut

4000 &lt; tot\_charge\_top &lt; 8000 [PE]

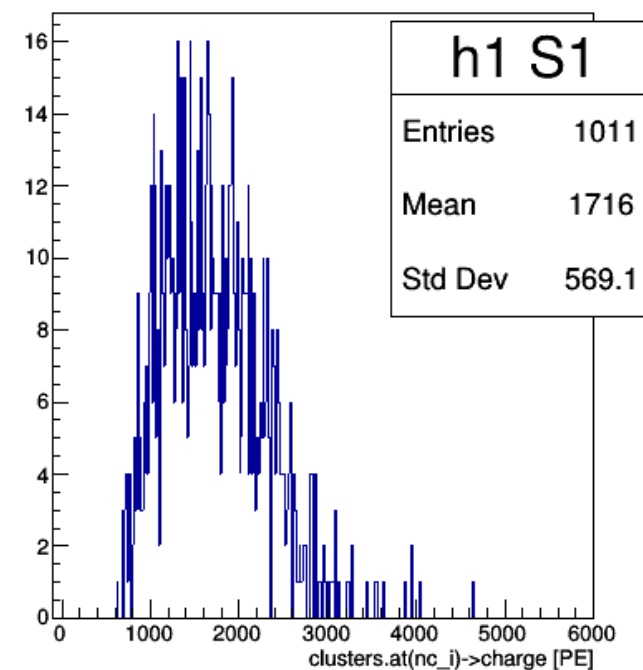
C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 4000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 8000



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 4000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 8000



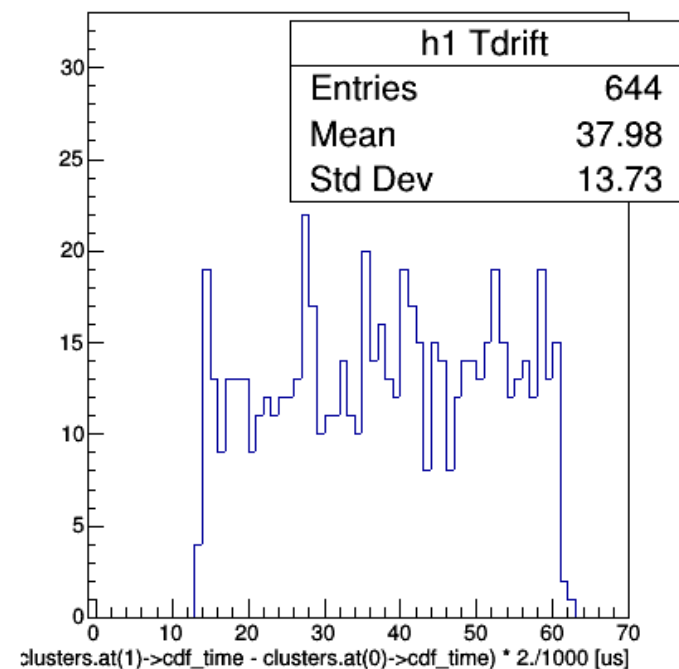
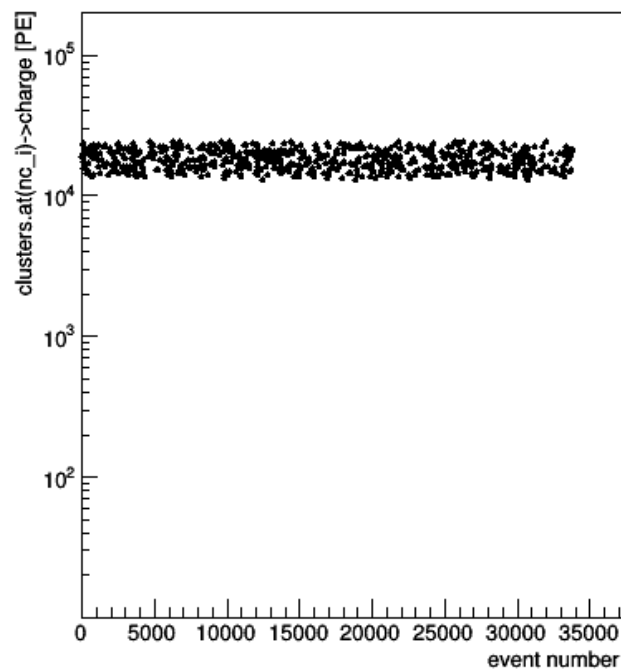
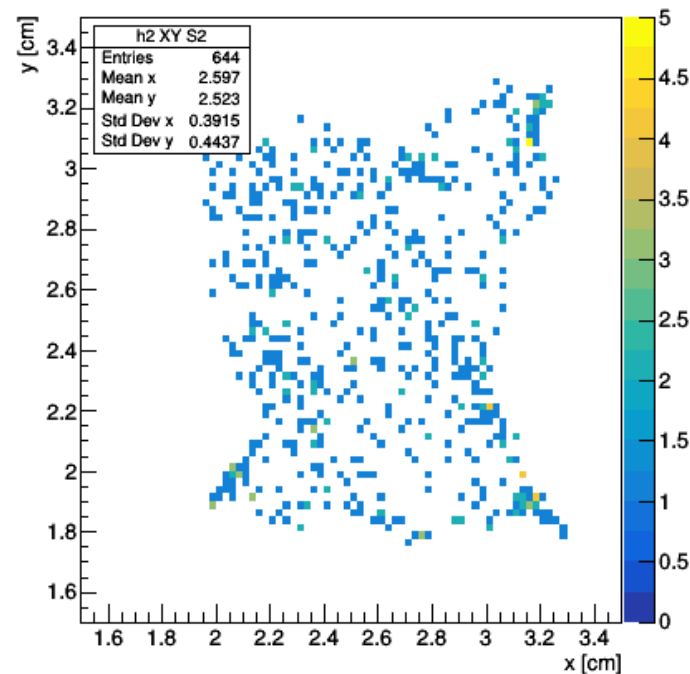
C2.is\_S1



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 8000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 14000

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 8000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 14000

C0.is\_S1\_S2



Ph2, bkg, run 534

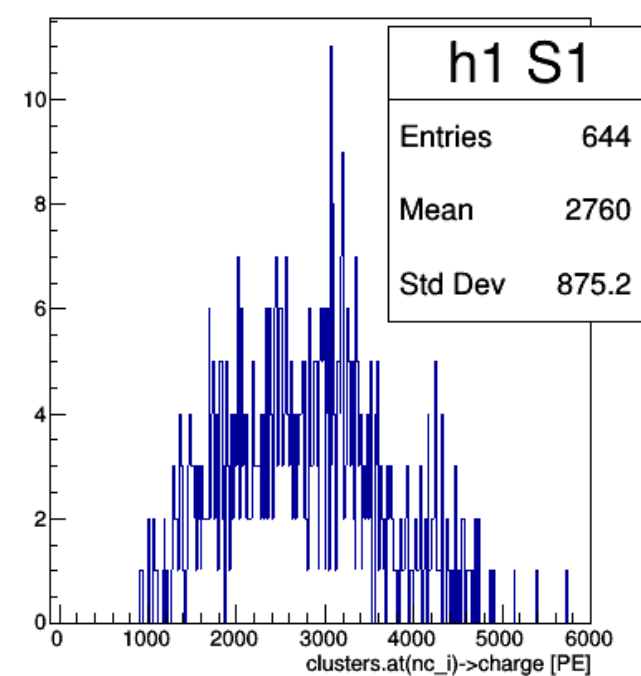
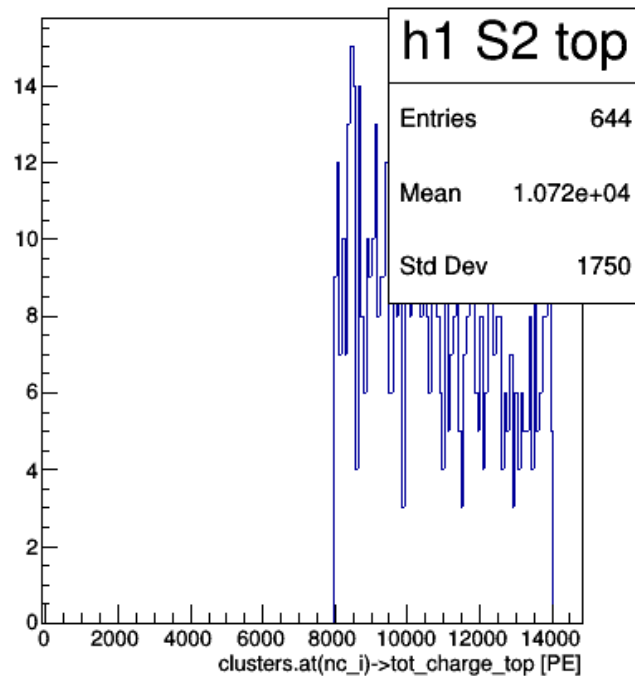
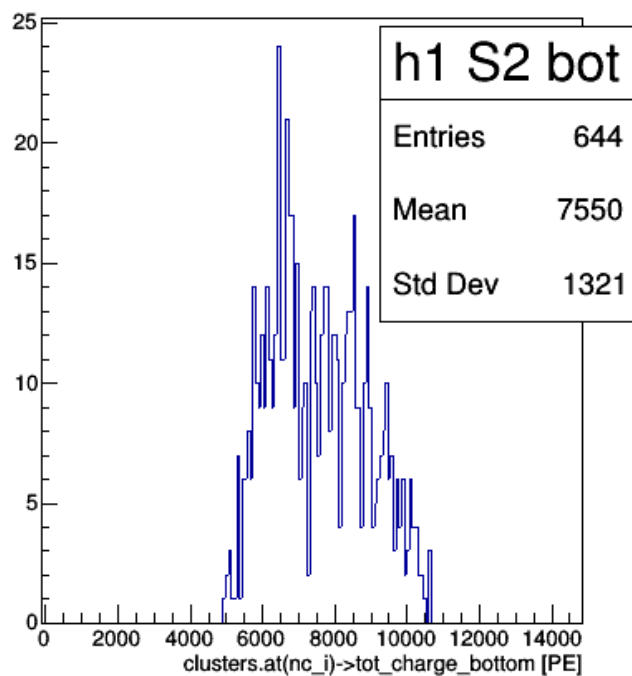
master cut

8000 &lt; tot\_charge\_top &lt; 14000 [PE]

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 8000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 14000

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 8000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 14000

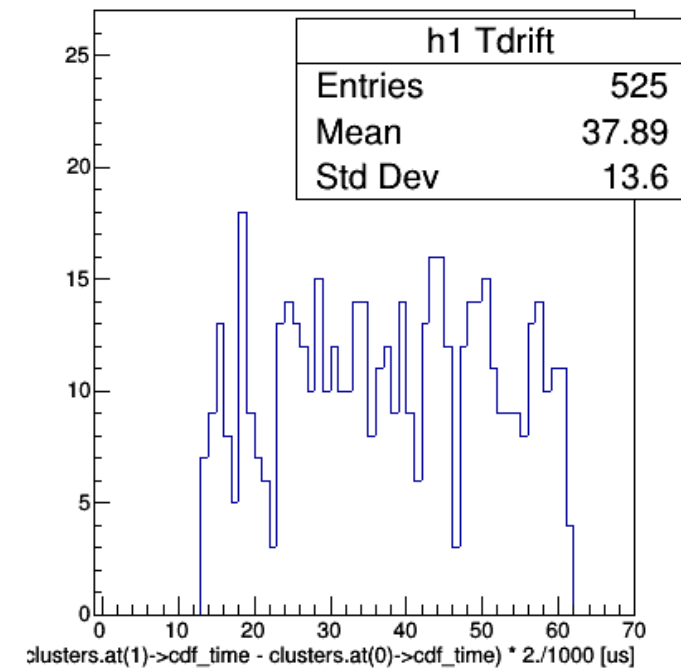
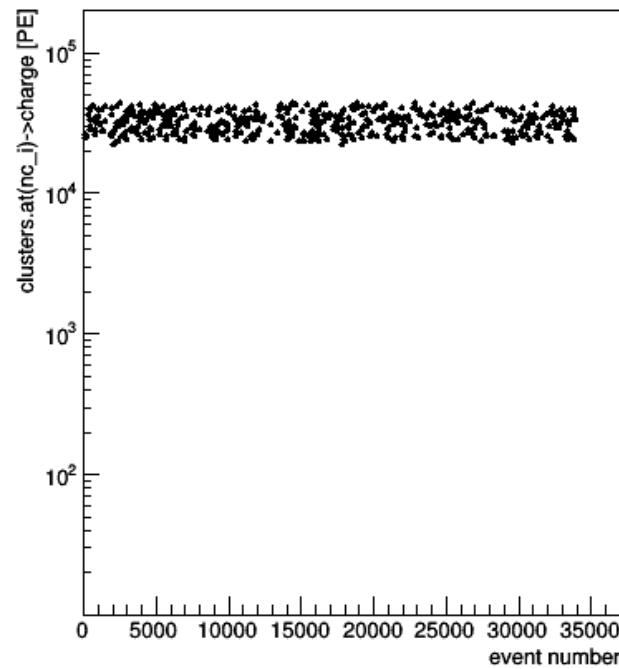
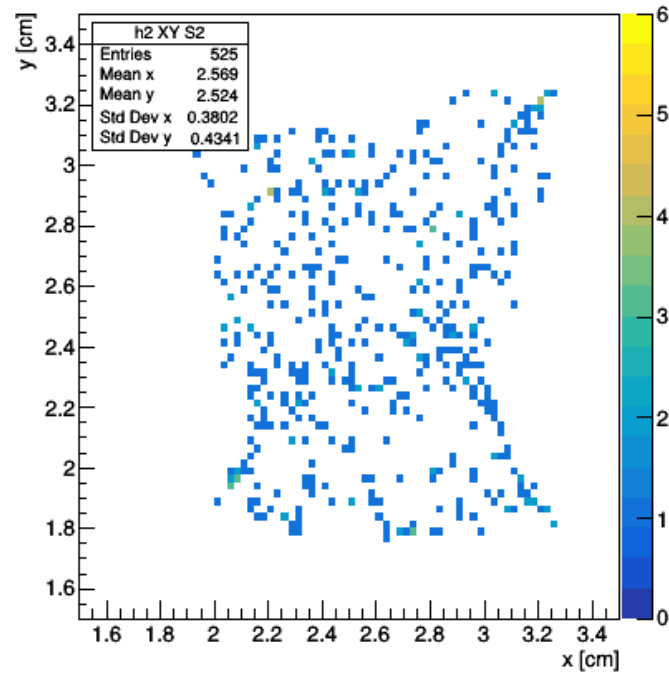
C2.is\_S1



C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 14000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 25000

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 14000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 25000

C0.is\_S1\_S2



Ph2, bkg, run 534

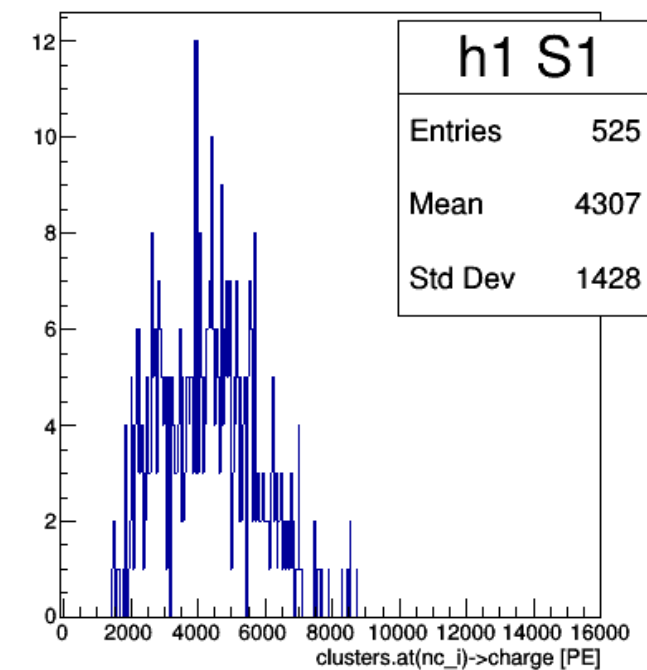
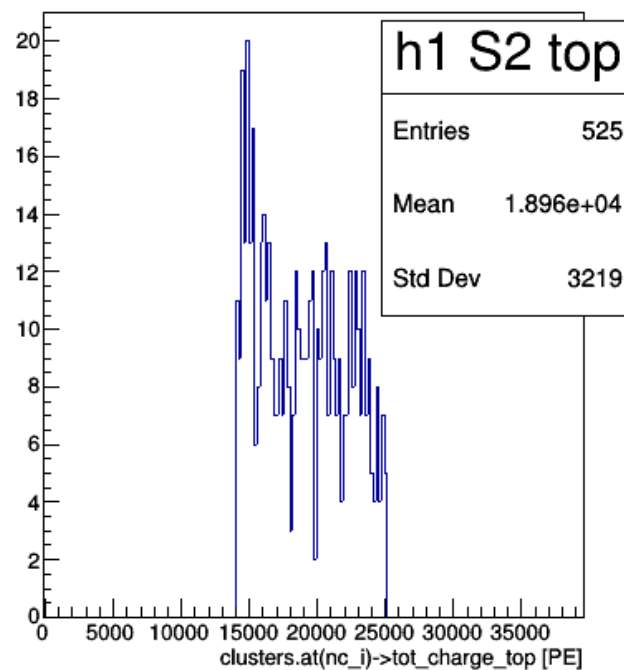
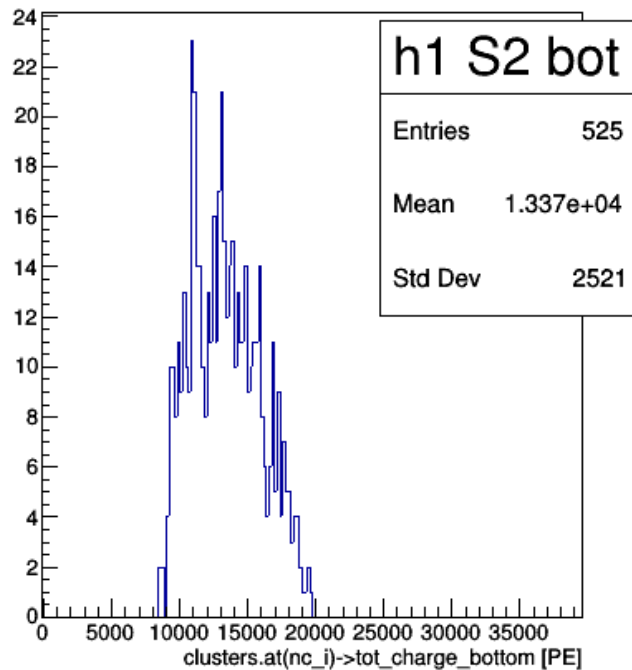
master cut

14000 &lt; tot\_charge\_top &lt; 25000 [PE]

C2.is\_S1

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 14000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 25000

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 14000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 25000

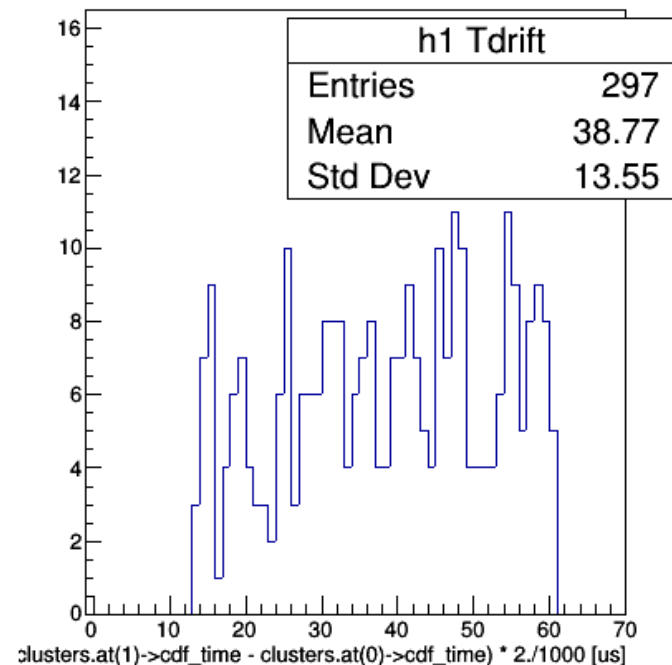
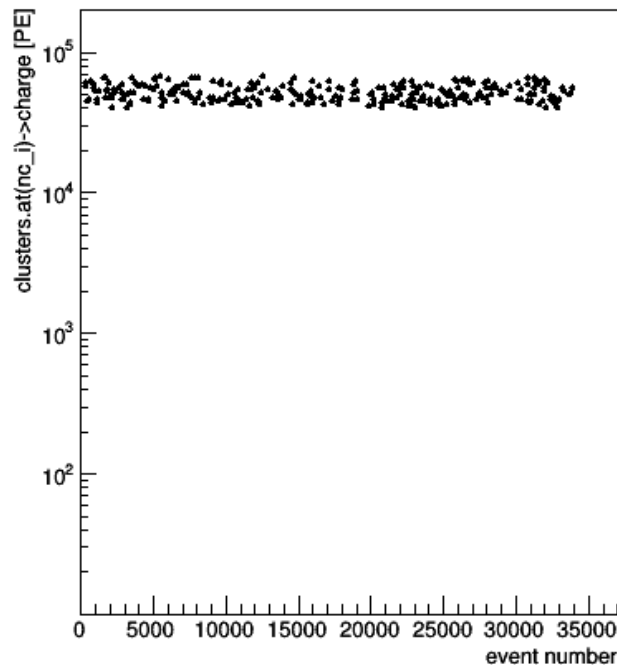
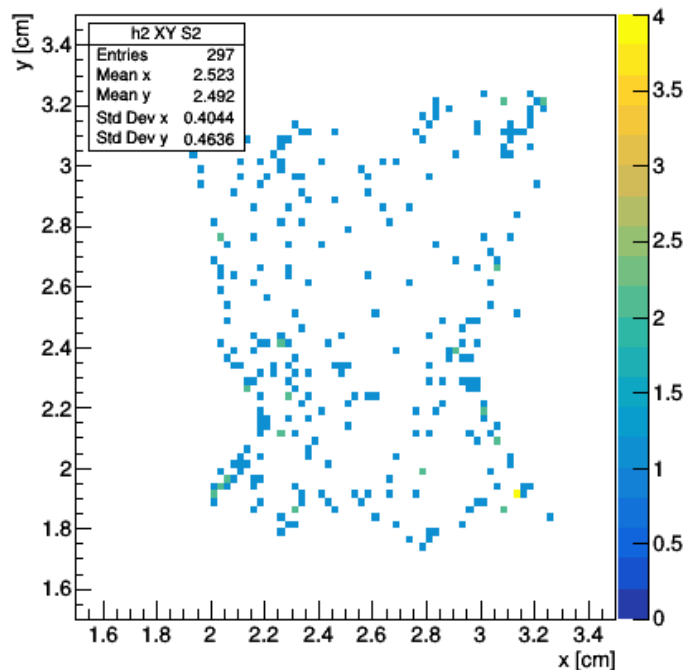




C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 25000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 40000

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 25000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 40000

C0.is\_S1\_S2



Ph2, bkg, run 534

master cut

25000 &lt; tot\_charge\_top &lt; 40000 [PE]

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 25000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 40000

C1.is\_S2 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &gt; 25000 &amp;&amp; clusters.at(nc\_i)-&gt;tot\_charge\_top &lt; 40000

C2.is\_S1

