SuperB Collaboration Meeting
Frascatti, March 21, 2012

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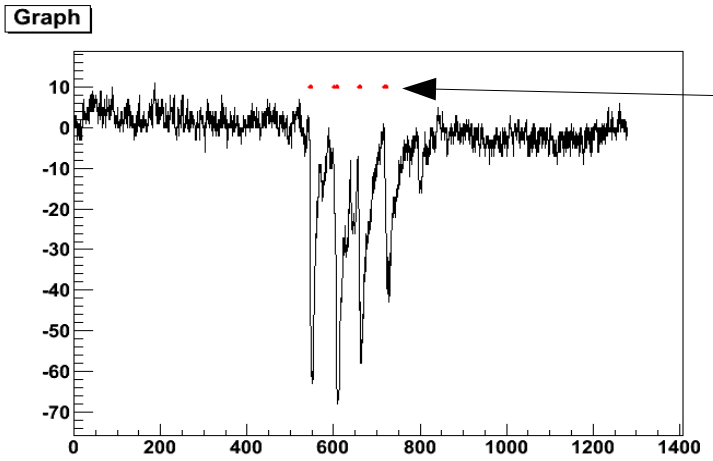
Cluster counting Algorithm

- Algorithm takes the difference between a bin and the average of previous n bins

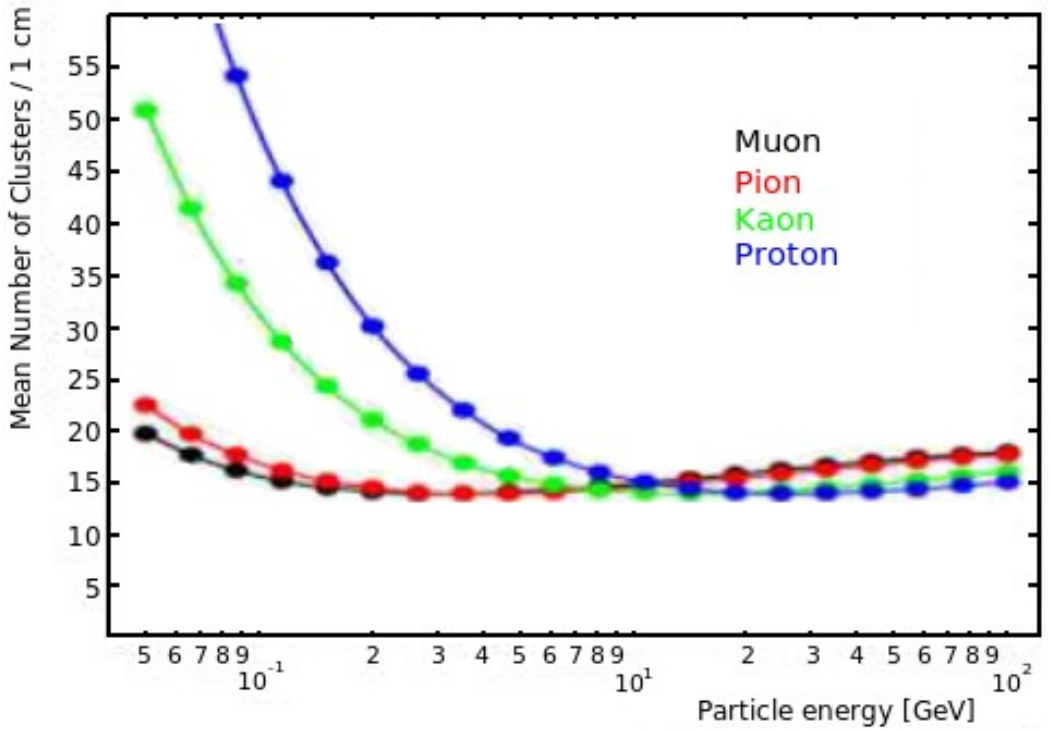
$$a_i = v_i - \frac{\sum_{j=1}^{n} v_{i-j}}{n}$$

- If a_i is above a certain threshold, a cluster is detected, as long as a_{i-1} is below threshold



TRIUMF testbeam data

- Looking at data in 80/20 and 90/10 for three momenta:
  - 140MeV/c, 180MeV/c, 220MeV/c



80% Helium, 20% Isobutane

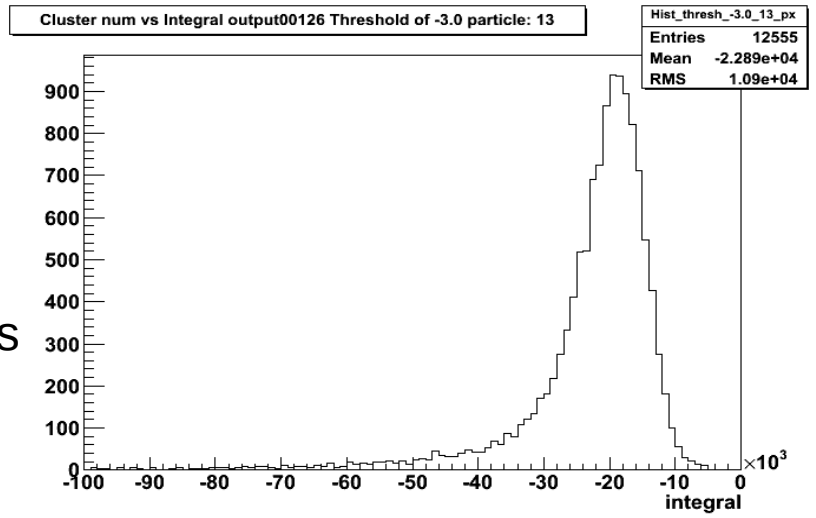
Threshold a=3.7
n=5
Particle = Muon
Gas: 80/20

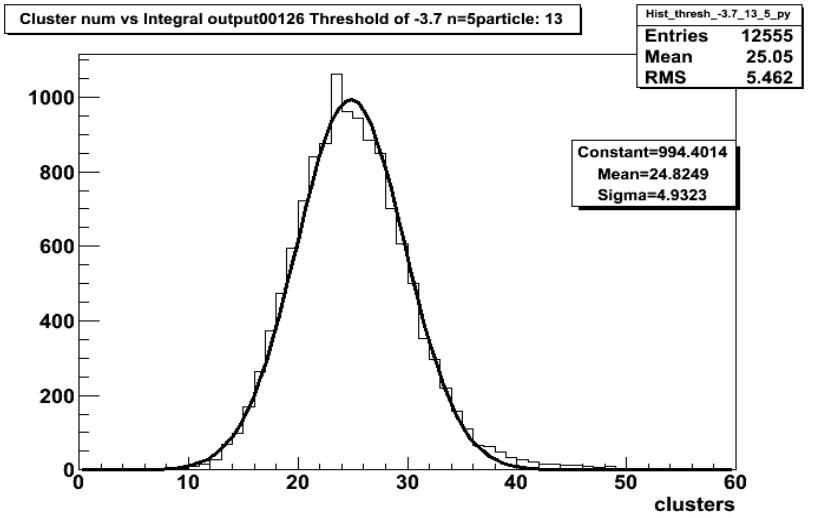
Integral of Signal

Distribution of detected clusters

p=140MeV/c

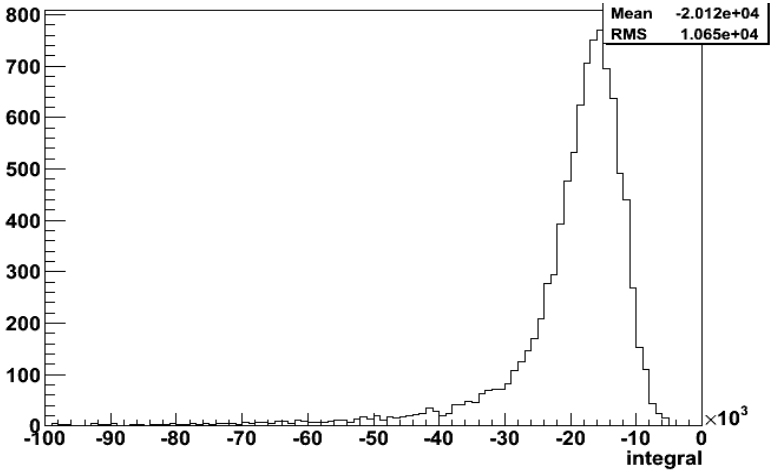
12555 entries

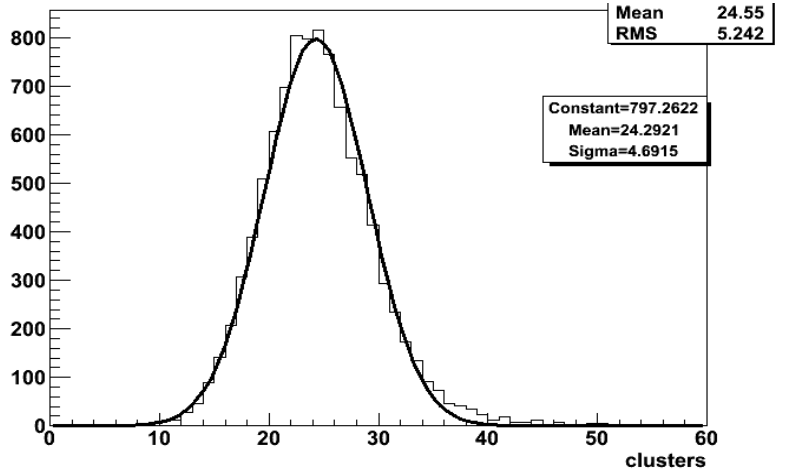




p=180MeV/c

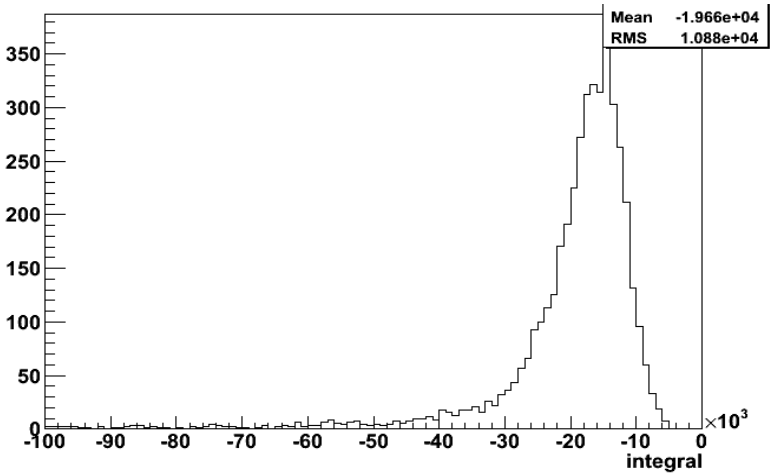
9609 entries

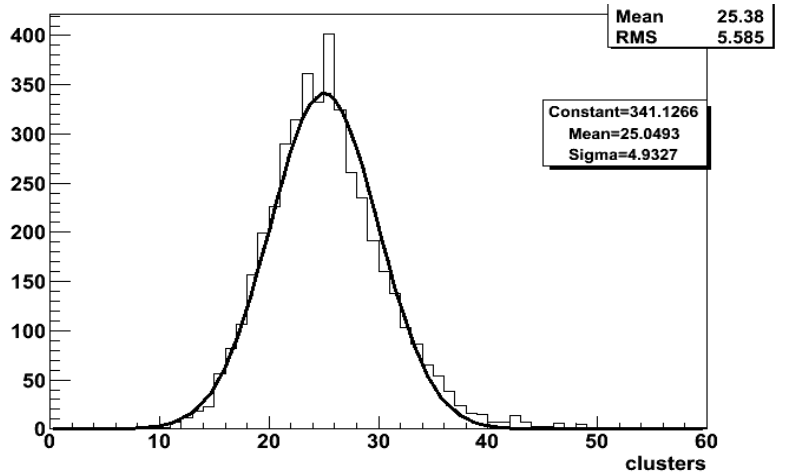




p=220MeV/c

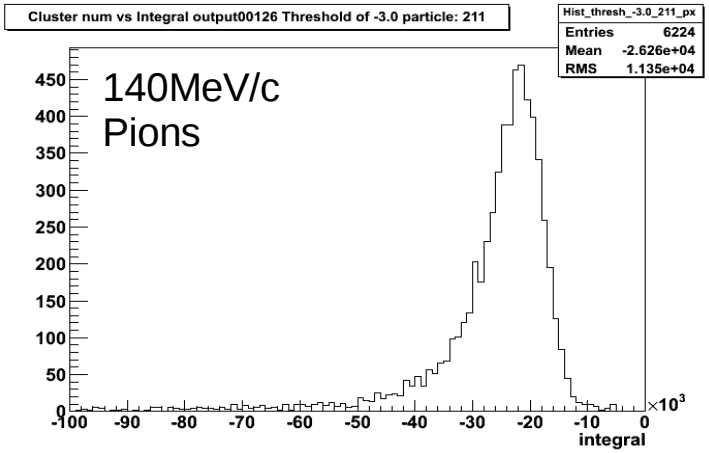
4363 entries

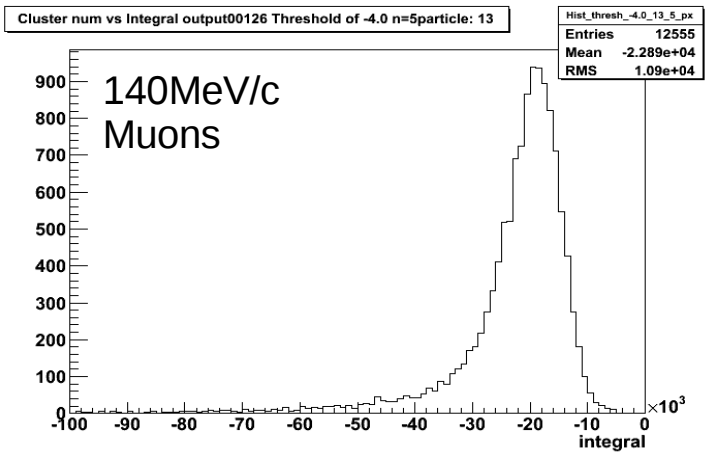




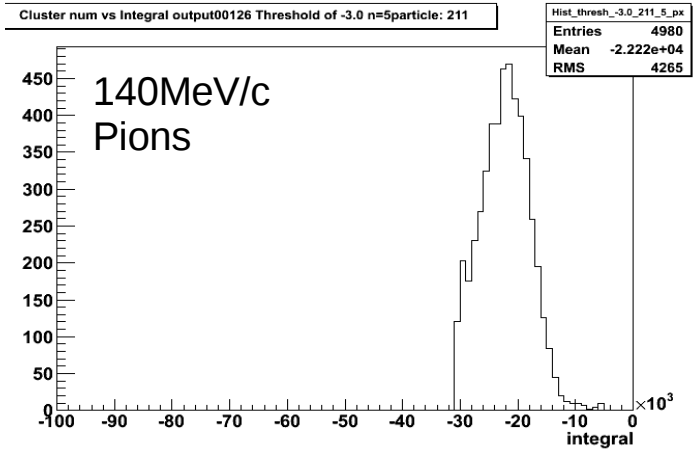
Truncated Integral 80/20

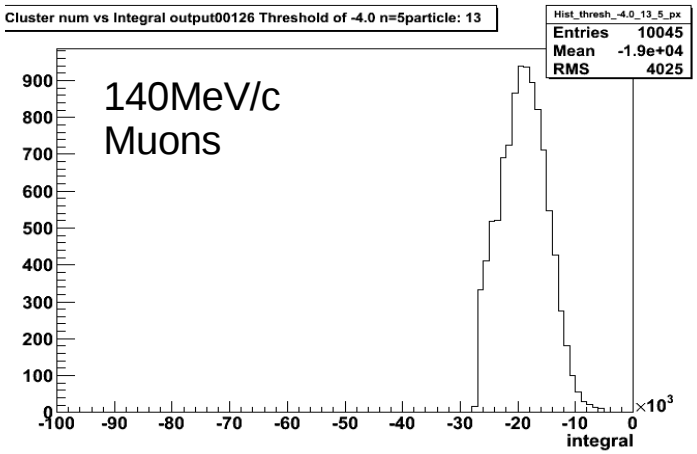
Full Integral



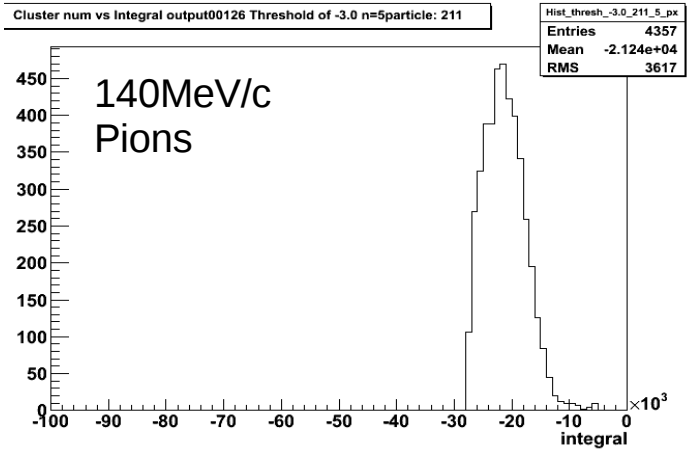


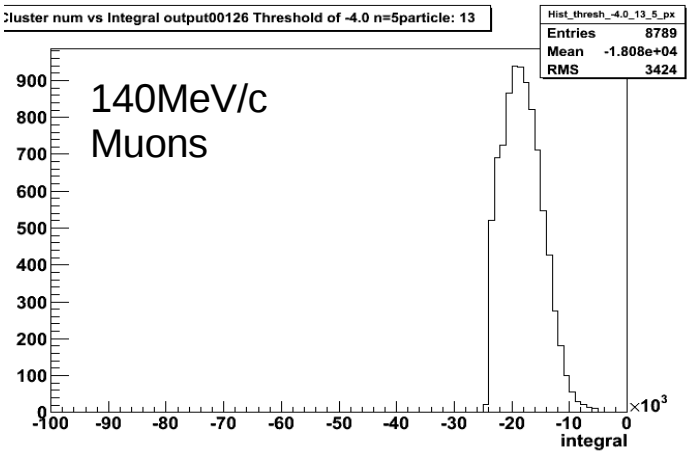
20% Truncated





30% Truncated



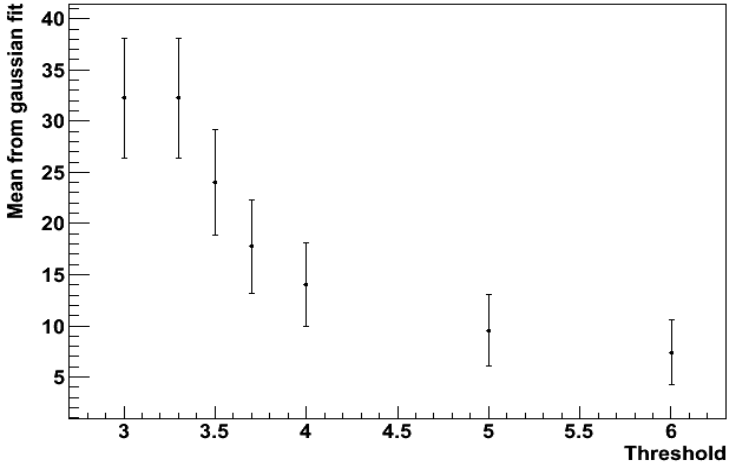


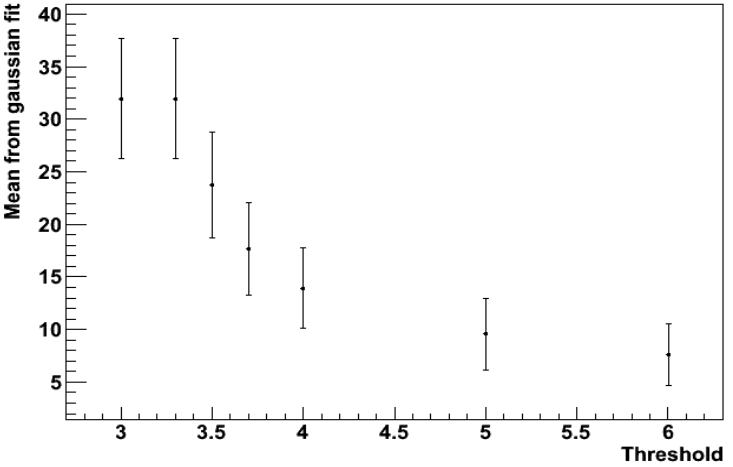
Summary
n=3 (averaged over previous 3 bins in algorithm
Gas: 80/20

Pions

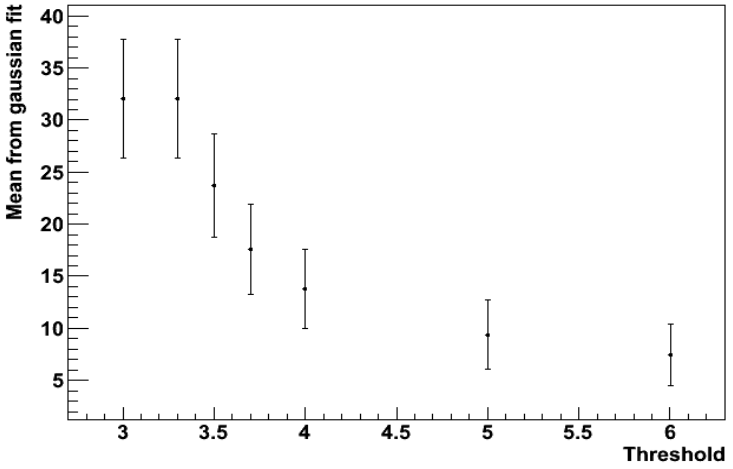
Muons

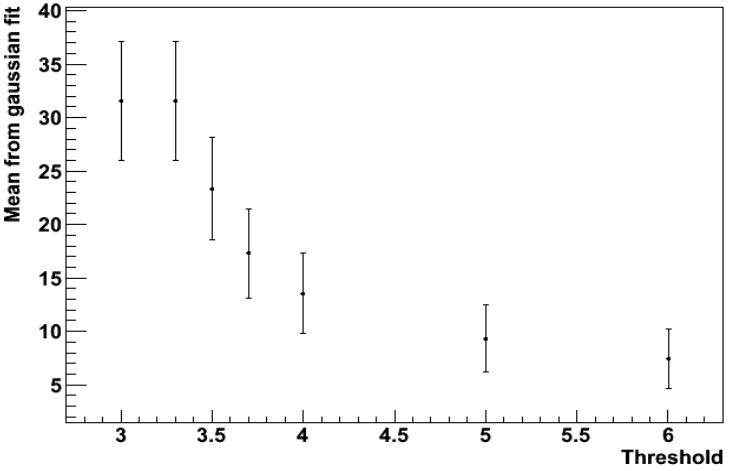
p=140MeV/c



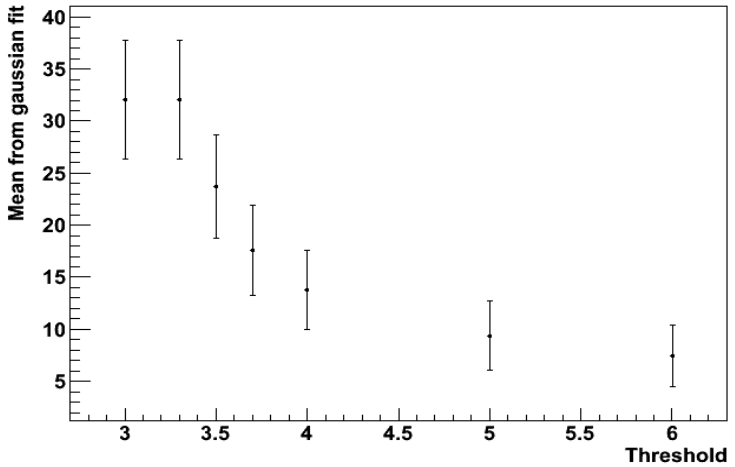


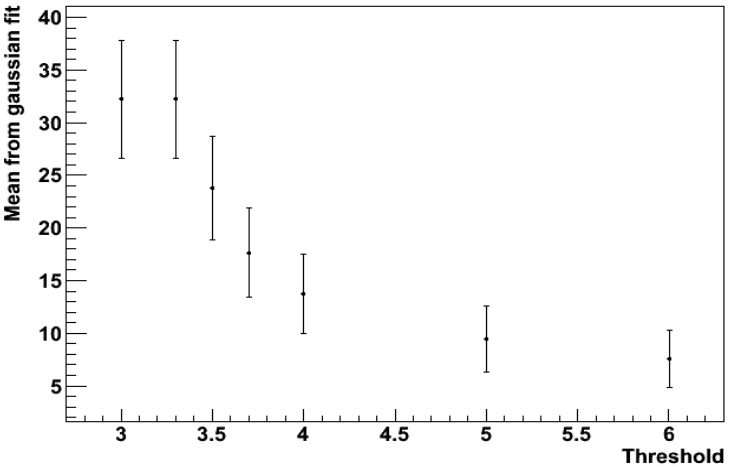
p=180MeV/c





p=220MeV/c





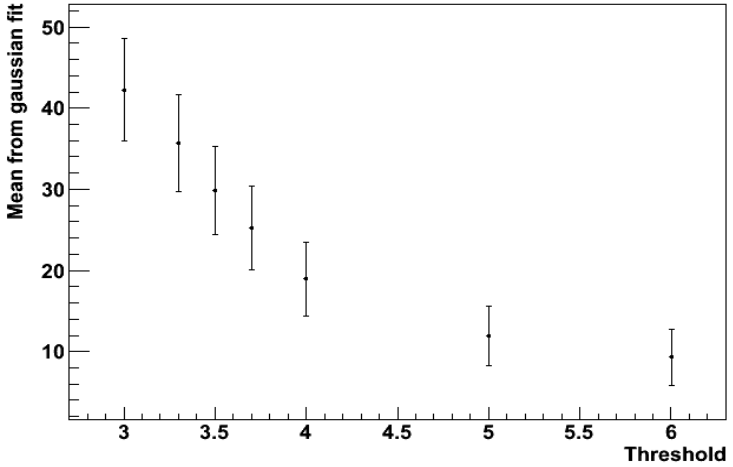
ra

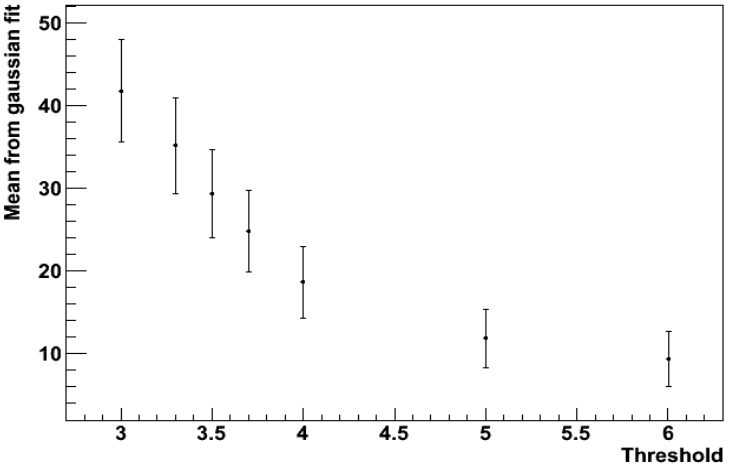
Summary
n=5 (averaged over previous 5 bins in algorithm
Gas: 80/20

Pions

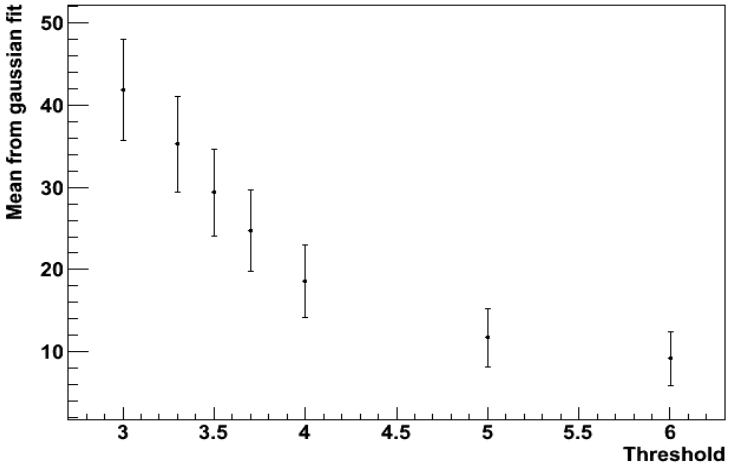
Muons

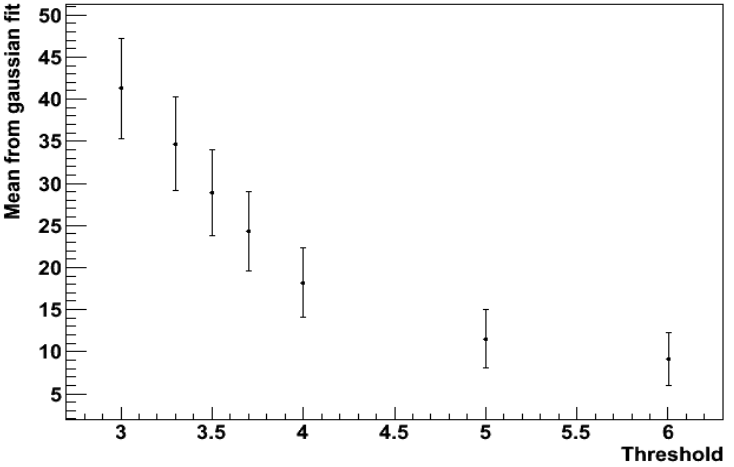
p=140MeV/c



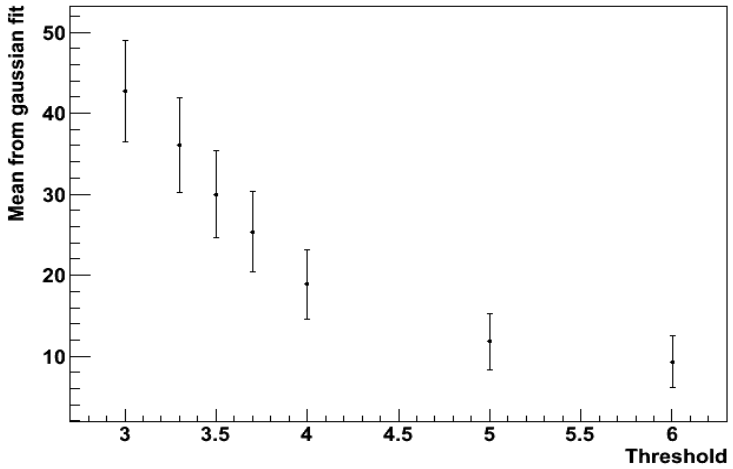


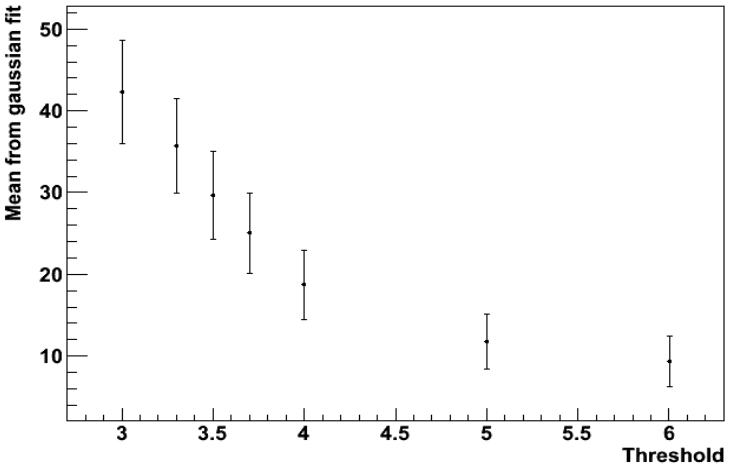
p=180MeV/c



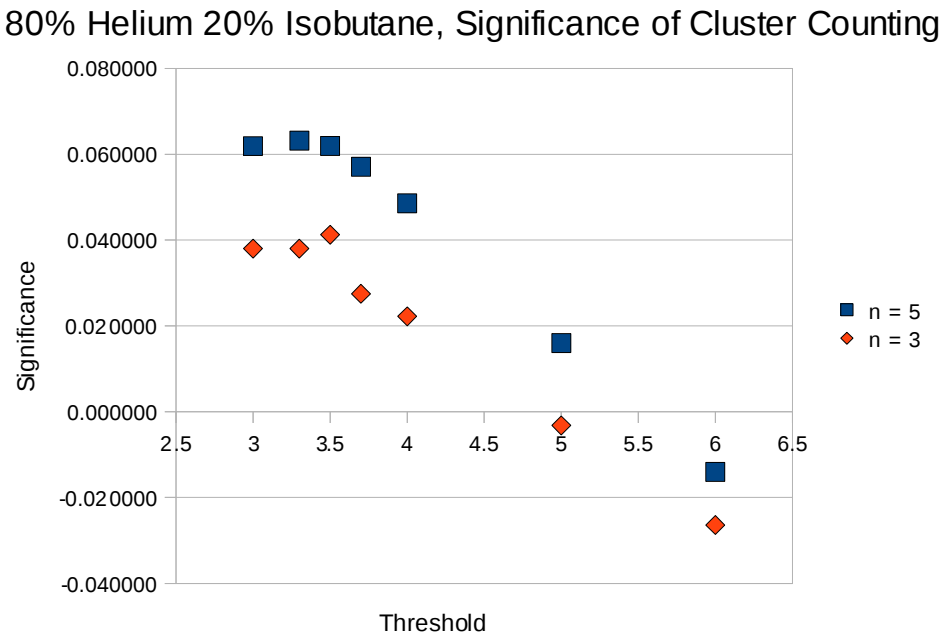


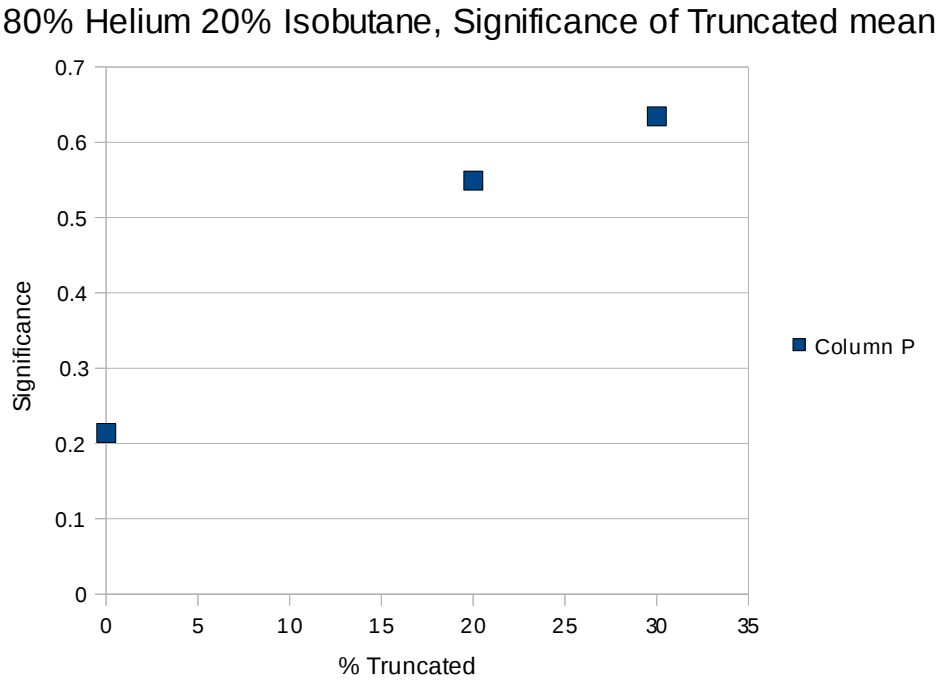
p=220MeV/c





Resolving power (80/20) 140MeV/c





$$Significance = \frac{(\pi_{mean} - \mu_{mean})}{\sqrt{\pi^2_{RMS} + \mu^2_{RMS}}}$$

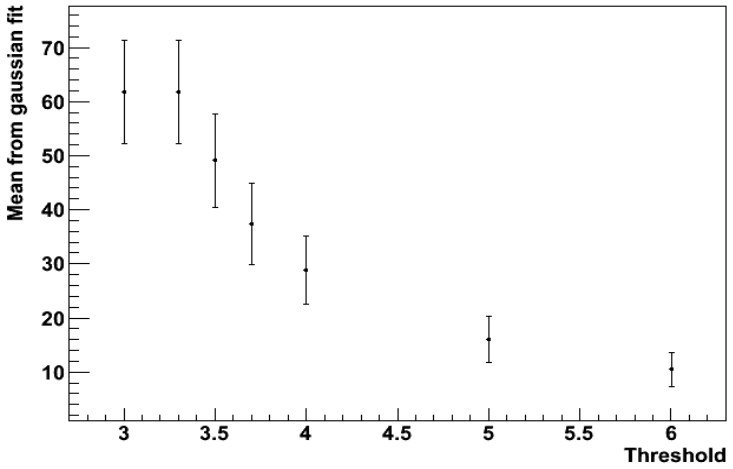
90% Helium, 10% Isobutane

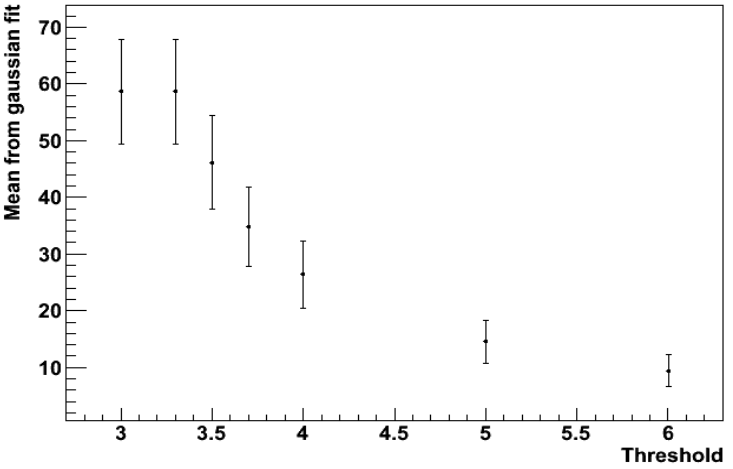
Summary
n=3 (averaged over previous 3 bins in algorithm
Gas: 90/10

Pions

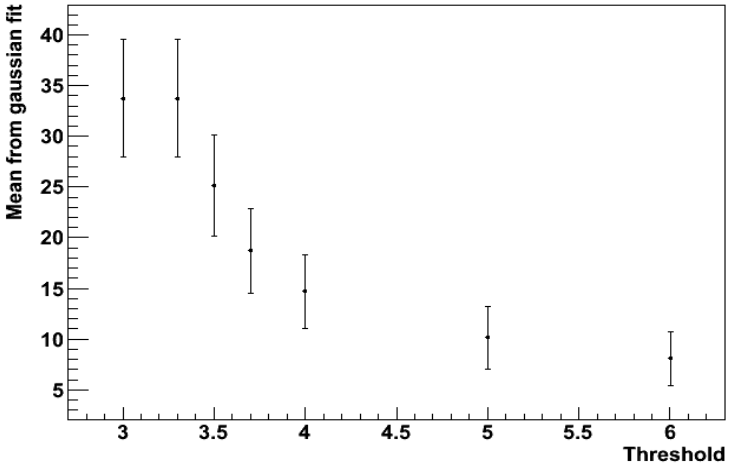
Muons

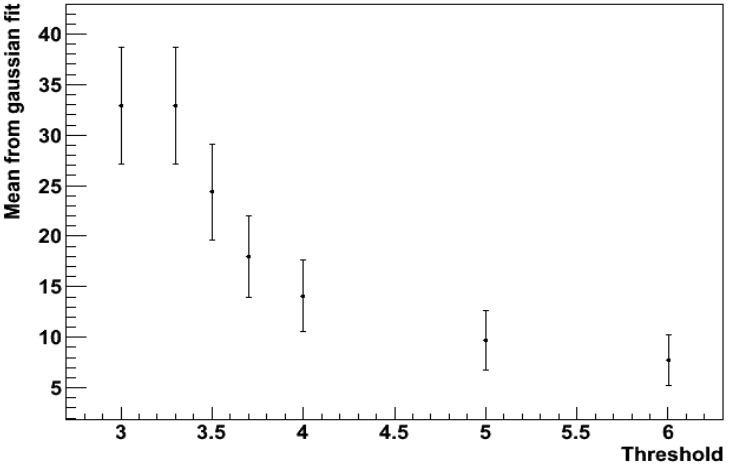
p=140MeV/c



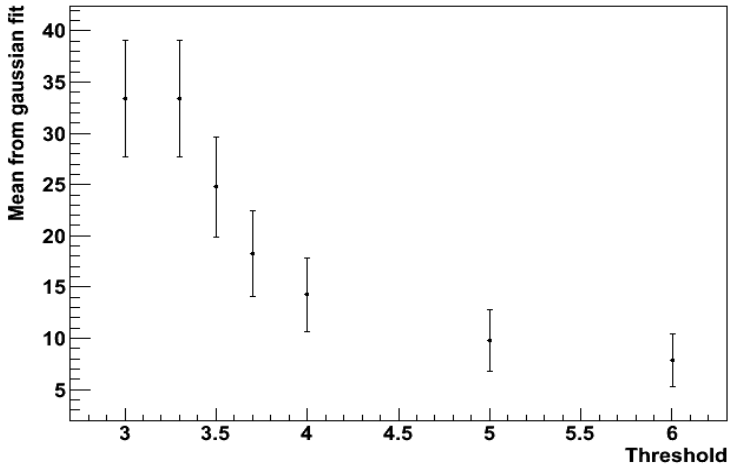


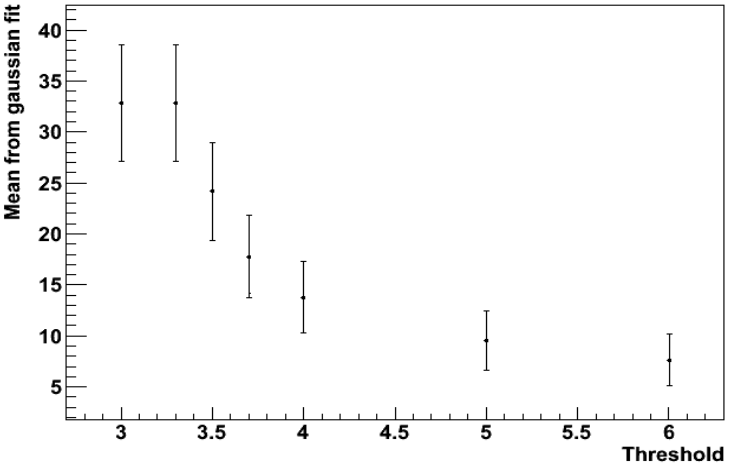
p=180MeV/c





p=220MeV/c





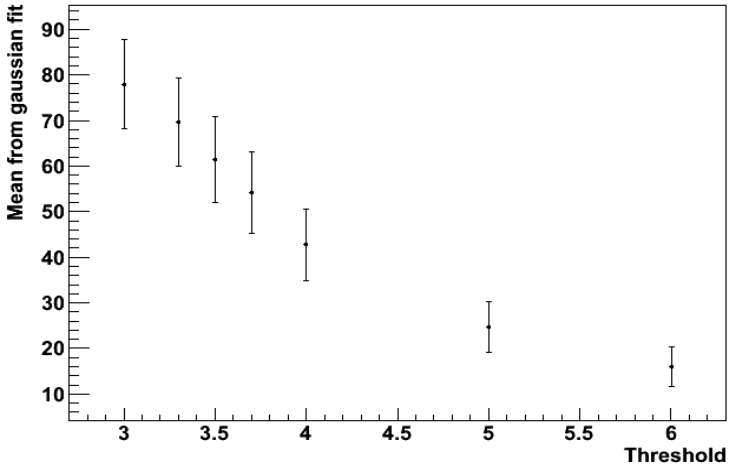
ra

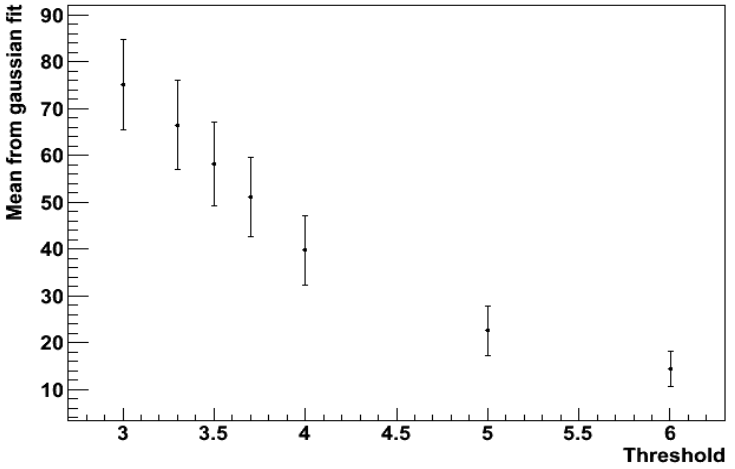
Summary
n=5 (averaged over previous 5 bins in algorithm
Gas: 90/10

Pions

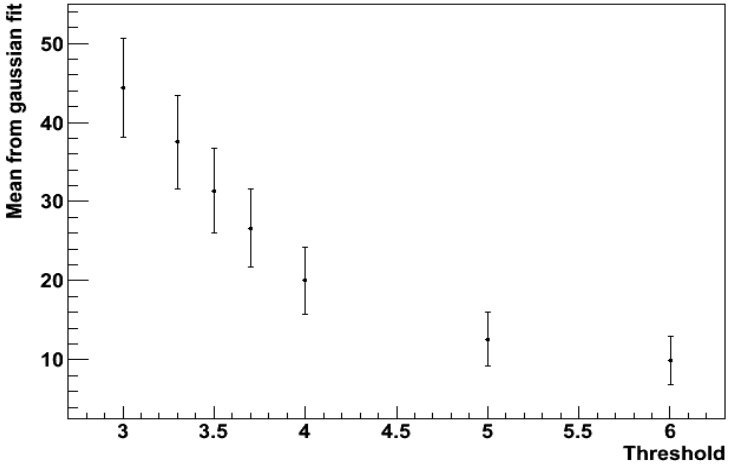
Muons

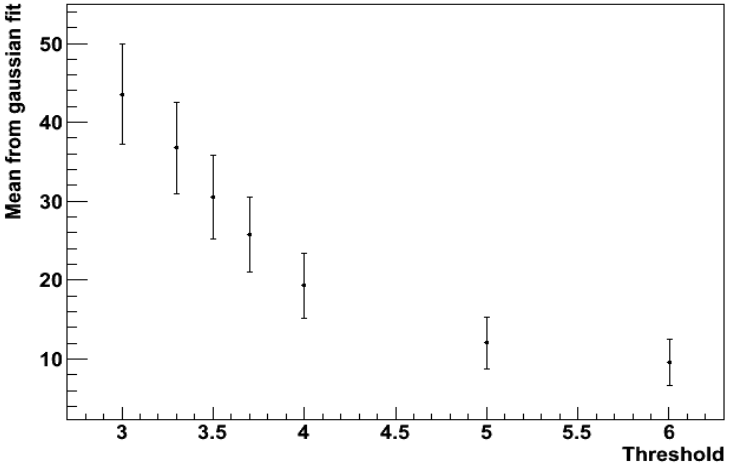
p=140MeV/c



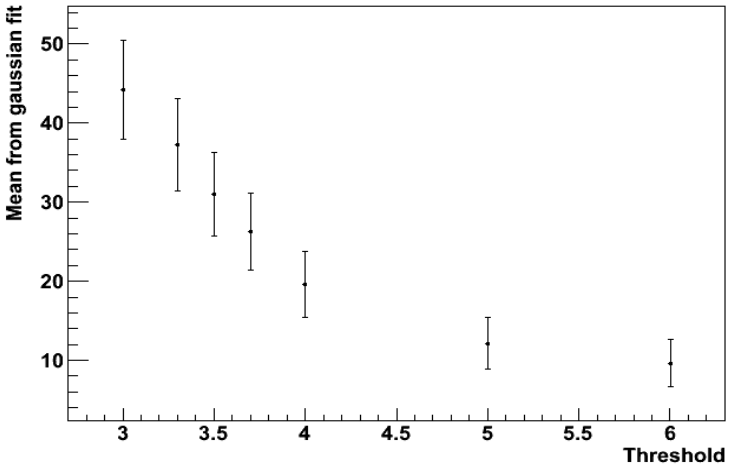


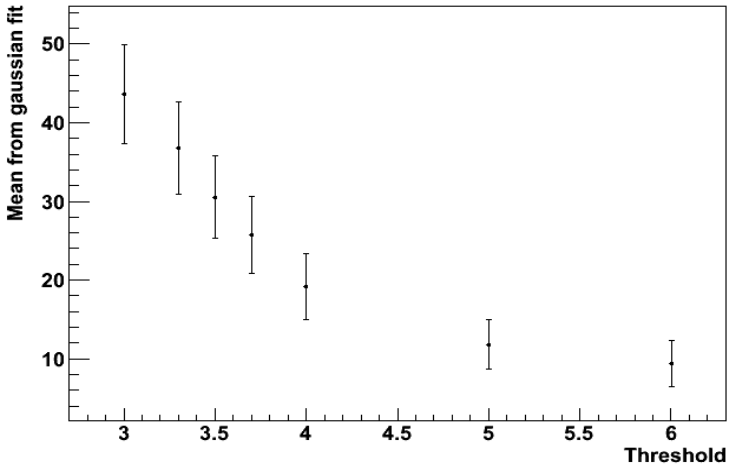
p=180MeV/c



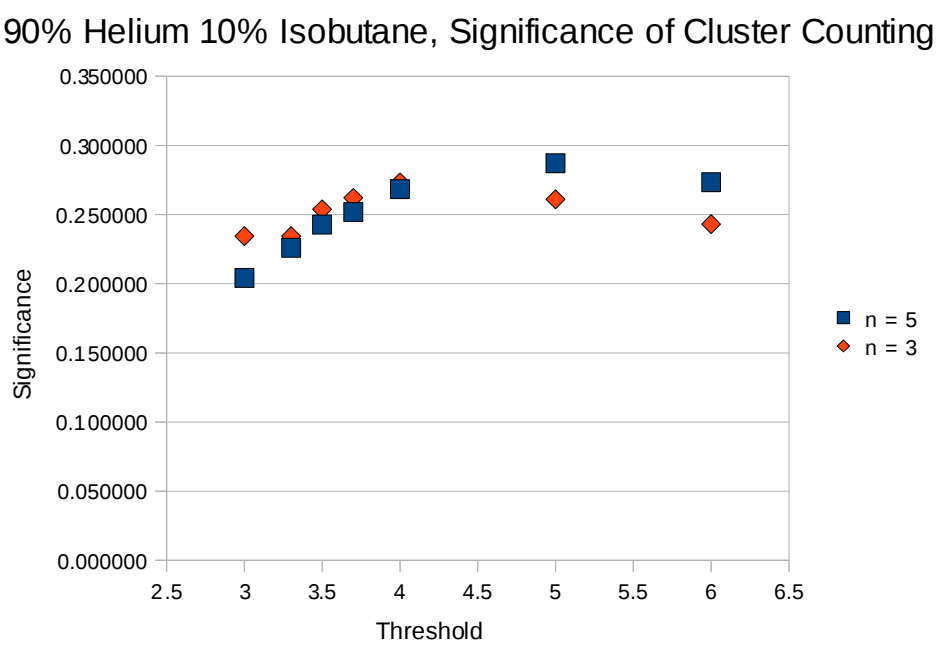


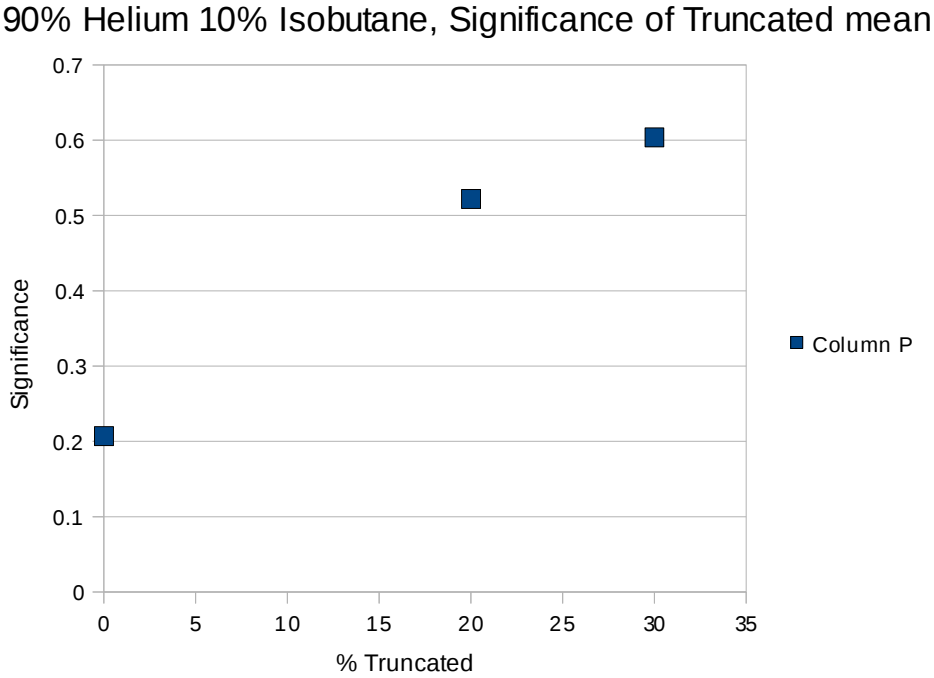
p=220MeV/c





Resolving power (90/10) 140MeV/c





$$Significance = \frac{(\pi_{mean} - \mu_{mean})}{\sqrt{\pi^2_{RMS} + \mu^2_{RMS}}}$$

Conclusion / Future work

- Work in progress
- Not the best algorithm, so far the truncated mean is better
- More sophisticated approach needed
- 90/10 data has better significance: look at 95/5
- Means of evaluating algorithm is in place

Backup slides

Runs used

- For 80/20:
  - Run 126 for 140MeV/c
  - Run 129 for 180MeV/c
  - Run 127 for 220MeV/c
- For 90/10
  - Run 175 for 140MeV/c
  - Run 138 for 180MeV/c
  - Run 139 for 220MeV/c

Pions, n=5
80/20

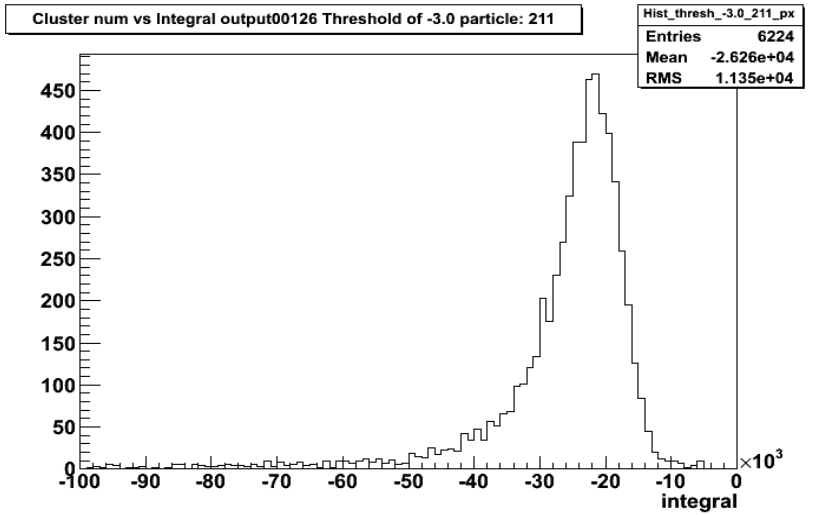
Threshold a=3
n=5
Particle = Pion
Gas: 80/20

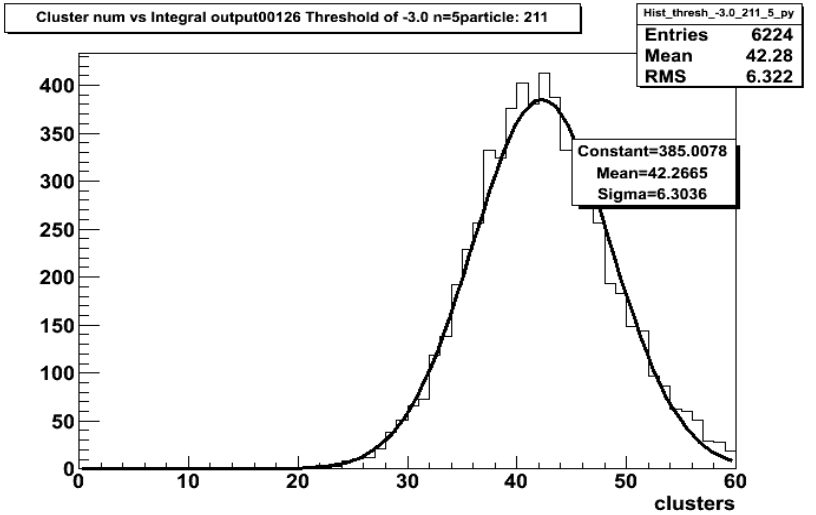
Integral of Signal

Distribution of detected clusters

p=140MeV/c

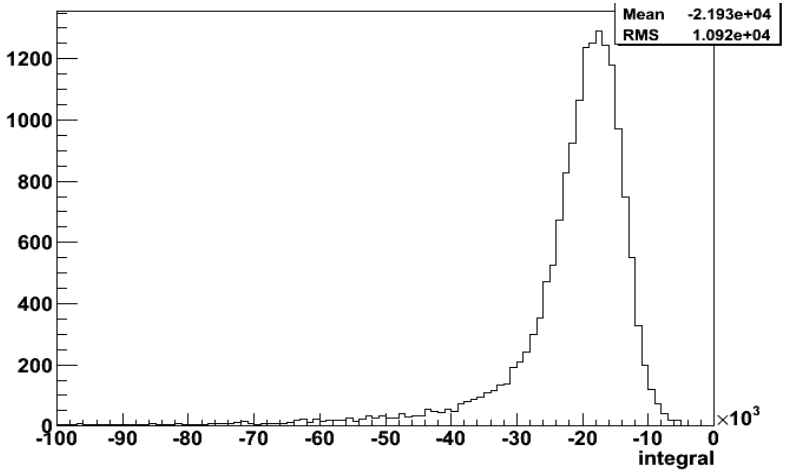
6224 entries

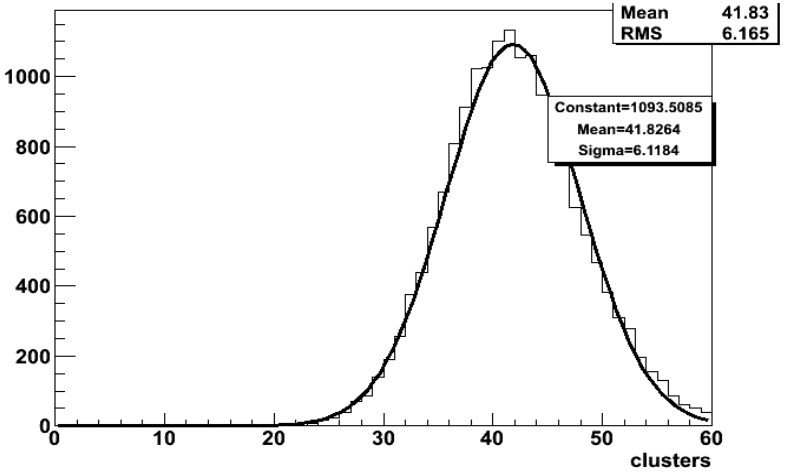




p=180MeV/c

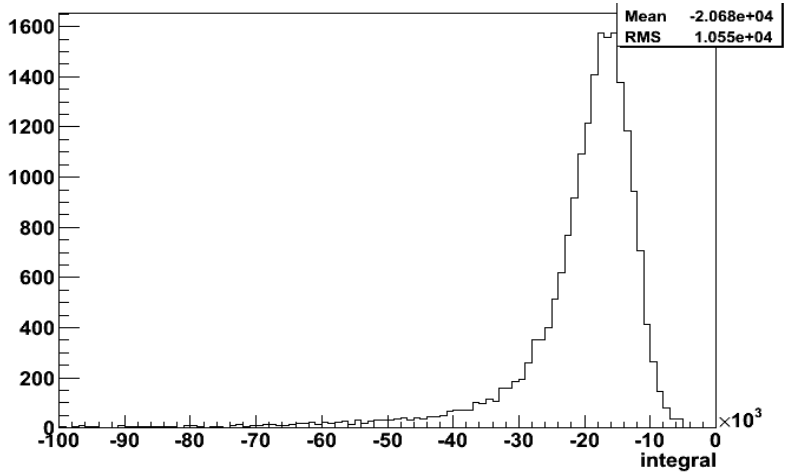
17062 entries

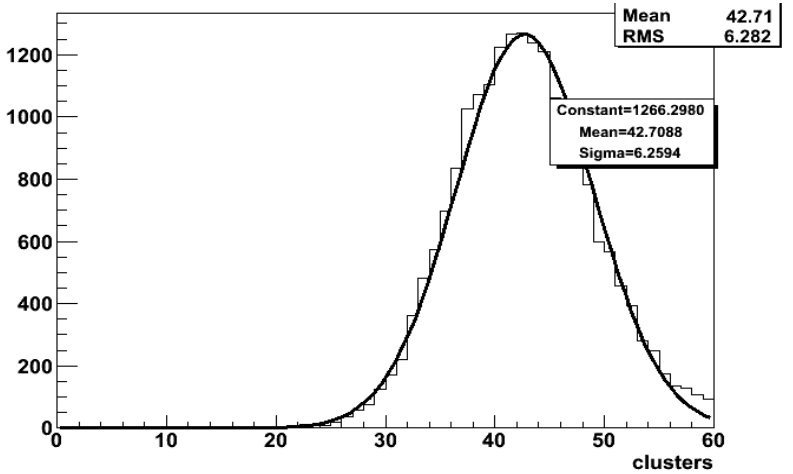




p=220MeV/c

20304 entries





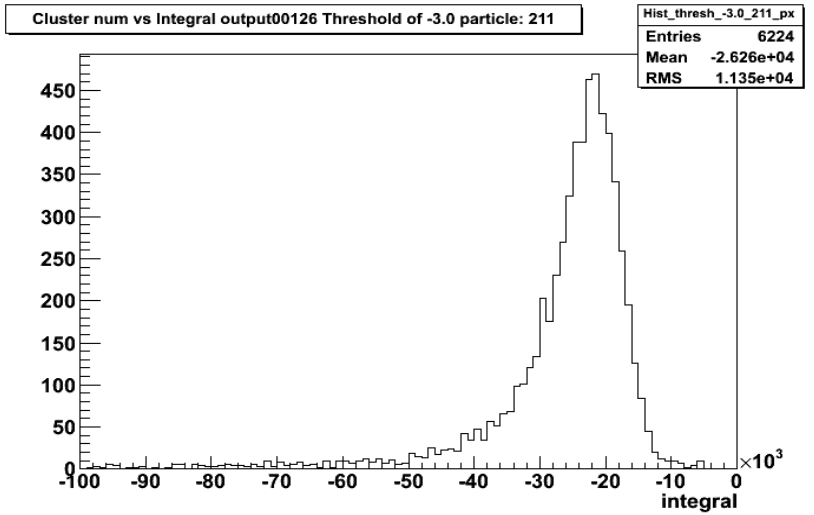
Threshold a=3.3
n=5
Particle = Pion
Gas: 80/20

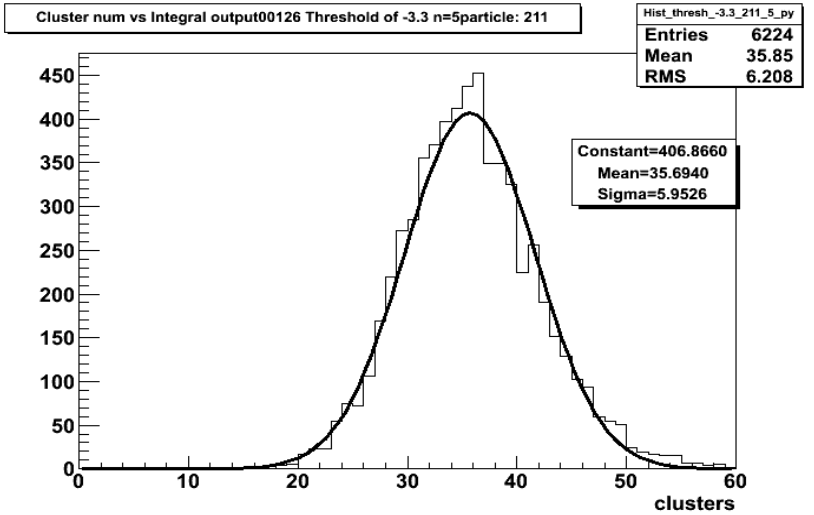
Integral of Signal

Distribution of detected clusters

p=140MeV/c

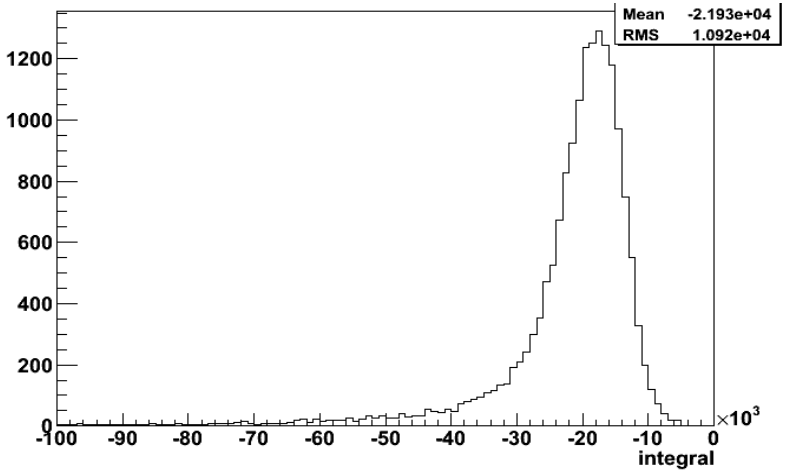
6224 entries

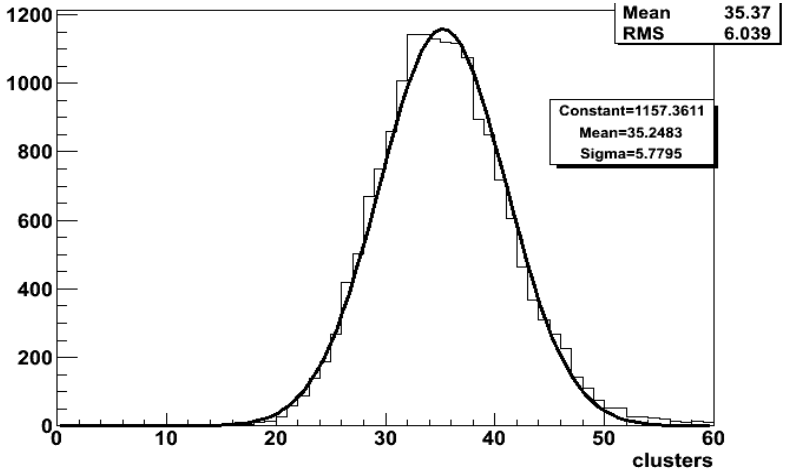




p=180MeV/c

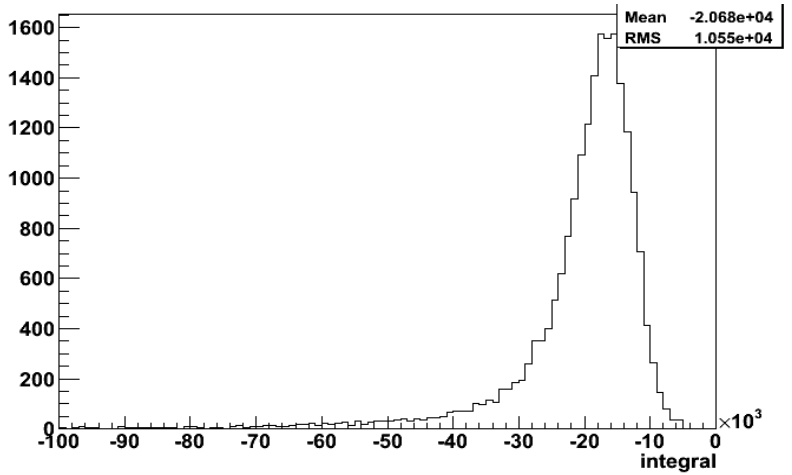
17062 entries

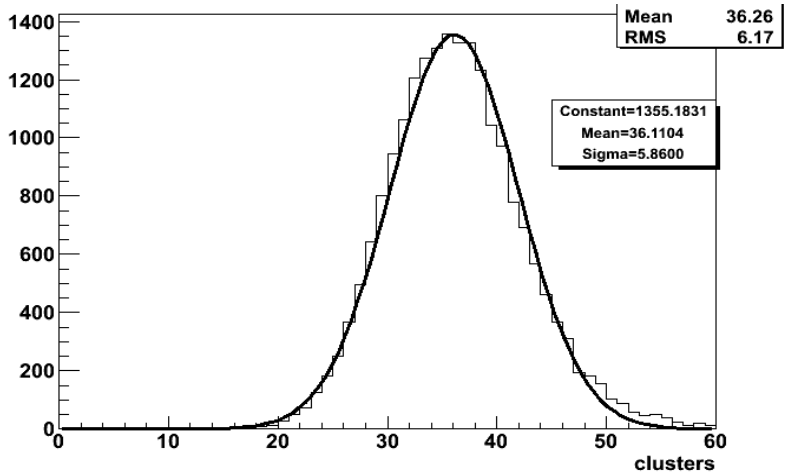




p=220MeV/c

20304 entries





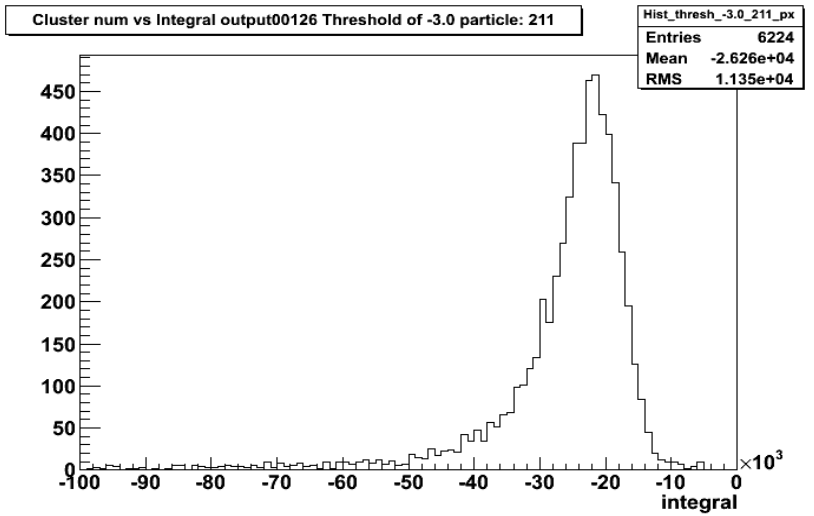
Threshold a=3.5
n=5
Particle = Pion
Gas: 80/20

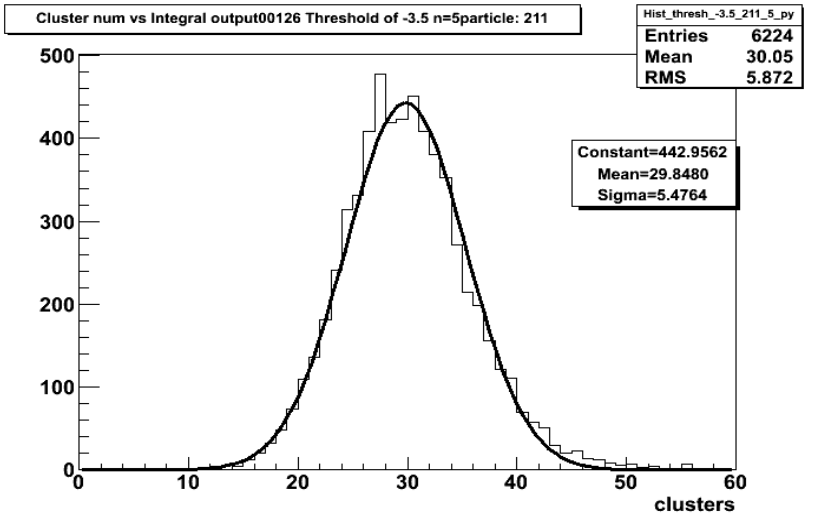
Integral of Signal

Distribution of detected clusters

p=140MeV/c

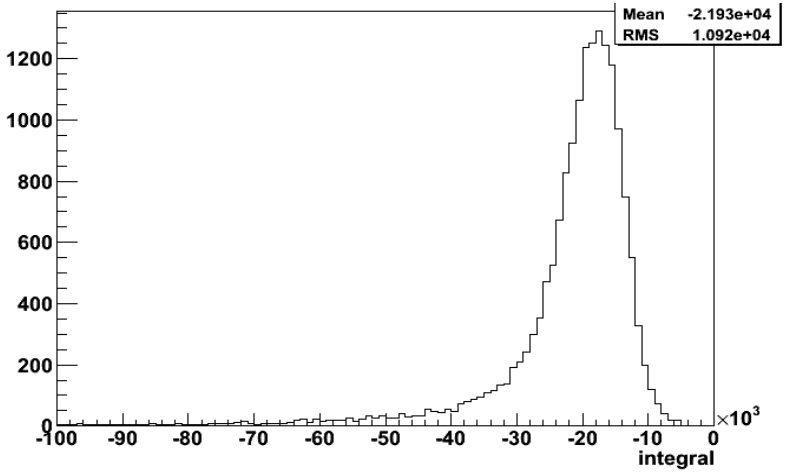
6224 entries

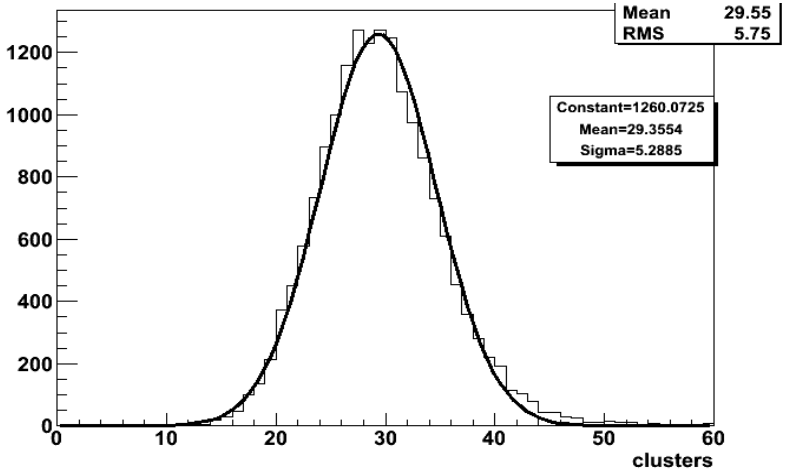




p=180MeV/c

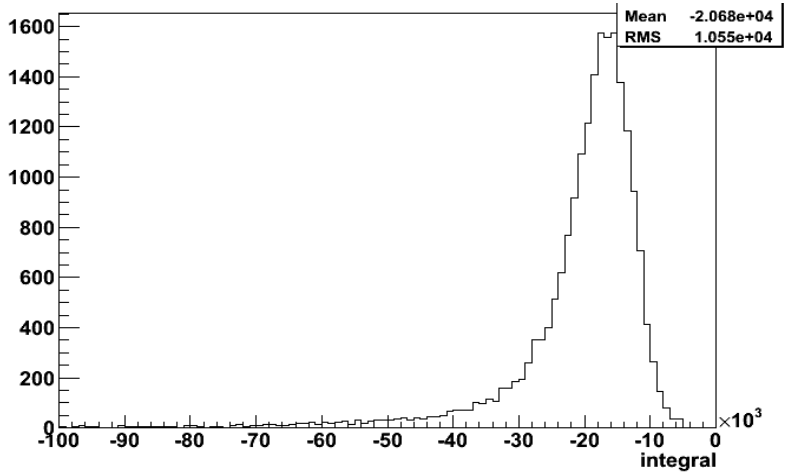
17062 entries

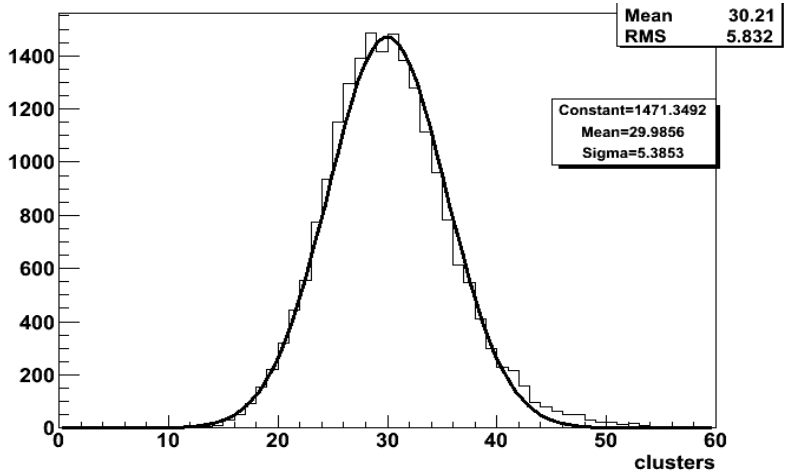




p=220MeV/c

20304 entries





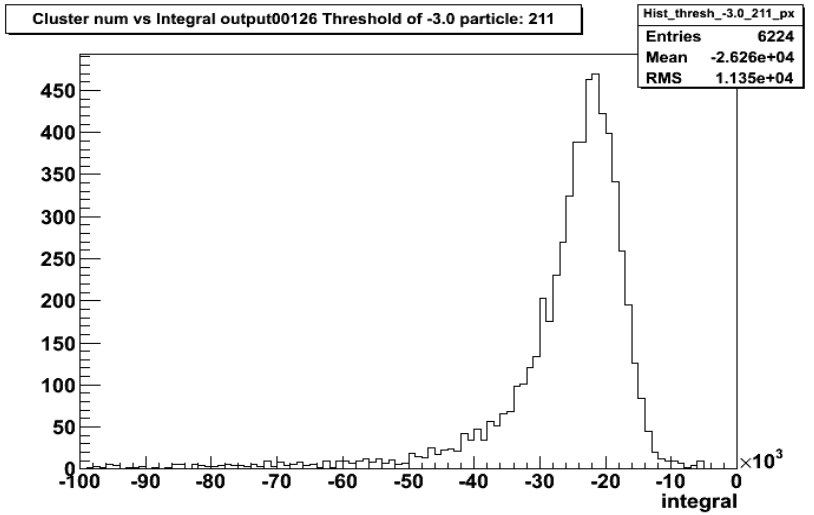
Threshold a=3.7
n=5
Particle = Pion
Gas: 80/20

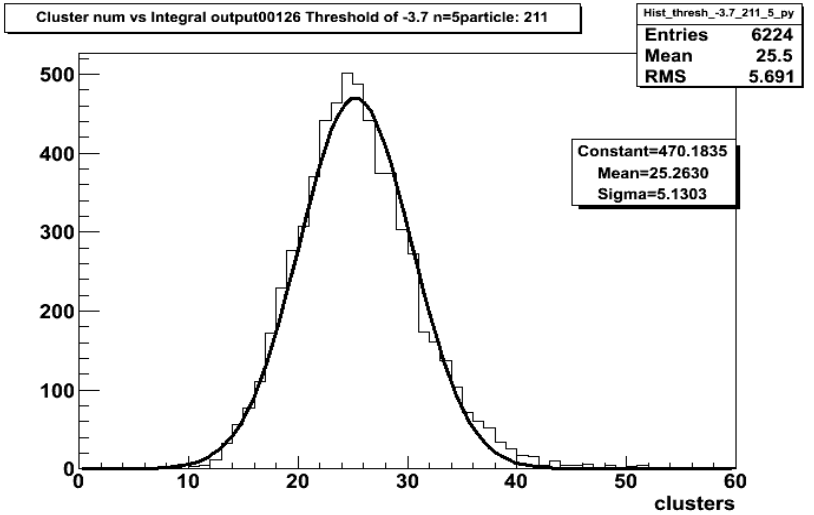
Integral of Signal

Distribution of detected clusters

p=140MeV/c

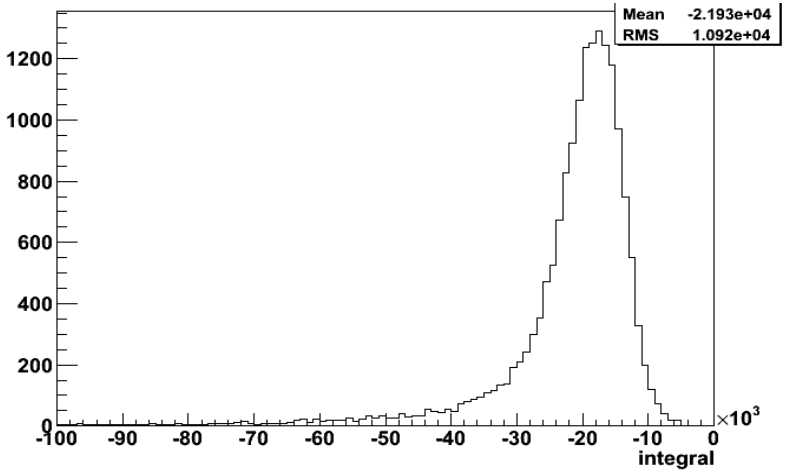
6224 entries

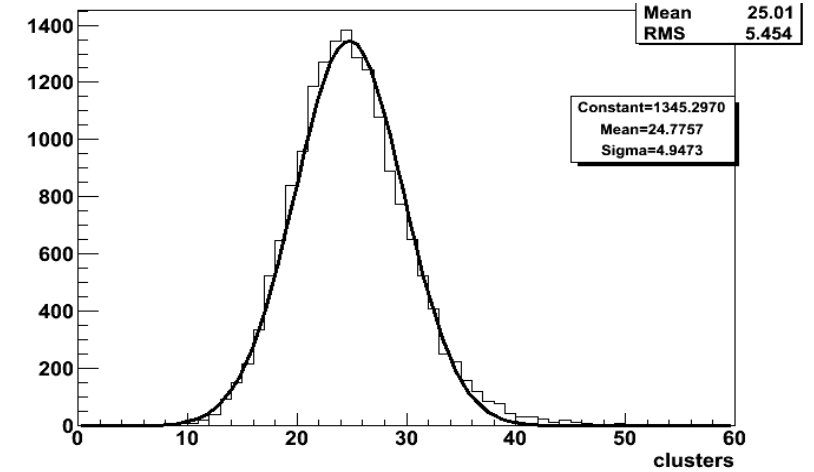




p=180MeV/c

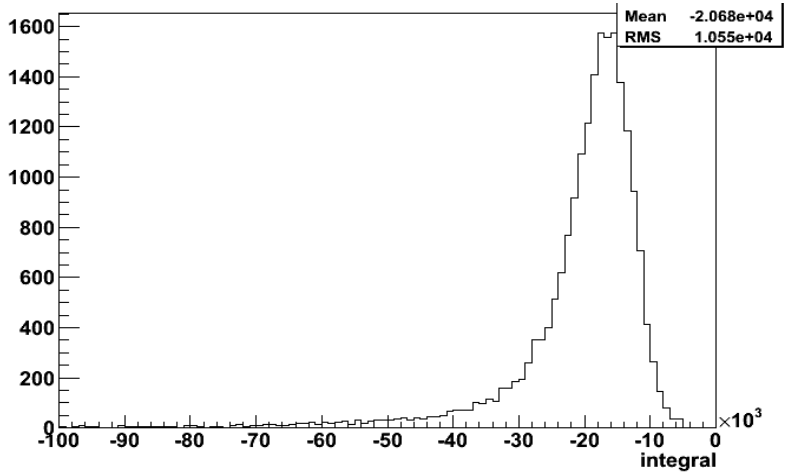
17062 entries

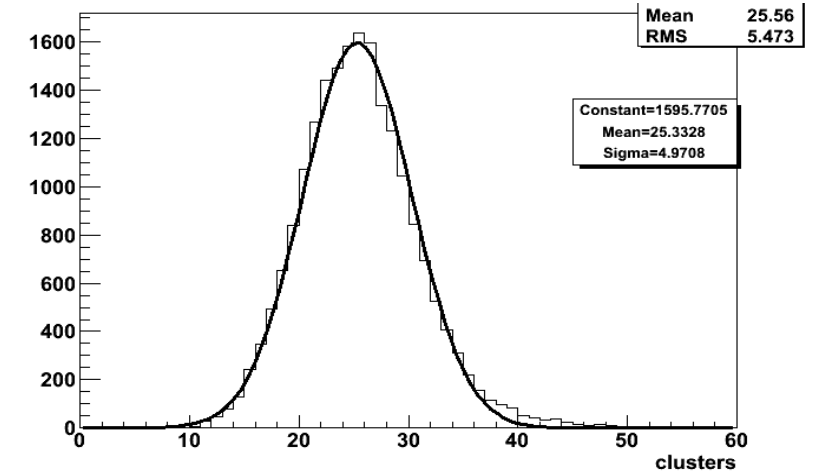




p=220MeV/c

20304 entries





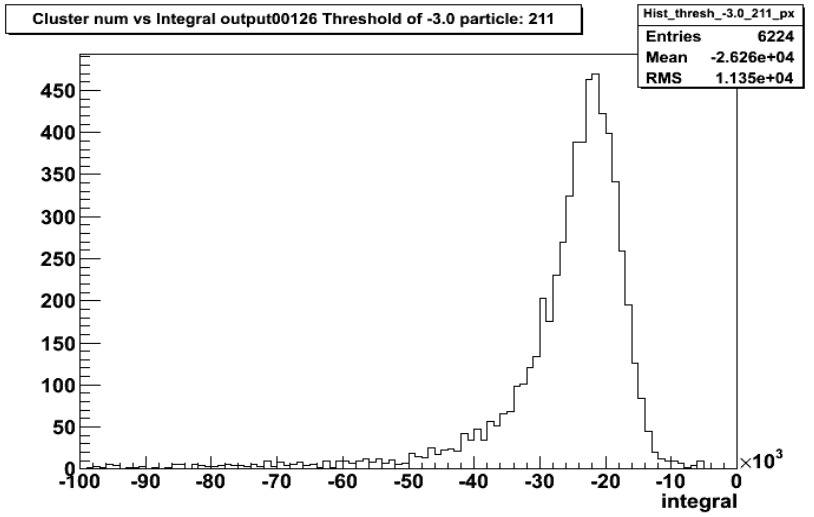
Threshold a=4
n=5
Particle = Pion
Gas: 80/20

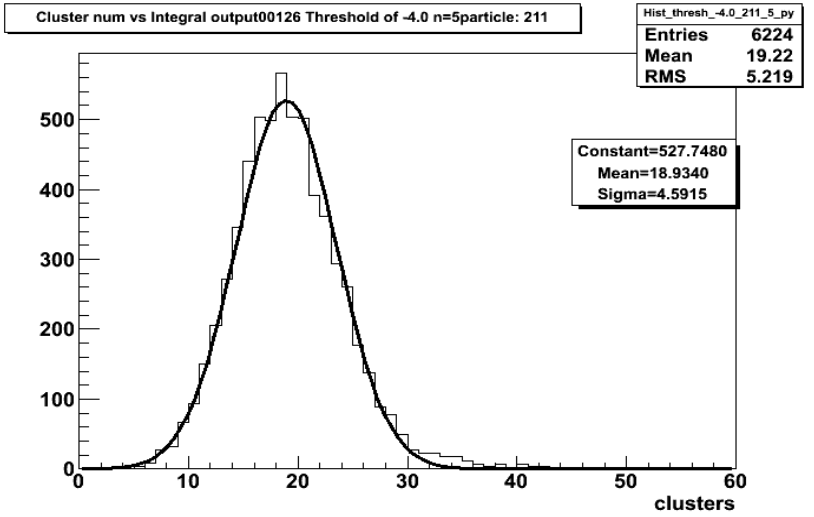
Integral of Signal

Distribution of detected clusters

p=140MeV/c

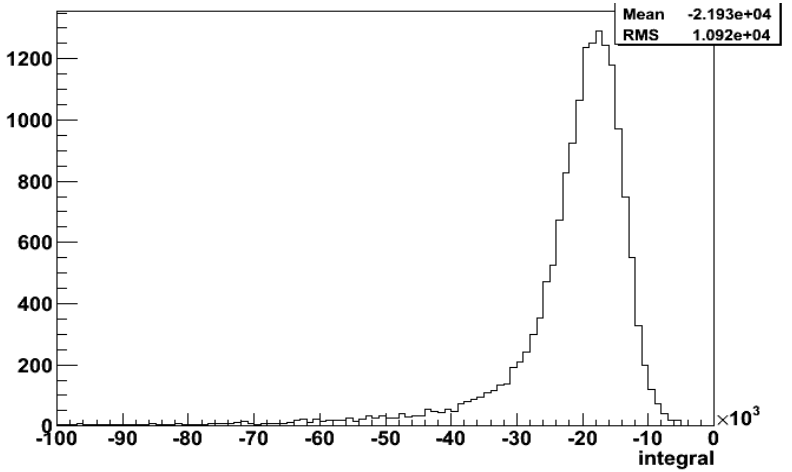
6224 entries

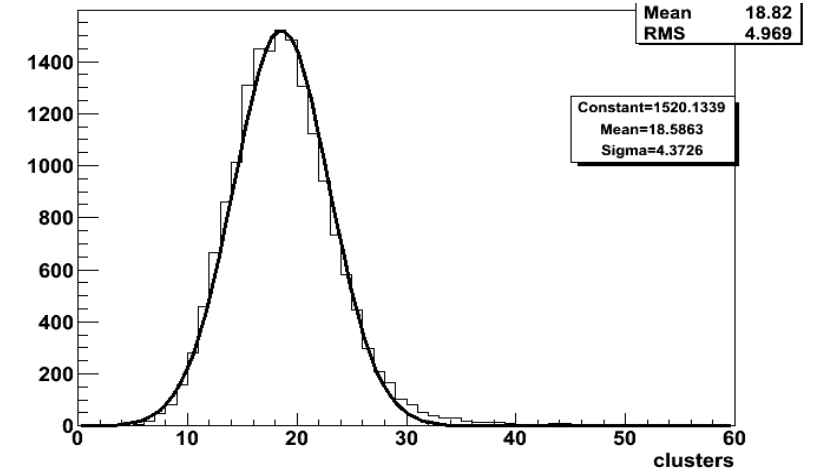




p=180MeV/c

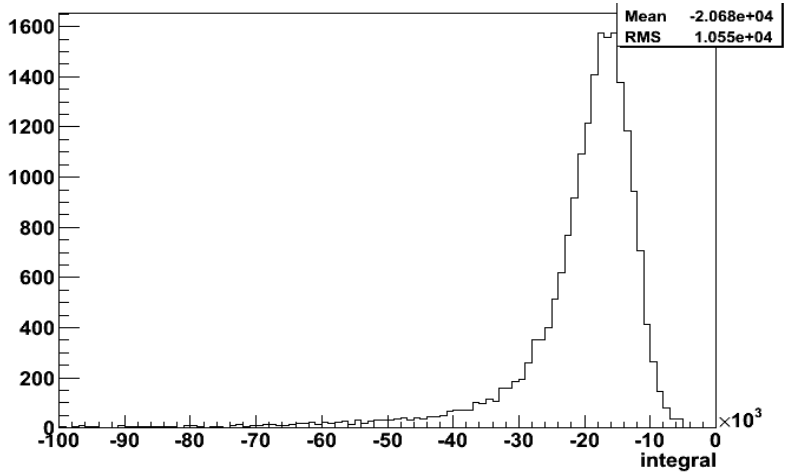
17062 entries

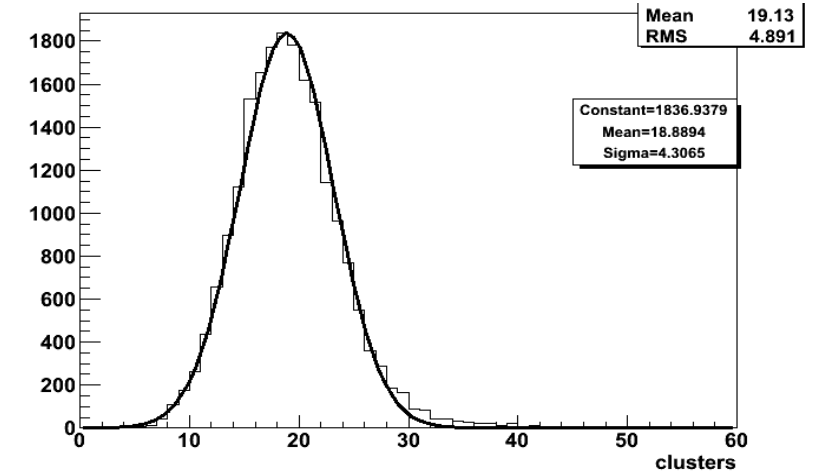




p=220MeV/c

20304 entries





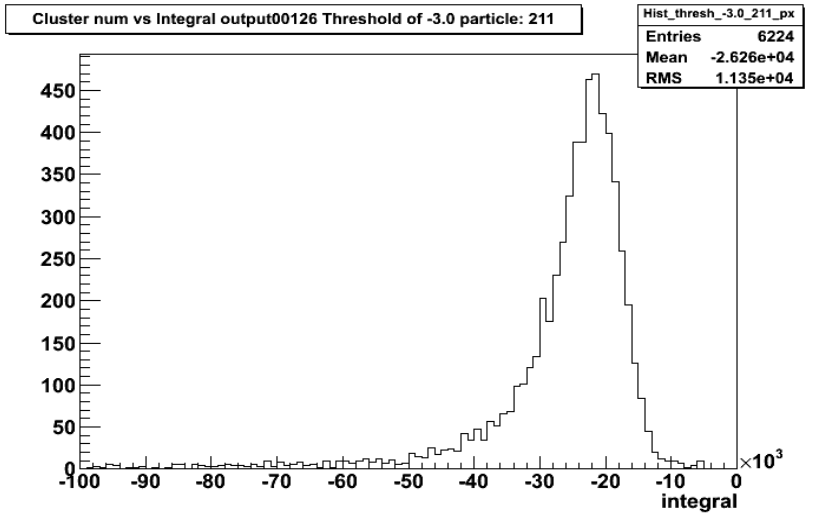
Threshold a=5
n=5
Particle = Pion
Gas: 80/20

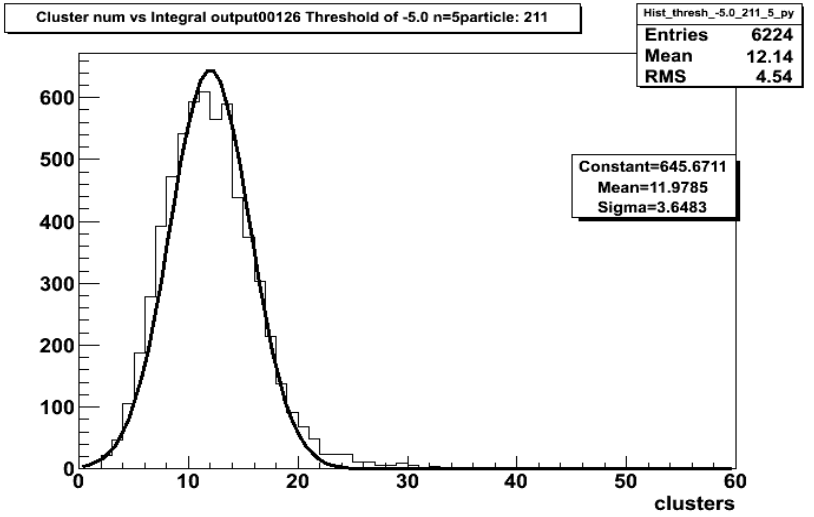
Integral of Signal

Distribution of detected clusters

p=140MeV/c

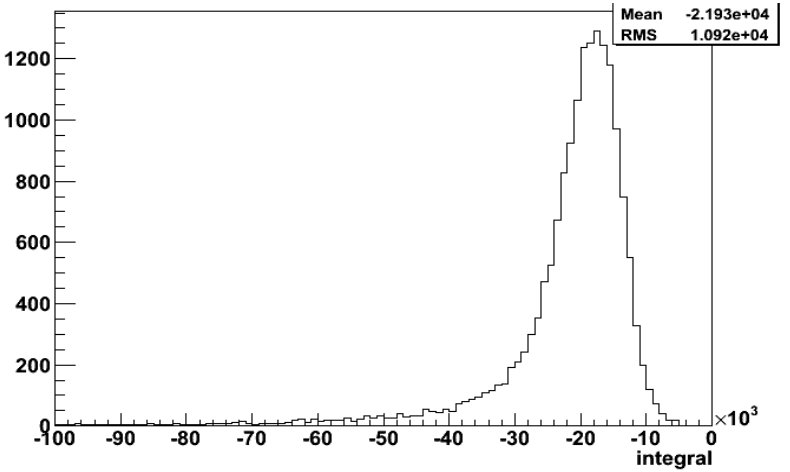
6224 entries

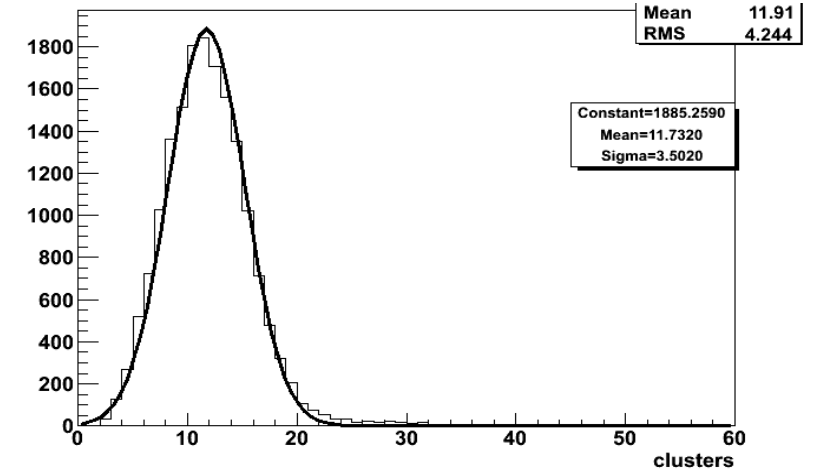




p=180MeV/c

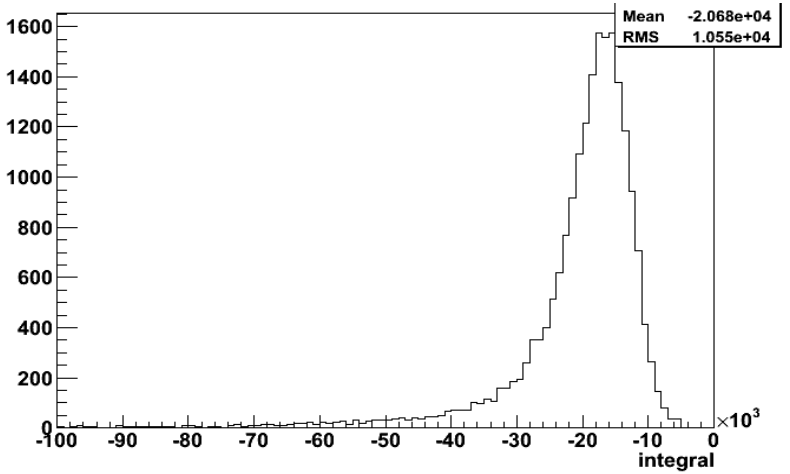
17062 entries

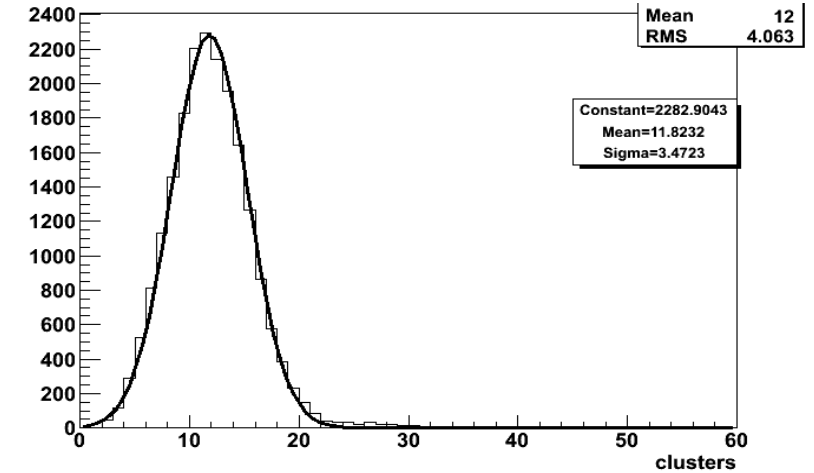




p=220MeV/c

20304 entries





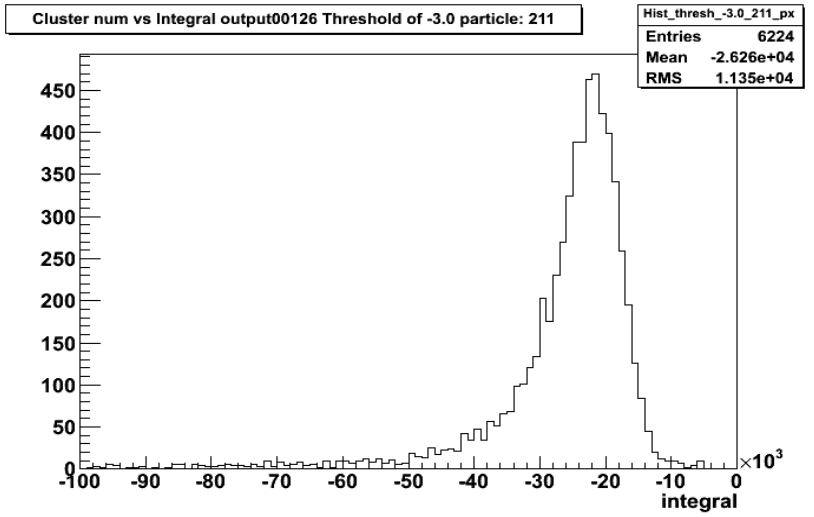
Threshold a=6
n=5
Particle = Pion
Gas: 80/20

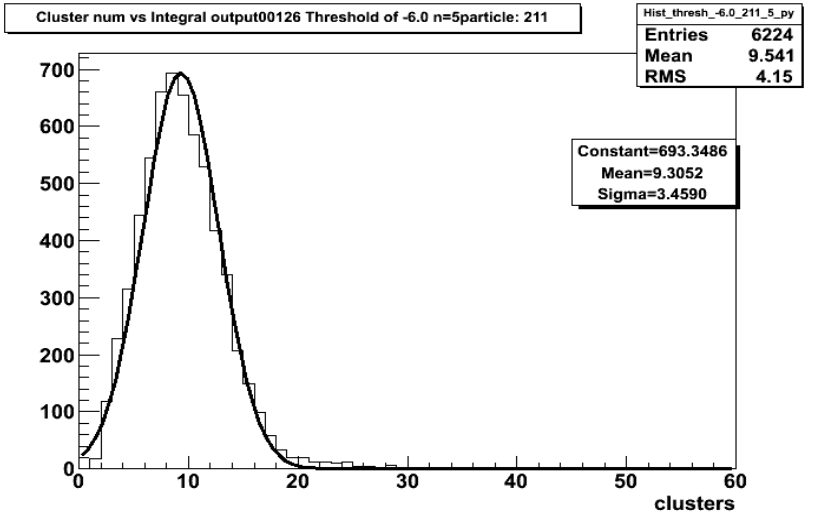
Integral of Signal

Distribution of detected clusters

p=140MeV/c

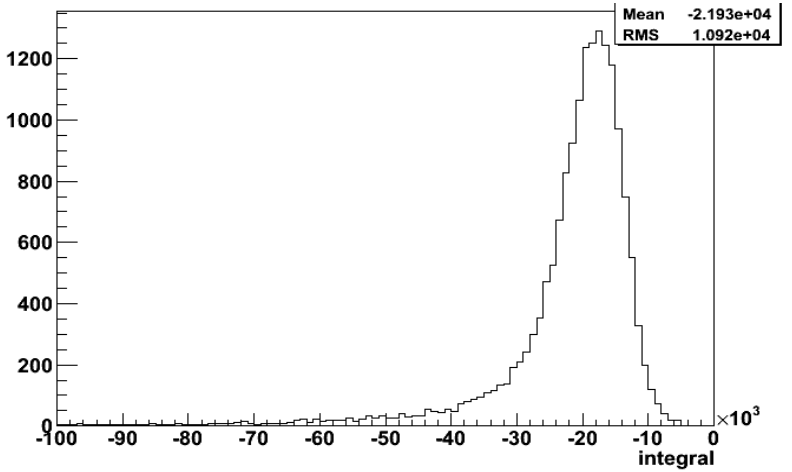
6224 entries

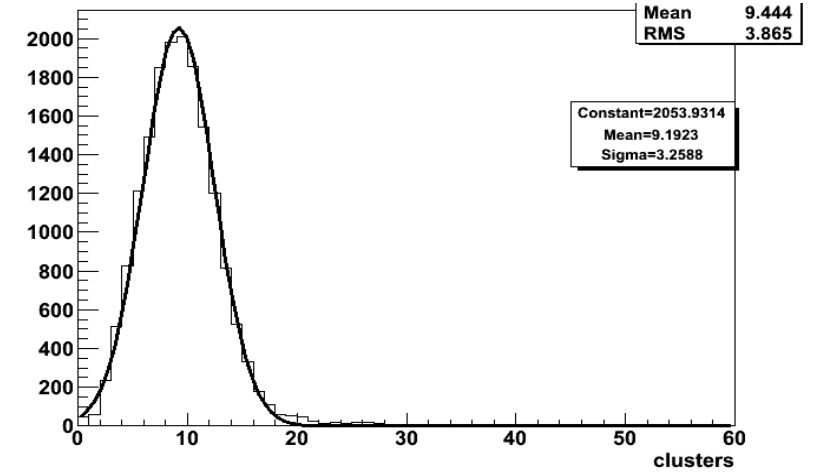




p=180MeV/c

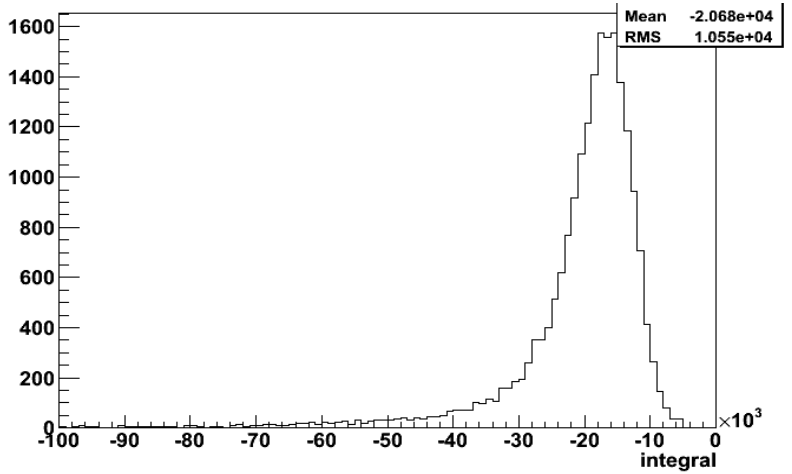
17062 entries

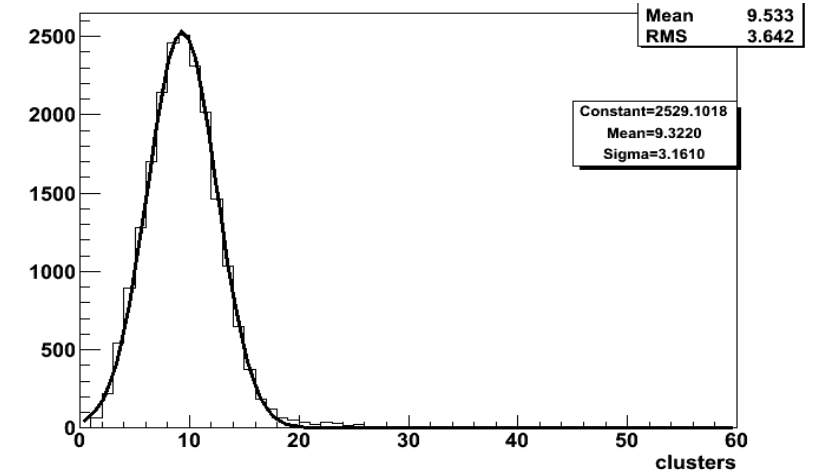




p=220MeV/c

20304 entries





Pions, n=3
80/20

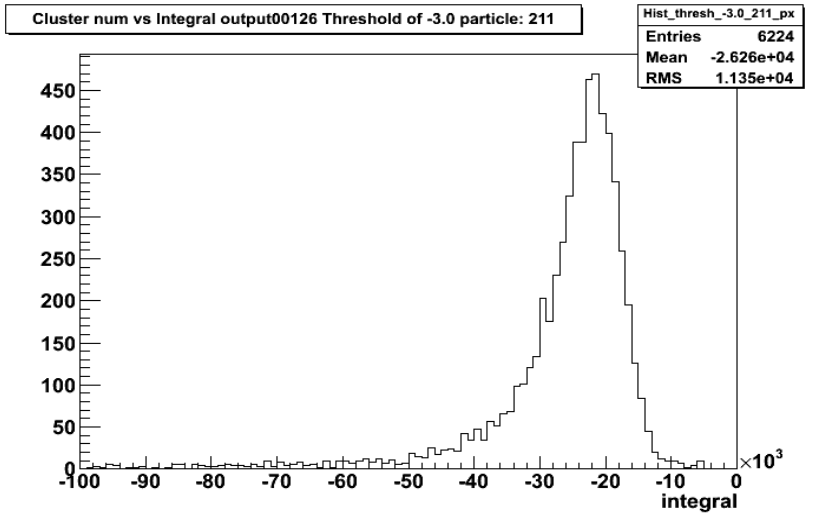
Threshold a=3
n=3
Particle = Pion
Gas: 80/20

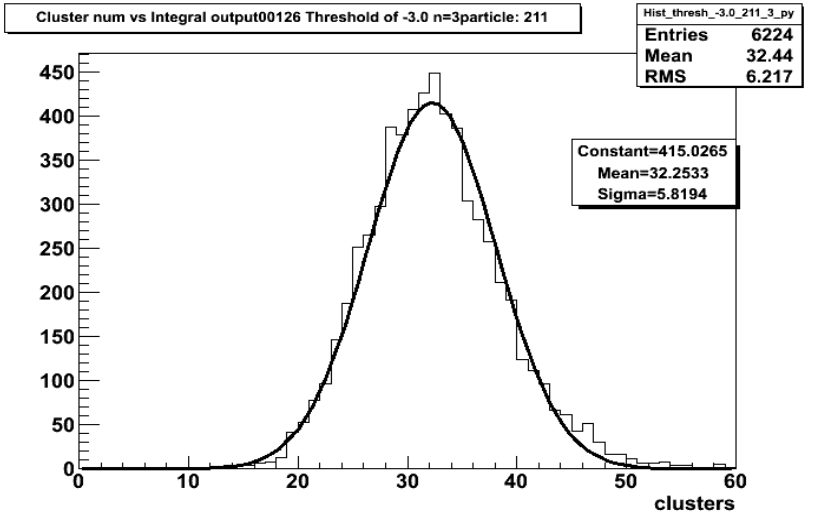
Integral of Signal

Distribution of detected clusters

p=140MeV/c

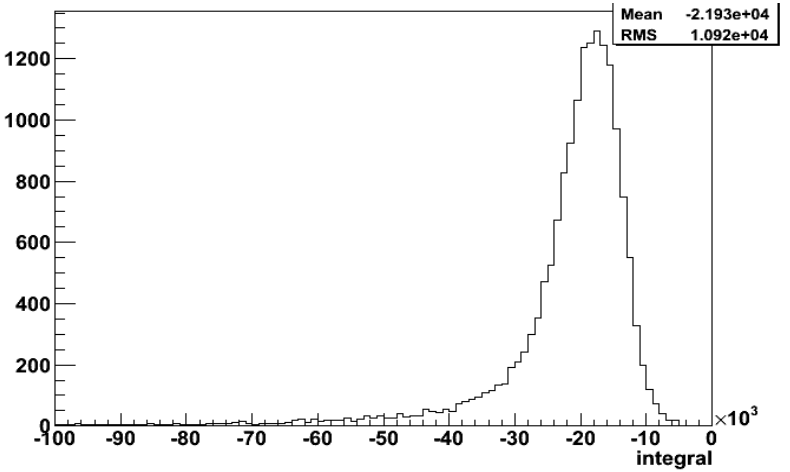
6224 entries

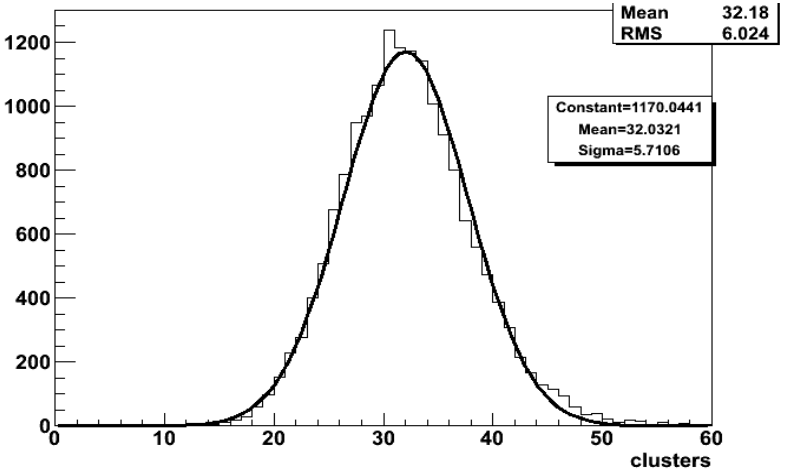




p=180MeV/c

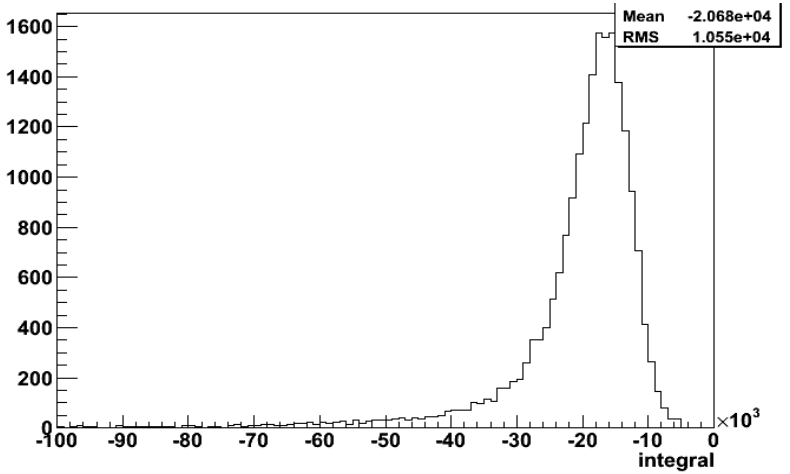
17062 entries

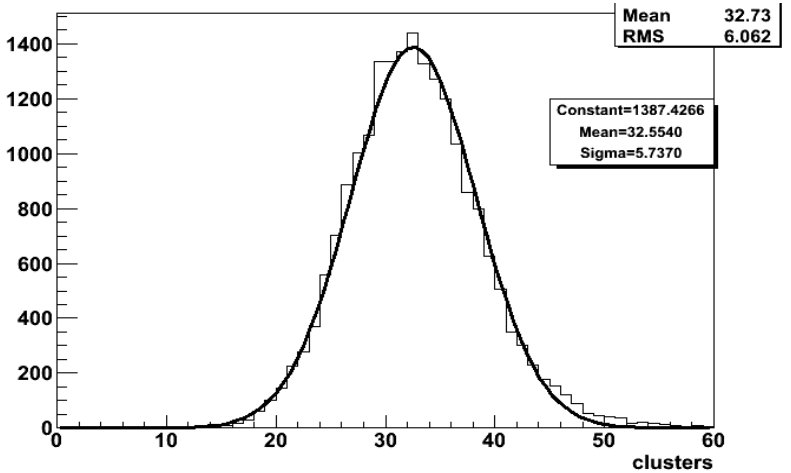




p=220MeV/c

20304 entries





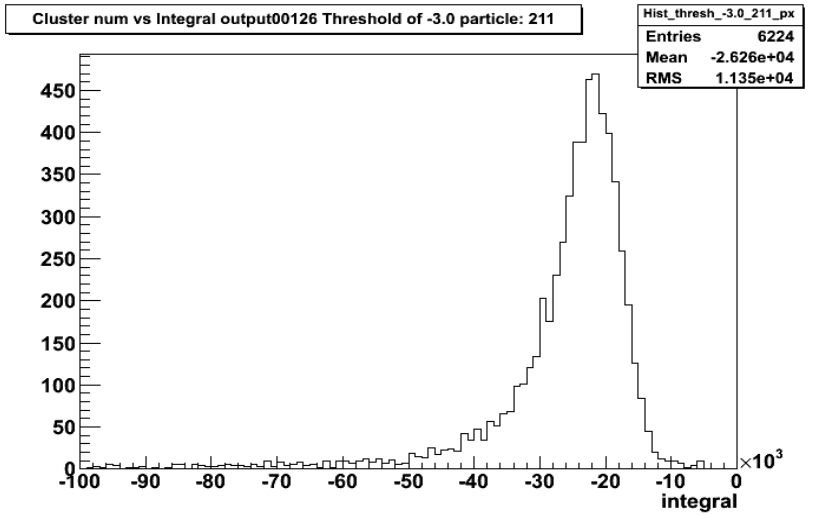
Threshold a=3.3
n=3
Particle = Pion
Gas: 80/20

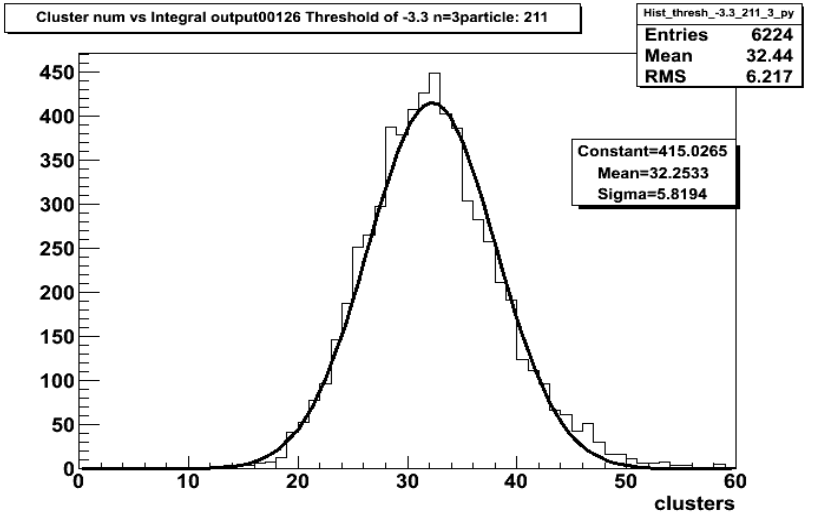
Integral of Signal

Distribution of detected clusters

p=140MeV/c

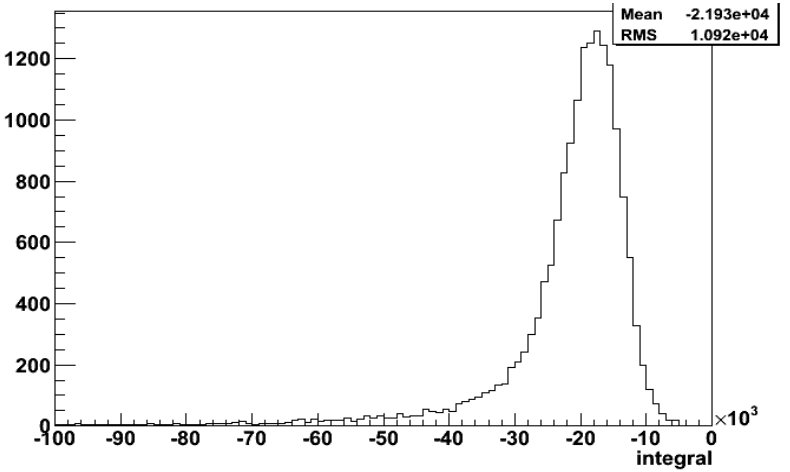
6224 entries

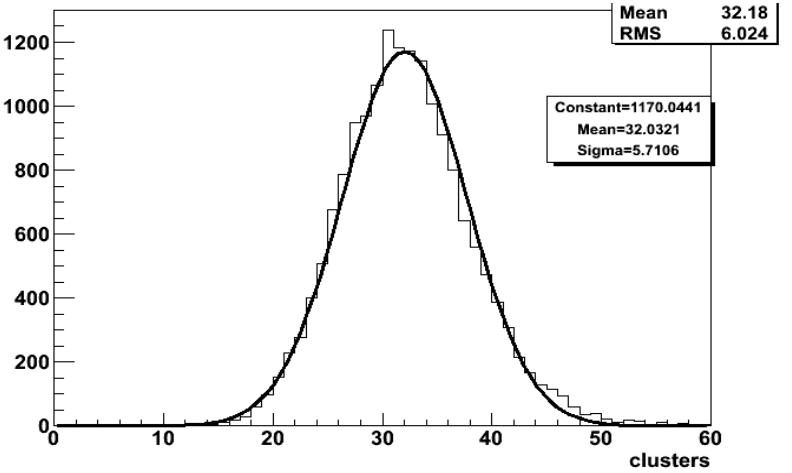




p=180MeV/c

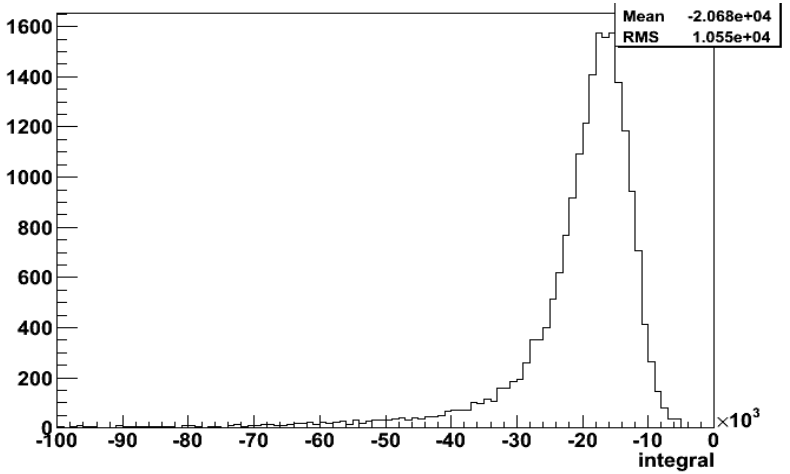
17062 entries

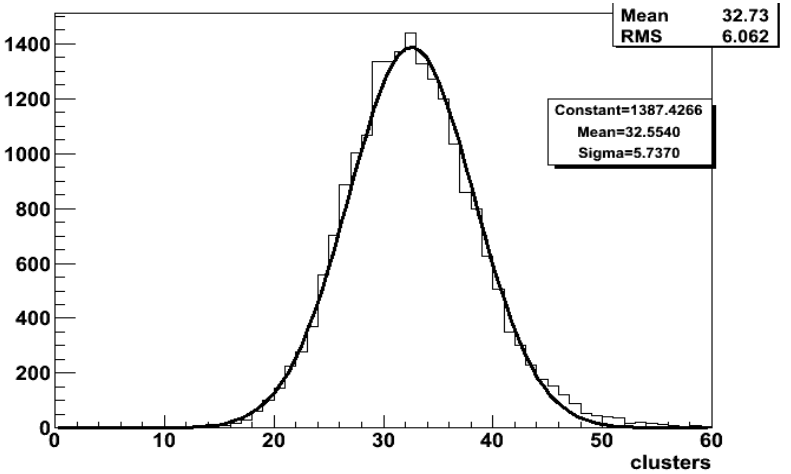




p=220MeV/c

20304 entries





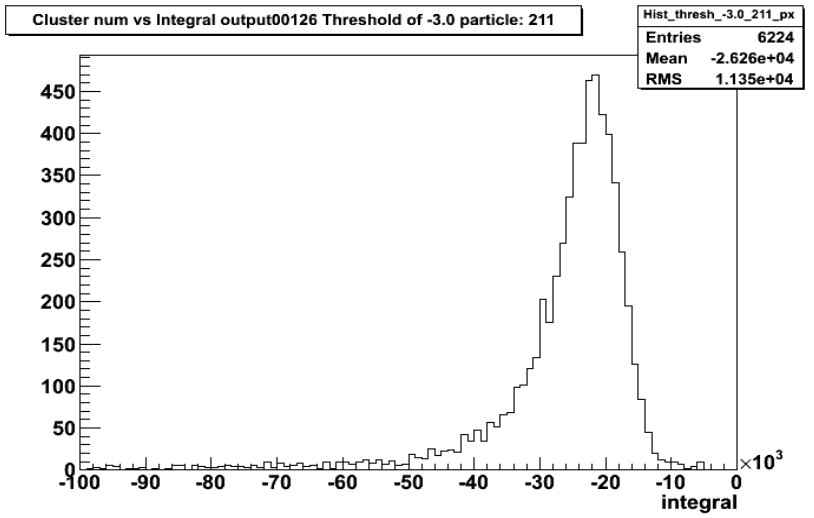
Threshold a=3.5
n=3
Particle = Pion
Gas: 80/20

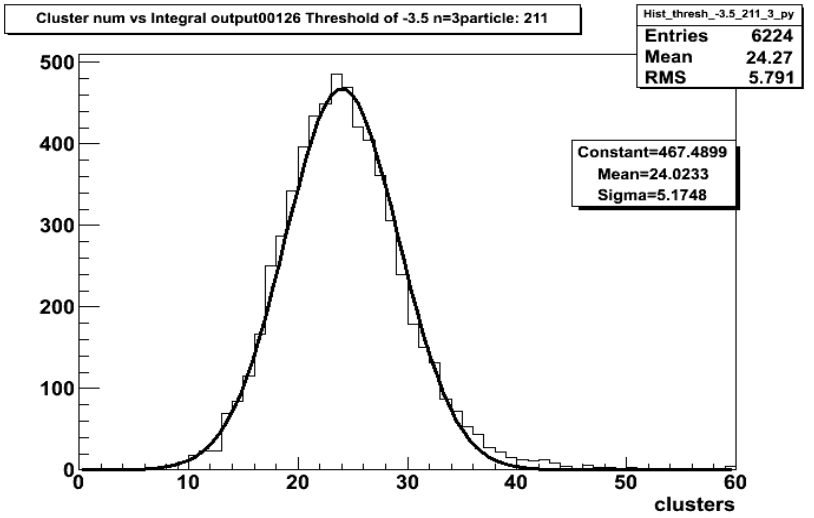
Integral of Signal

Distribution of detected clusters

p=140MeV/c

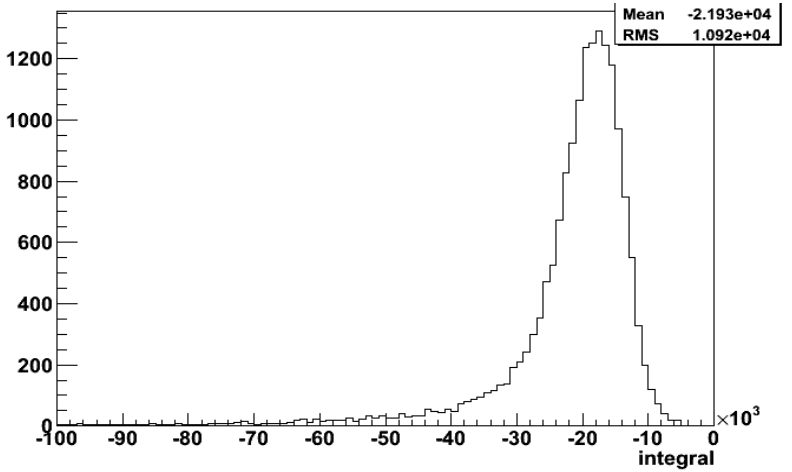
6224 entries

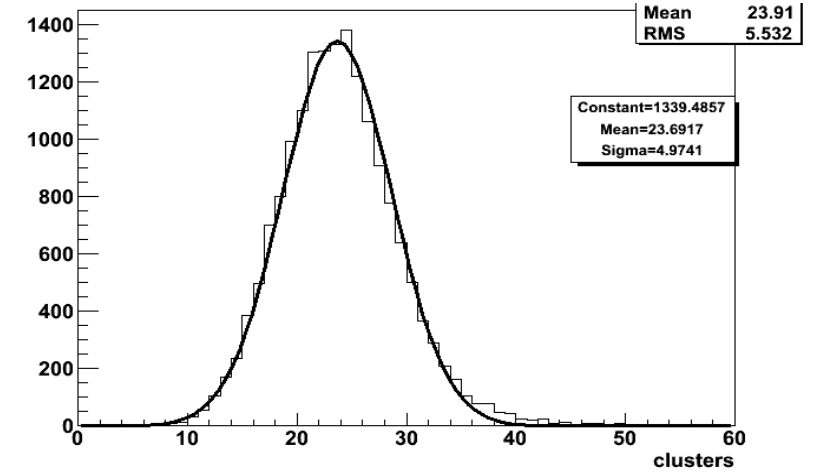




p=180MeV/c

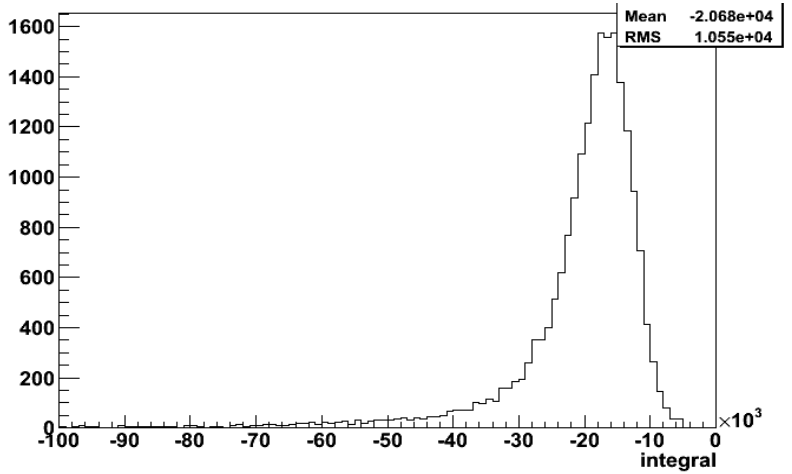
17062 entries

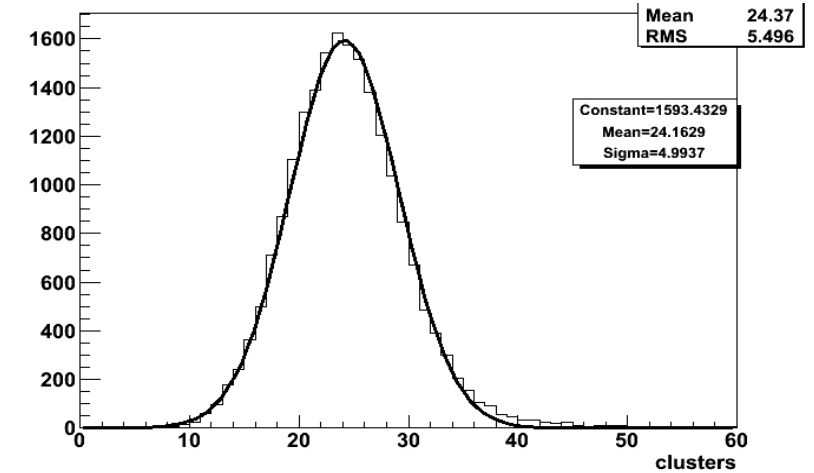




p=220MeV/c

20304 entries





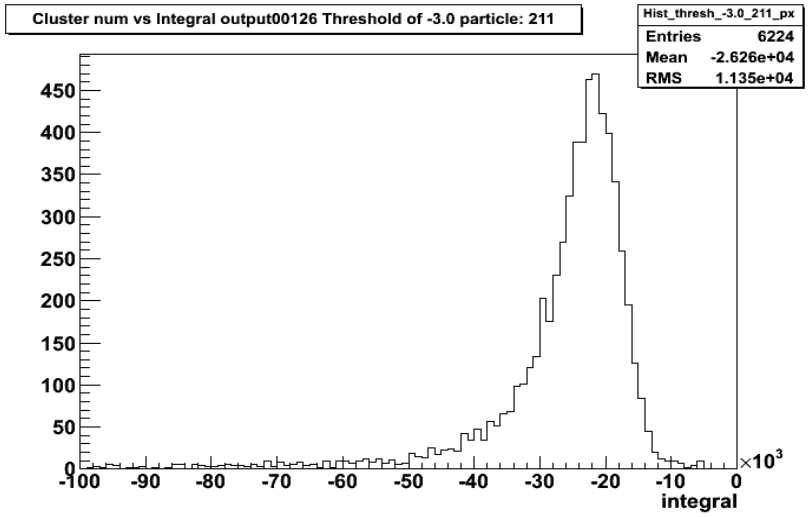
Threshold a=3.7
n=3
Particle = Pion
Gas: 80/20

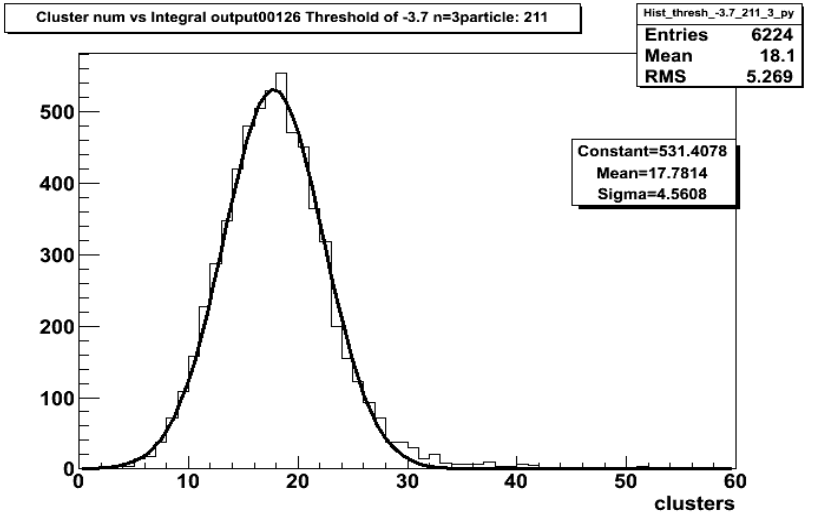
Integral of Signal

Distribution of detected clusters

p=140MeV/c

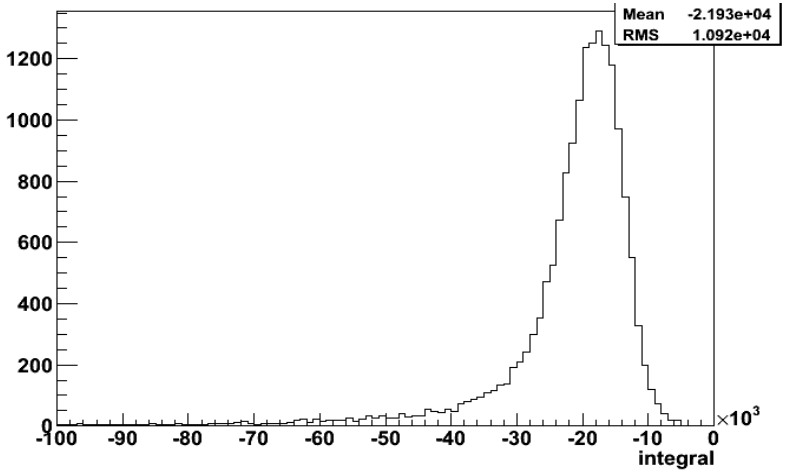
6224 entries

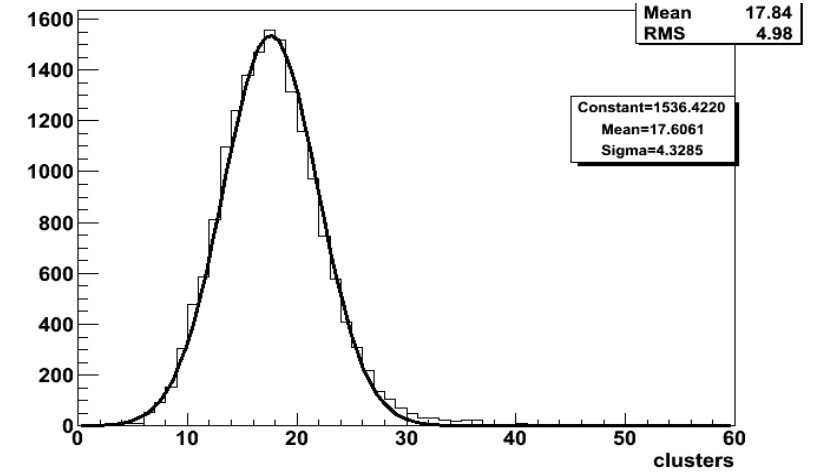




p=180MeV/c

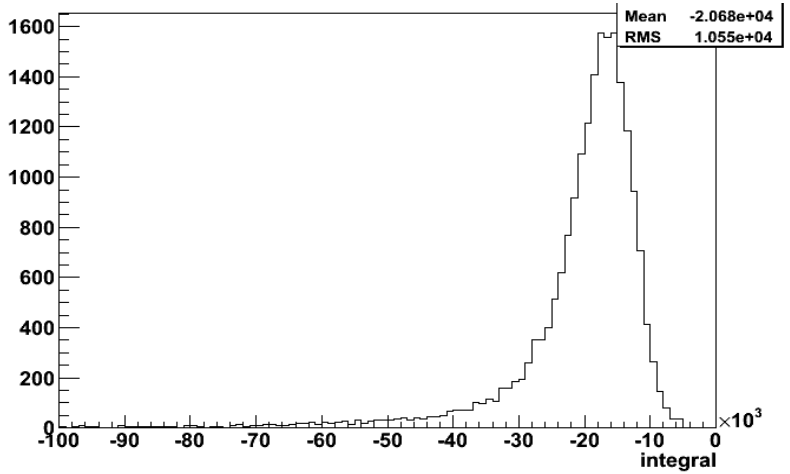
17062 entries

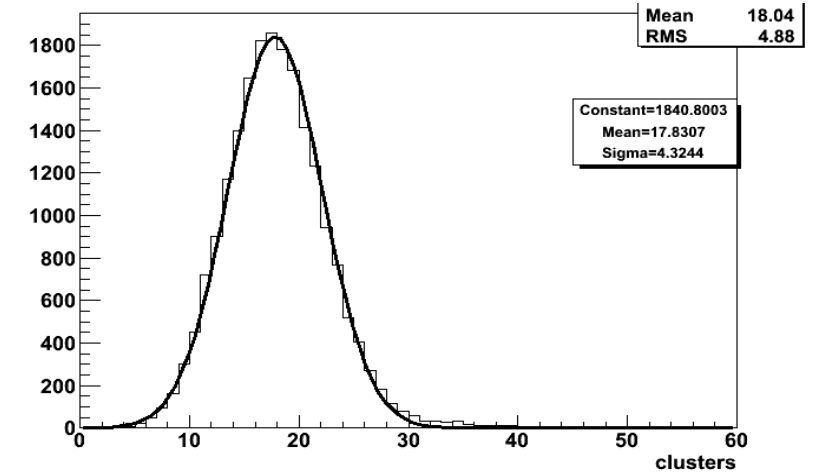




p=220MeV/c

20304 entries





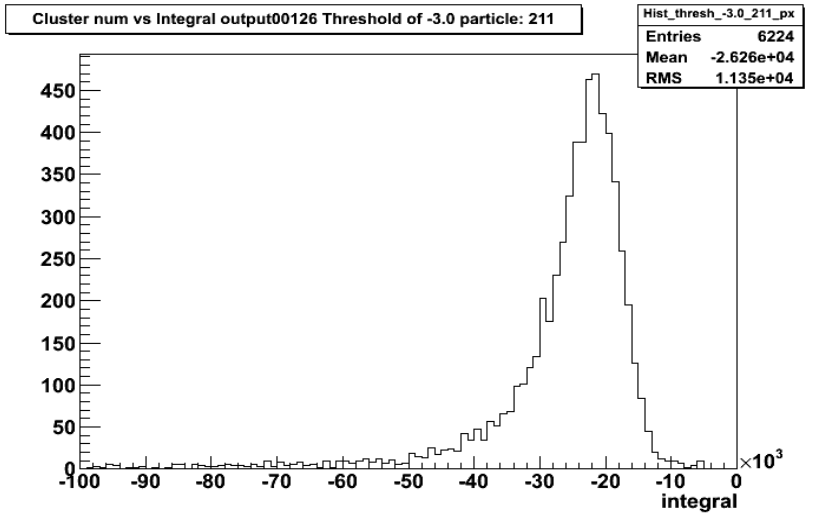
Threshold a=4
n=3
Particle = Pion
Gas: 80/20

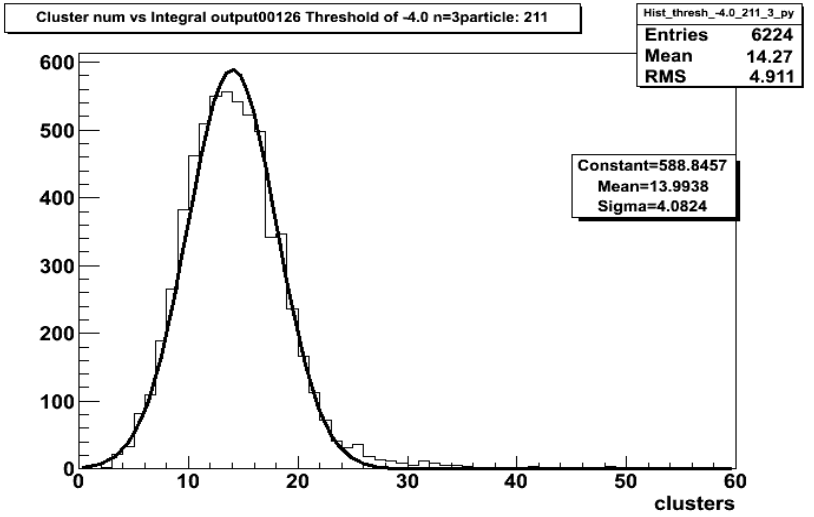
Integral of Signal

Distribution of detected clusters

p=140MeV/c

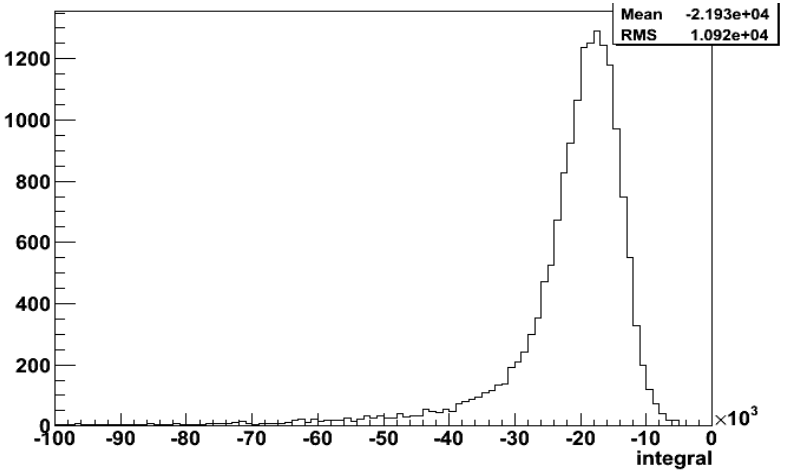
6224 entries

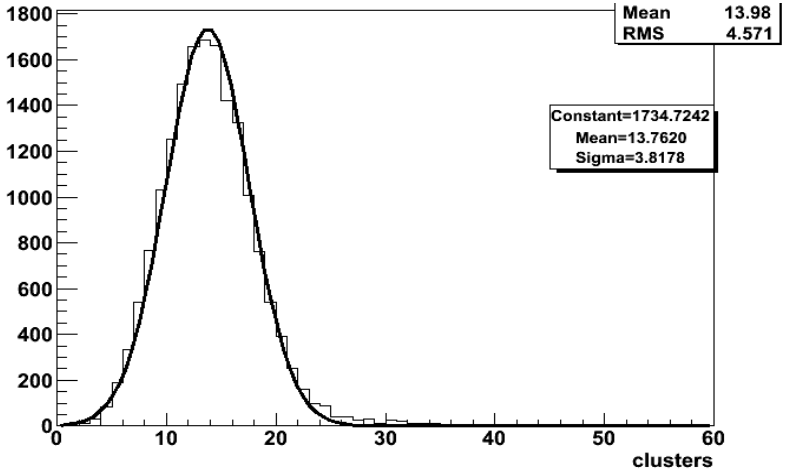




p=180MeV/c

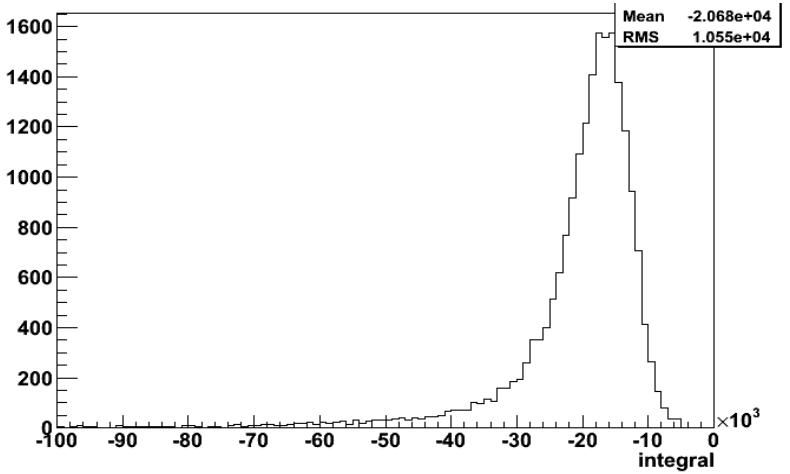
17062 entries

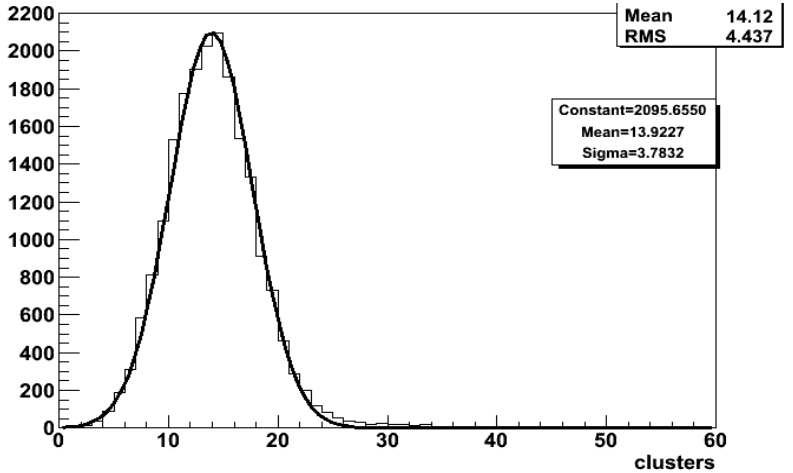




p=220MeV/c

20304 entries





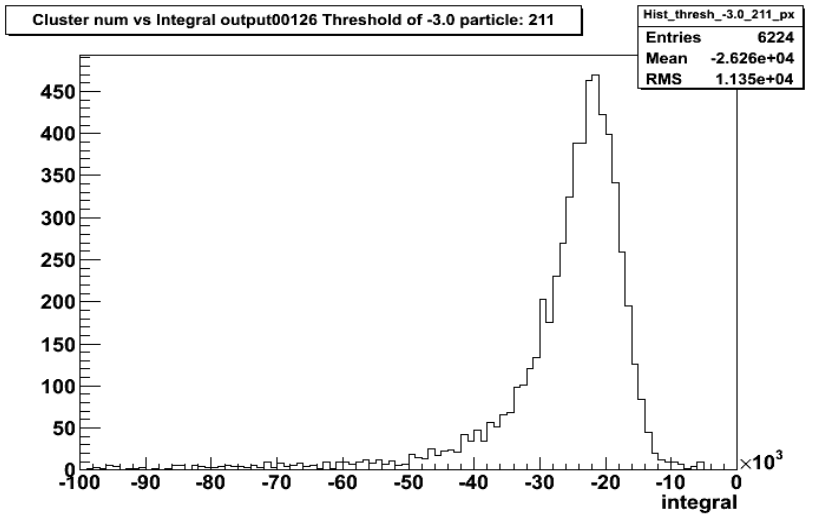
Threshold a=5
n=3
Particle = Pion
Gas: 80/20

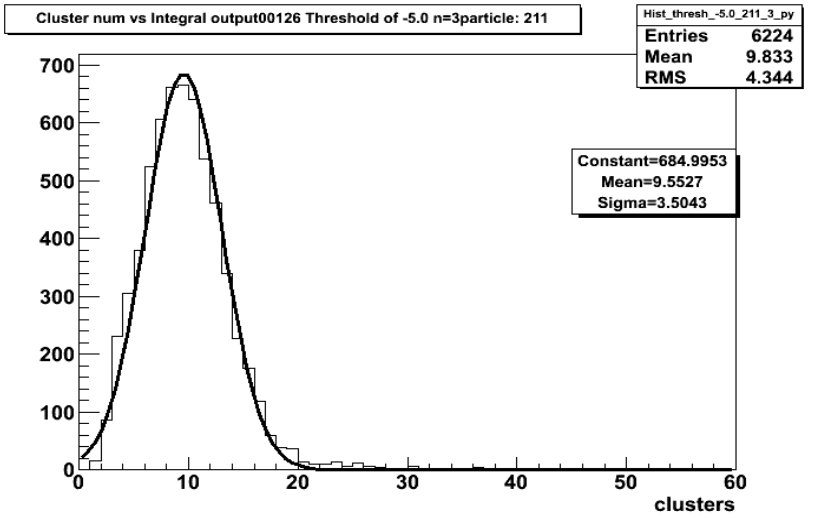
Integral of Signal

Distribution of detected clusters

p=140MeV/c

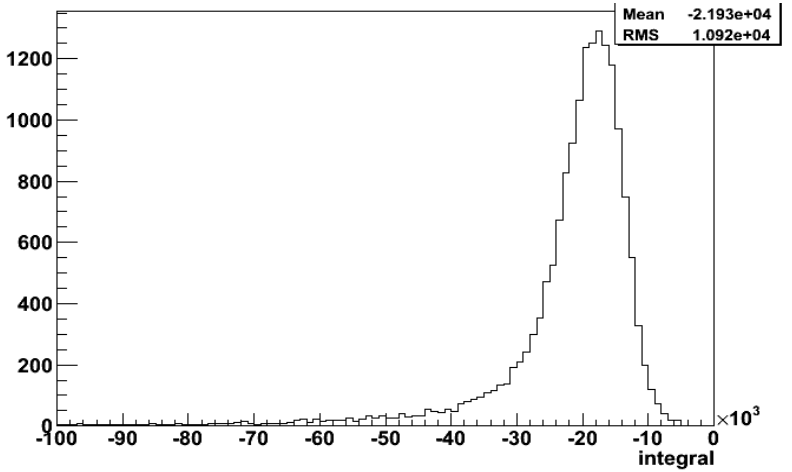
6224 entries

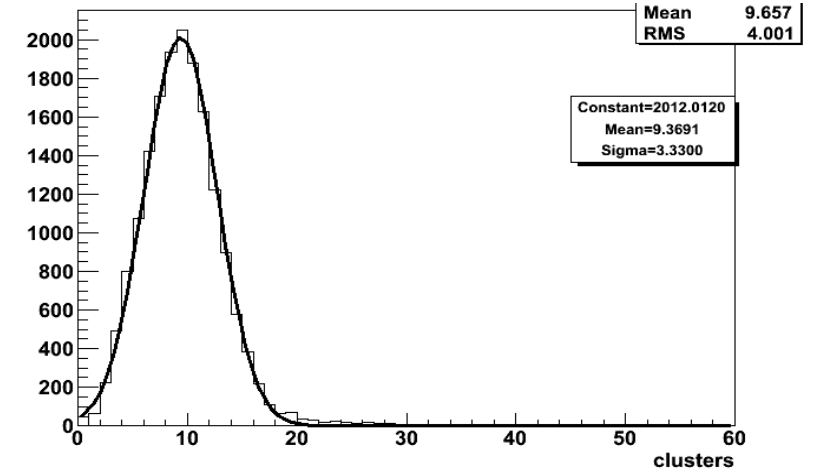




p=180MeV/c

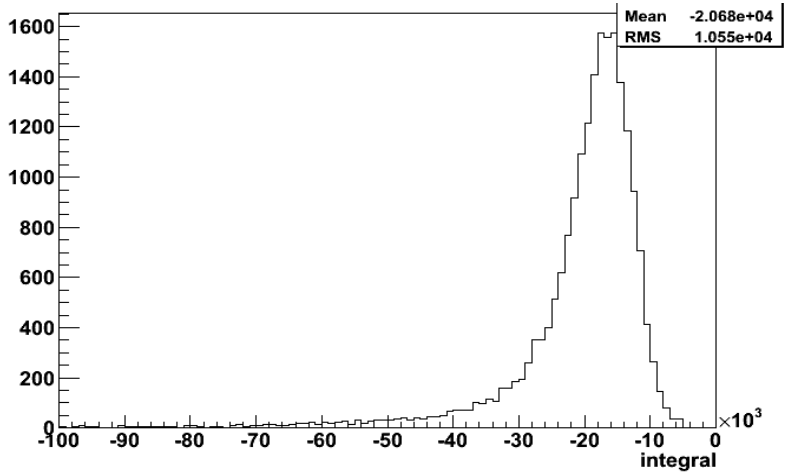
17062 entries

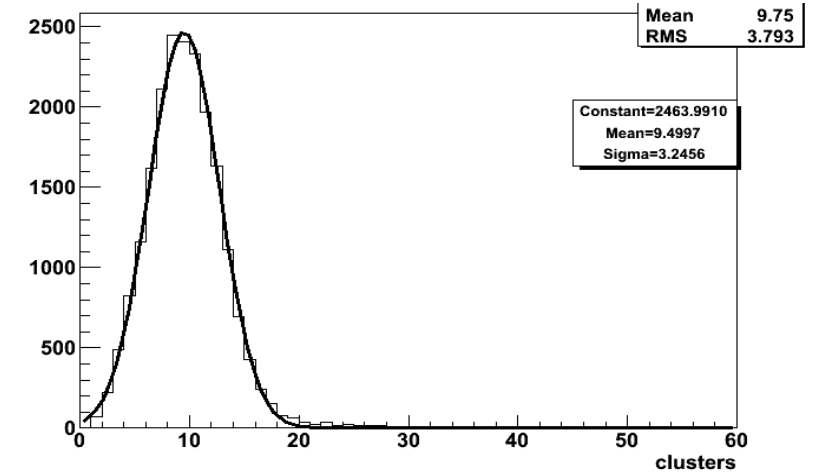




p=220MeV/c

20304 entries





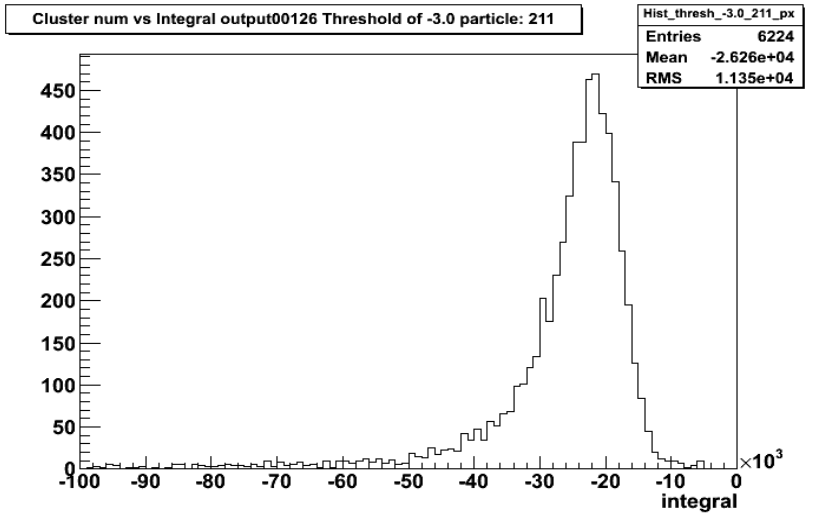
Threshold a=6
n=3
Particle = Pion
Gas: 80/20

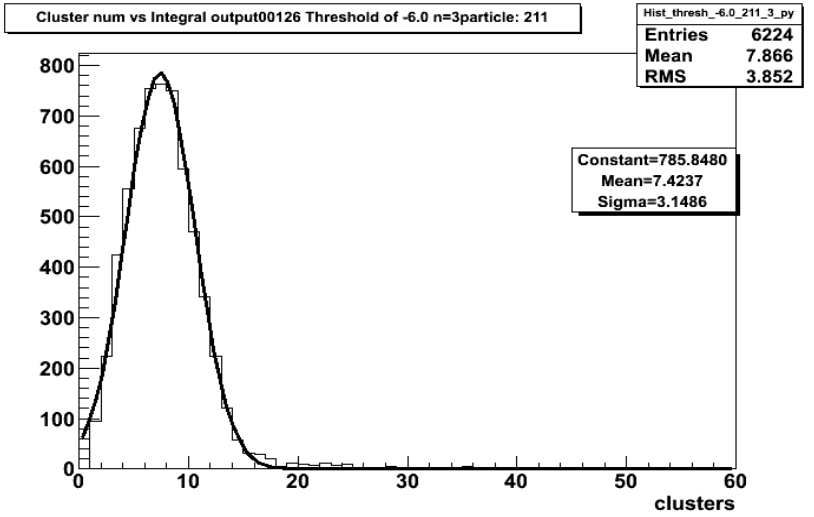
Integral of Signal

Distribution of detected clusters

p=140MeV/c

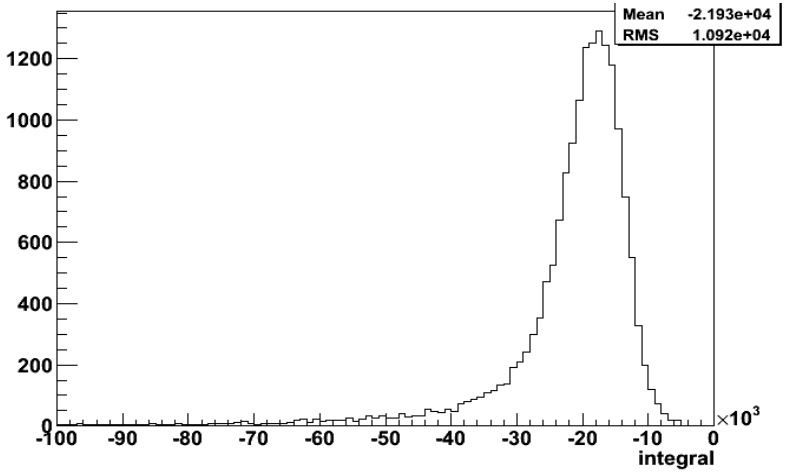
6224 entries

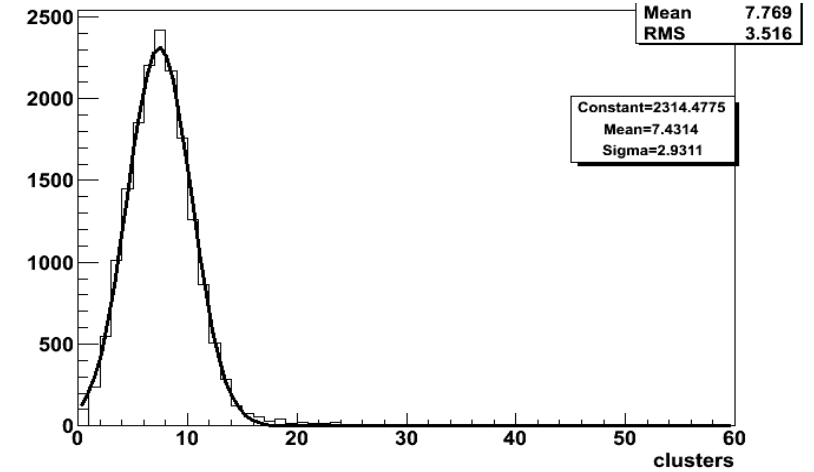




p=180MeV/c

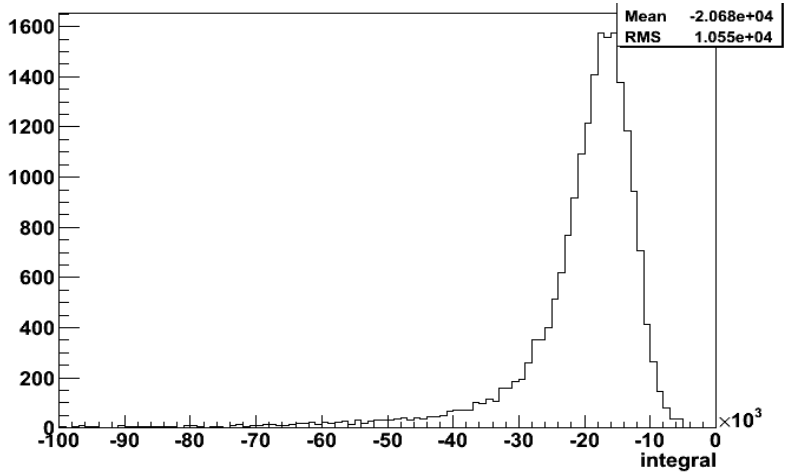
17062 entries

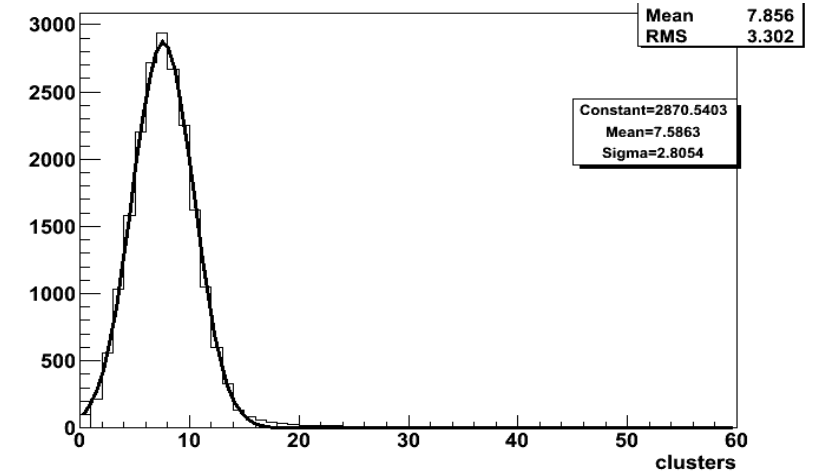




p=220MeV/c

20304 entries





Muons, n=5
80/20

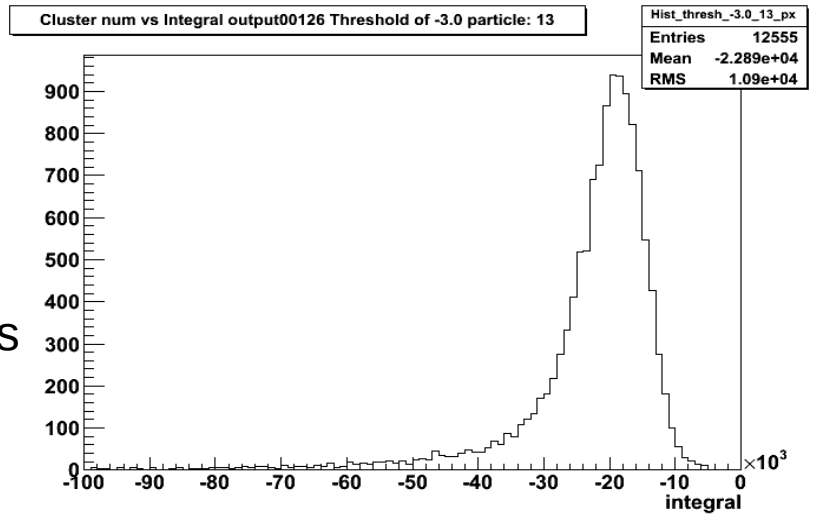
Threshold a=3
n=5
Particle = Muon
Gas: 80/20

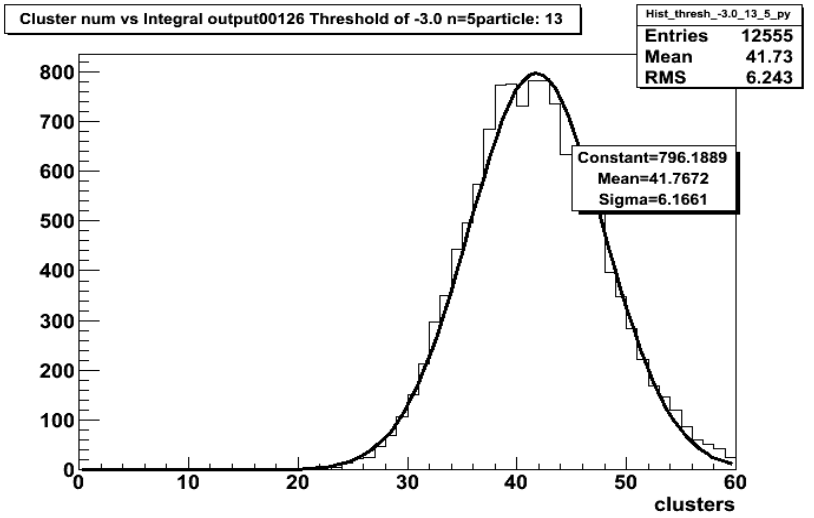
Integral of Signal

Distribution of detected clusters

p=140MeV/c

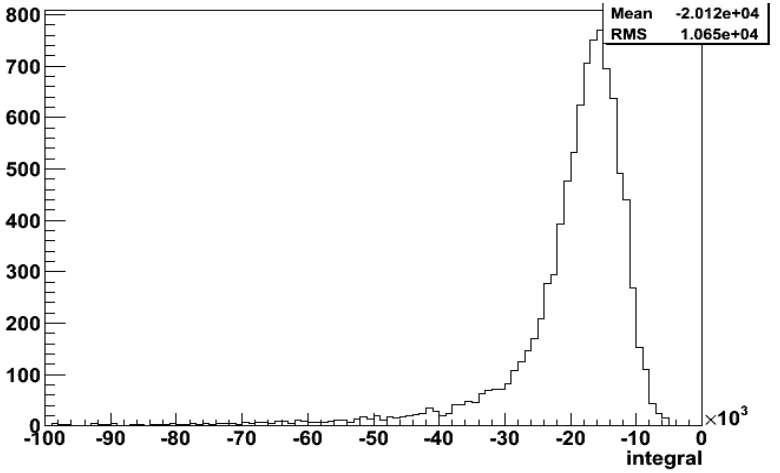
12555 entries

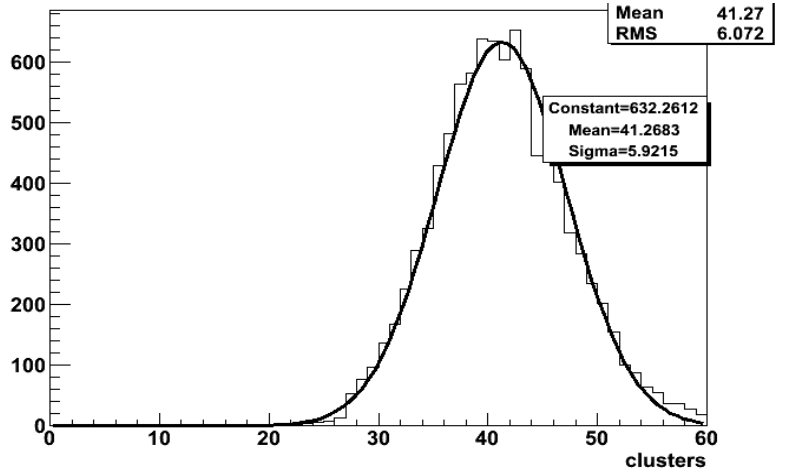




p=180MeV/c

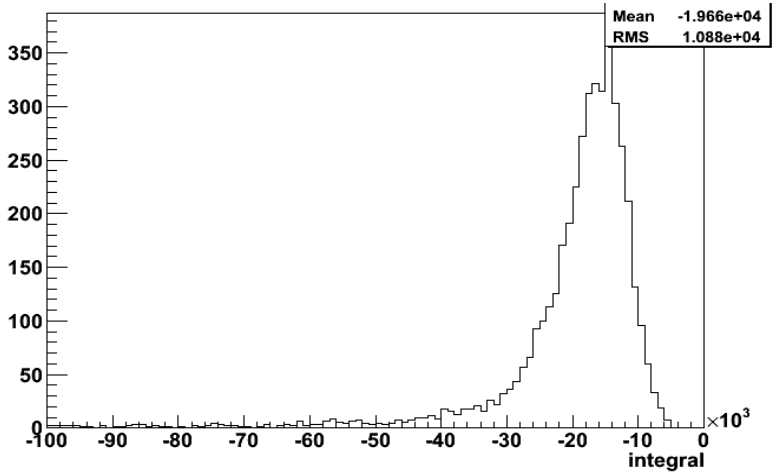
9609 entries

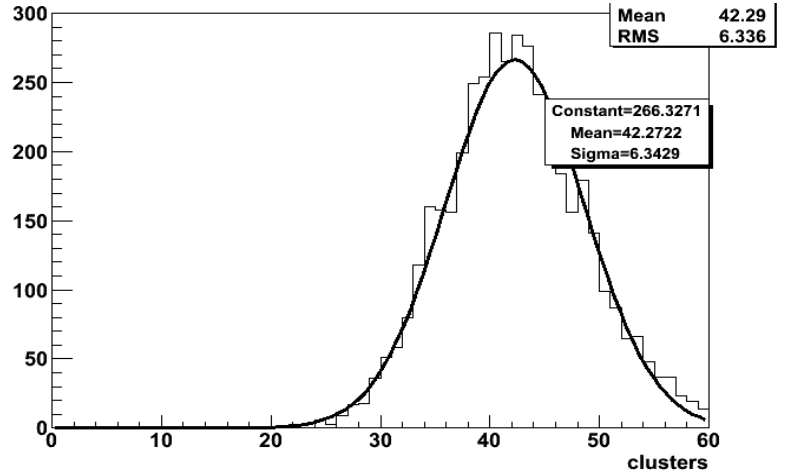




p=220MeV/c

4363 entries





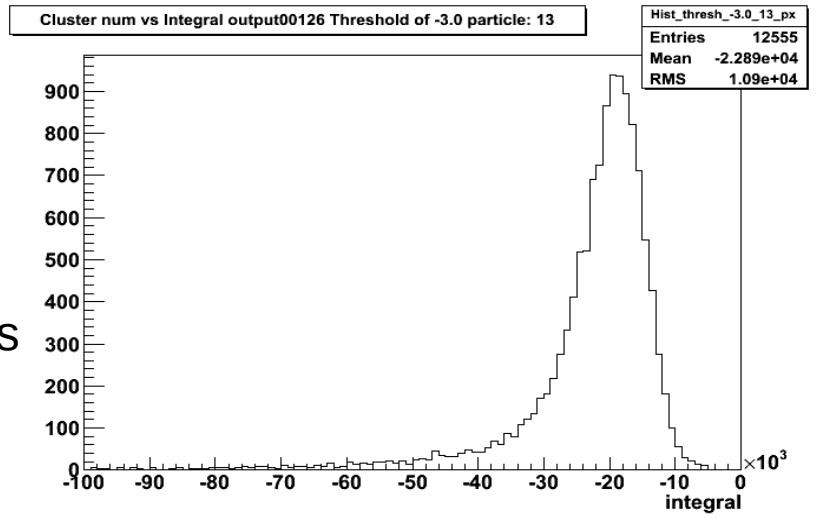
Threshold a=3.3
n=5
Particle = Muon
Gas: 80/20

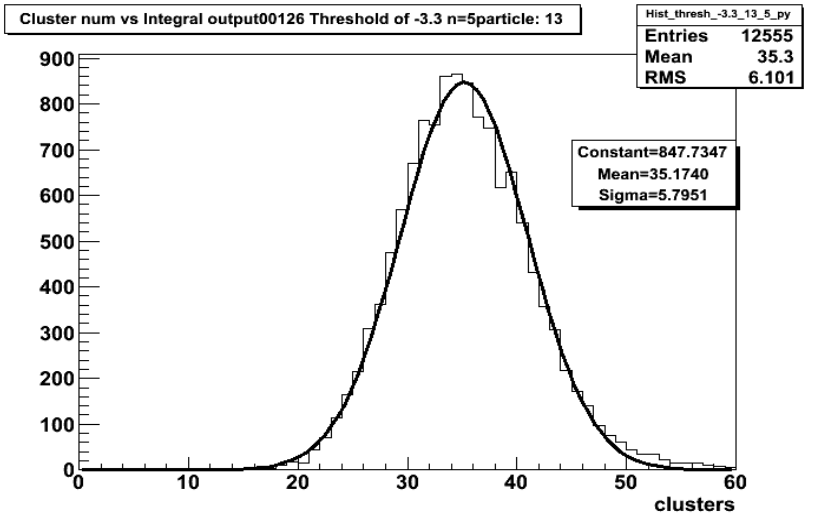
Integral of Signal

Distribution of detected clusters

p=140MeV/c

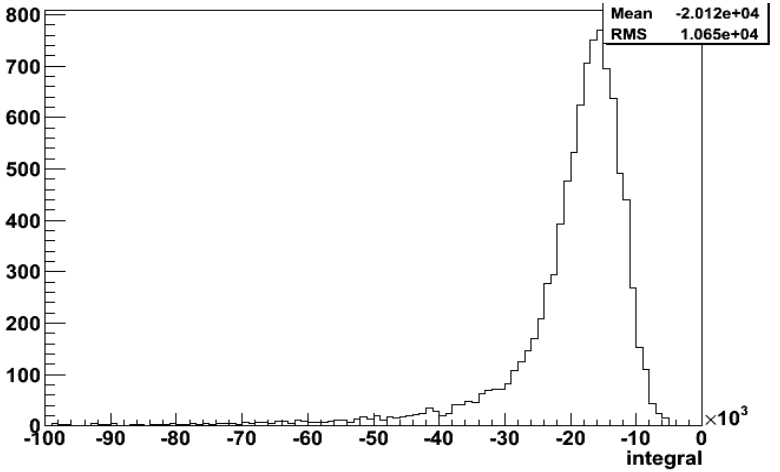
12555 entries

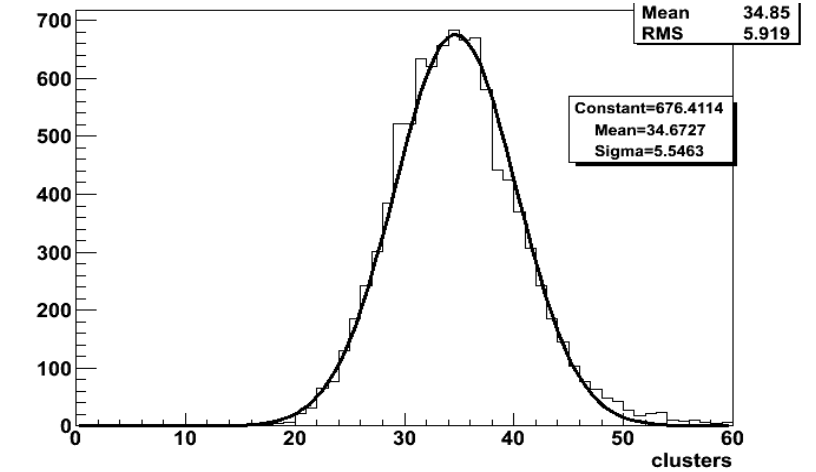




p=180MeV/c

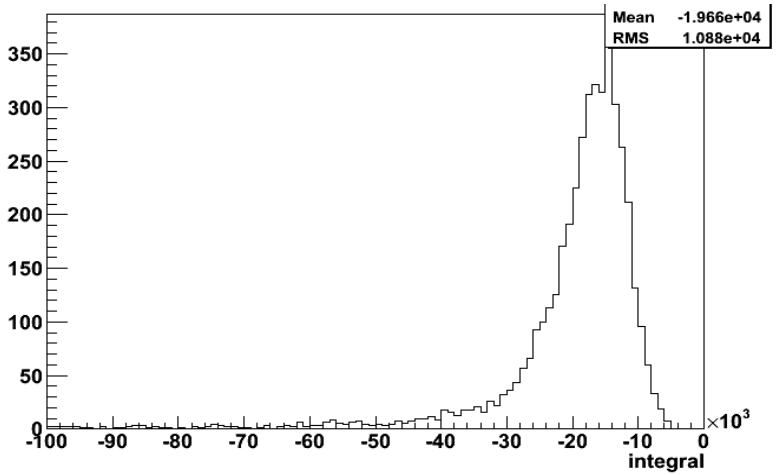
9609 entries

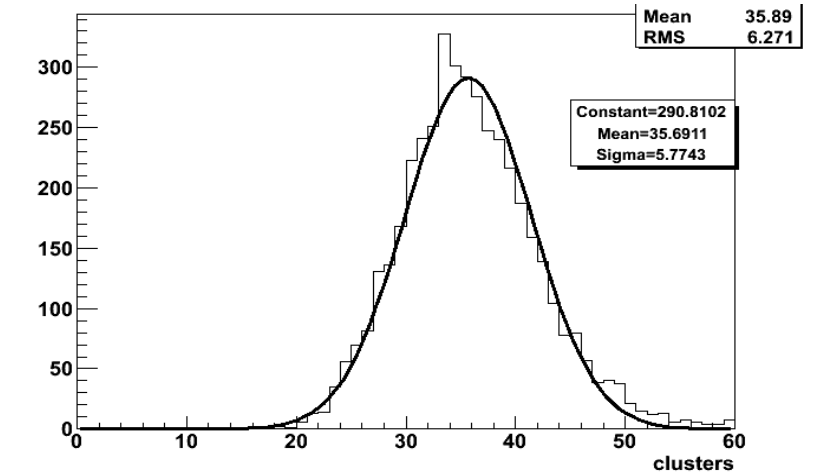




p=220MeV/c

4363 entries





ra

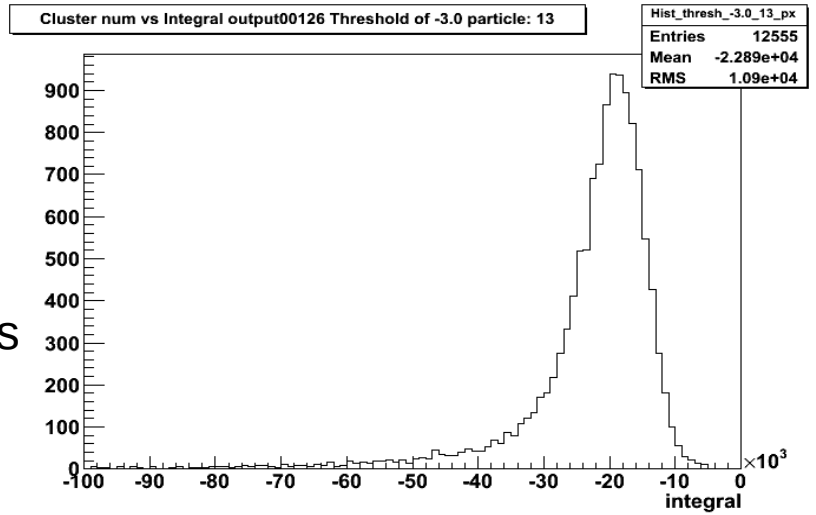
Threshold a=3.5
n=5
Particle = Muon
Gas: 80/20

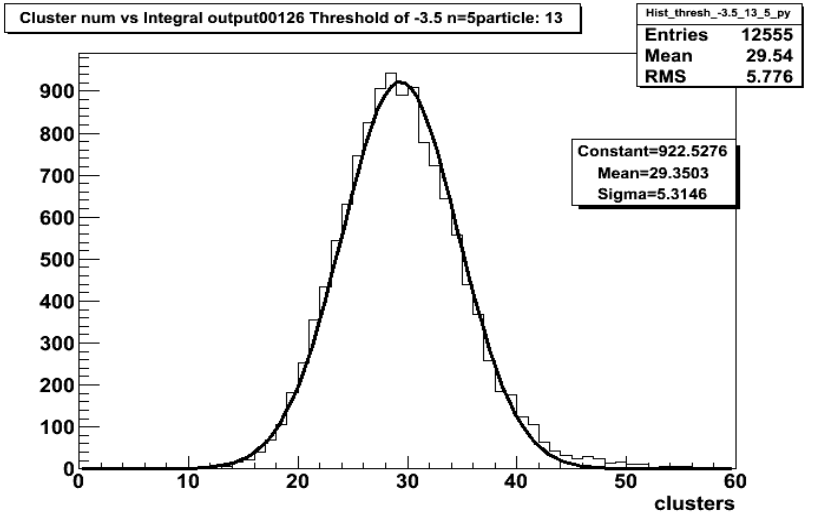
Integral of Signal

Distribution of detected clusters

p=140MeV/c

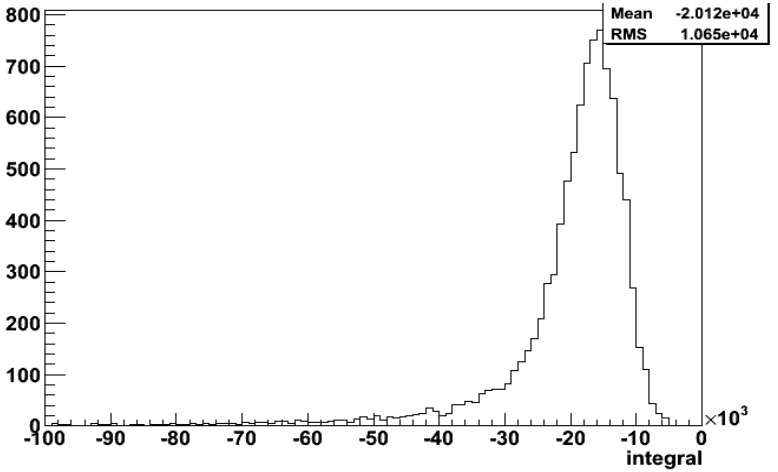
12555 entries

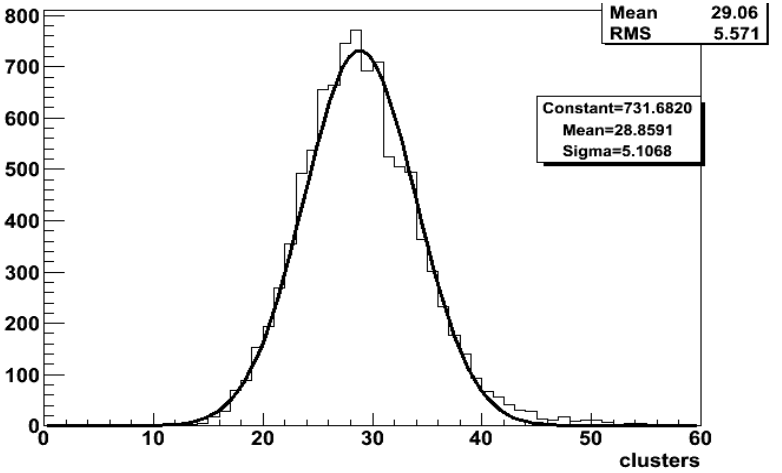




p=180MeV/c

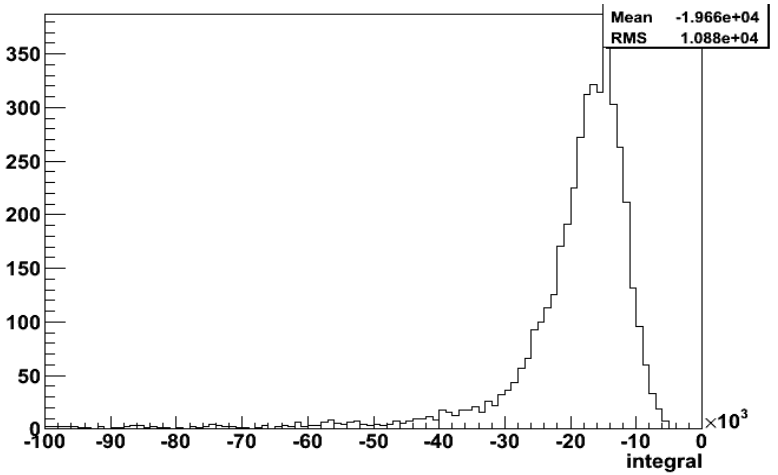
9609 entries

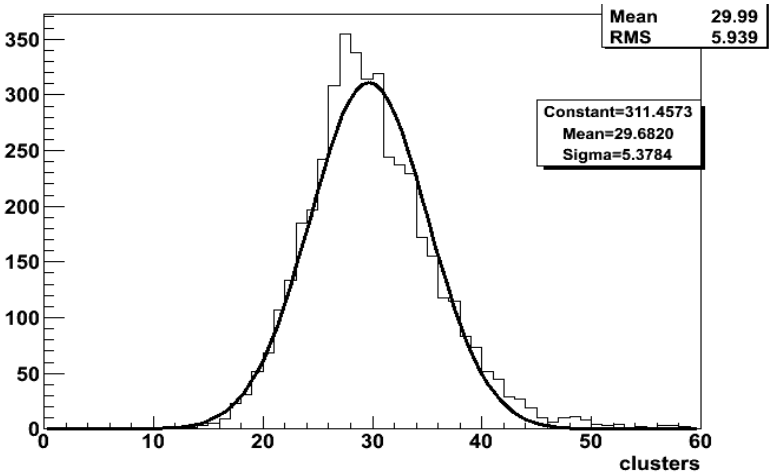




p=220MeV/c

4363 entries





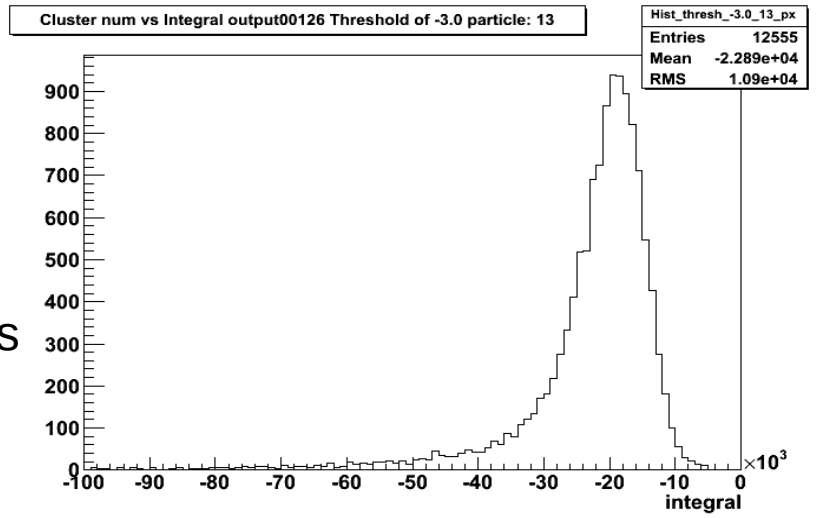
Threshold a=3.7
n=5
Particle = Muon
Gas: 80/20

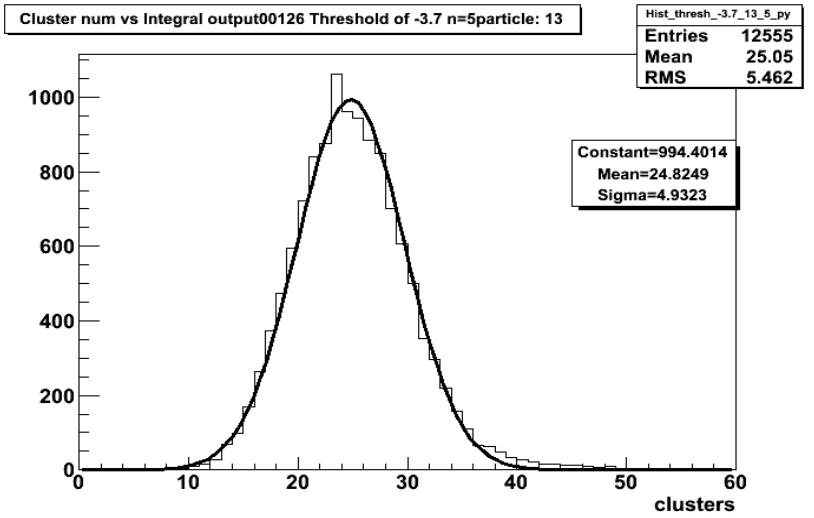
Integral of Signal

Distribution of detected clusters

p=140MeV/c

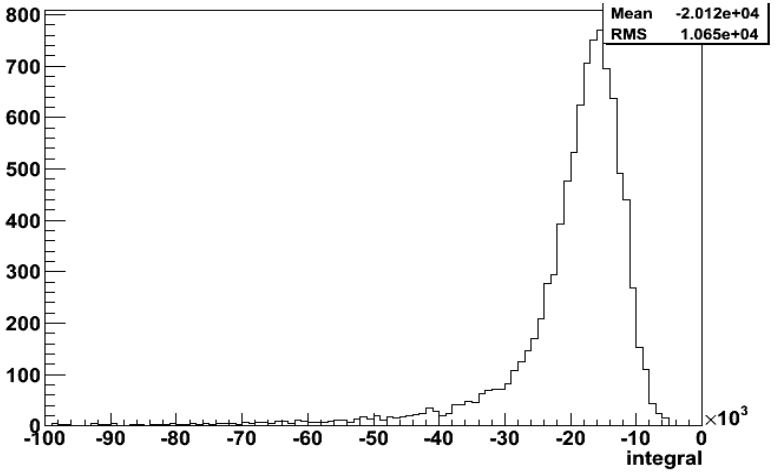
12555 entries

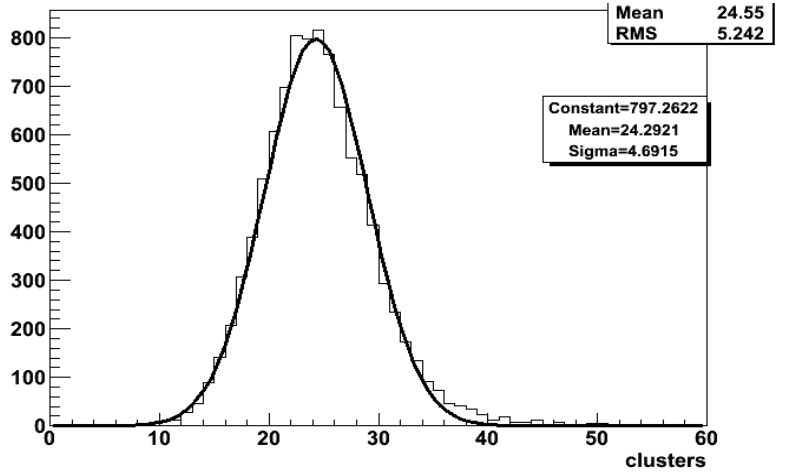




p=180MeV/c

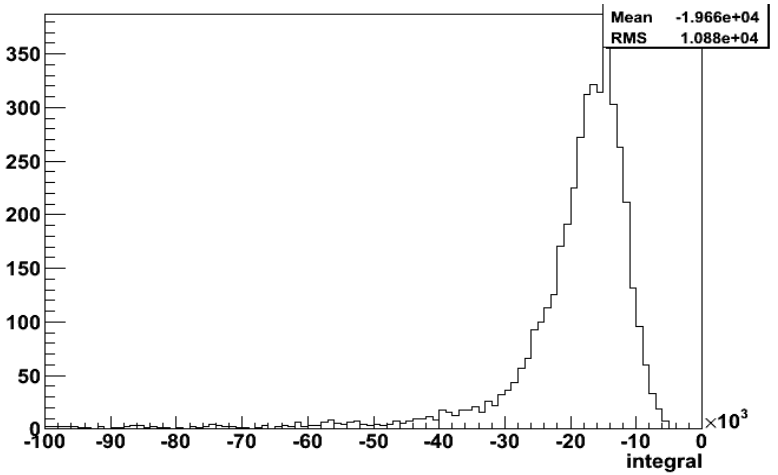
9609 entries

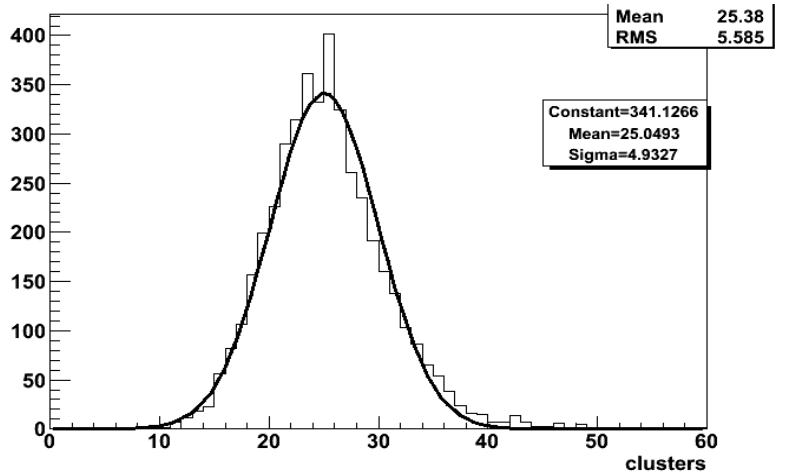




p=220MeV/c

4363 entries





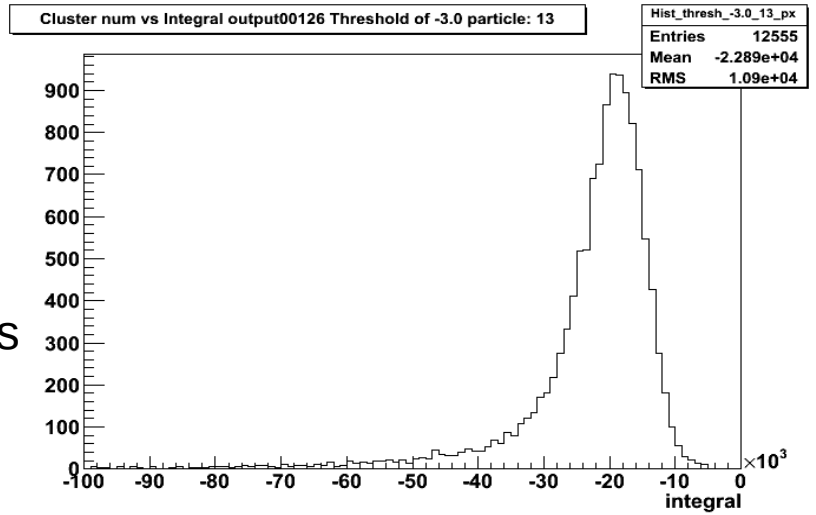
Threshold a=4
n=5
Particle = Muon
Gas: 80/20

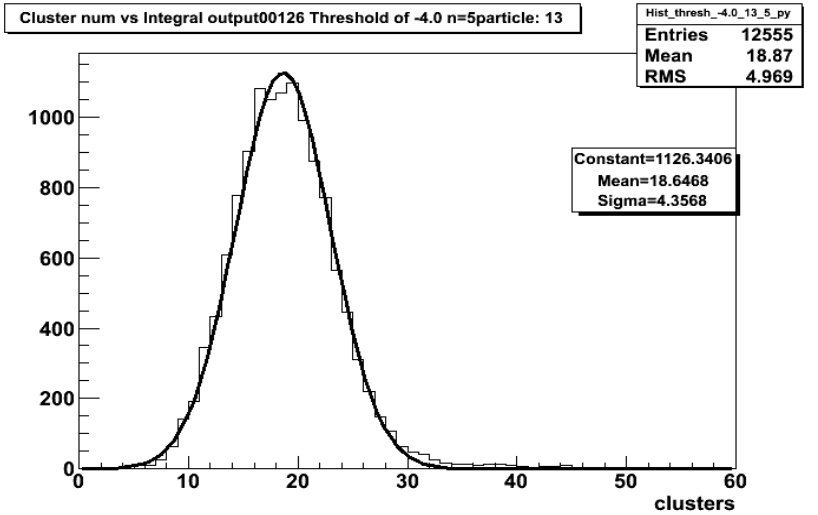
Integral of Signal

Distribution of detected clusters

p=140MeV/c

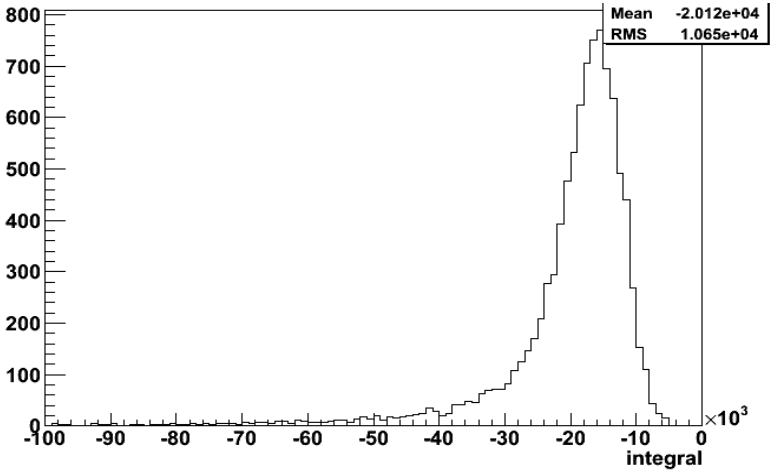
12555 entries

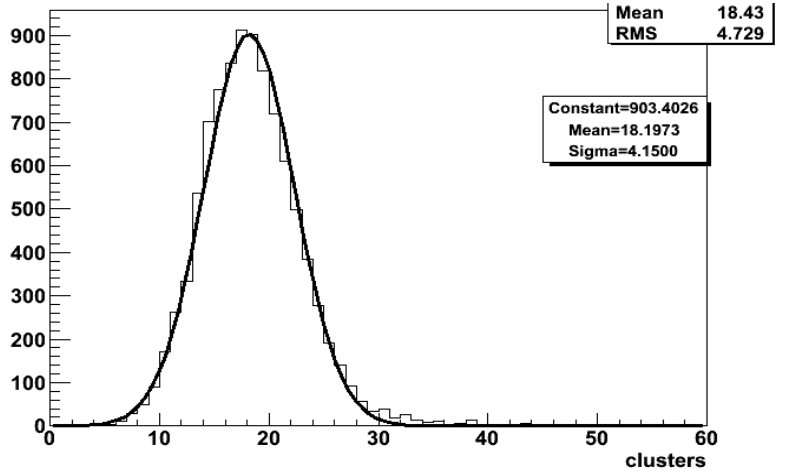




p=180MeV/c

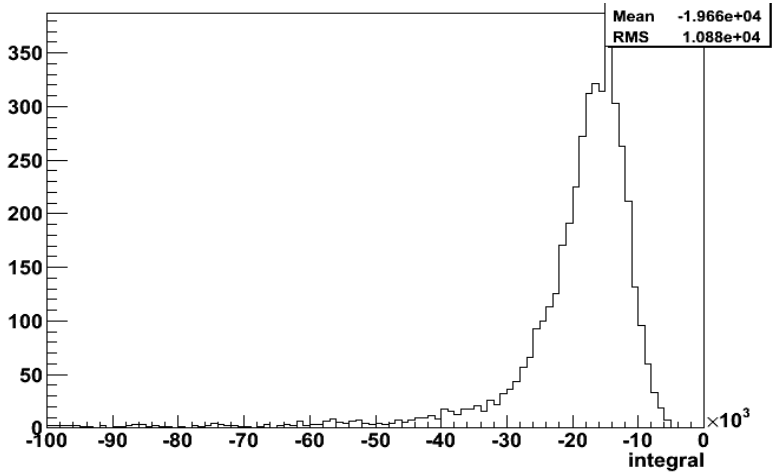
9609 entries

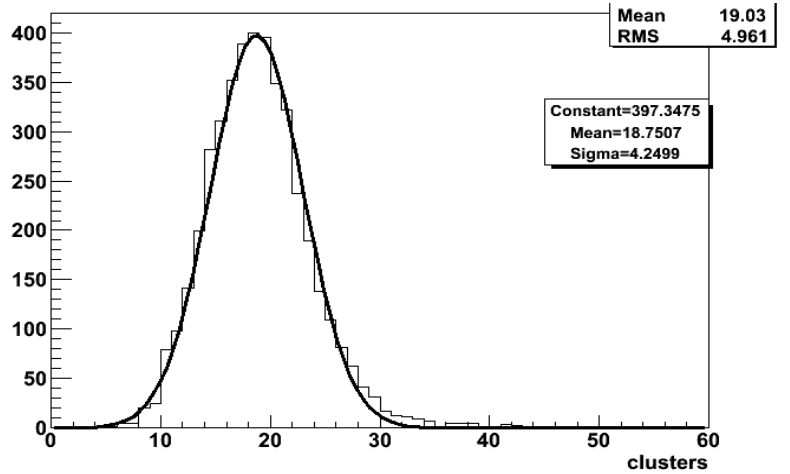




p=220MeV/c

4363 entries





ra

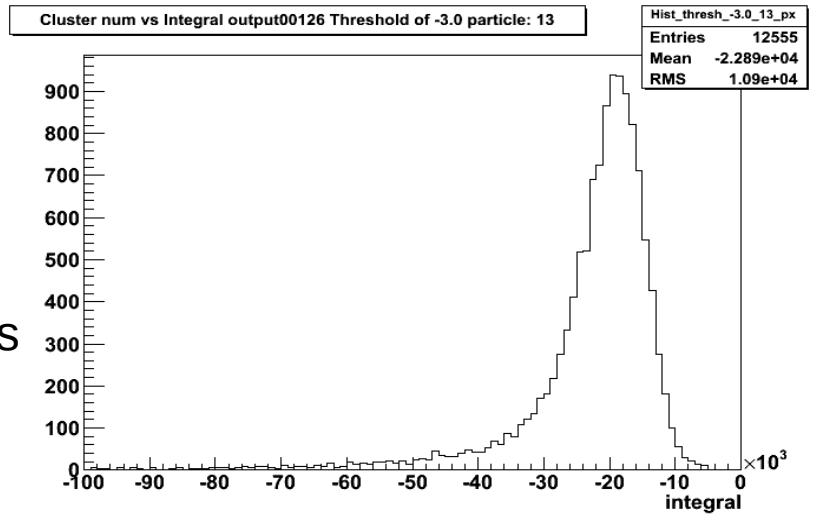
Threshold a=5
n=5
Particle = Muon
Gas: 80/20

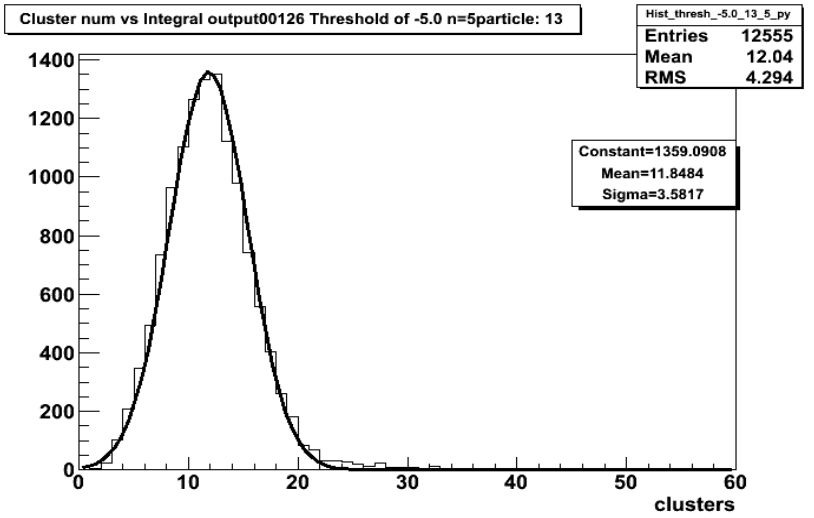
Integral of Signal

Distribution of detected clusters

p=140MeV/c

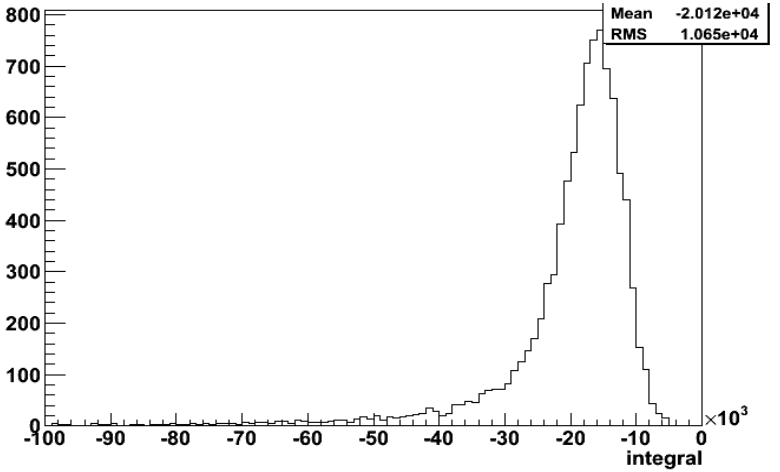
12555 entries

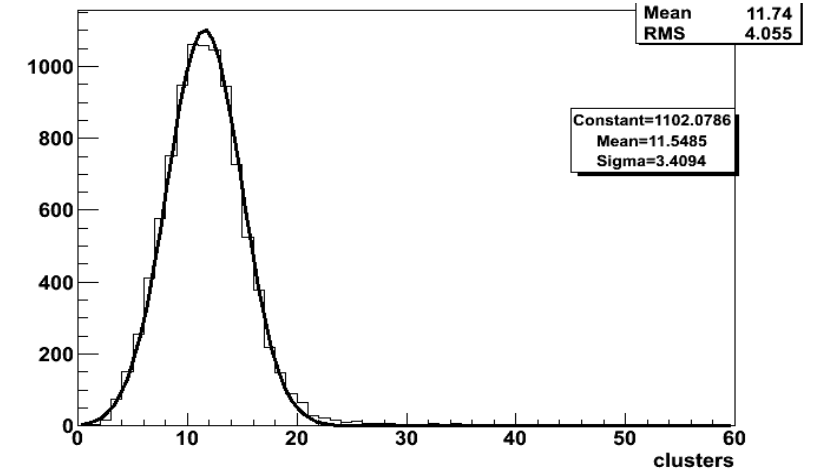




p=180MeV/c

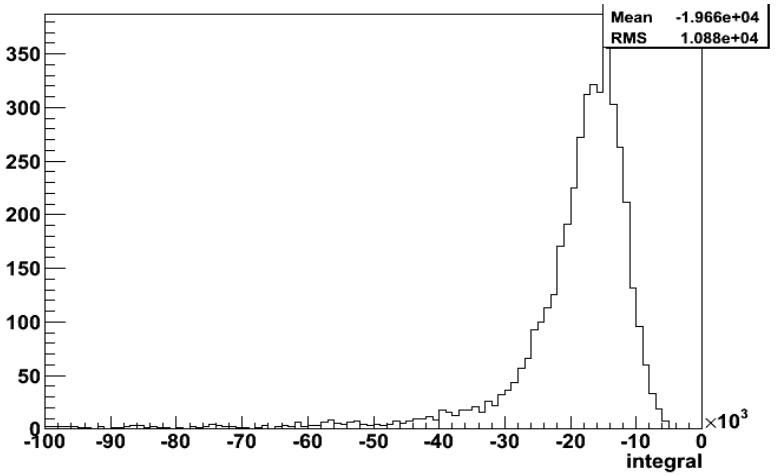
9609 entries

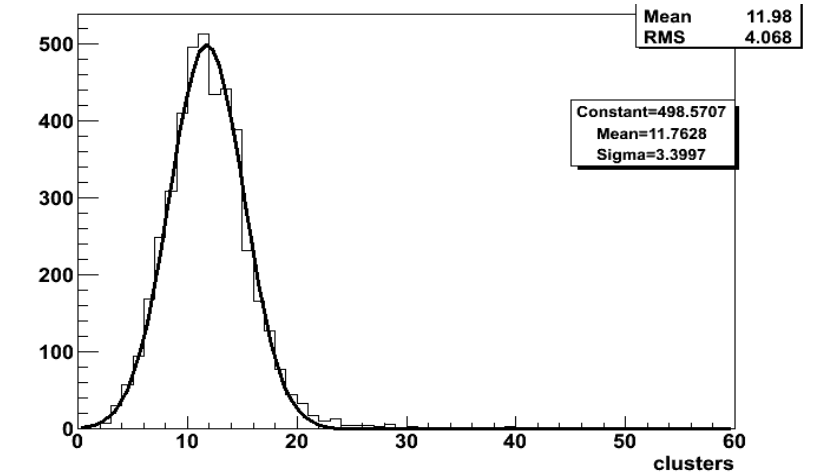




p=220MeV/c

4363 entries



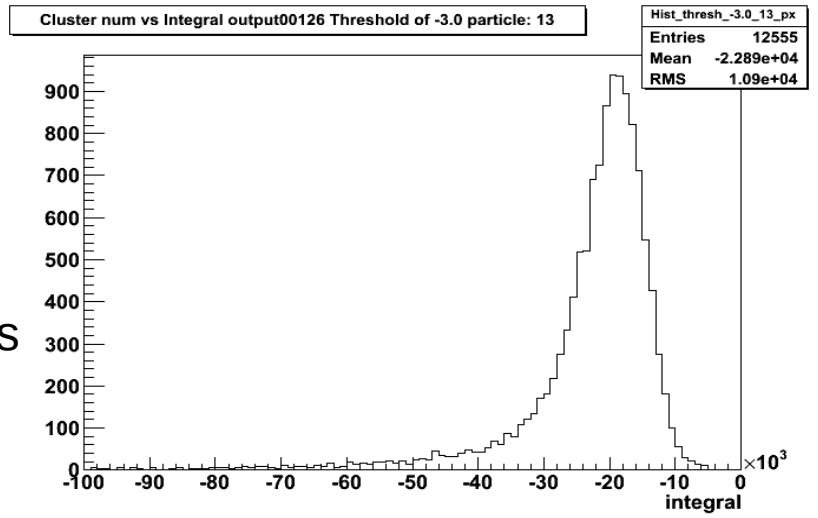


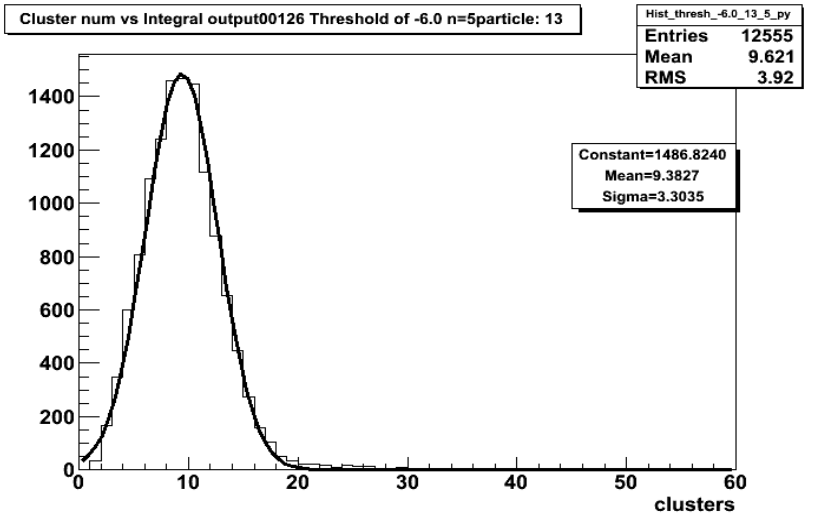
Threshold a=6
n=5
Particle = Muon
Gas: 80/20

Distribution of detected clusters

p=140MeV/c

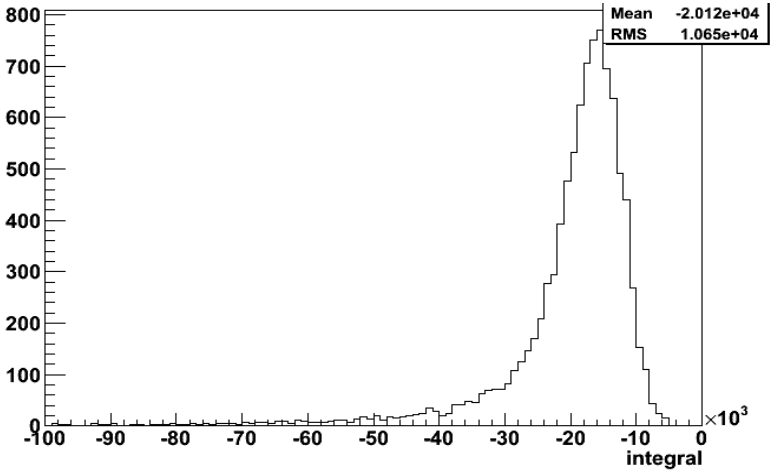
12555 entries

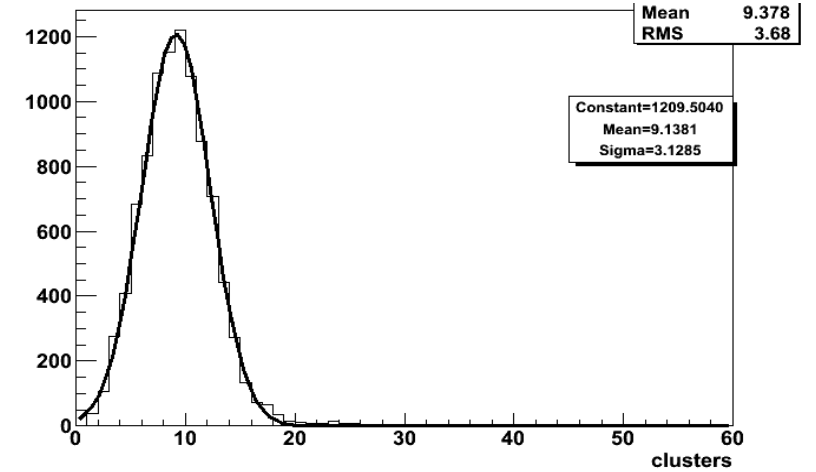




p=180MeV/c

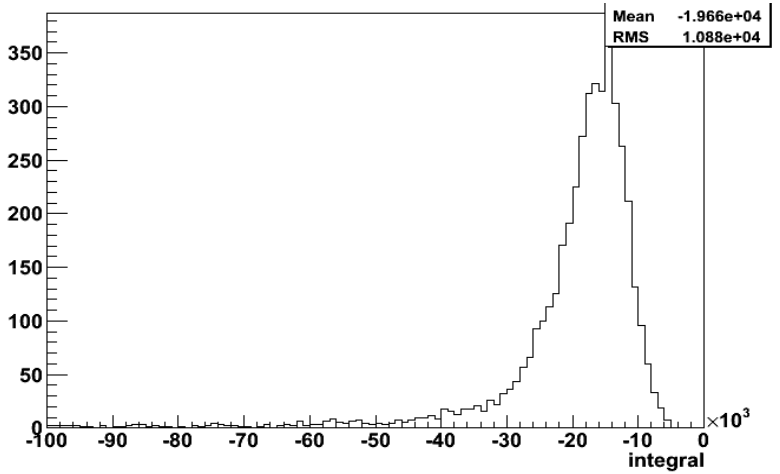
9609 entries

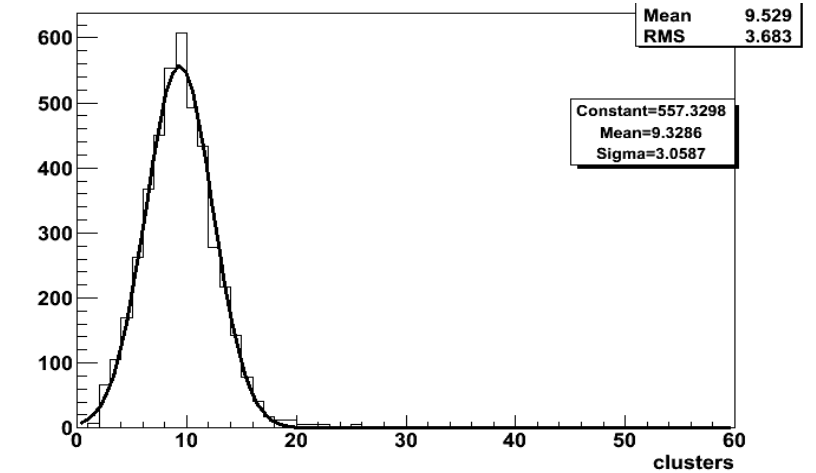




p=220MeV/c

4363 entries





ra

Muons, n=3
80/20

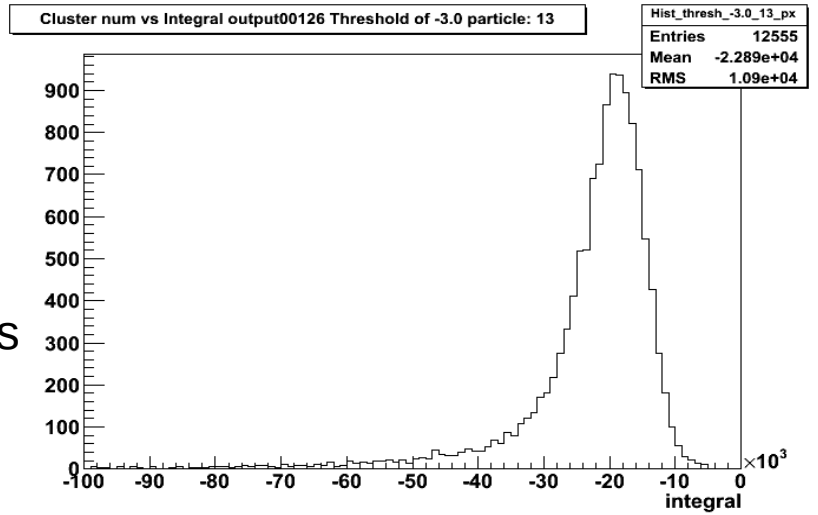
Threshold a=3
n=3
Particle = Muon
Gas: 80/20

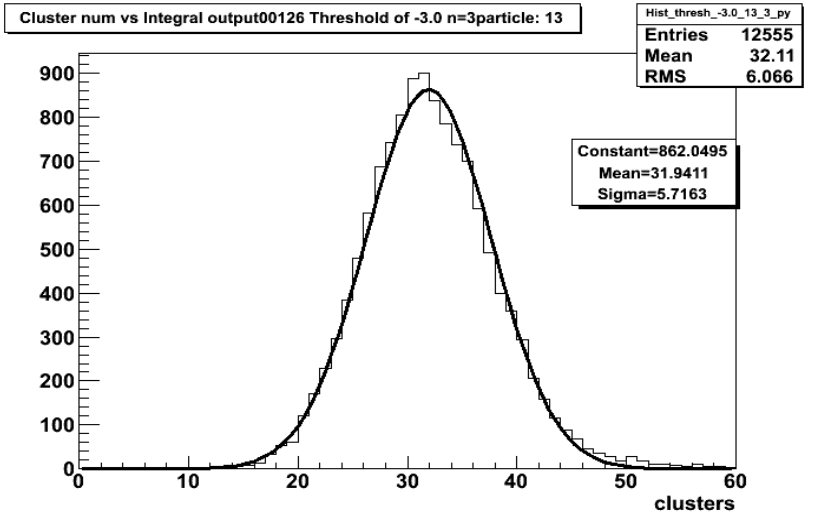
Integral of Signal

Distribution of detected clusters

p=140MeV/c

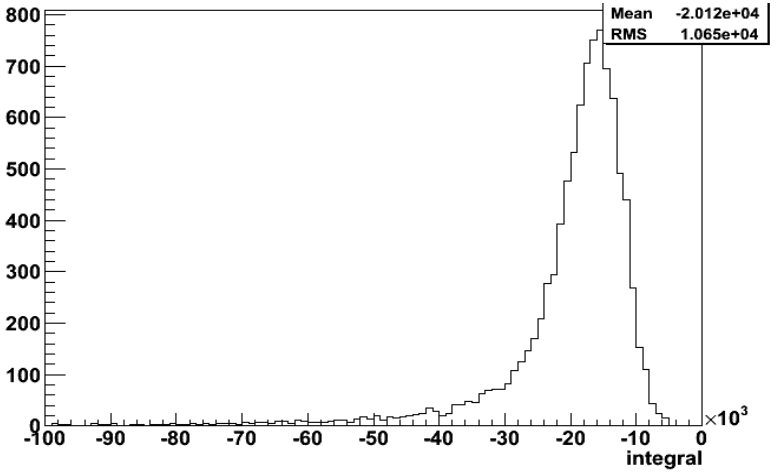
12555 entries

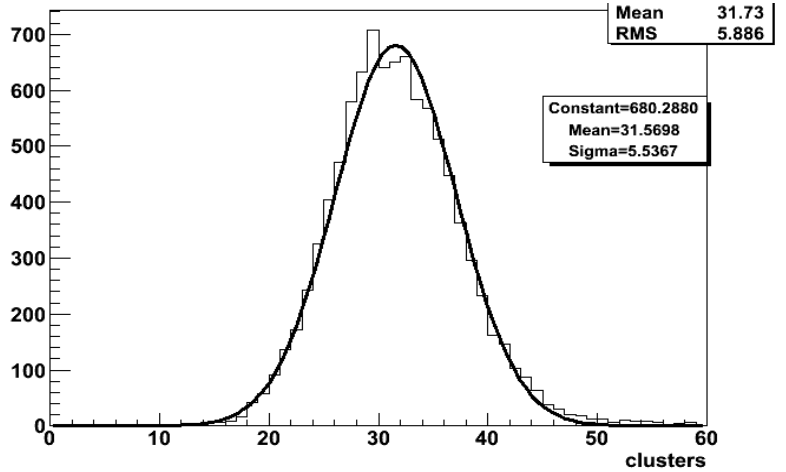




p=180MeV/c

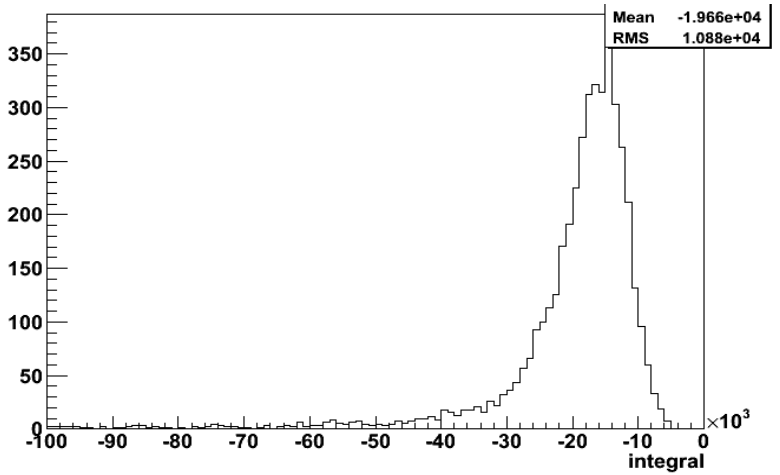
9609 entries

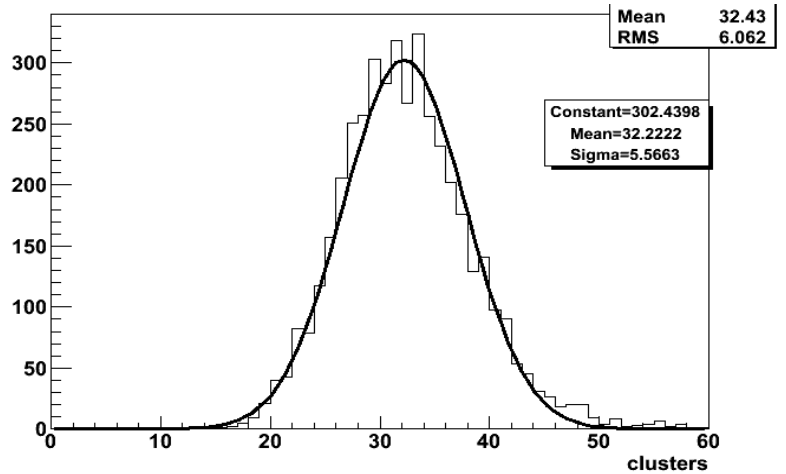




p=220MeV/c

4363 entries





ra

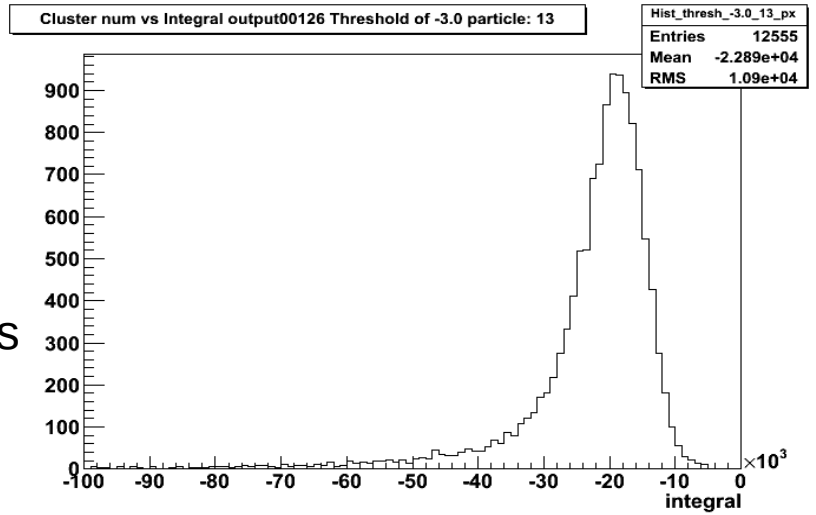
Threshold a=3.3
n=3
Particle = Muon
Gas: 80/20

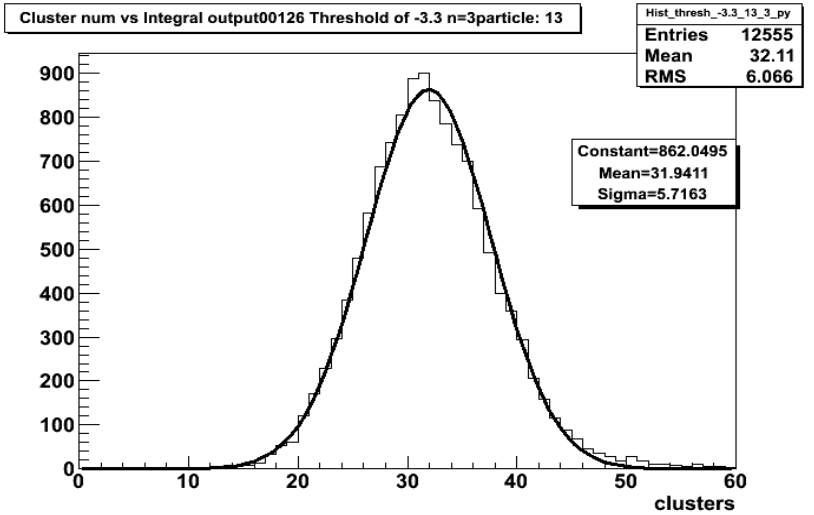
Integral of Signal

Distribution of detected clusters

p=140MeV/c

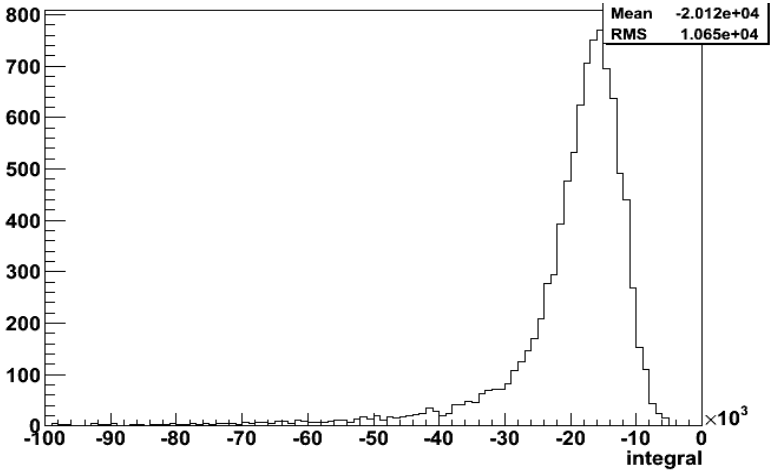
12555 entries

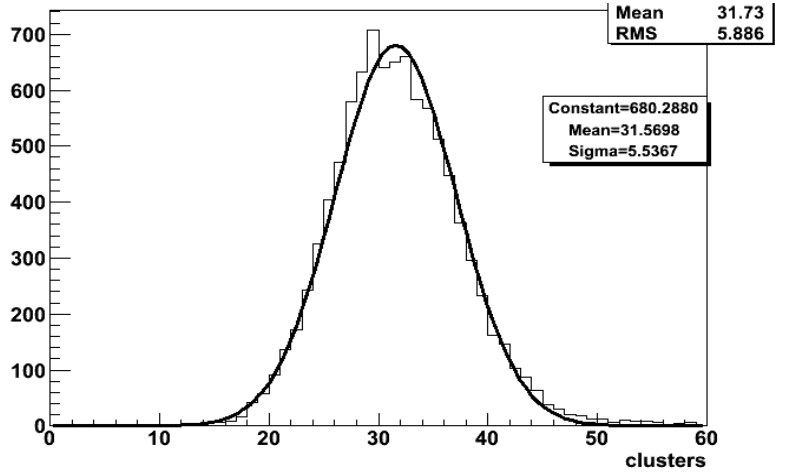




p=180MeV/c

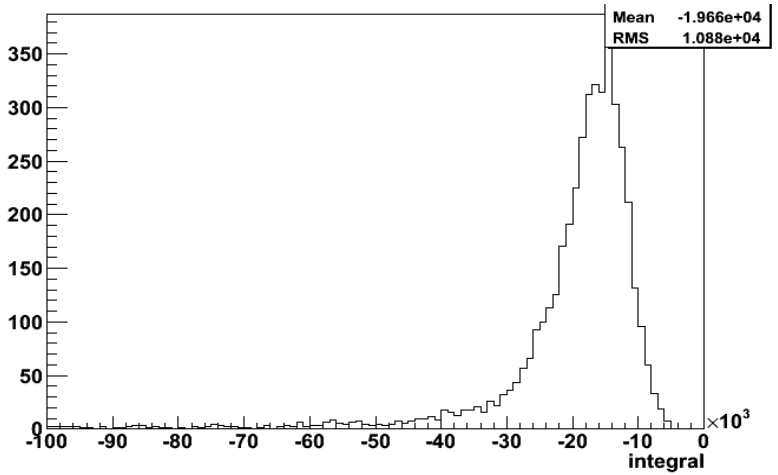
9609 entries

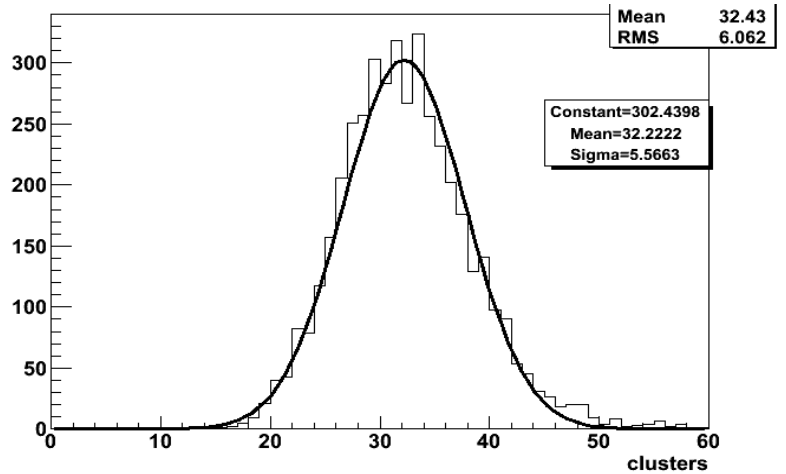




p=220MeV/c

4363 entries





ra

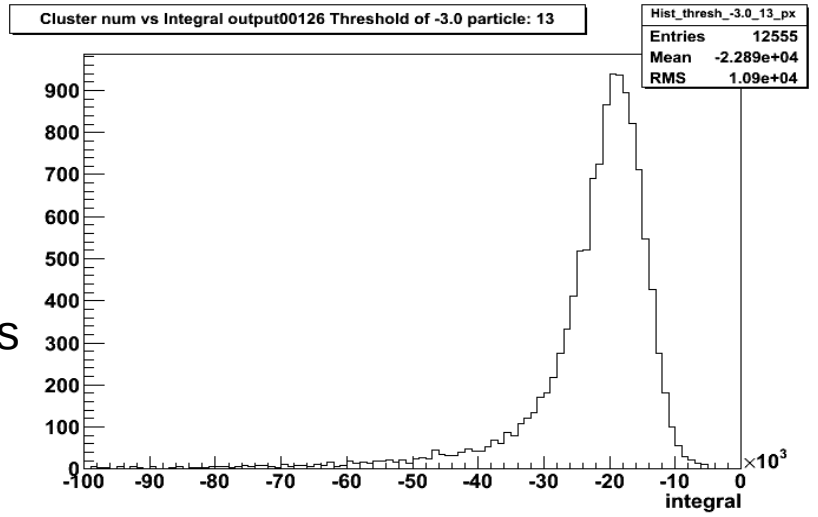
Threshold a=3.5
n=3
Particle = Muon
Gas: 80/20

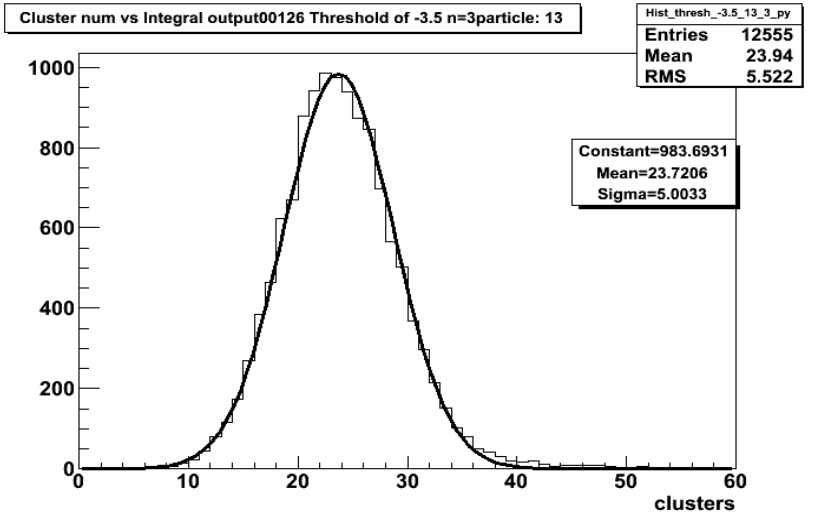
Integral of Signal

Distribution of detected clusters

p=140MeV/c

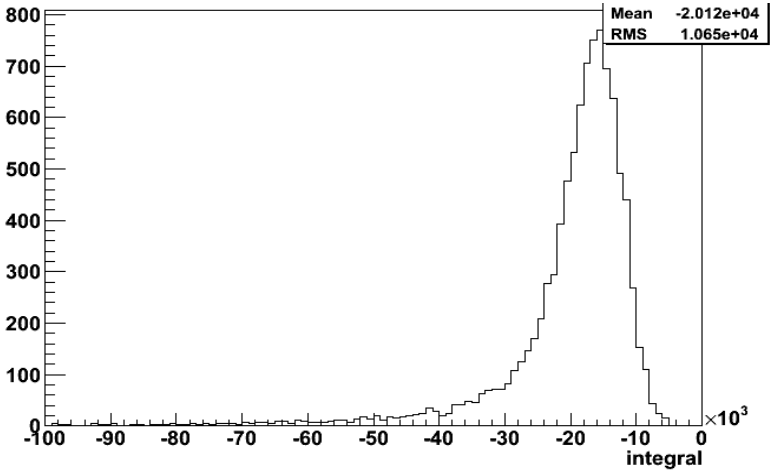
12555 entries

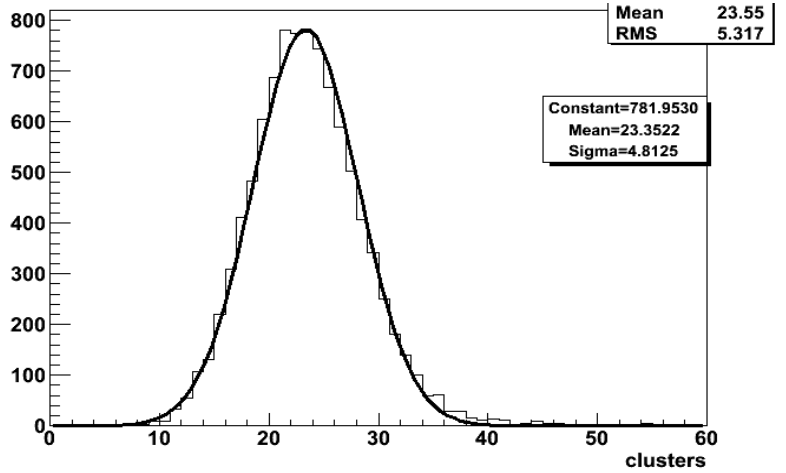




p=180MeV/c

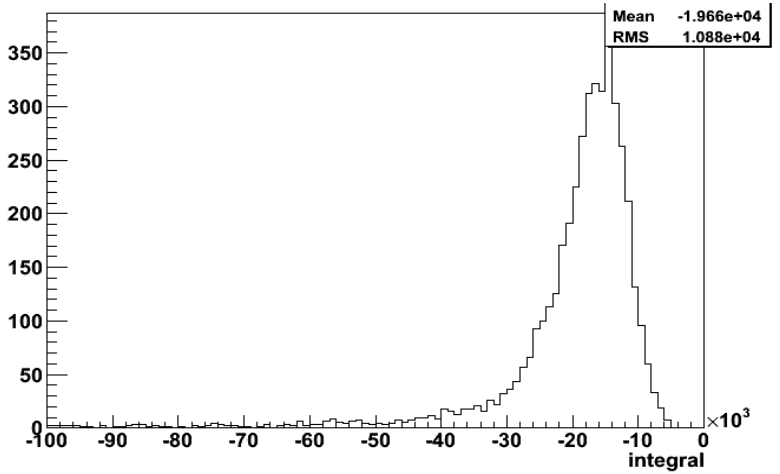
9609 entries

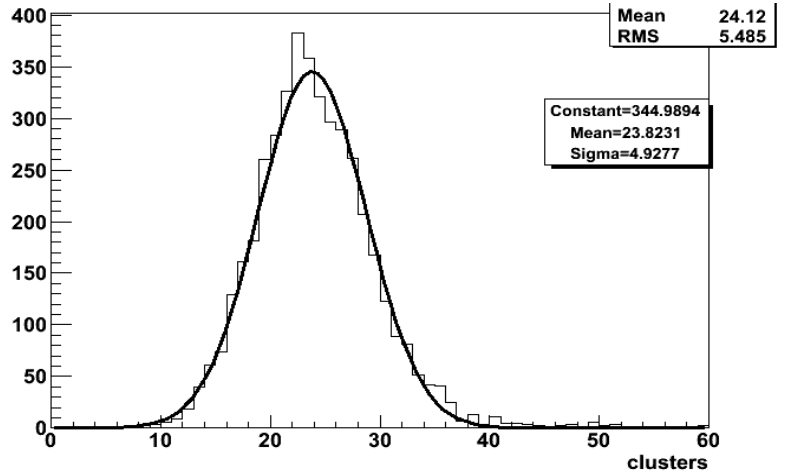




p=220MeV/c

4363 entries





ra

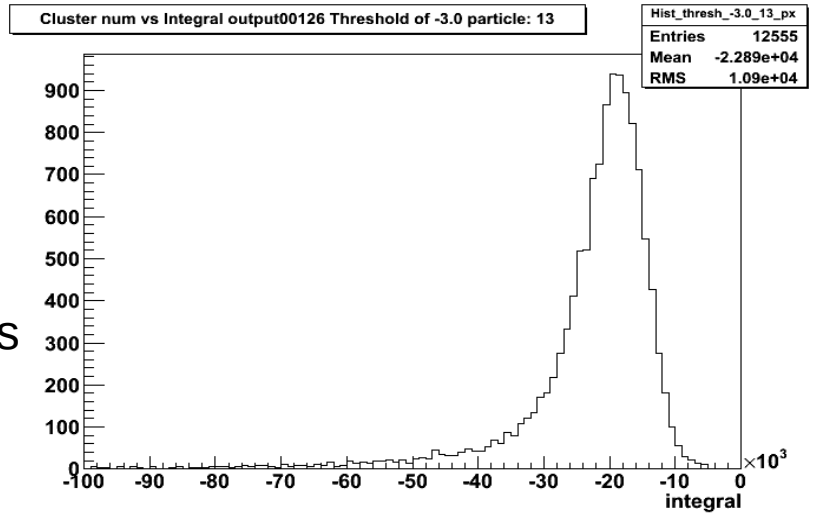
Threshold a=3.7
n=3
Particle = Muon
Gas: 80/20

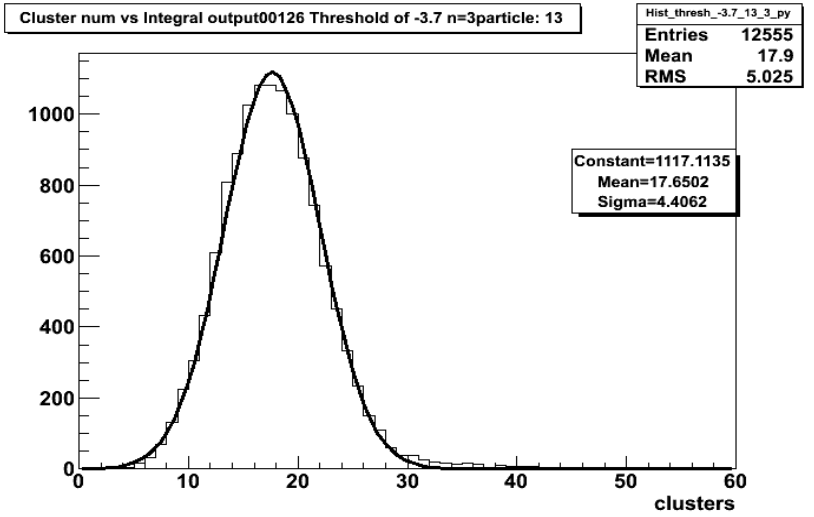
Integral of Signal

Distribution of detected clusters

p=140MeV/c

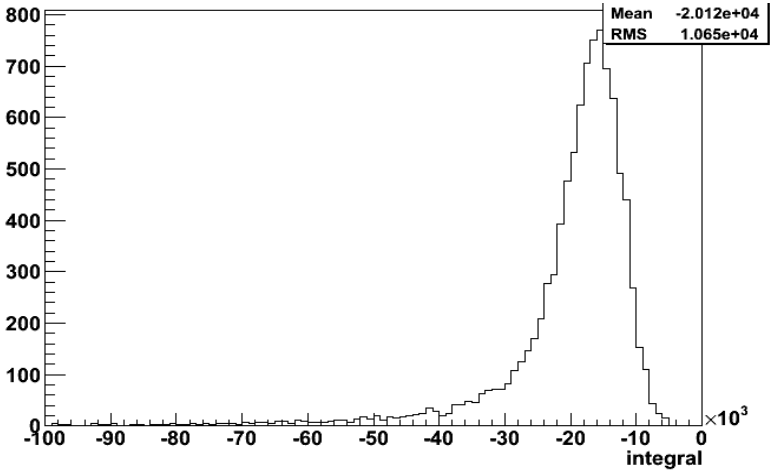
12555 entries

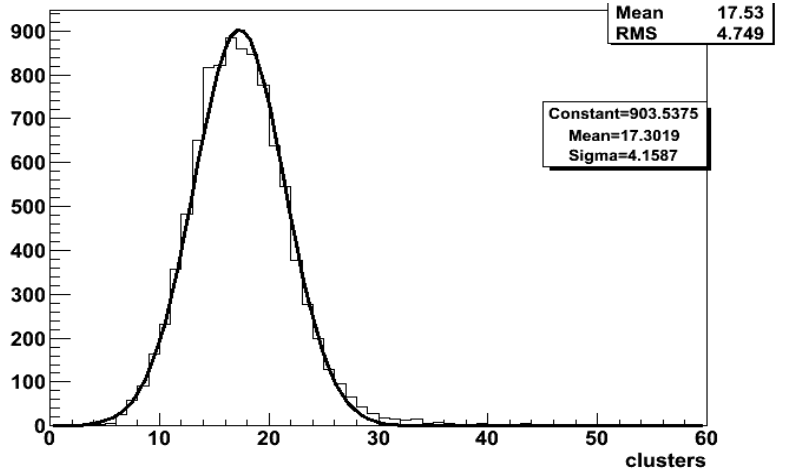




p=180MeV/c

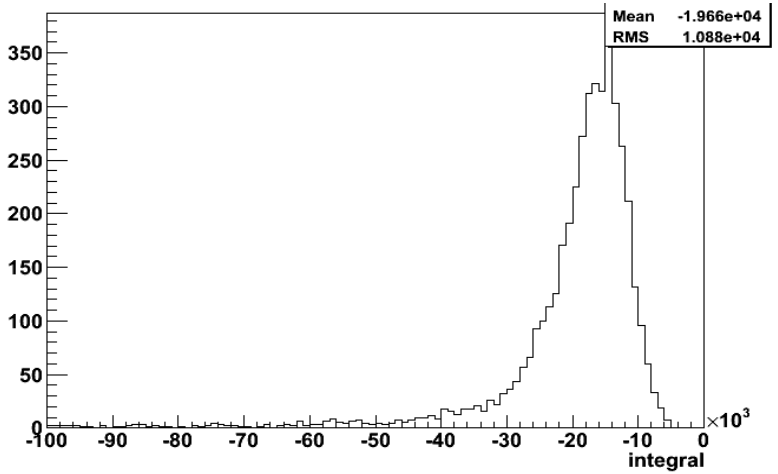
9609 entries

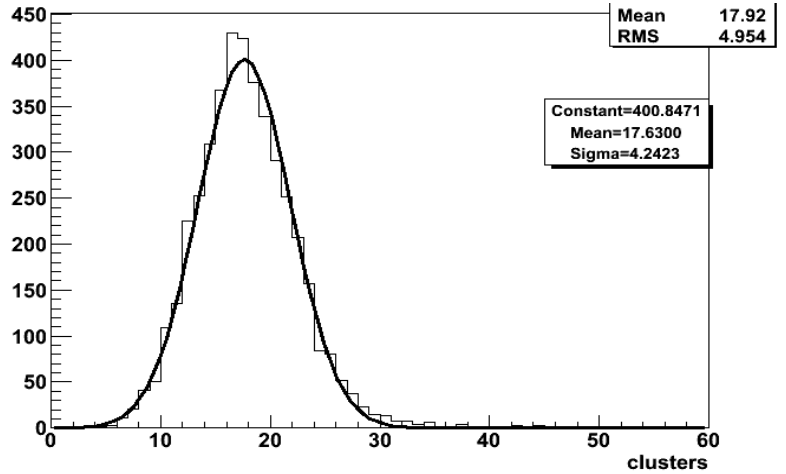




p=220MeV/c

4363 entries





ra

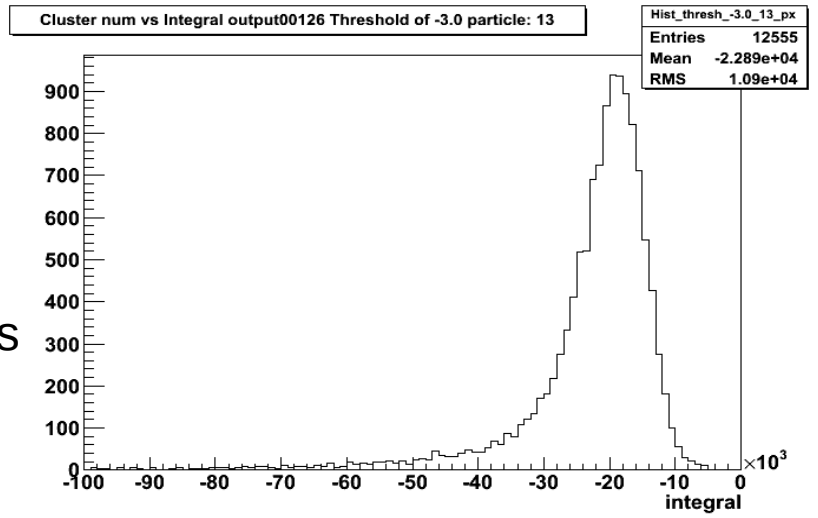
Threshold a=4
n=3
Particle = Muon
Gas: 80/20

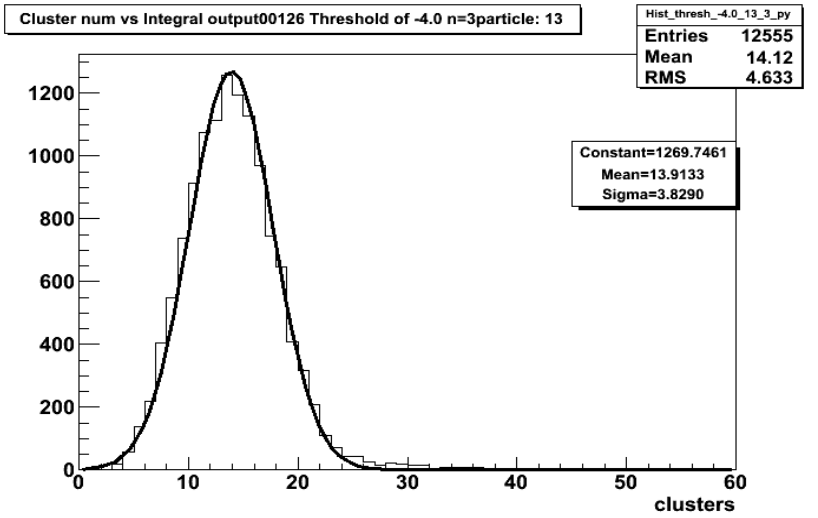
Integral of Signal

Distribution of detected clusters

p=140MeV/c

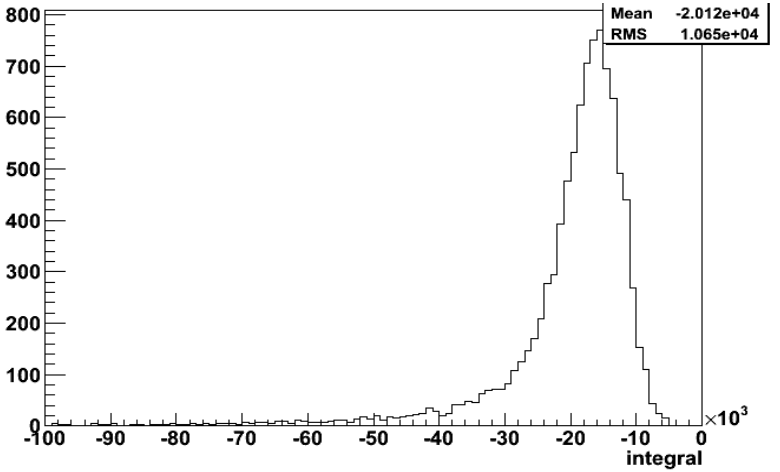
12555 entries

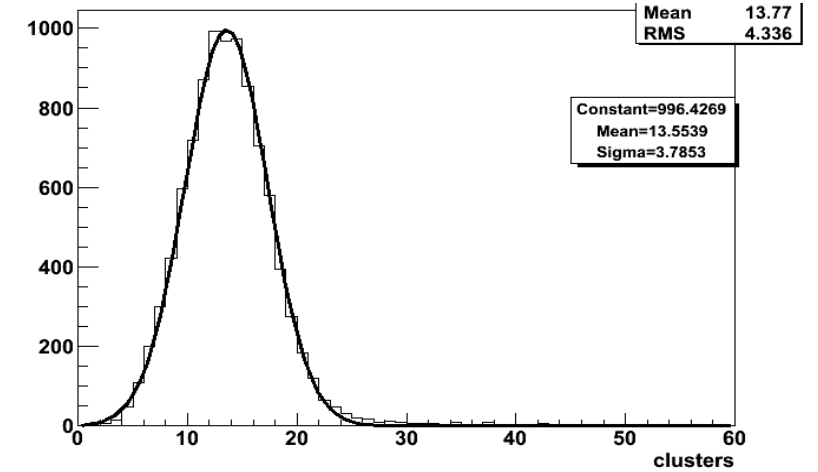




p=180MeV/c

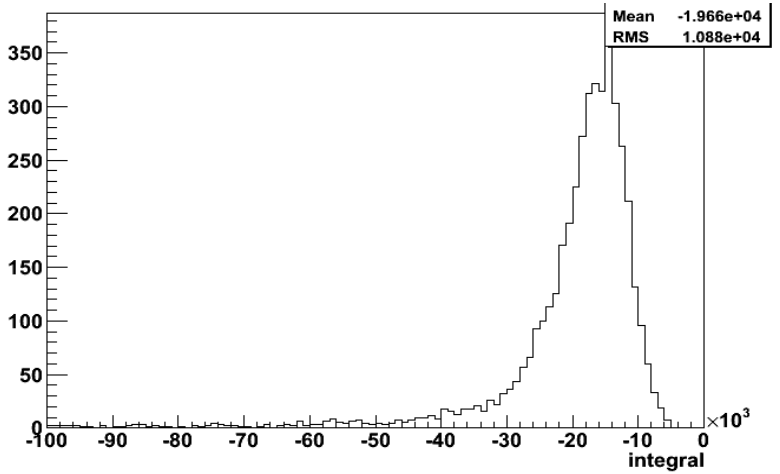
9609 entries

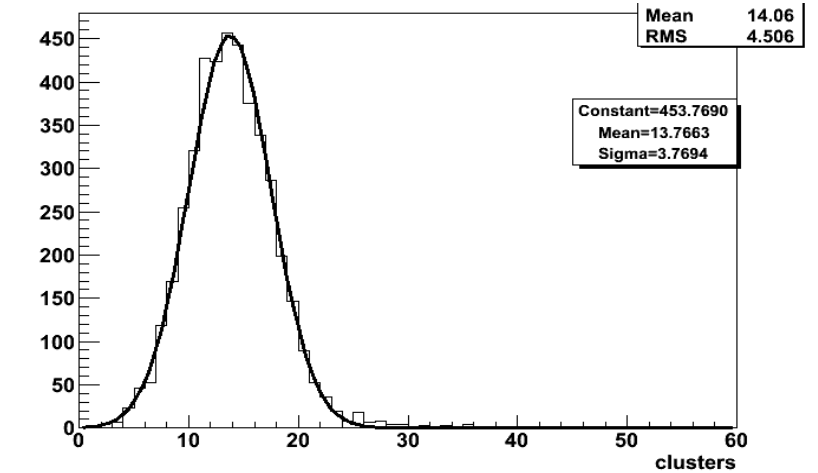




p=220MeV/c

4363 entries





ra

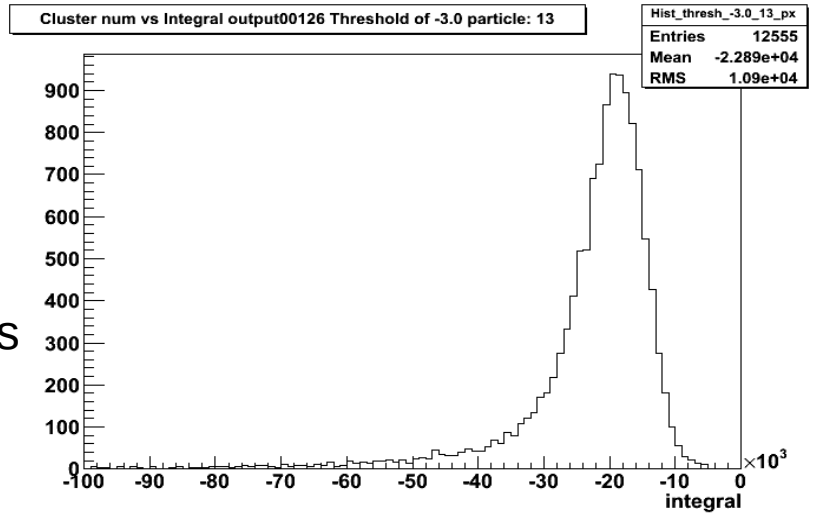
Threshold a=5
n=3
Particle = Muon
Gas: 80/20

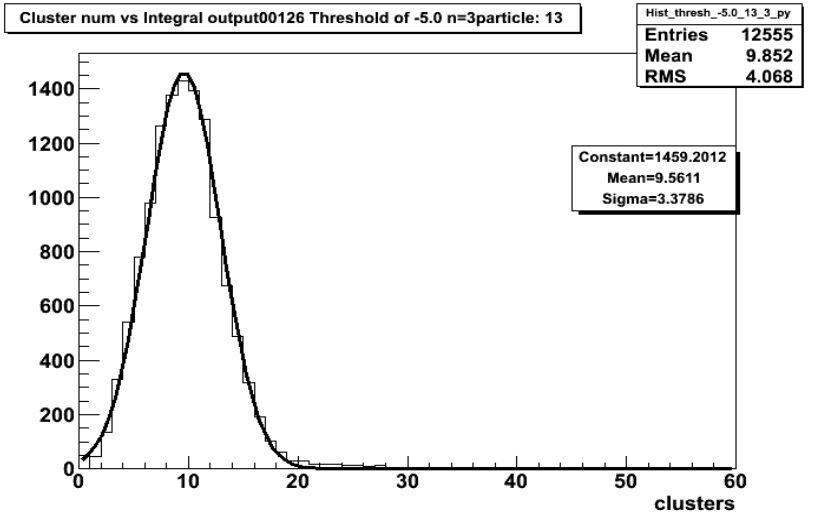
Integral of Signal

Distribution of detected clusters

p=140MeV/c

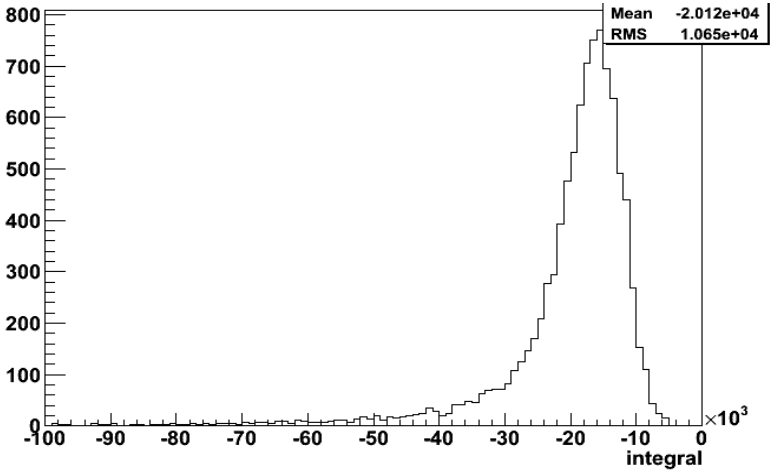
12555 entries

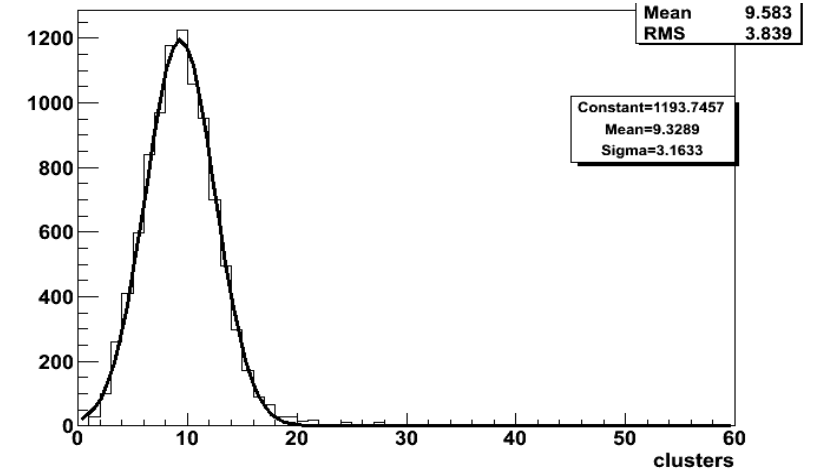




p=180MeV/c

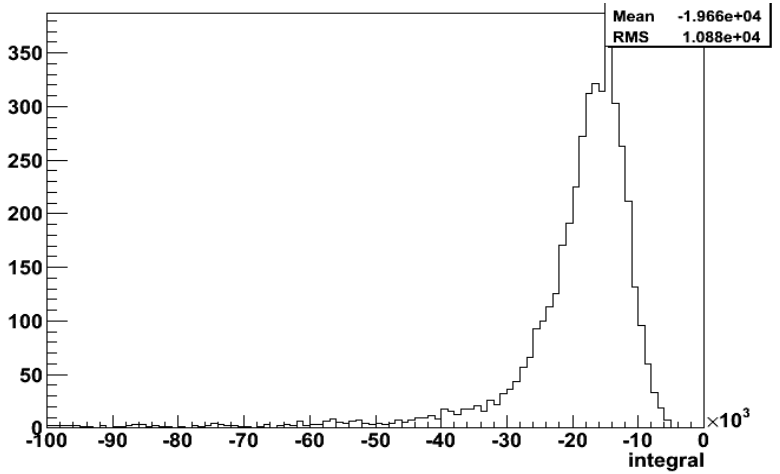
9609 entries

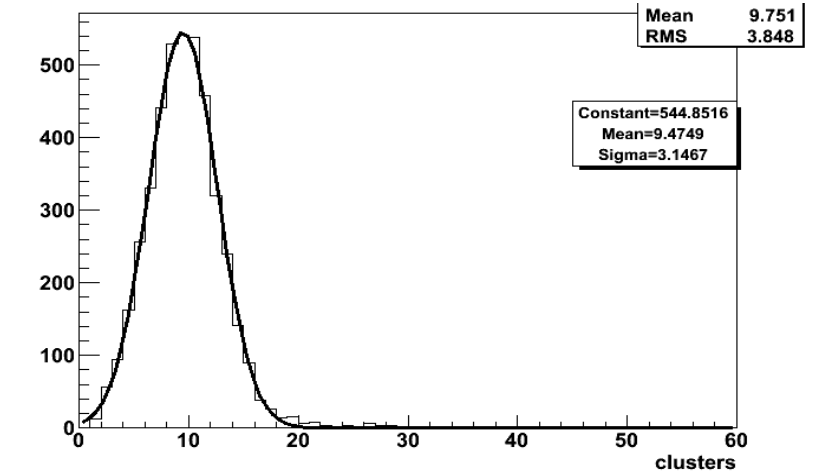




p=220MeV/c

4363 entries





ra

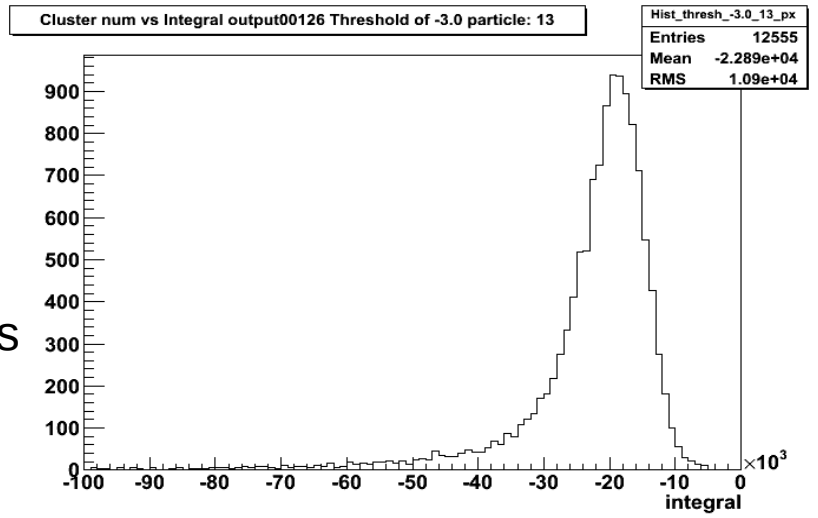
Threshold a=6
n=3
Particle = Muon
Gas: 80/20

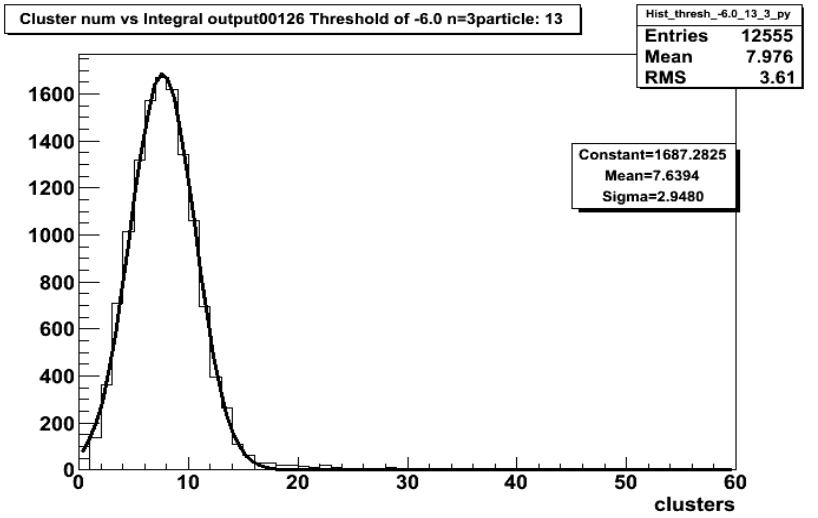
Integral of Signal

Distribution of detected clusters

p=140MeV/c

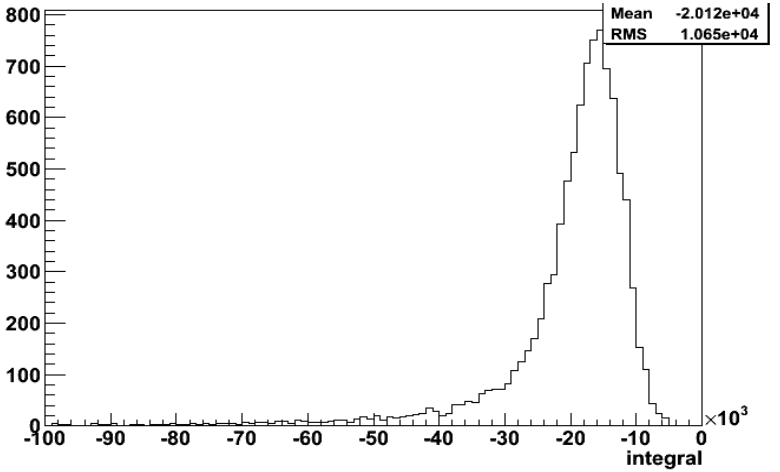
12555 entries

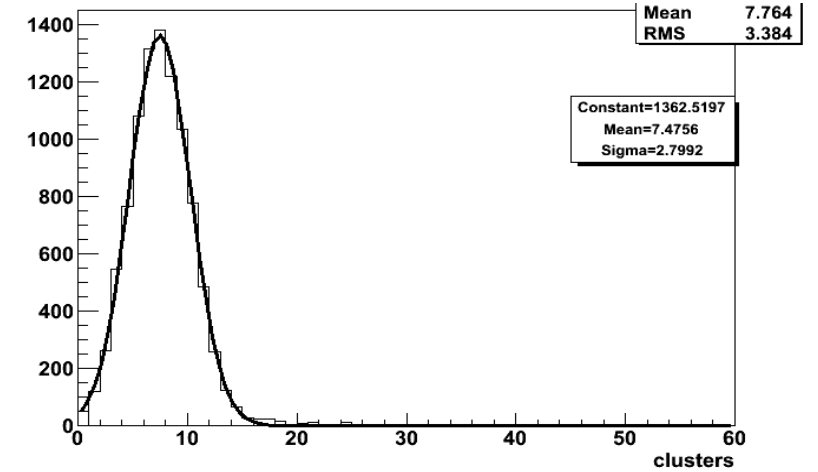




p=180MeV/c

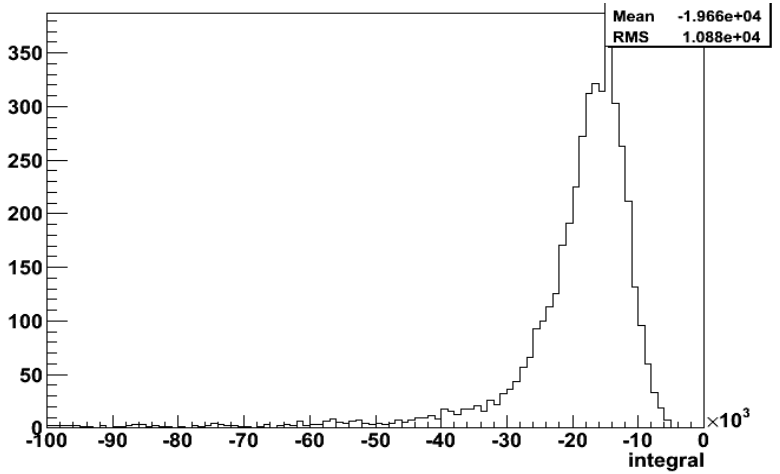
9609 entries

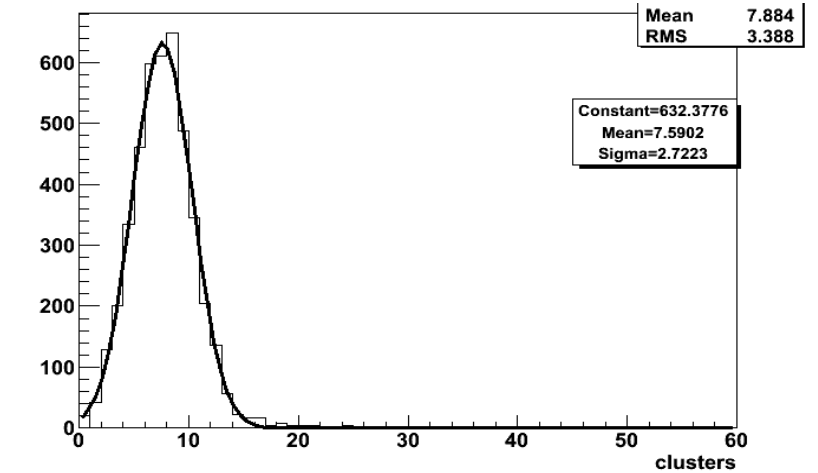




p=220MeV/c

4363 entries





ra

Pions, n=5
90/10

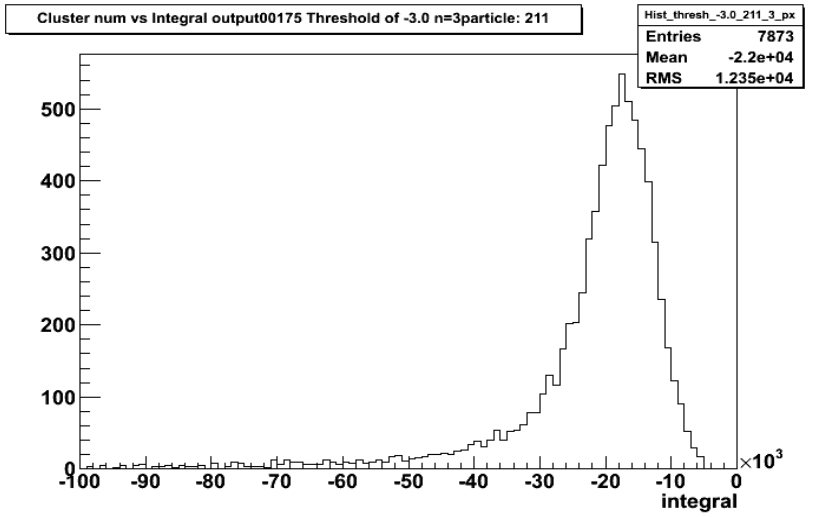
Threshold a=3
n=5
Particle = Pion
Gas: 90/10

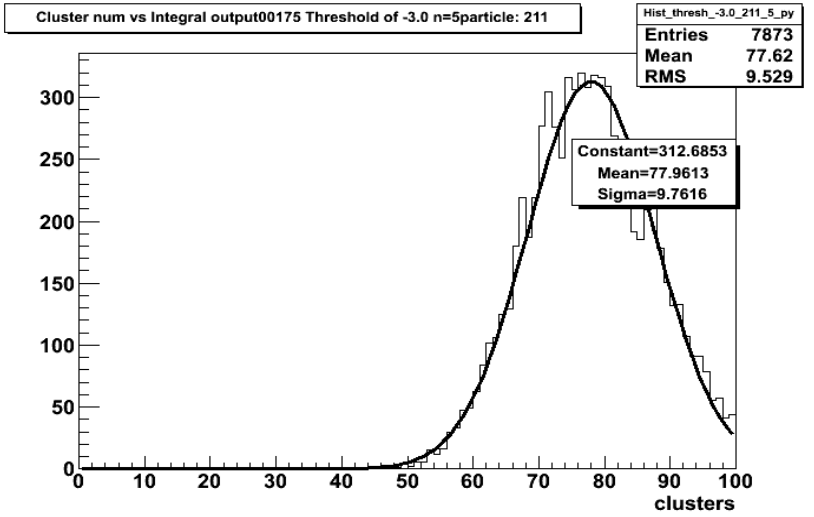
Integral of Signal

Distribution of detected clusters

p=140MeV/c

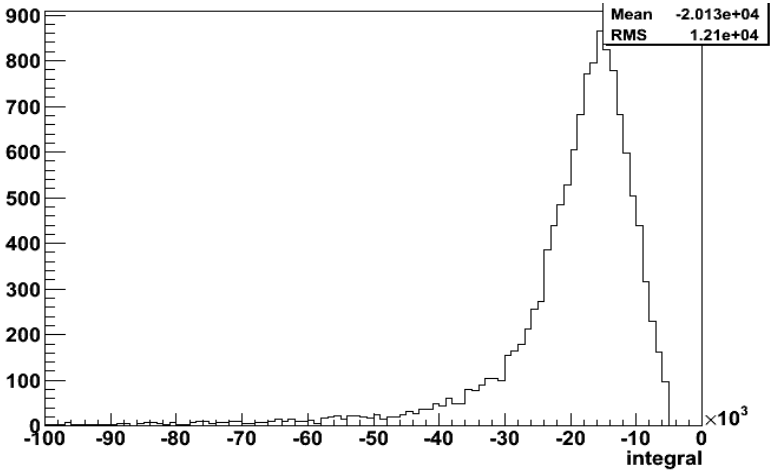
7873 entries

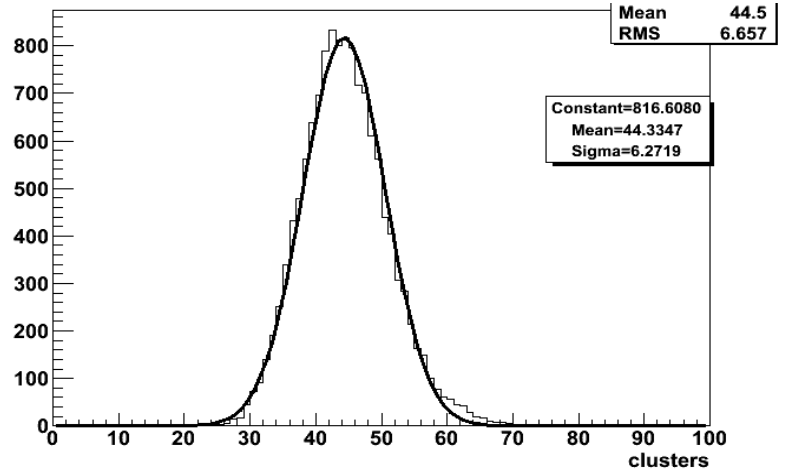




p=180MeV/c

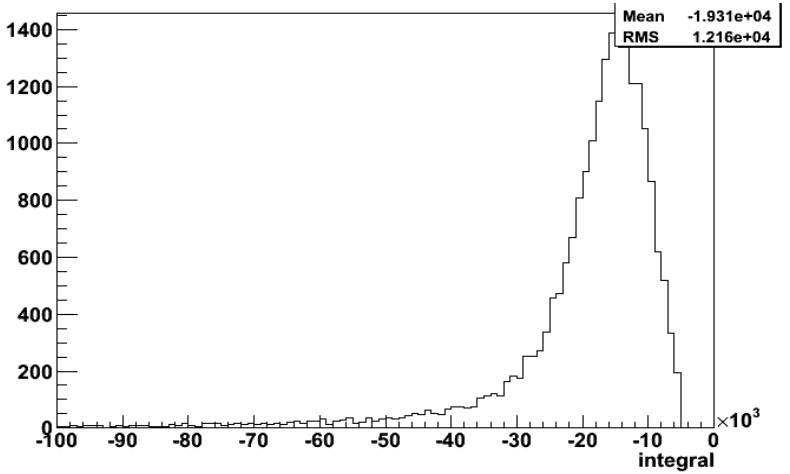
13073 entries

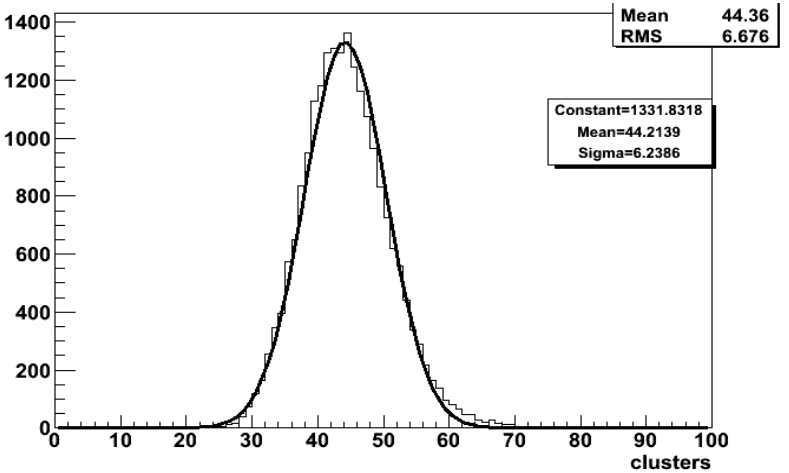




p=220MeV/c

21245 entries





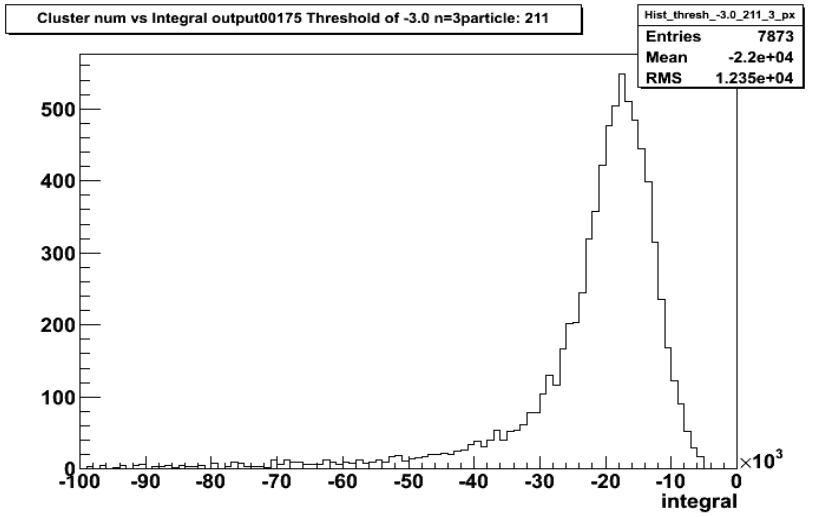
Threshold a=3.3
n=5
Particle = Pion
Gas: 90/10

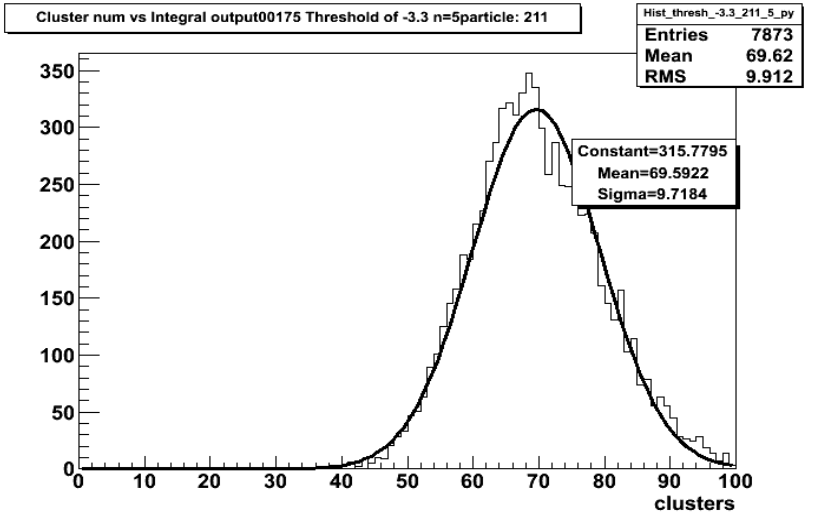
Integral of Signal

Distribution of detected clusters

p=140MeV/c

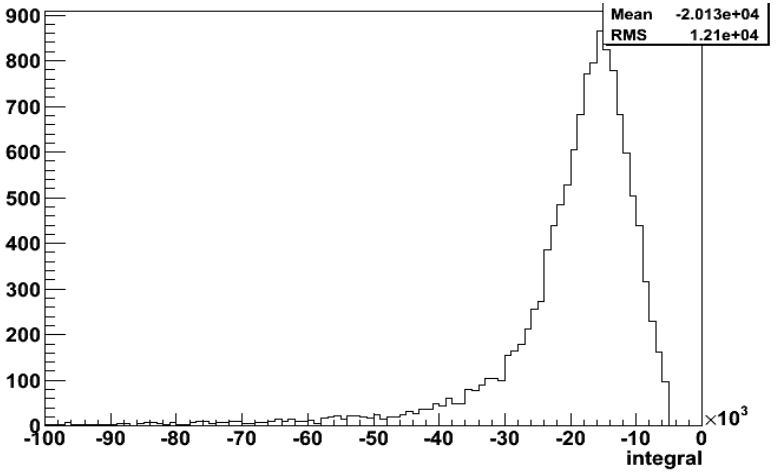
7873 entries

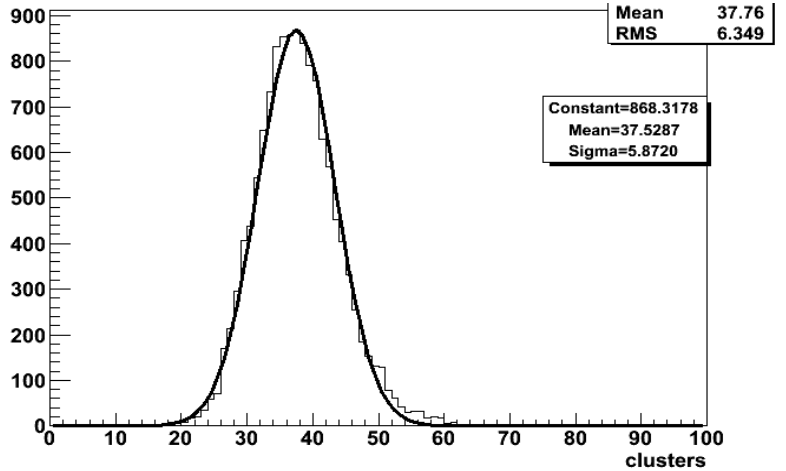




p=180MeV/c

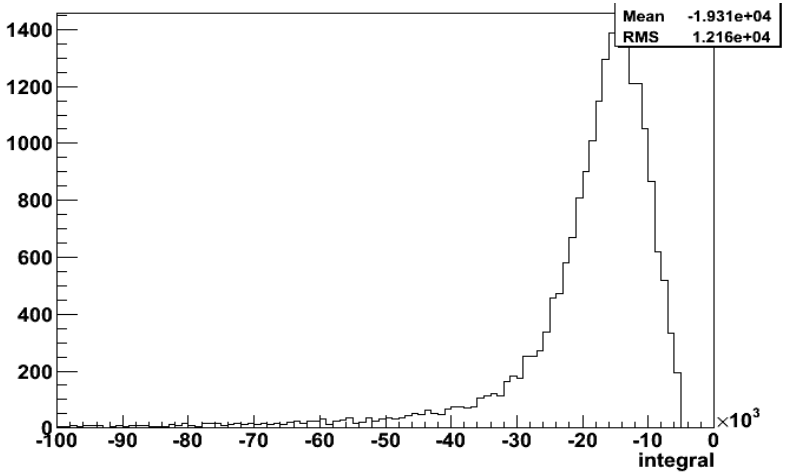
13073 entries

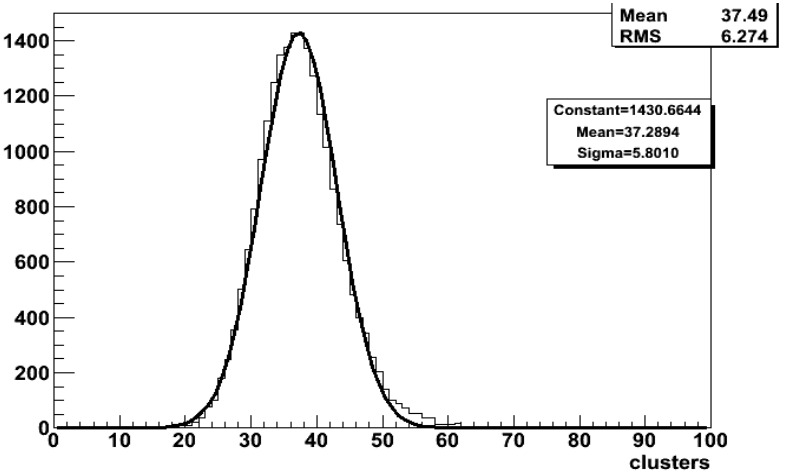




p=220MeV/c

21245 entries





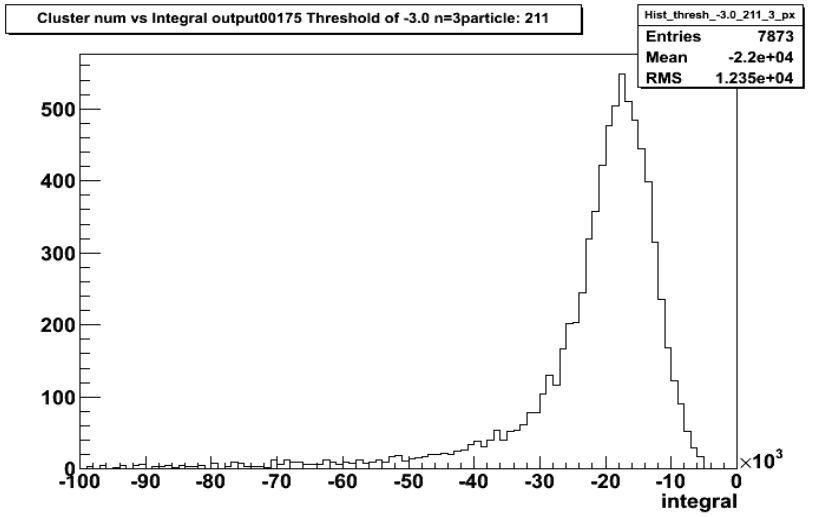
Threshold a=3.5
n=5
Particle = Pion
Gas: 90/10

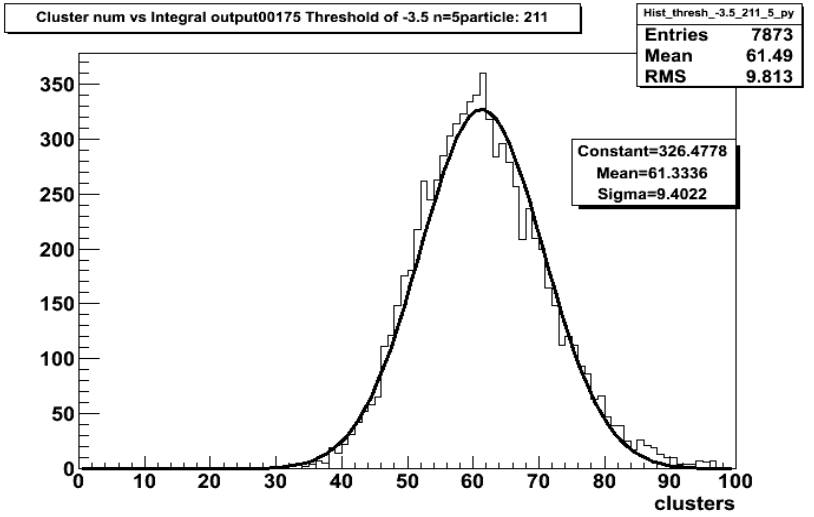
Integral of Signal

Distribution of detected clusters

p=140MeV/c

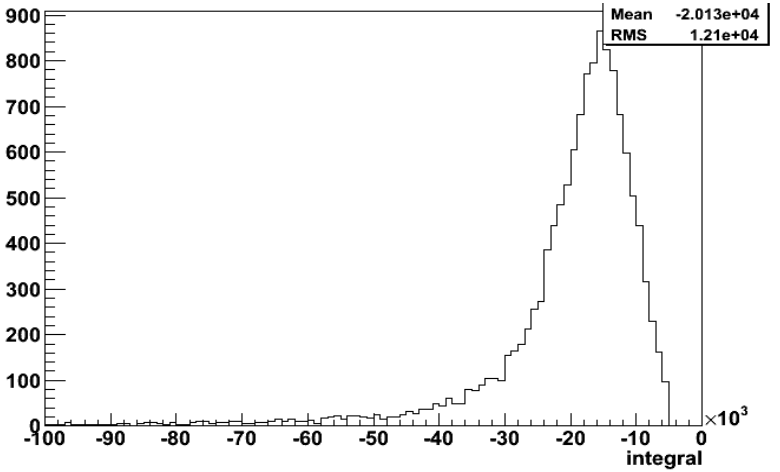
7873 entries

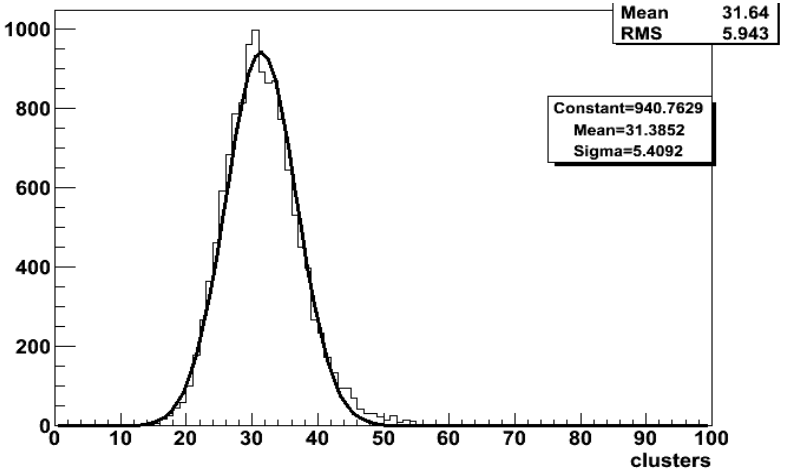




p=180MeV/c

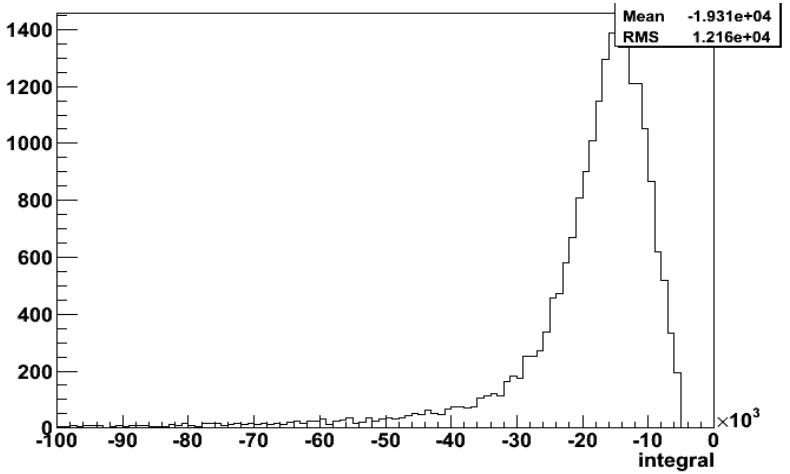
13073 entries

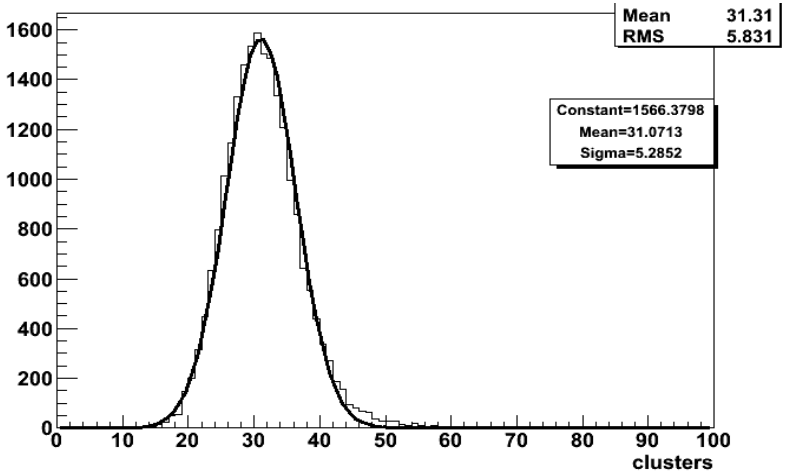




p=220MeV/c

21245 entries





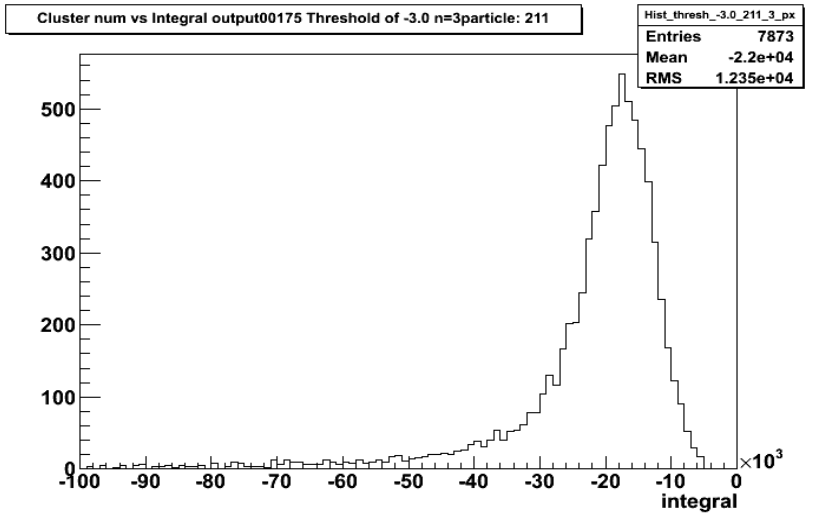
Threshold a=3.7
n=5
Particle = Pion
Gas: 90/10

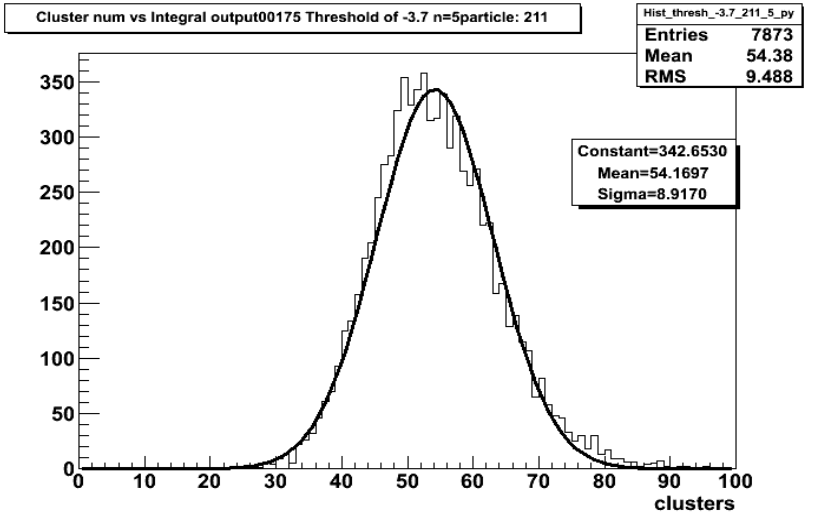
Integral of Signal

Distribution of detected clusters

p=140MeV/c

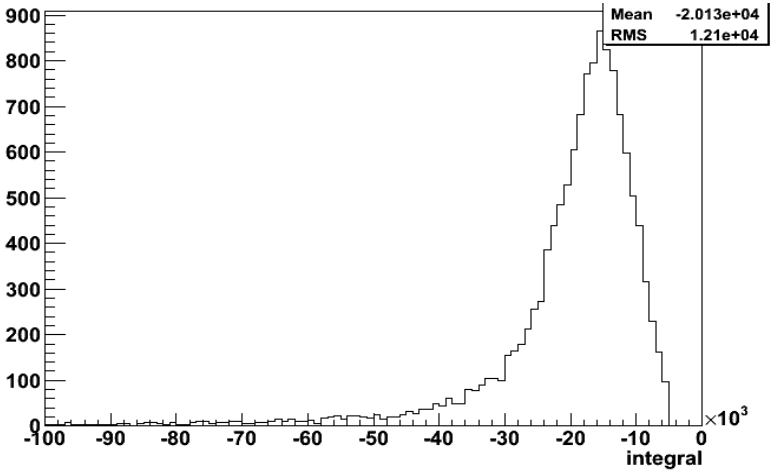
7873 entries

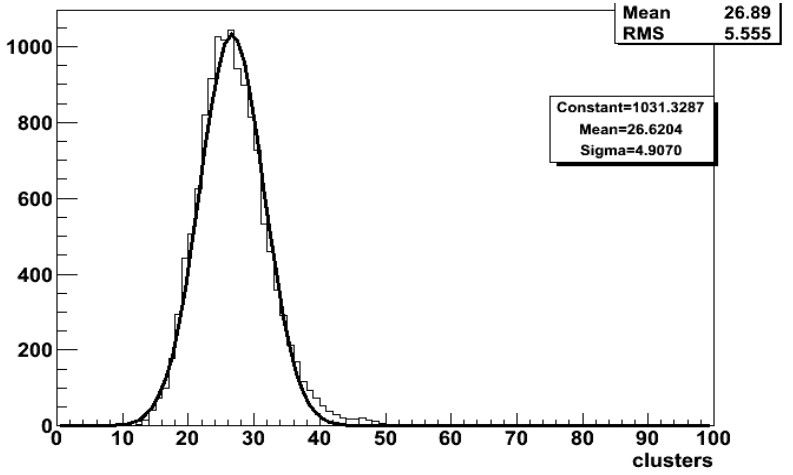




p=180MeV/c

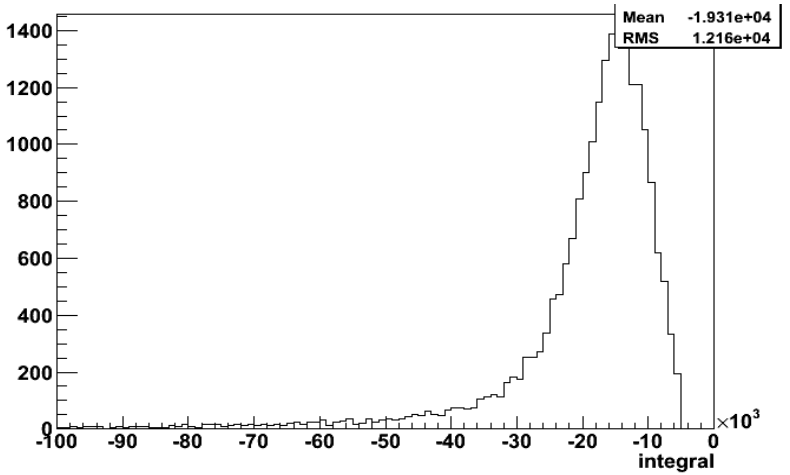
13073 entries

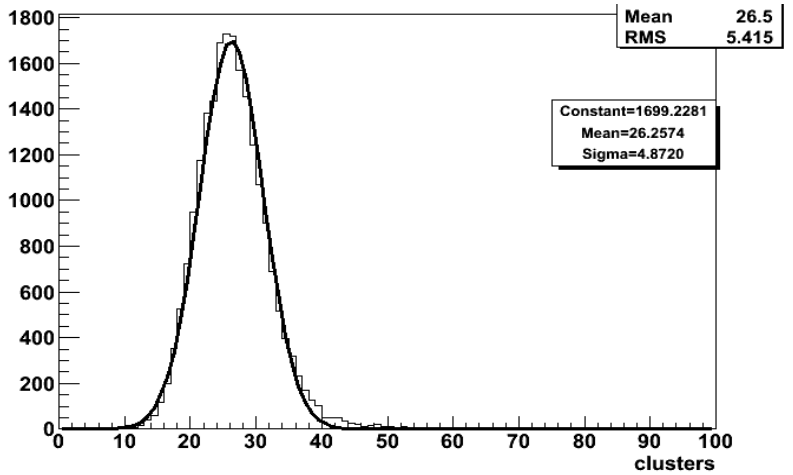




p=220MeV/c

21245 entries





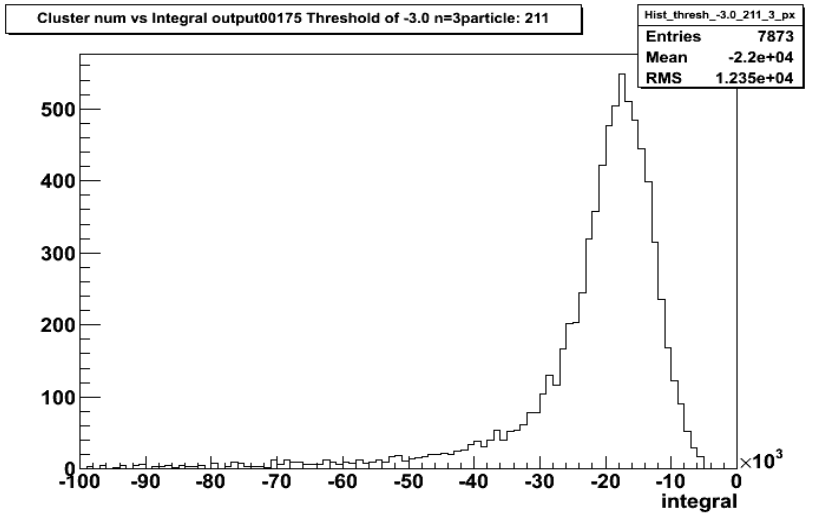
Threshold a=4
n=5
Particle = Pion
Gas: 90/10

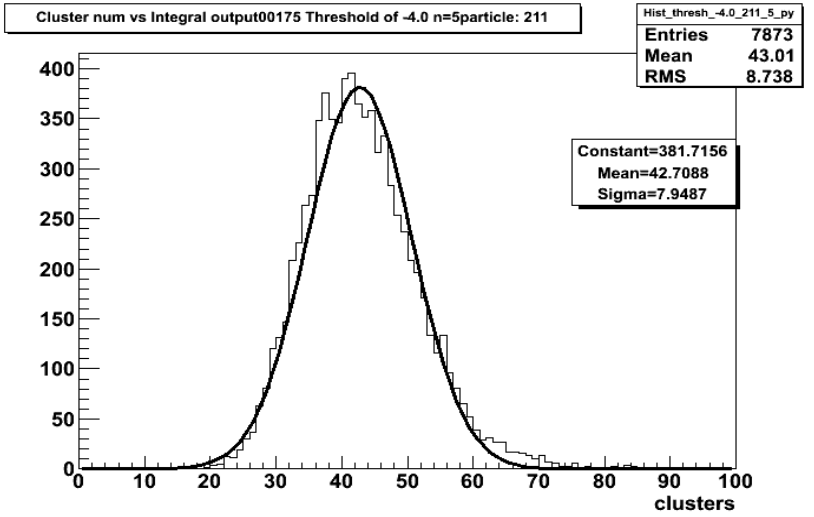
Integral of Signal

Distribution of detected clusters

p=140MeV/c

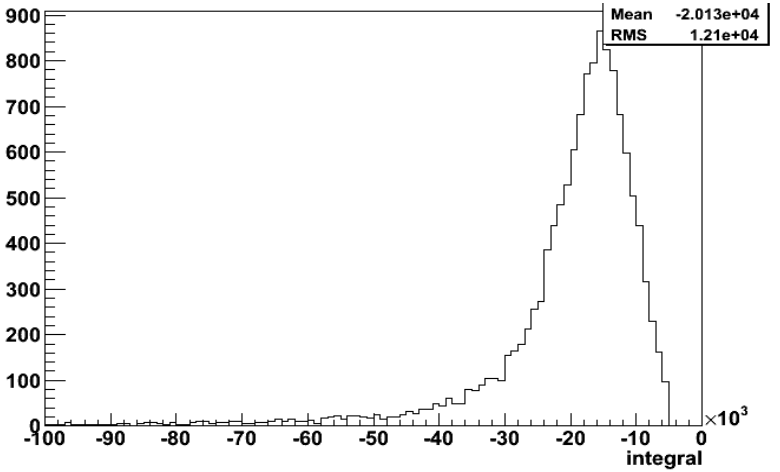
7873 entries

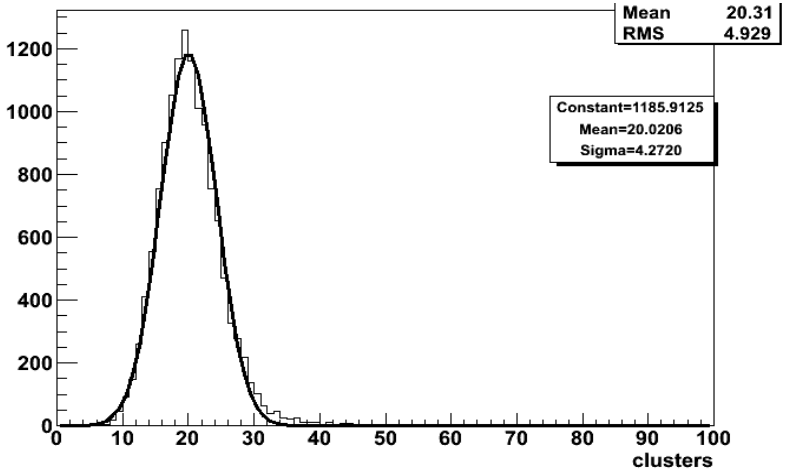




p=180MeV/c

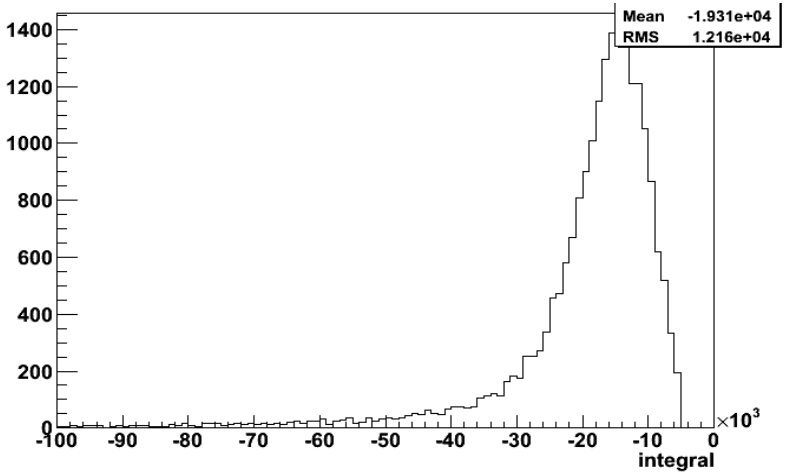
13073 entries

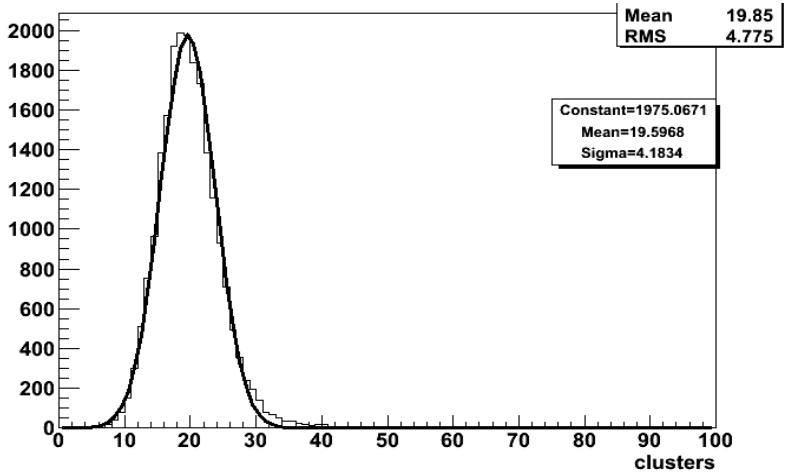




p=220MeV/c

21245 entries





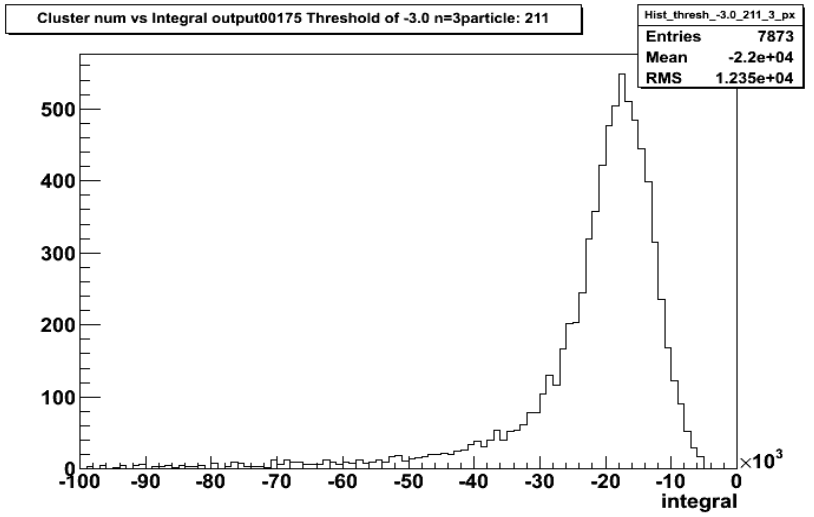
Threshold a=5
n=5
Particle = Pion
Gas: 90/10

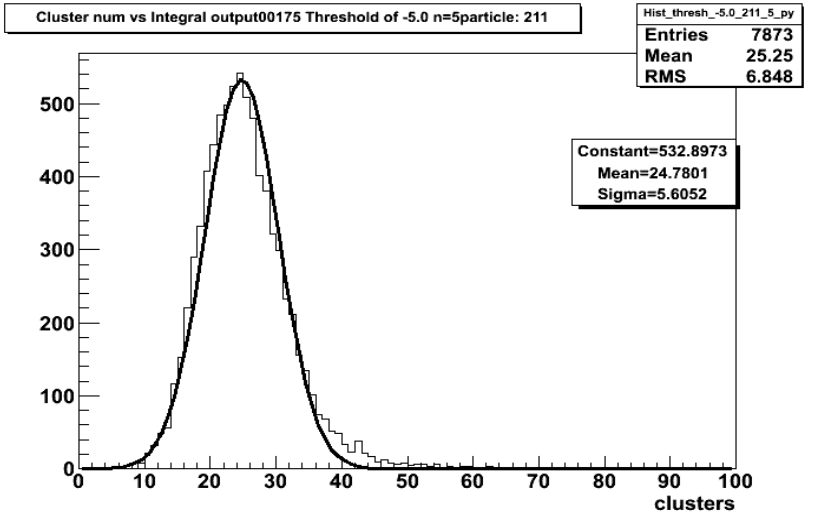
Integral of Signal

Distribution of detected clusters

p=140MeV/c

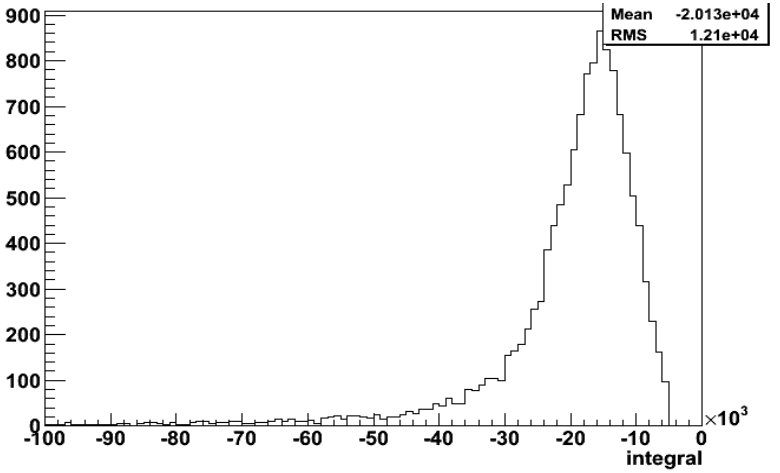
7873 entries

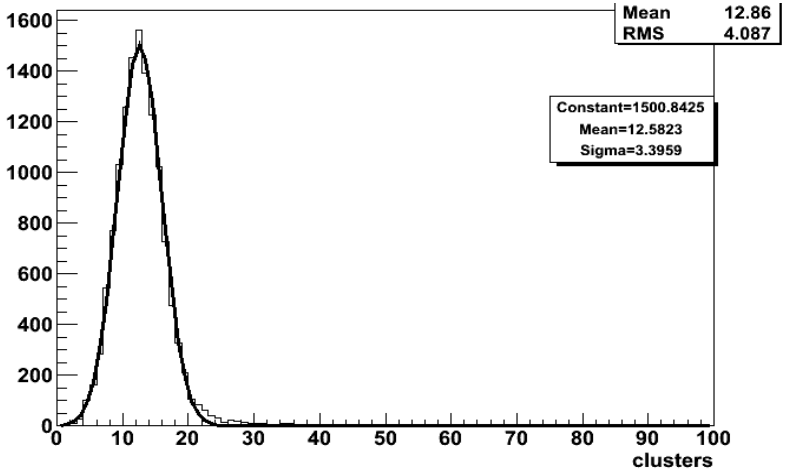




p=180MeV/c

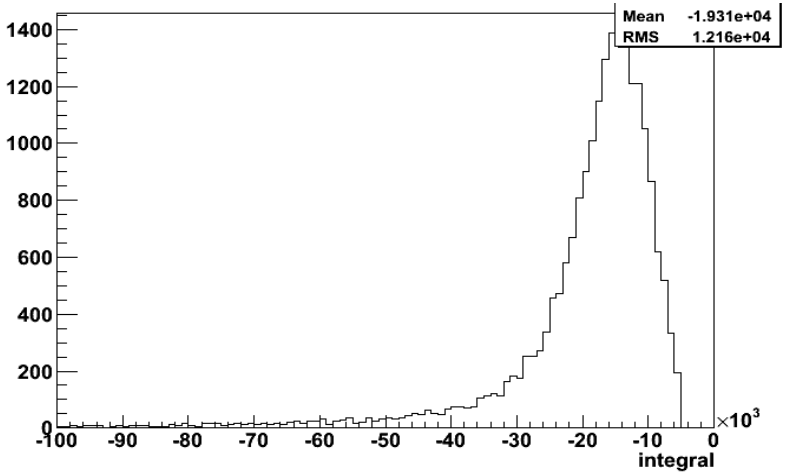
13073 entries

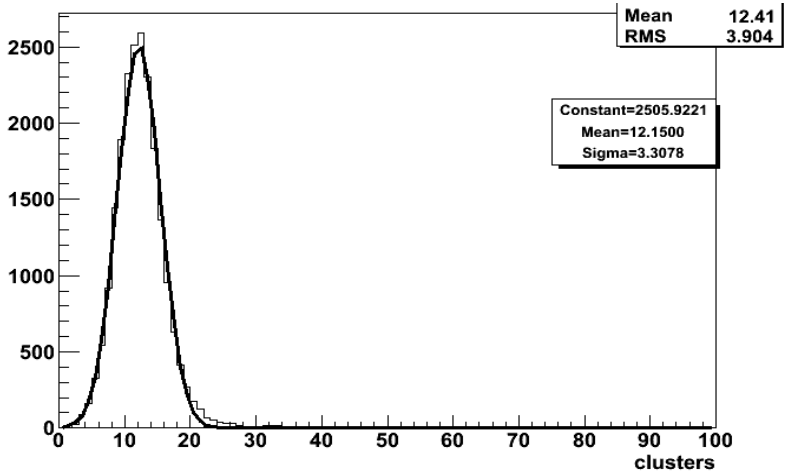




p=220MeV/c

21245 entries





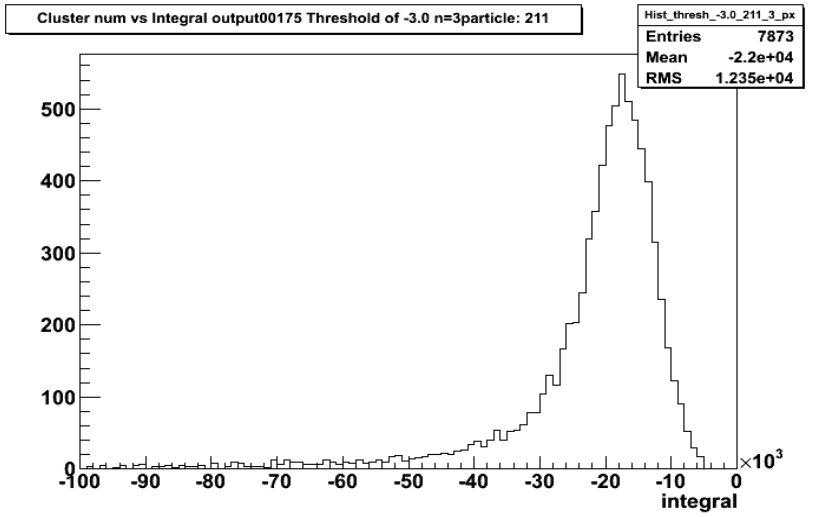
Threshold a=6
n=5
Particle = Pion
Gas: 90/10

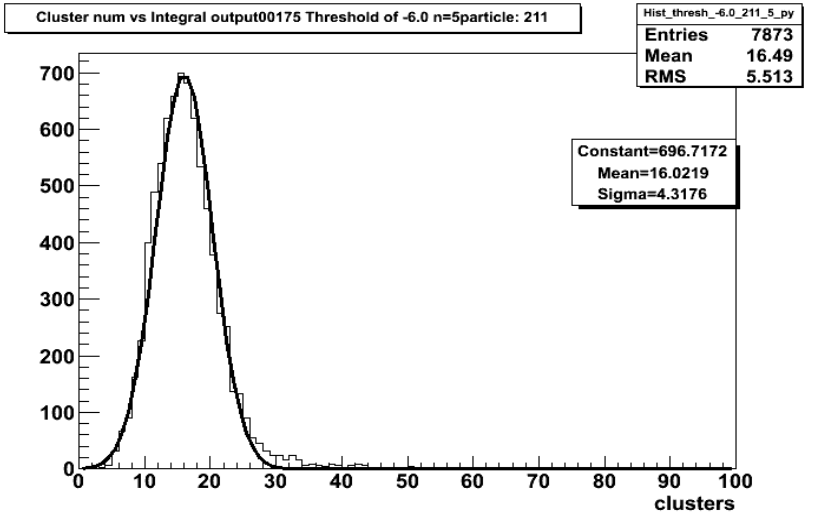
Integral of Signal

Distribution of detected clusters

p=140MeV/c

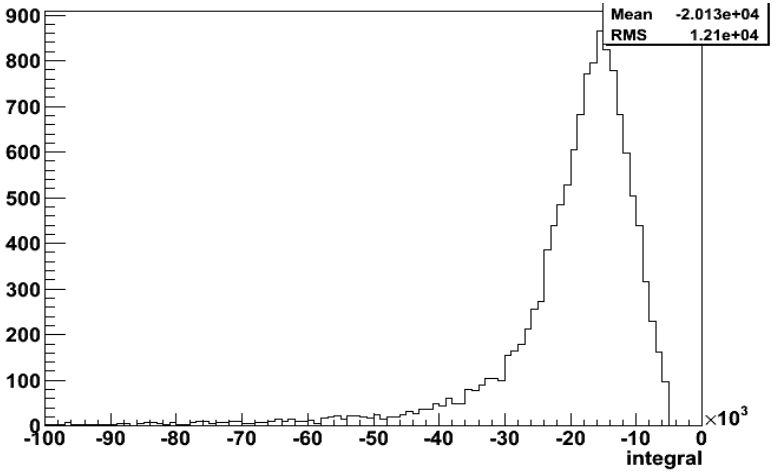
7873 entries

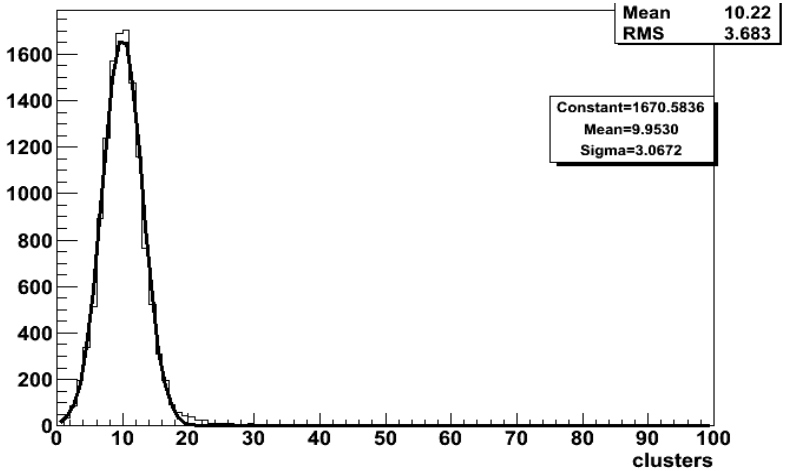




p=180MeV/c

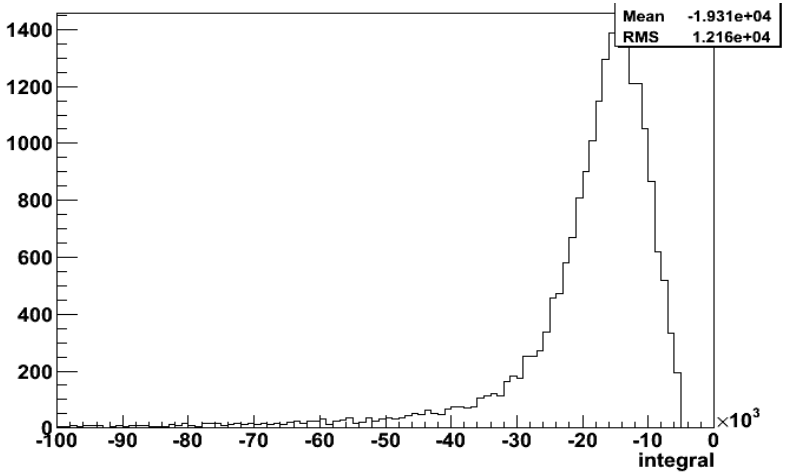
13073 entries

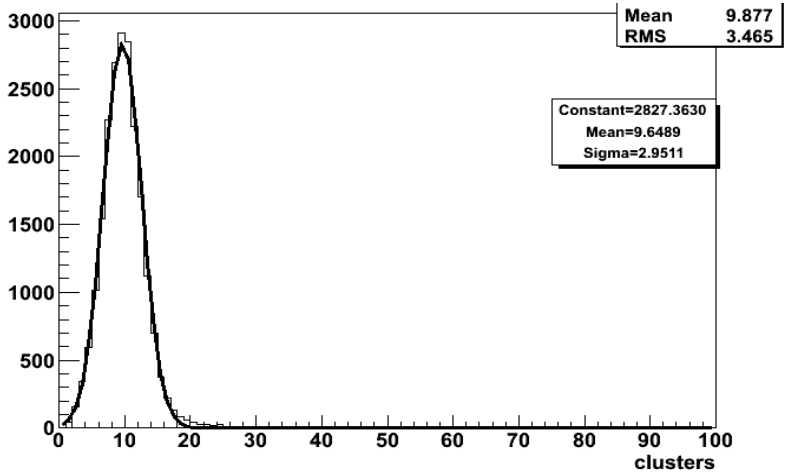




p=220MeV/c

21245 entries





Pions, n=3
90/10

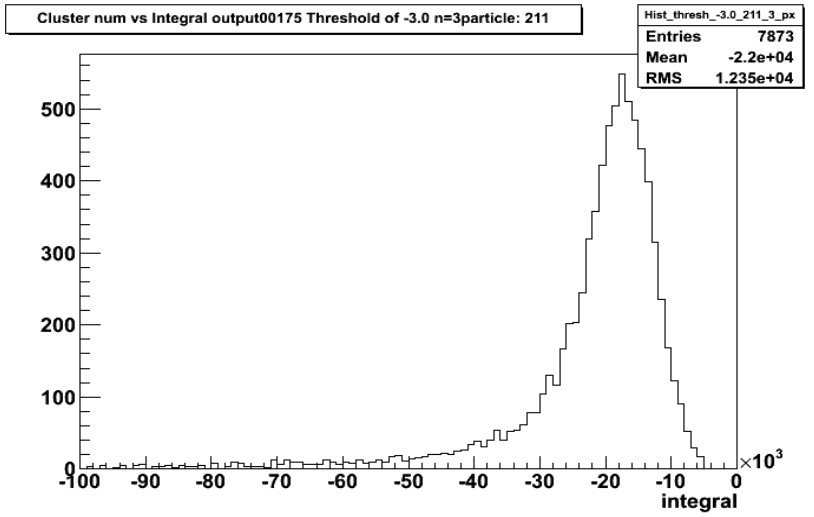
Threshold a=3
n=3
Particle = Pion
Gas: 90/10

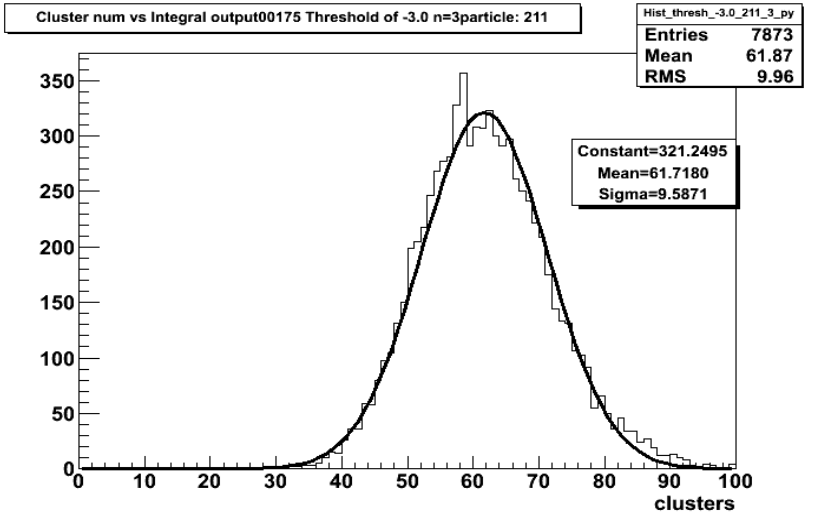
Integral of Signal

Distribution of detected clusters

p=140MeV/c

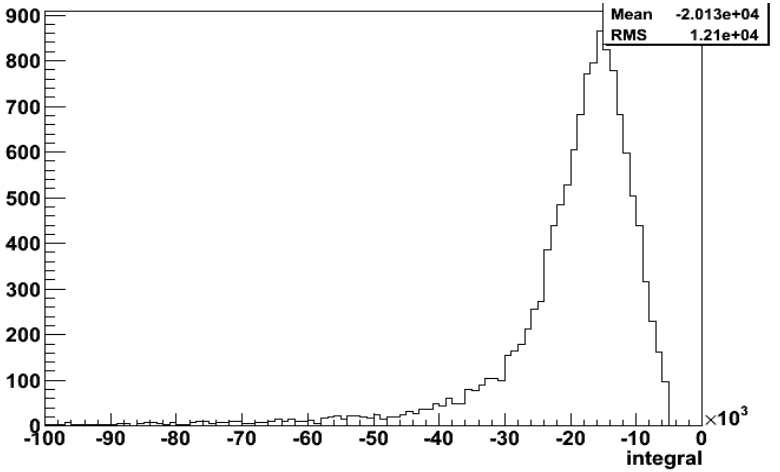
7873 entries

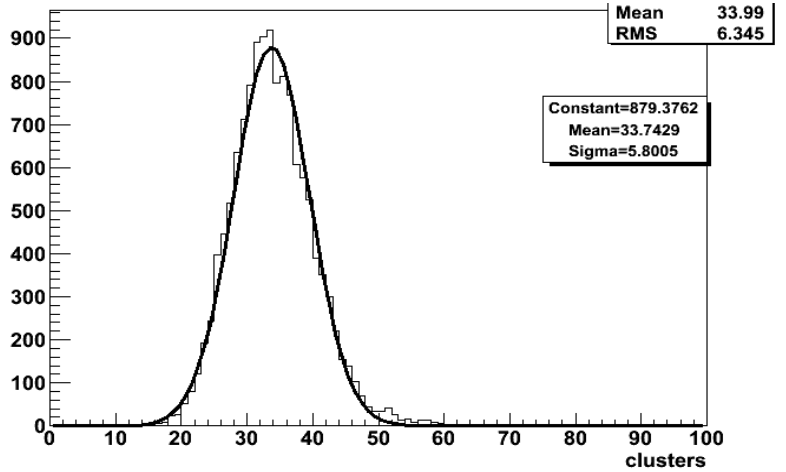




p=180MeV/c

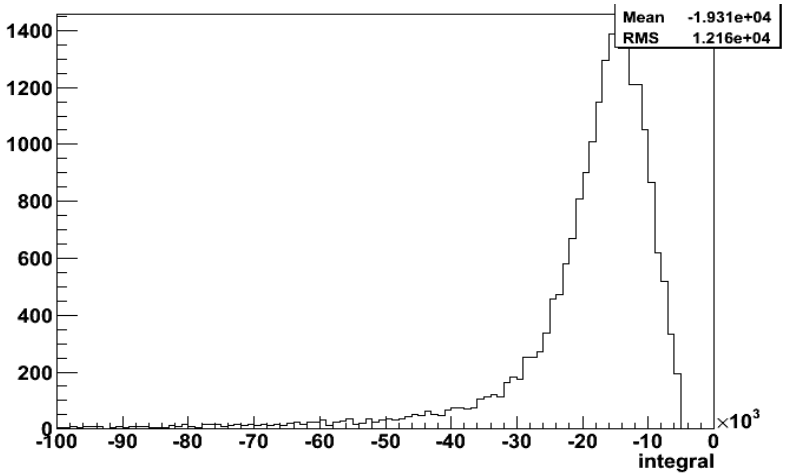
13073 entries

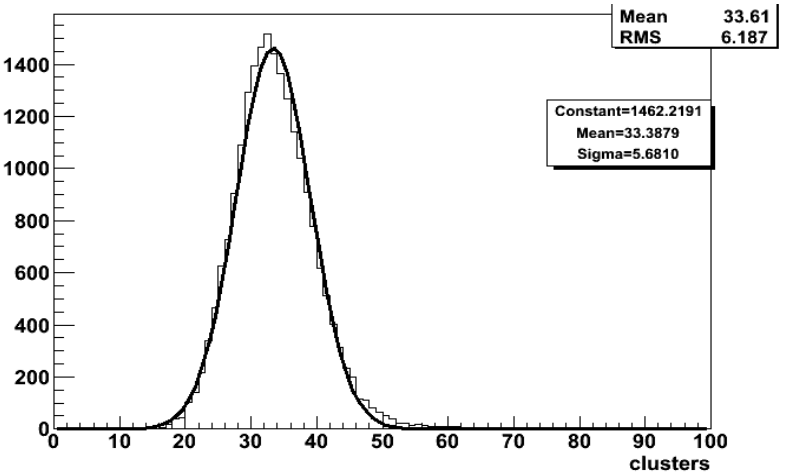




p=220MeV/c

21245 entries





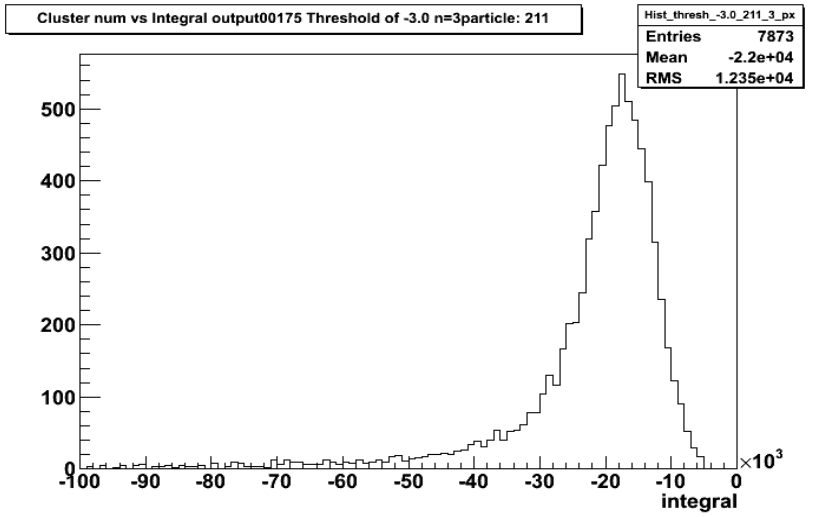
Threshold a=3.3
n=3
Particle = Pion
Gas: 90/10

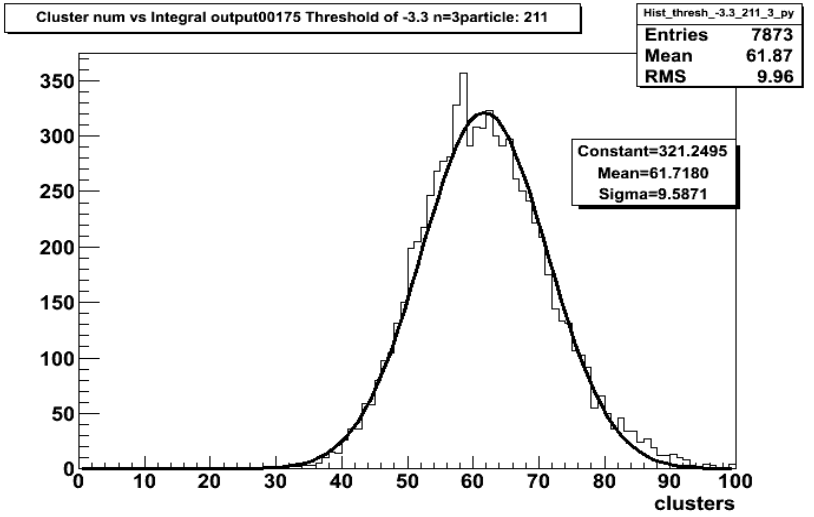
Integral of Signal

Distribution of detected clusters

p=140MeV/c

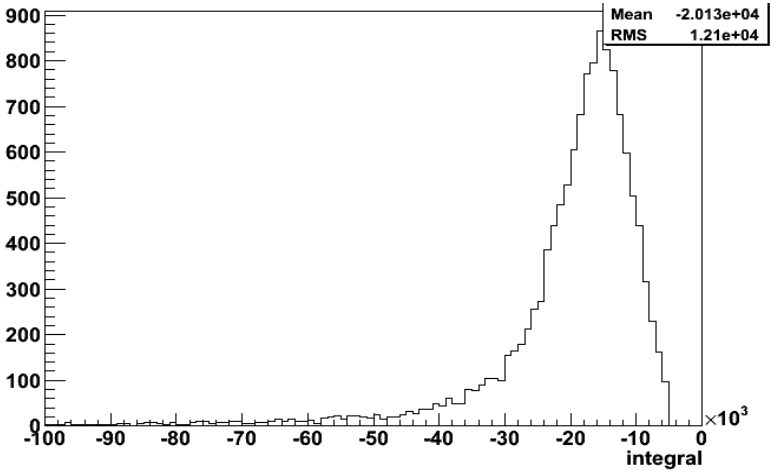
7873 entries

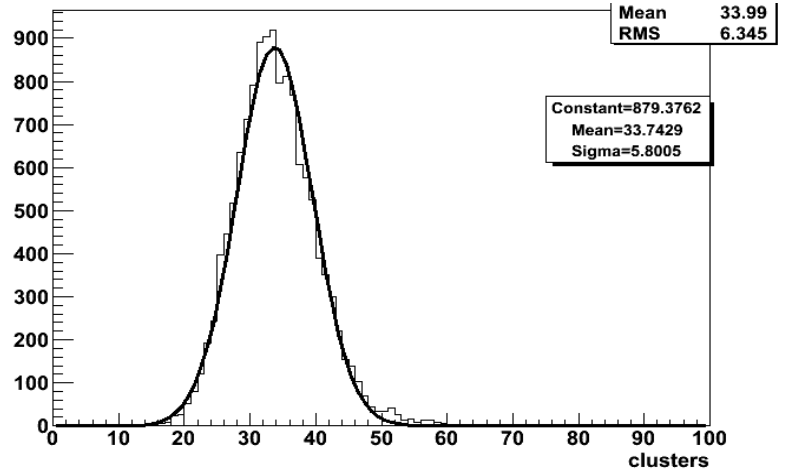




p=180MeV/c

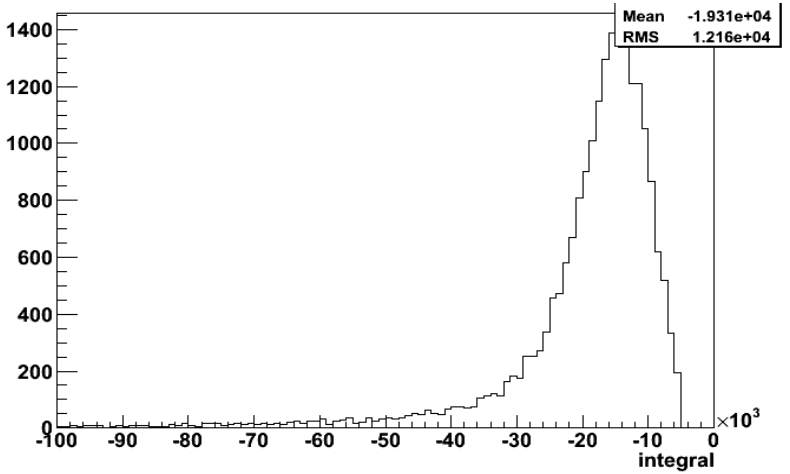
13073 entries

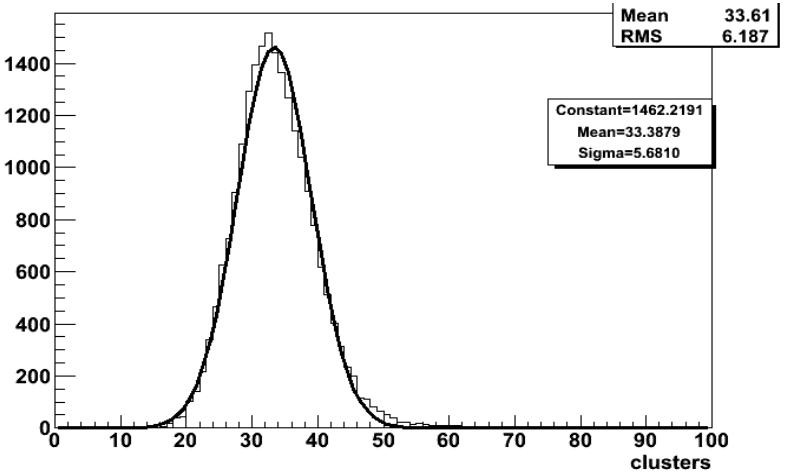




p=220MeV/c

21245 entries





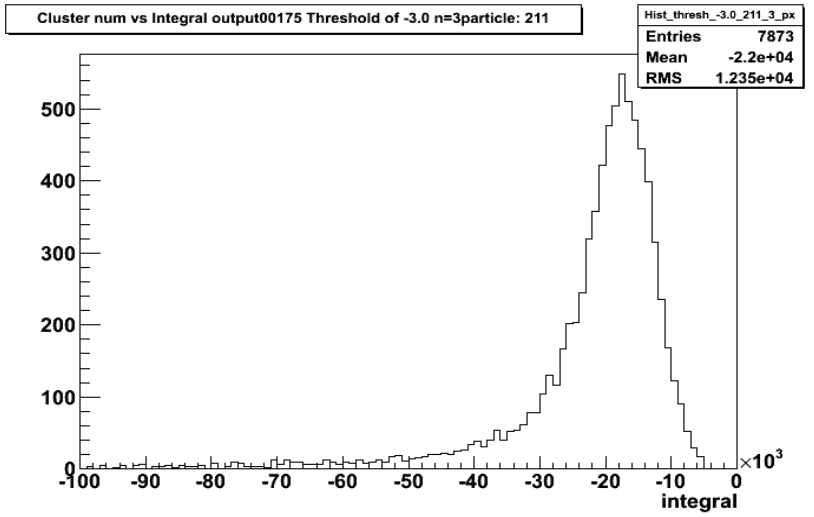
Threshold a=3.5
n=3
Particle = Pion
Gas: 90/10

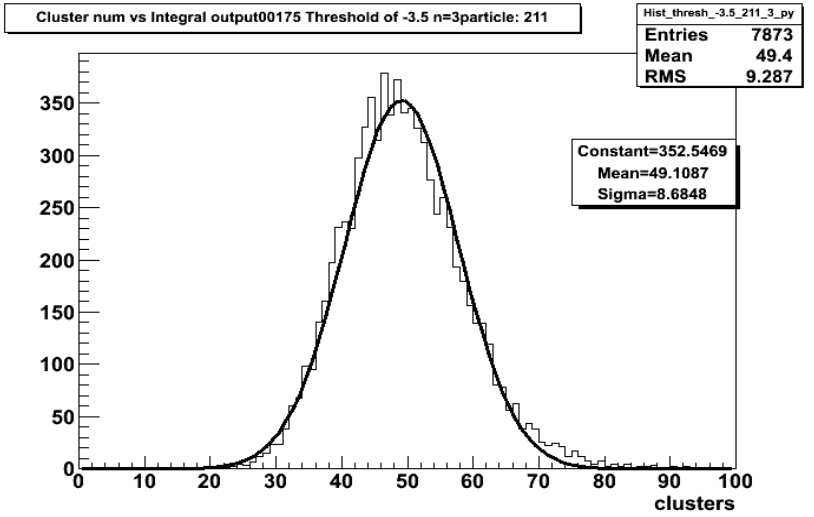
Integral of Signal

Distribution of detected clusters

p=140MeV/c

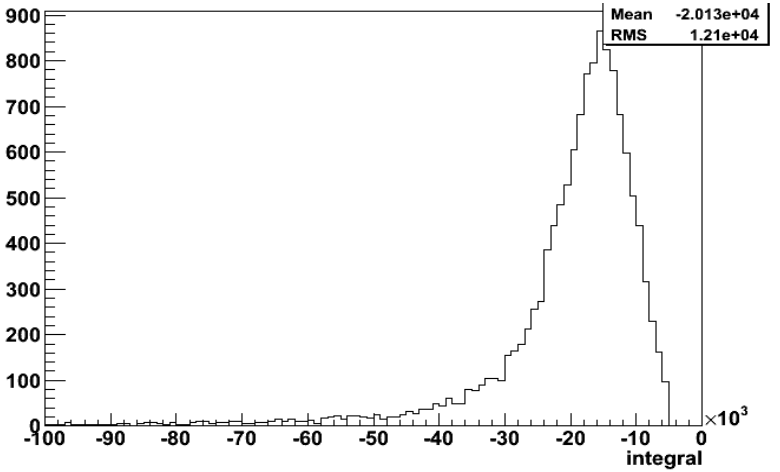
7873 entries

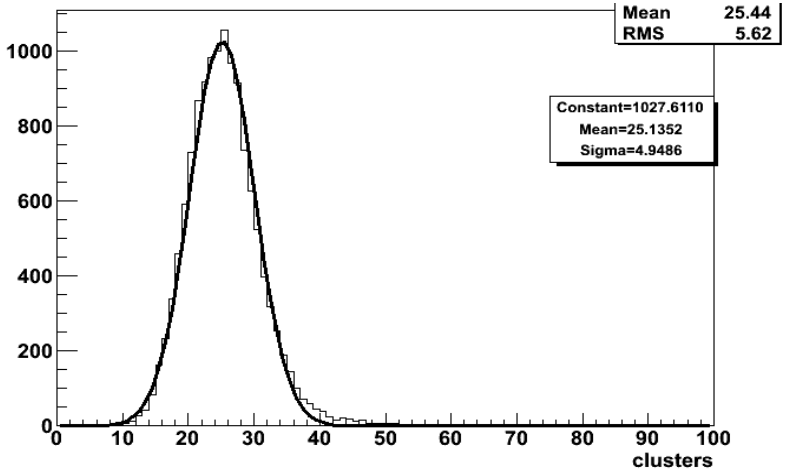




p=180MeV/c

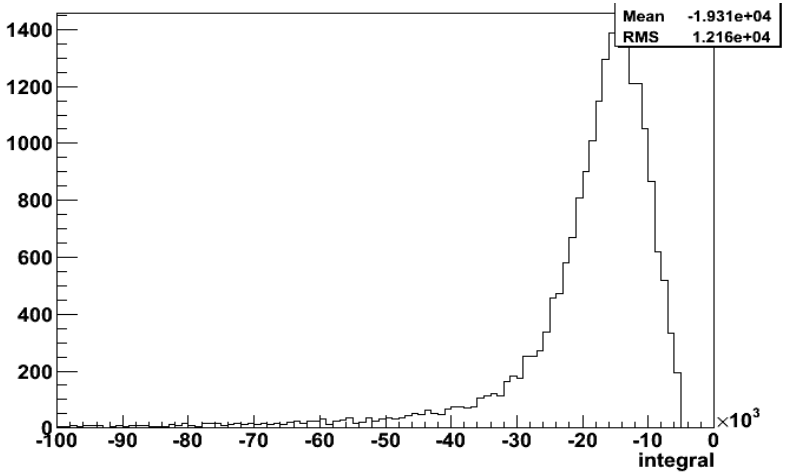
13073 entries

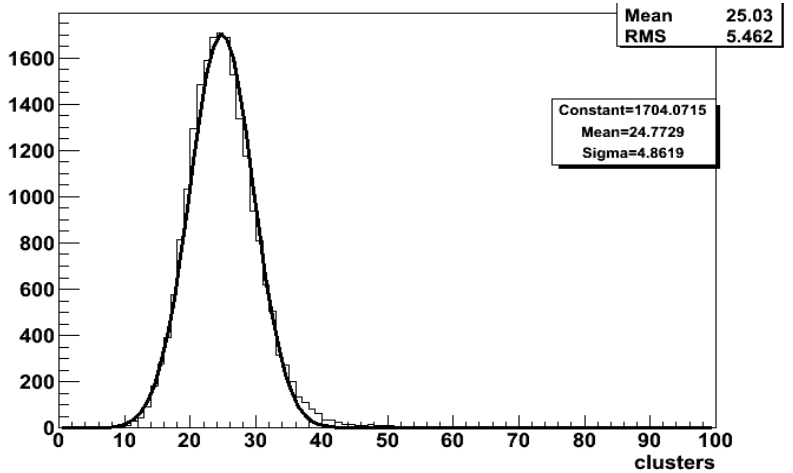




p=220MeV/c

21245 entries





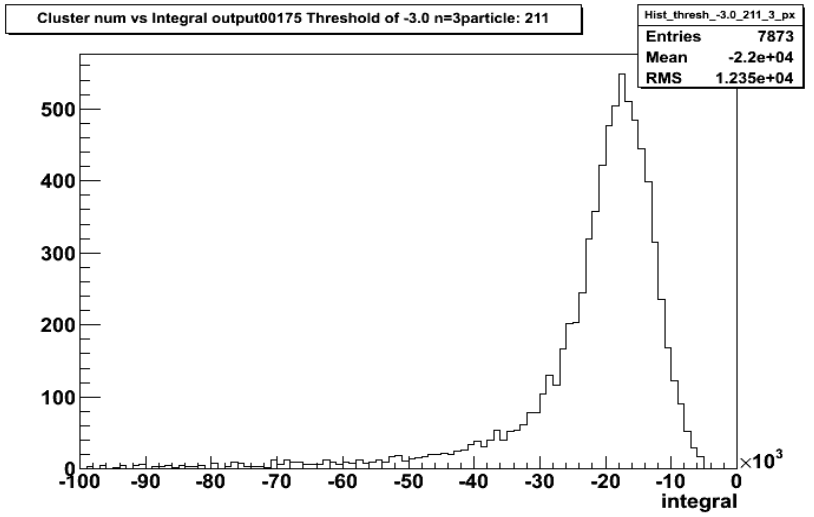
Threshold a=3.7
n=3
Particle = Pion
Gas: 90/10

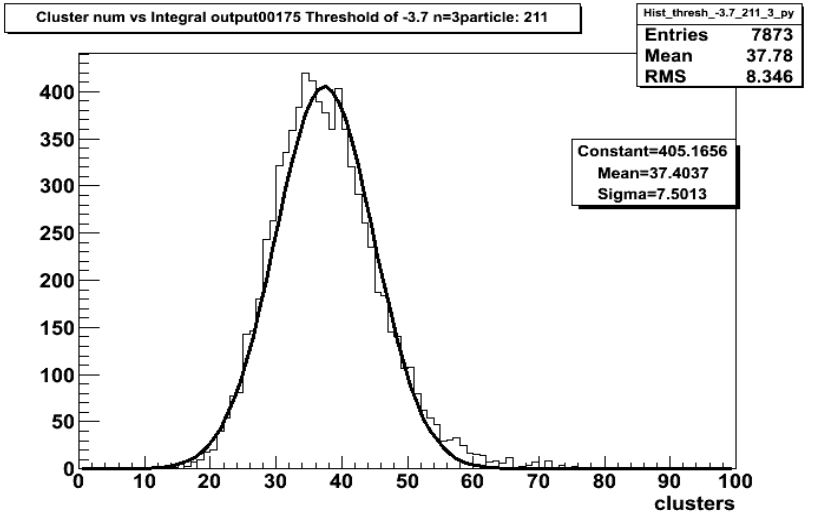
Integral of Signal

Distribution of detected clusters

p=140MeV/c

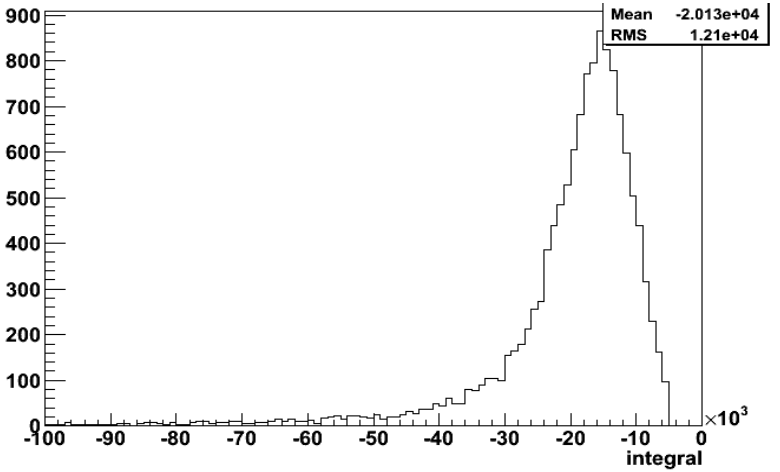
7873 entries

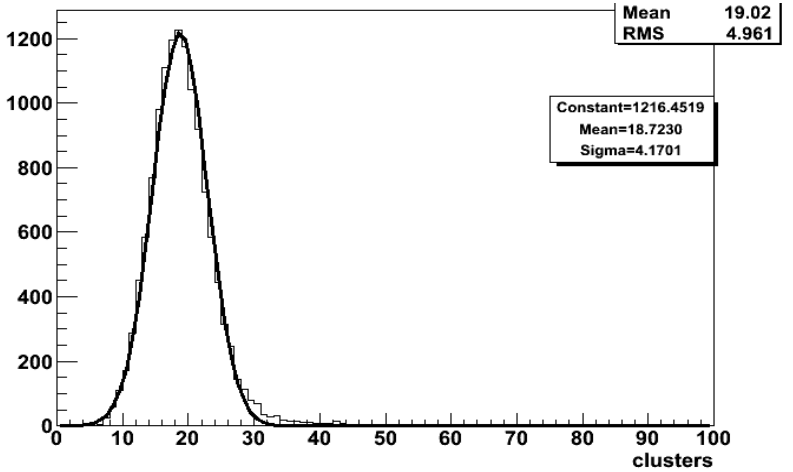




p=180MeV/c

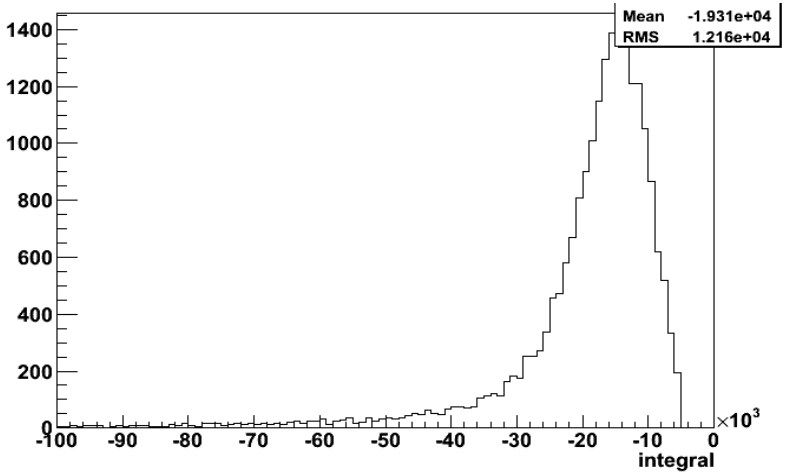
13073 entries

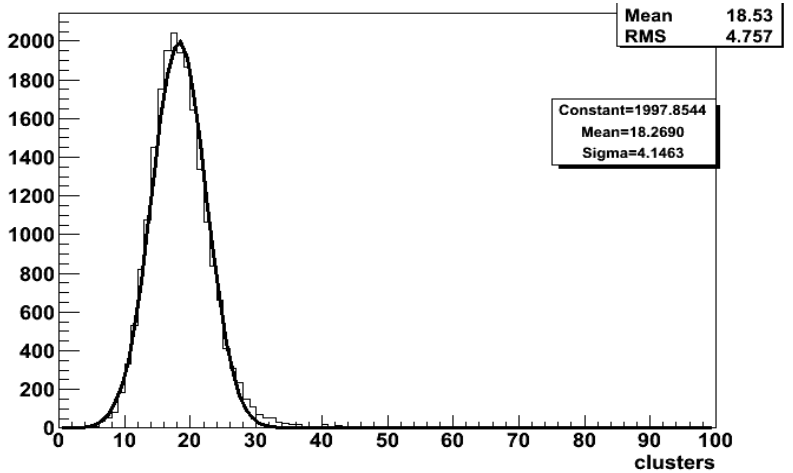




p=220MeV/c

21245 entries





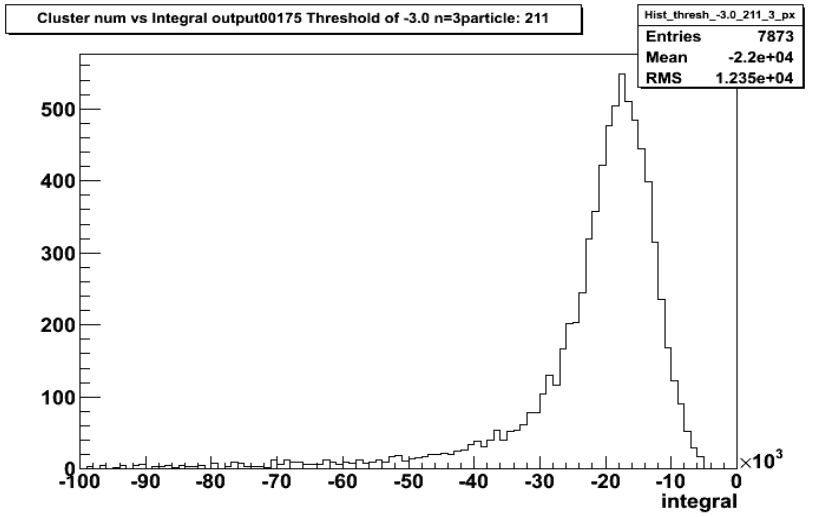
Threshold a=4
n=3
Particle = Pion
Gas: 90/10

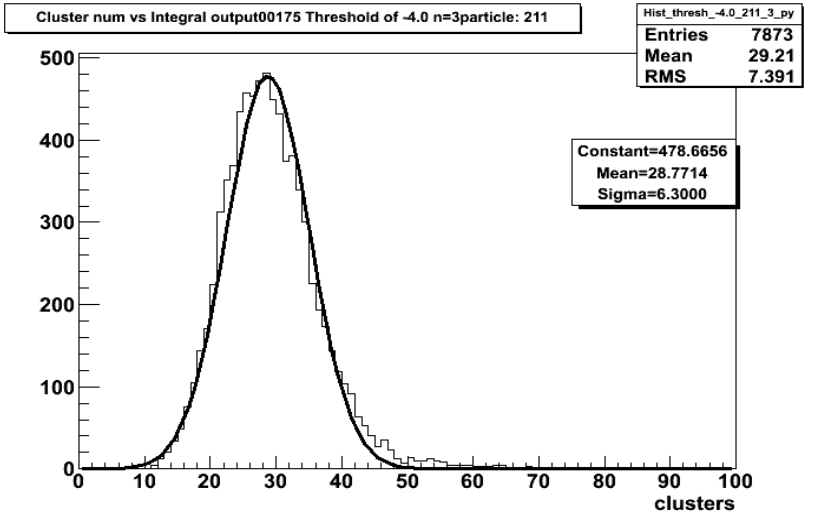
Integral of Signal

Distribution of detected clusters

p=140MeV/c

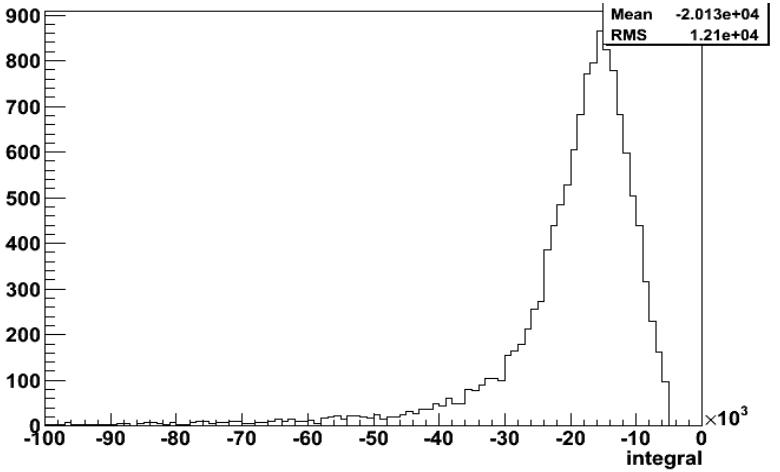
7873 entries

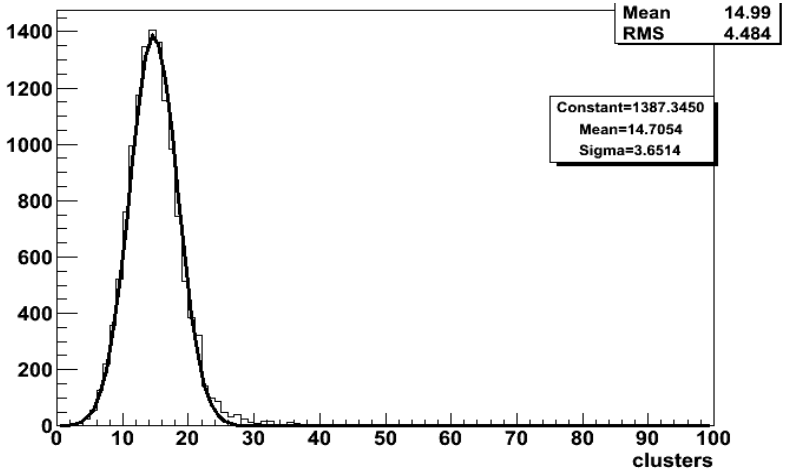




p=180MeV/c

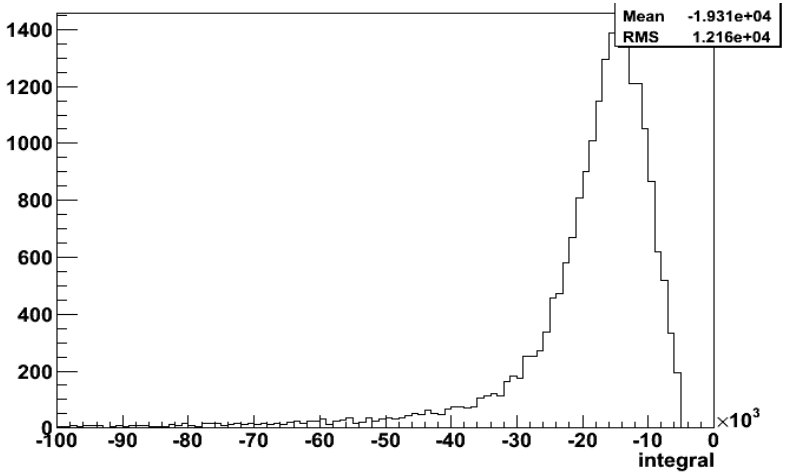
13073 entries

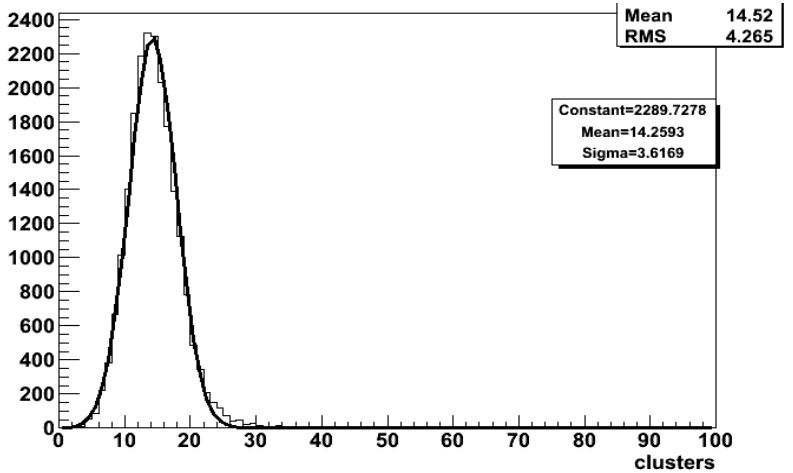




p=220MeV/c

21245 entries





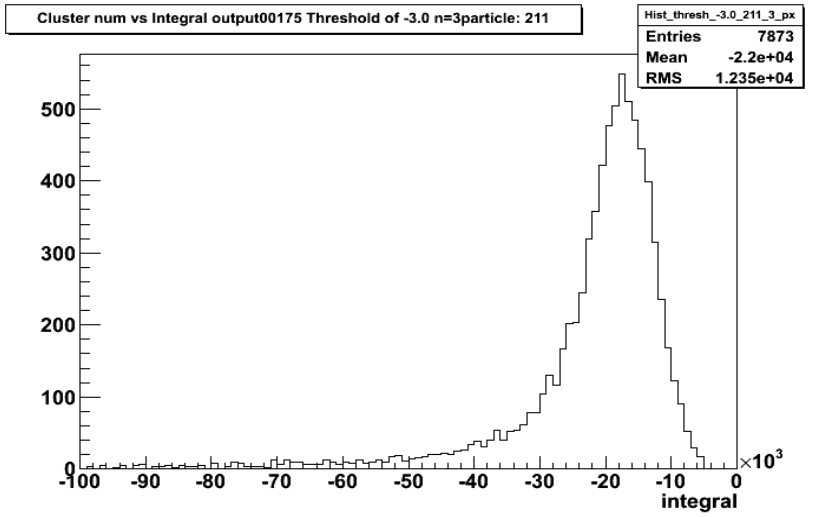
Threshold a=5
n=3
Particle = Pion
Gas: 90/10

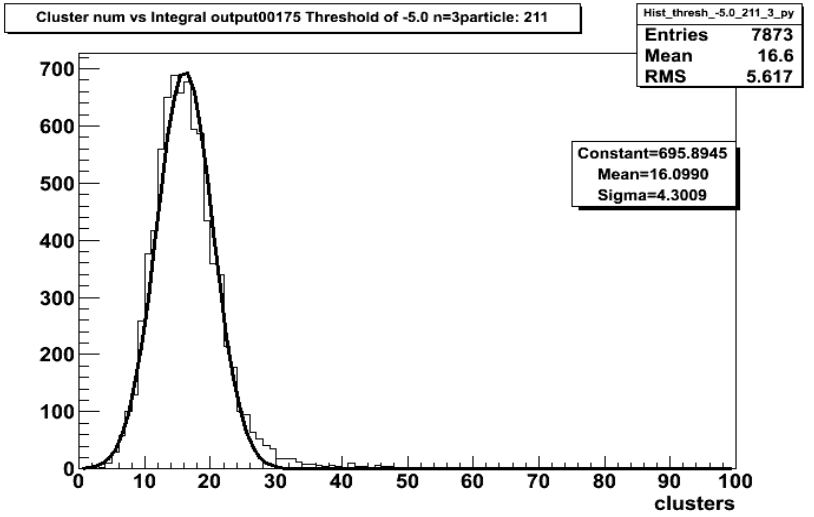
Integral of Signal

Distribution of detected clusters

p=140MeV/c

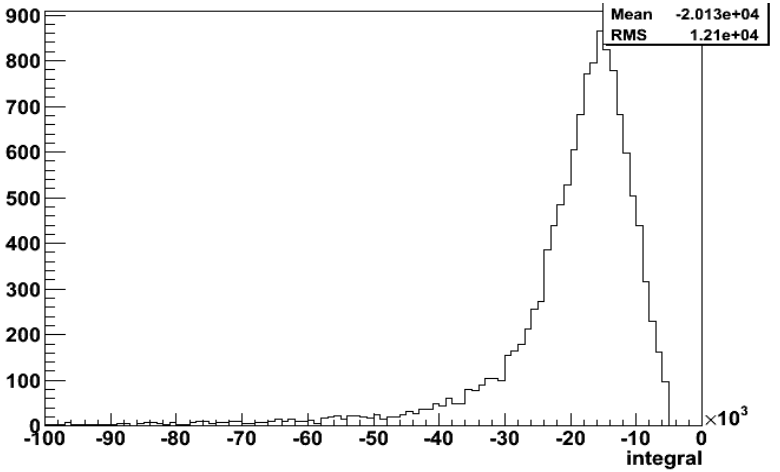
7873 entries

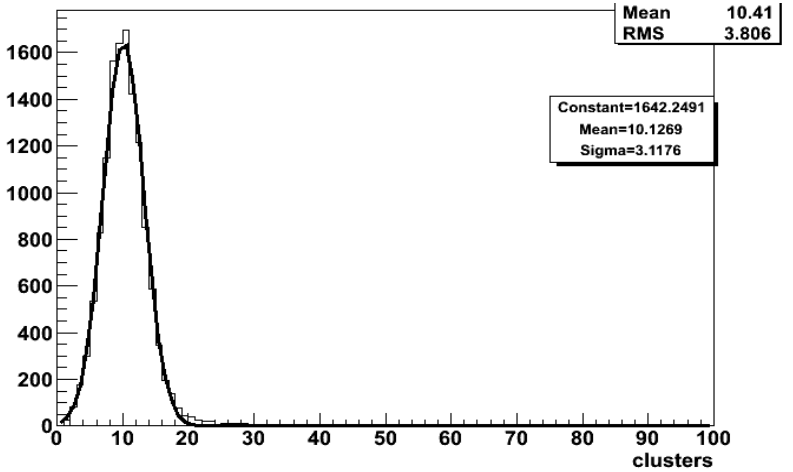




p=180MeV/c

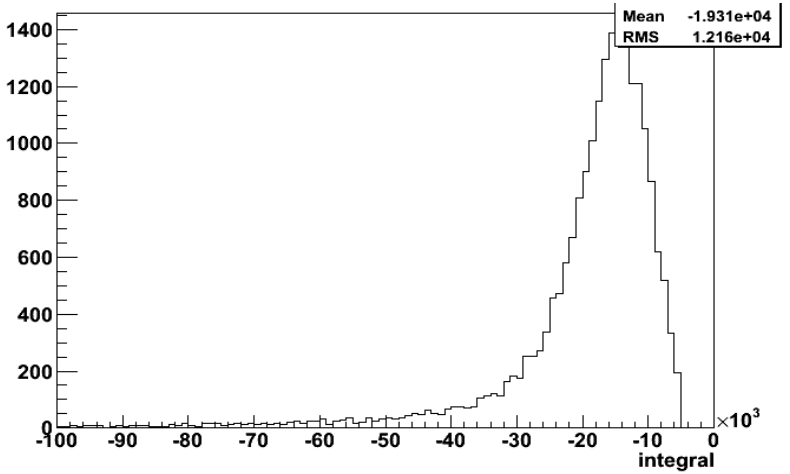
13073 entries

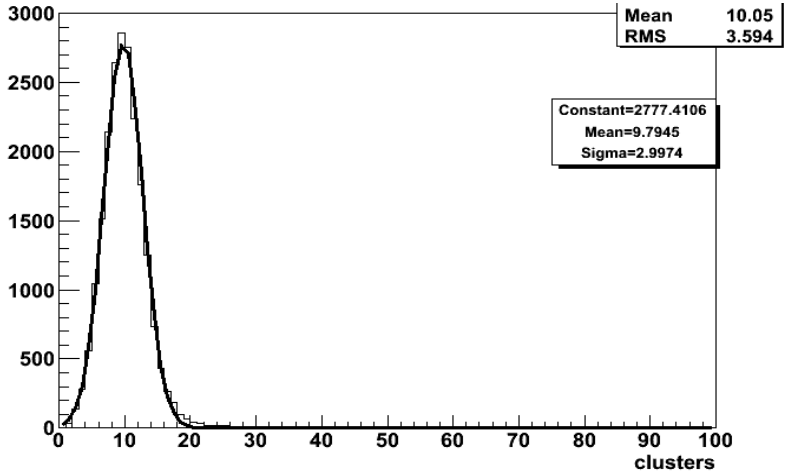




p=220MeV/c

21245 entries





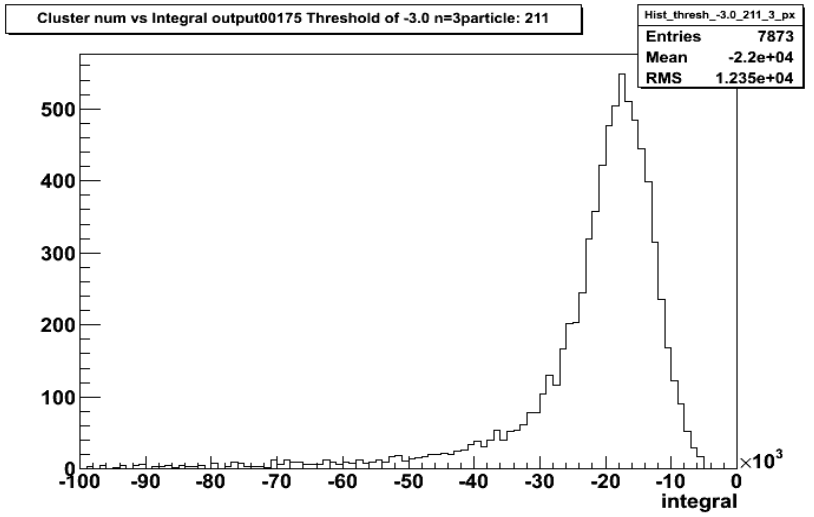
Threshold a=6
n=3
Particle = Pion
Gas: 90/10

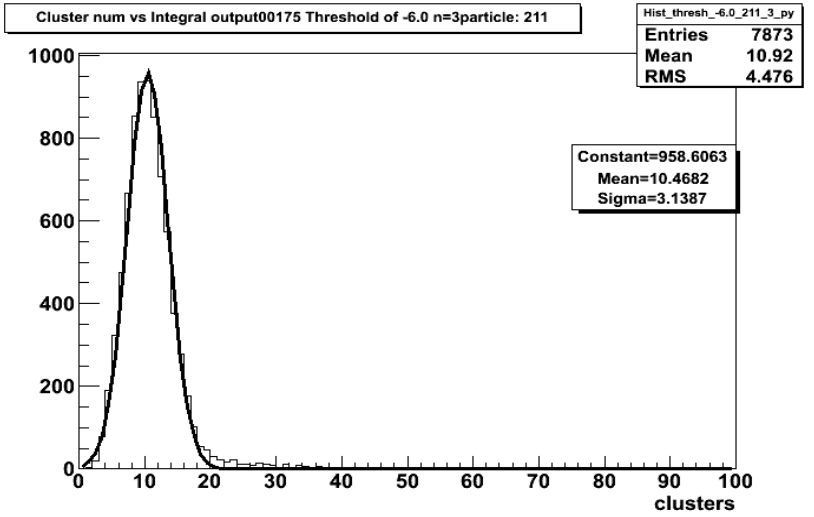
Integral of Signal

Distribution of detected clusters

p=140MeV/c

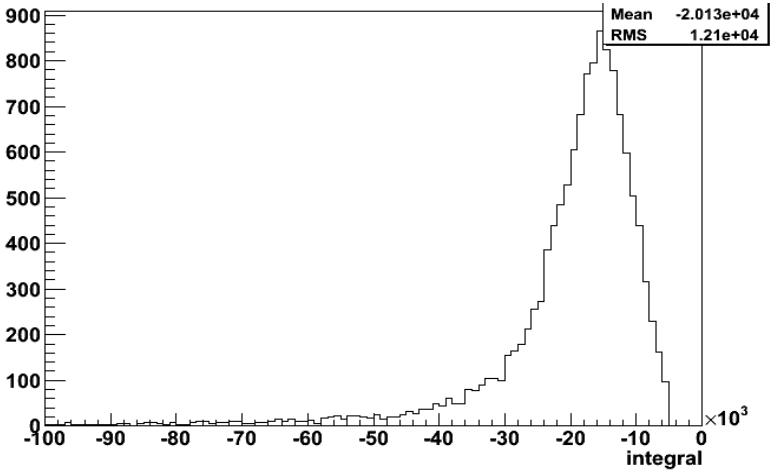
7873 entries

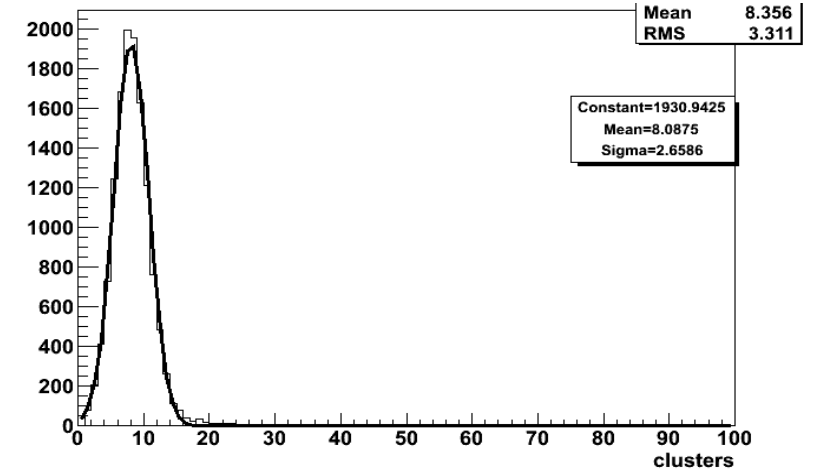




p=180MeV/c

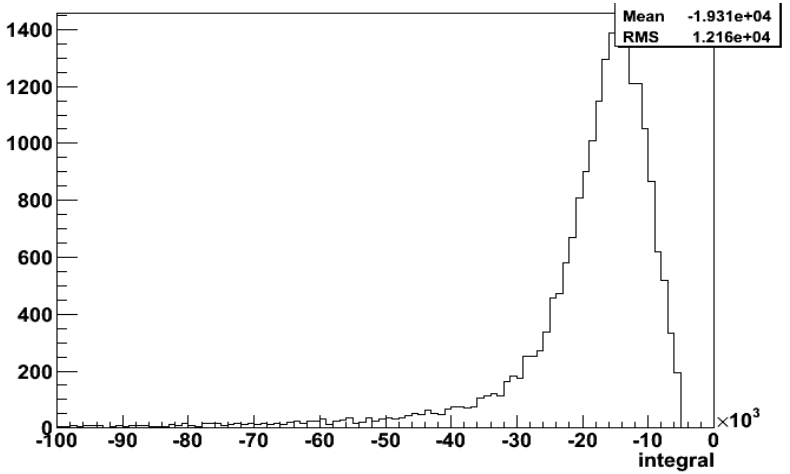
13073 entries

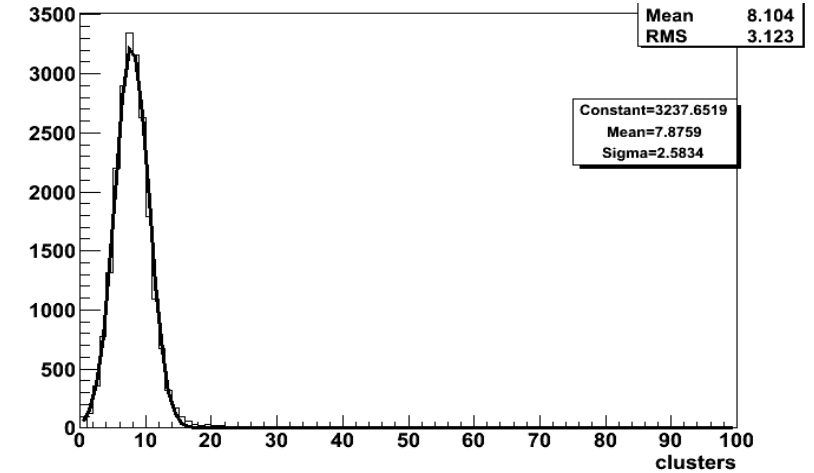




p=220MeV/c

21245 entries





Muons, n=5
90/10

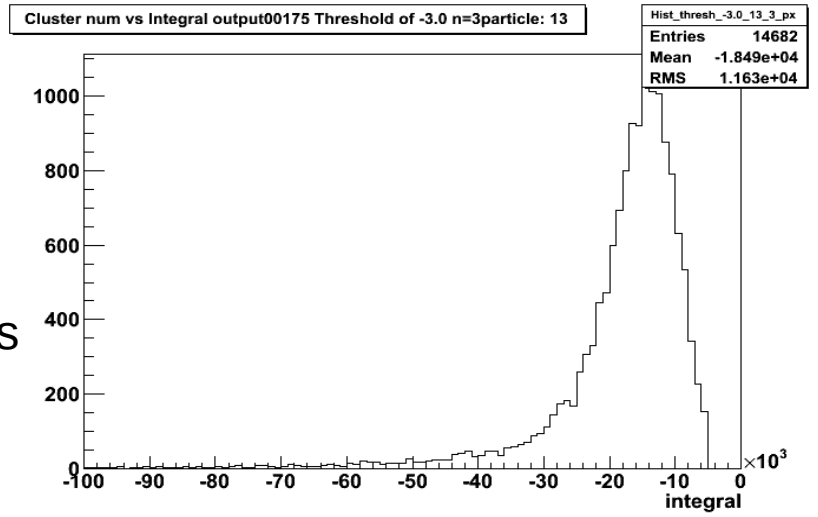
Threshold a=3
n=5
Particle = Muon
Gas: 90/10

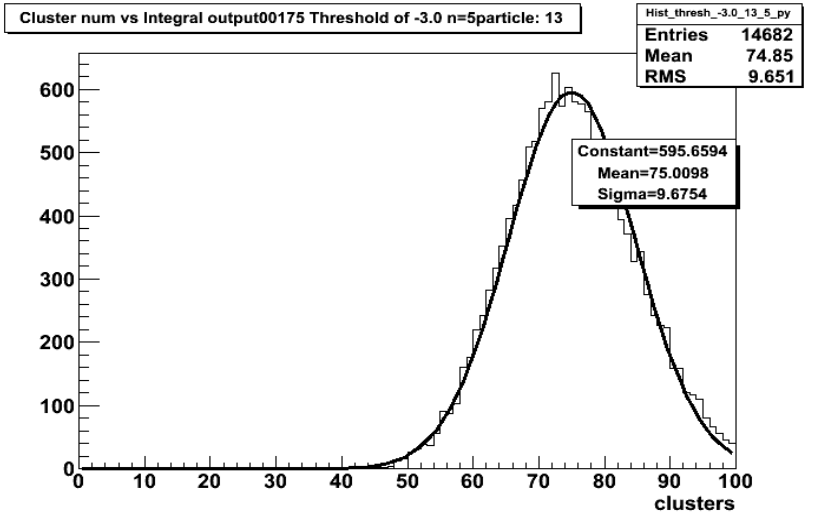
Integral of Signal

Distribution of detected clusters

p=140MeV/c

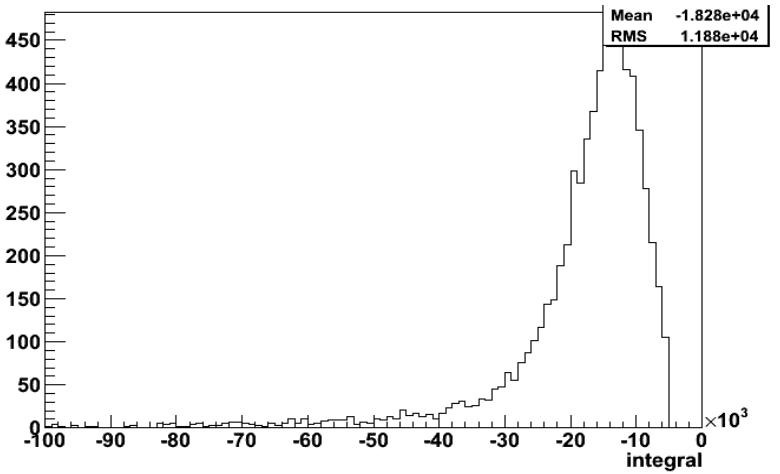
14682 entries

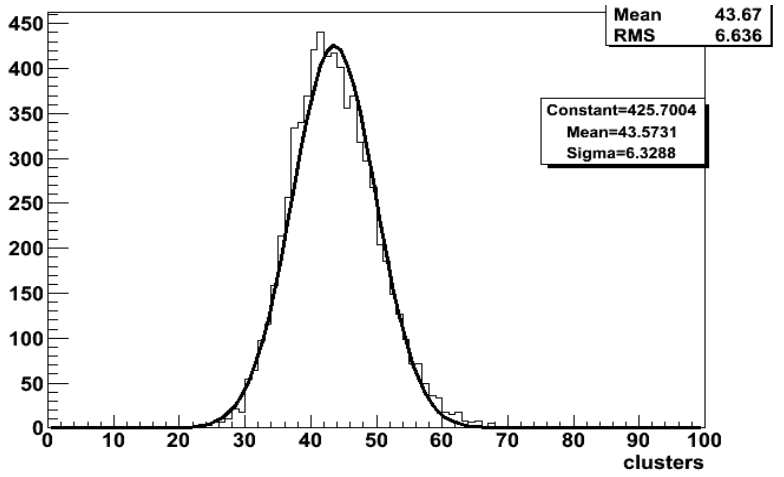




p=180MeV/c

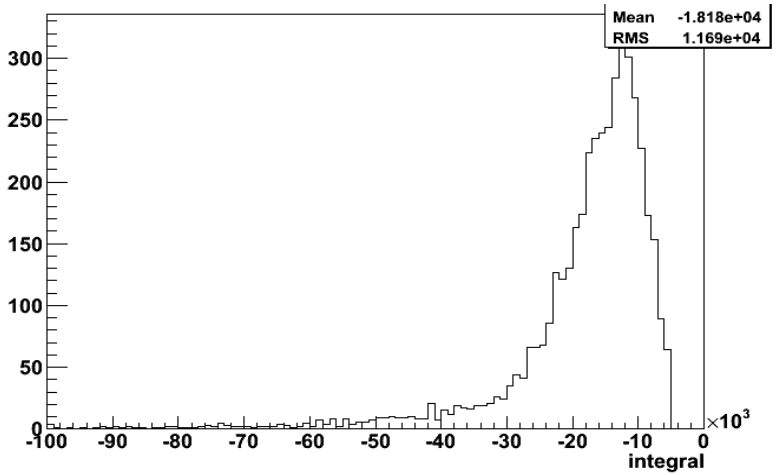
6892 entries

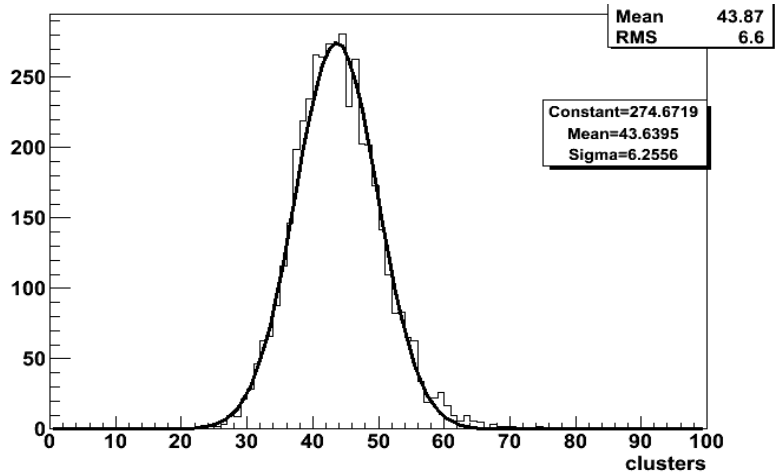




p=220MeV/c

4393 entries





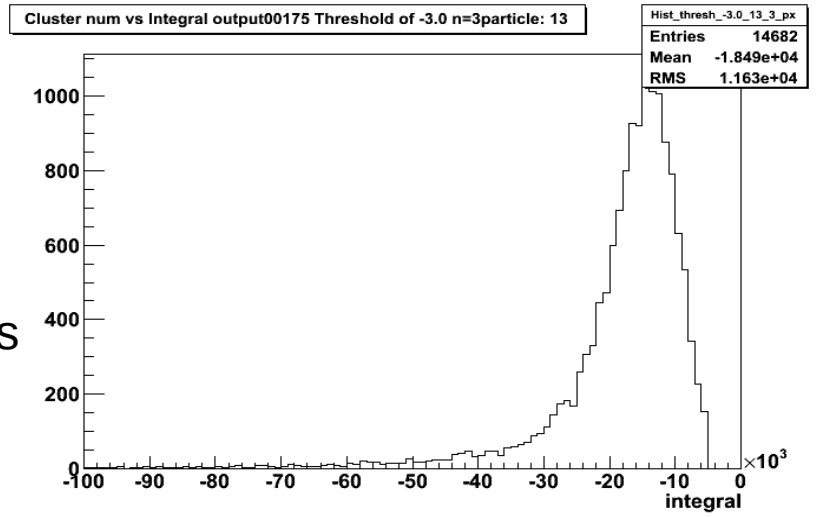
Threshold a=3.3
n=5
Particle = Muon
Gas: 90/10

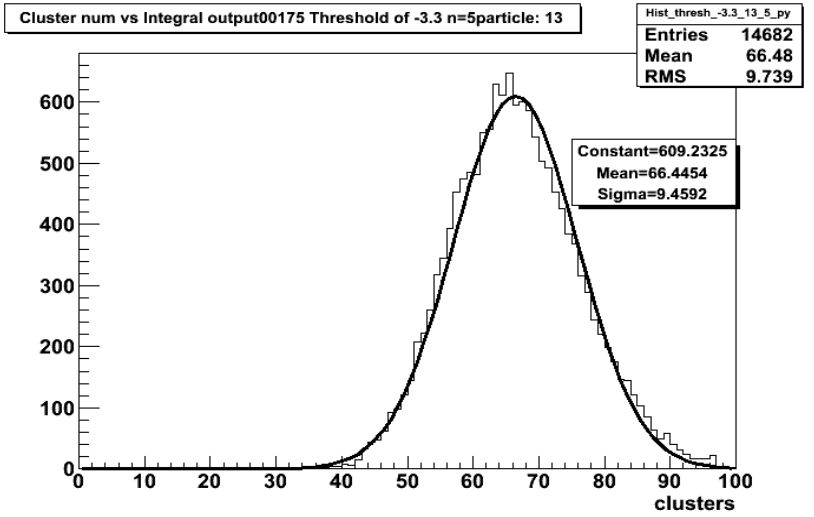
Integral of Signal

Distribution of detected clusters

p=140MeV/c

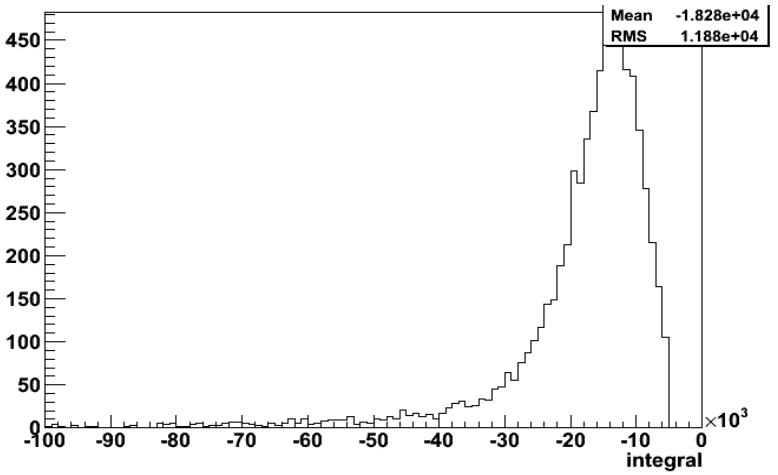
14682 entries

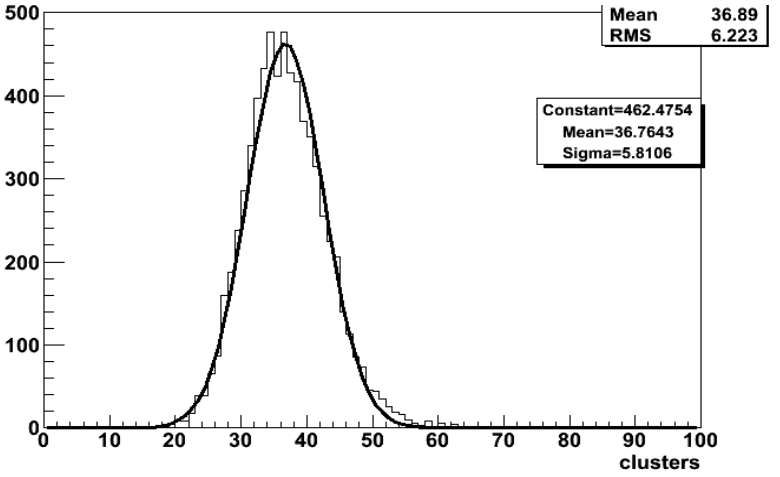




p=180MeV/c

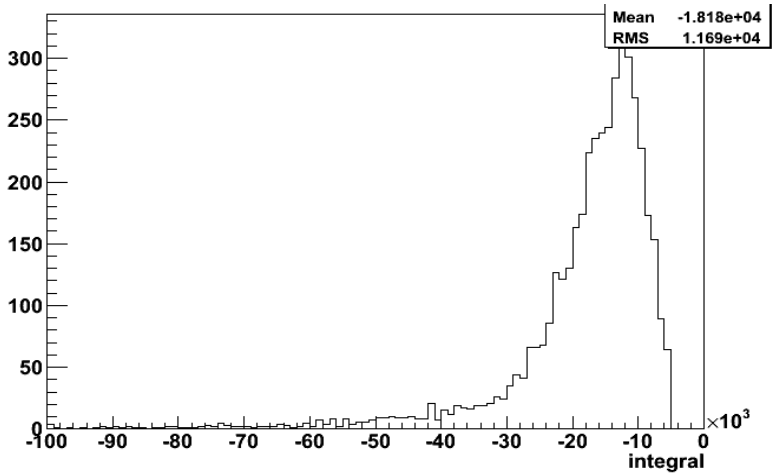
6892 entries

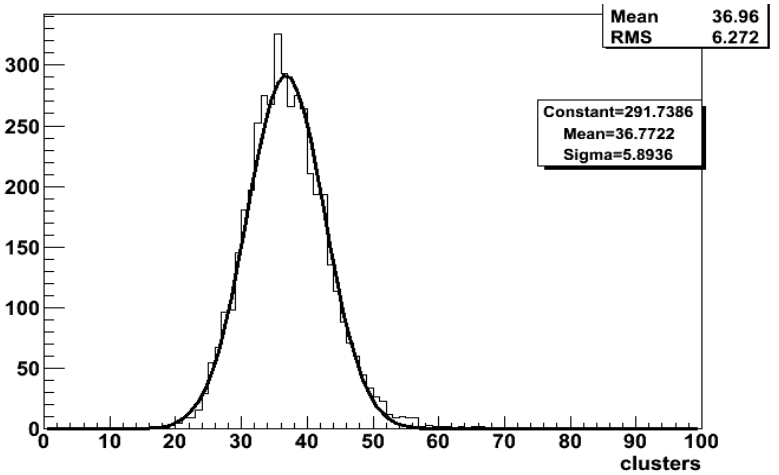




p=220MeV/c

4393 entries





ra

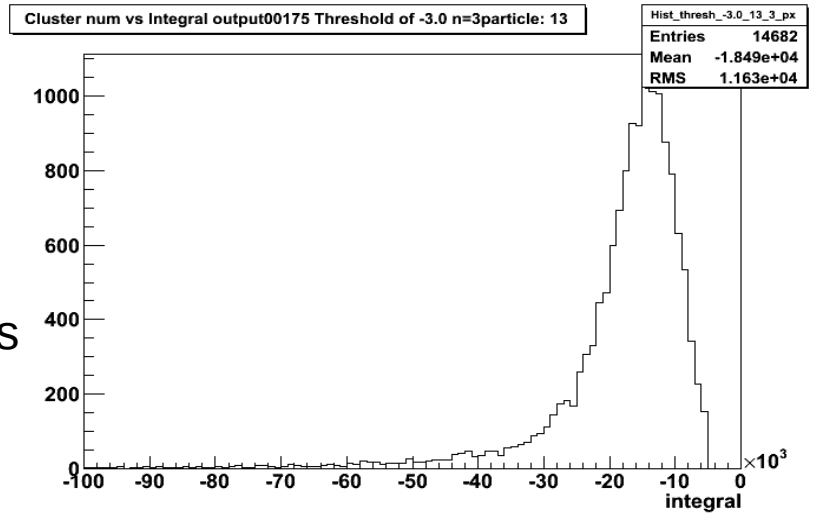
Threshold a=3.5
n=5
Particle = Muon
Gas: 90/10

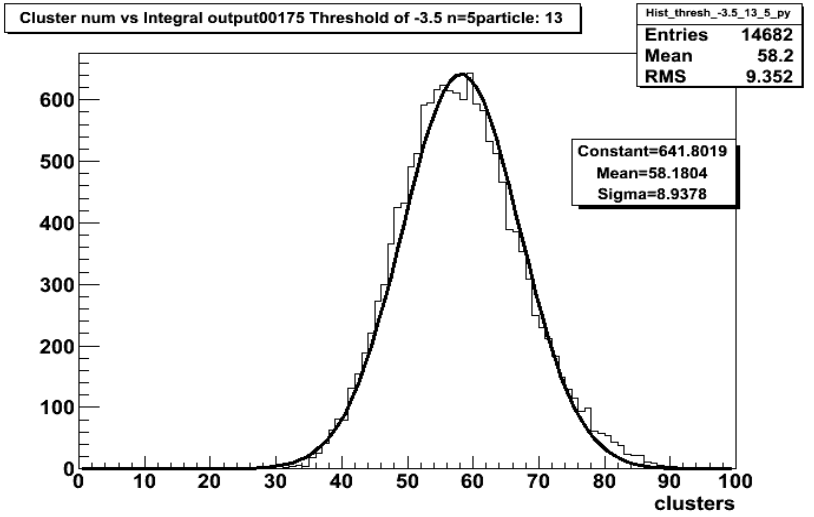
Integral of Signal

Distribution of detected clusters

p=140MeV/c

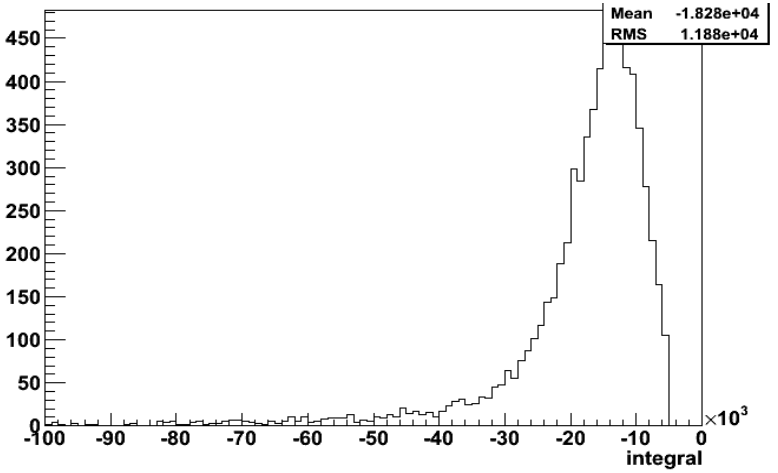
14682 entries

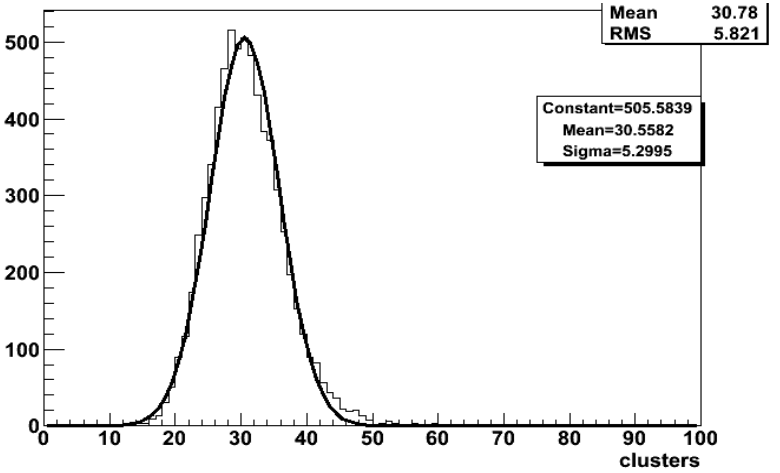




p=180MeV/c

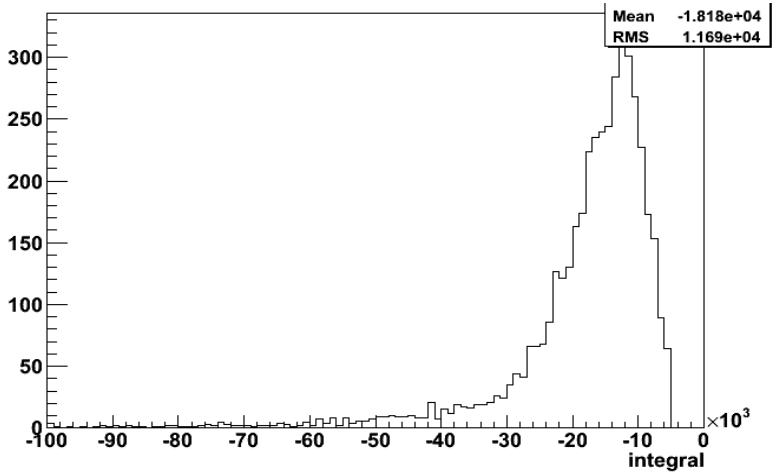
6892 entries

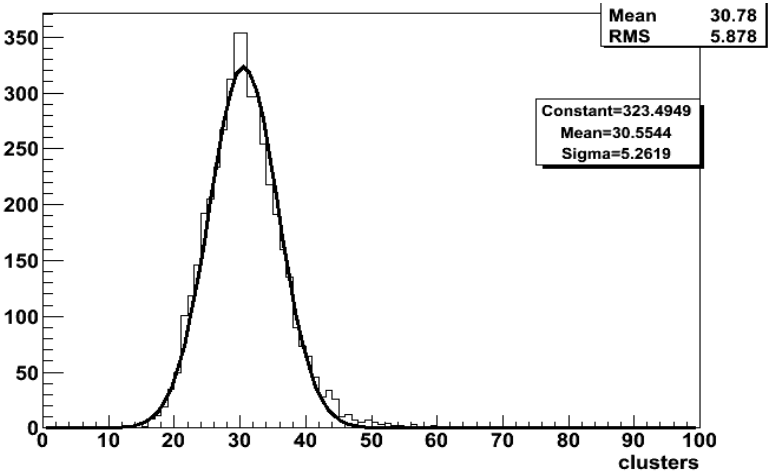




p=220MeV/c

4393 entries





ra

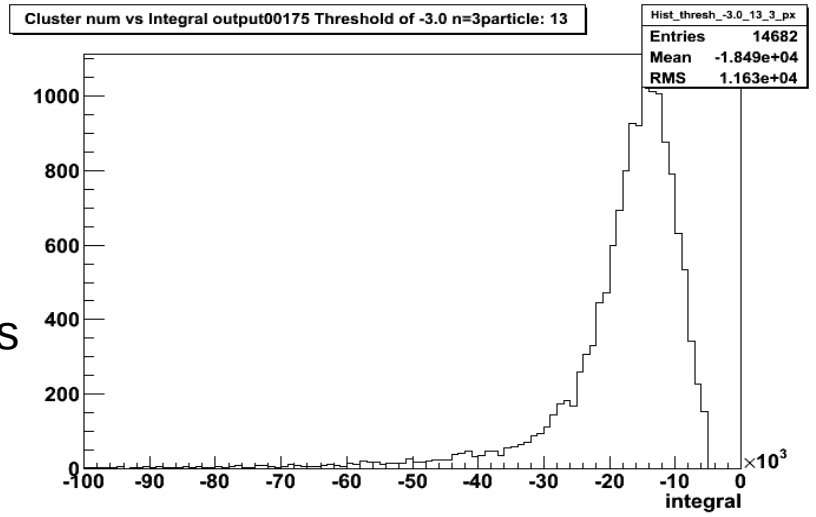
Threshold a=3.7
n=5
Particle = Muon
Gas: 90/10

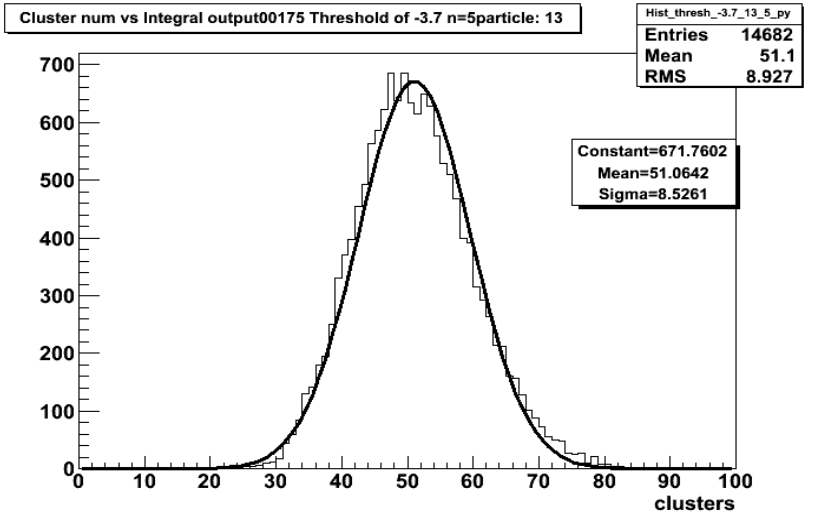
Integral of Signal

Distribution of detected clusters

p=140MeV/c

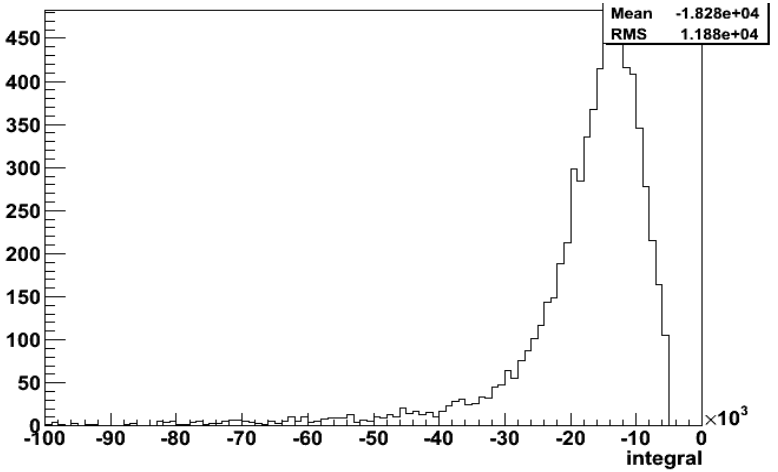
14682 entries

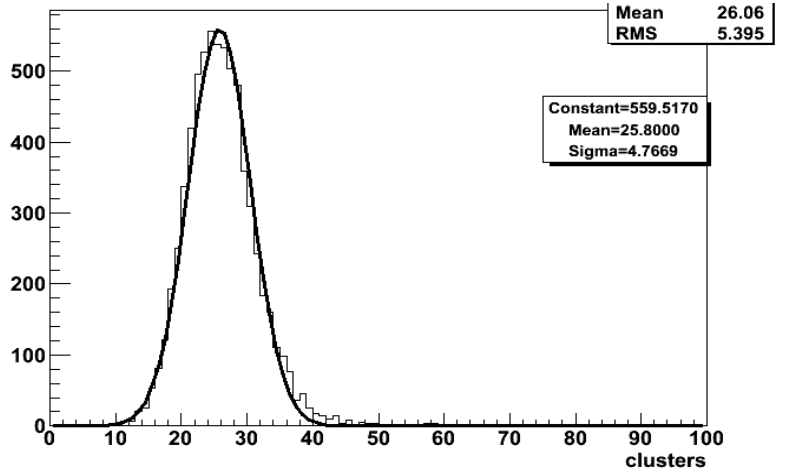




p=180MeV/c

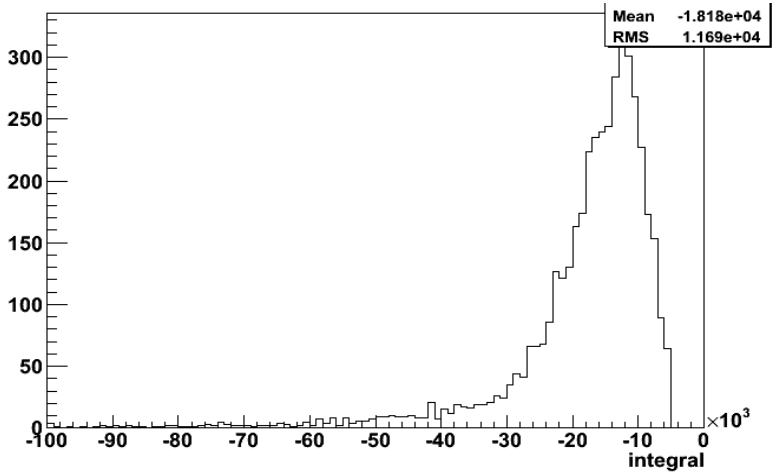
6892 entries

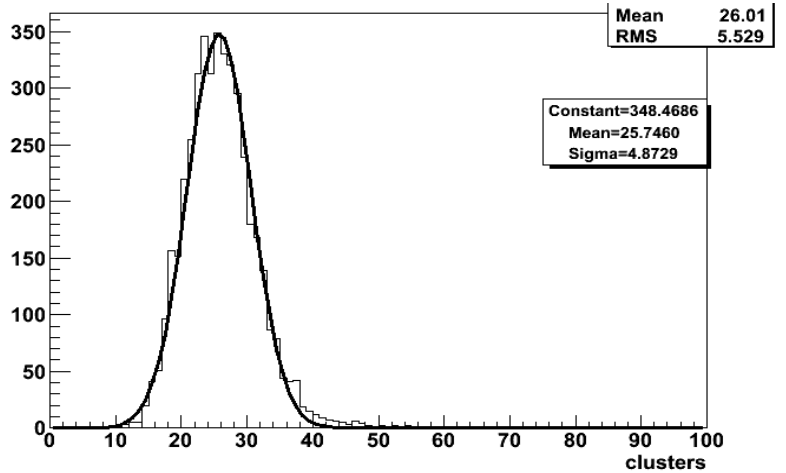




p=220MeV/c

4393 entries





ra

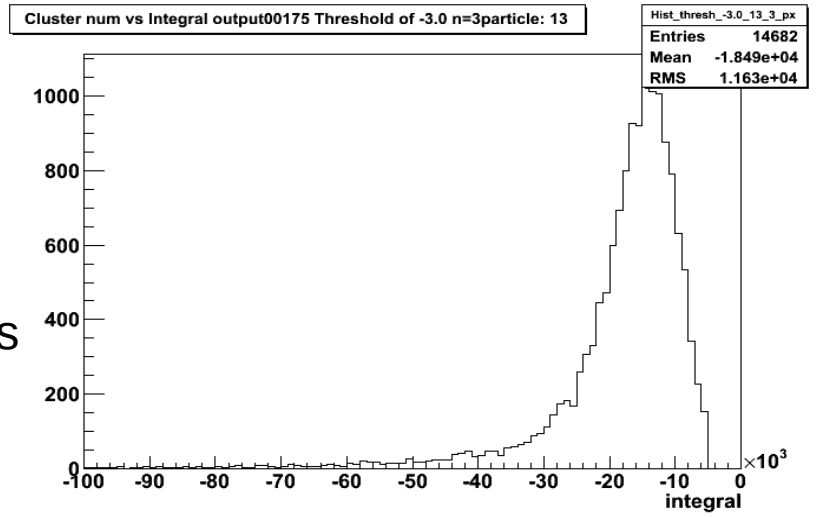
Threshold a=4
n=5
Particle = Muon
Gas: 90/10

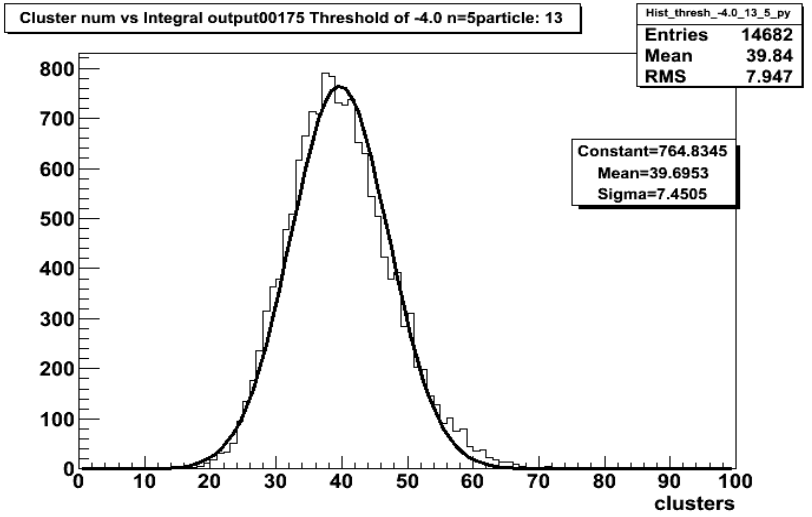
Integral of Signal

Distribution of detected clusters

p=140MeV/c

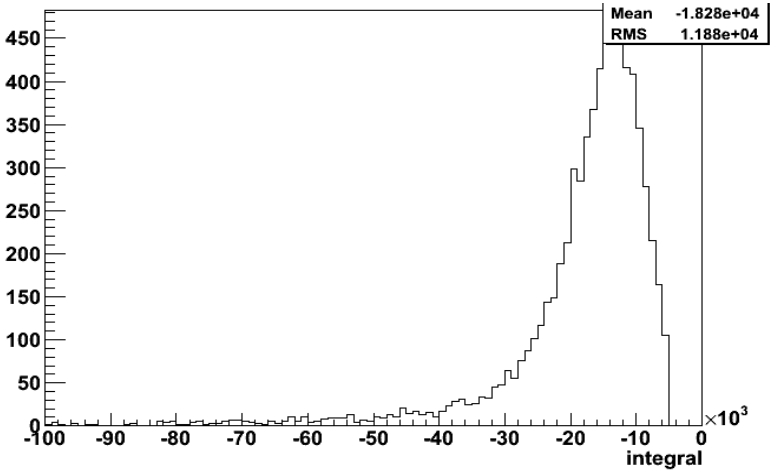
14682 entries

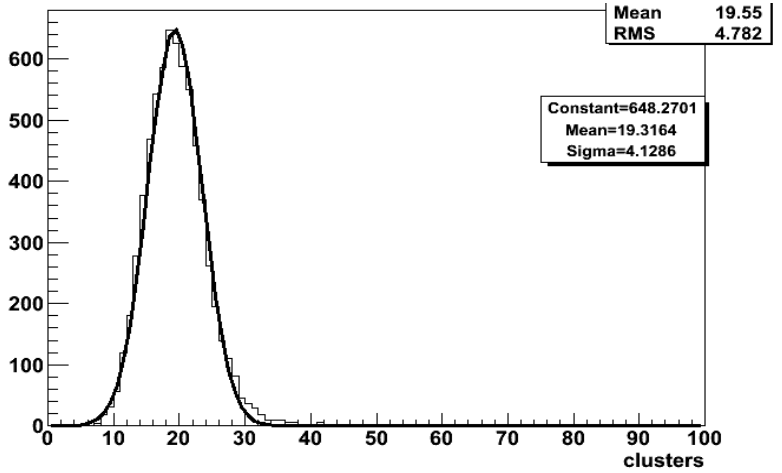




p=180MeV/c

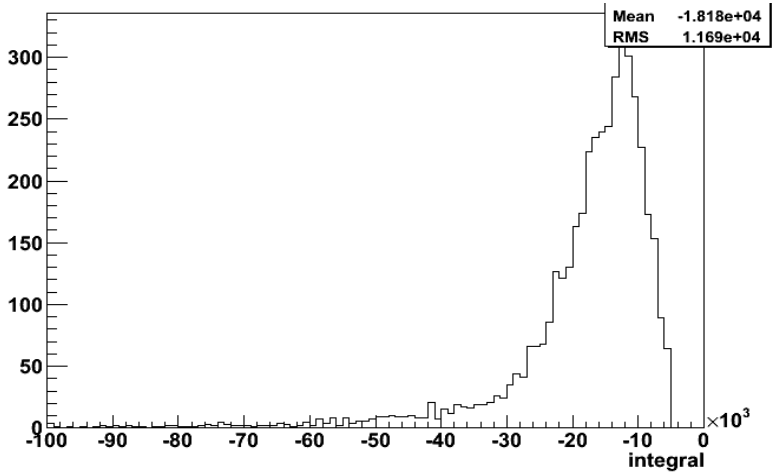
6892 entries

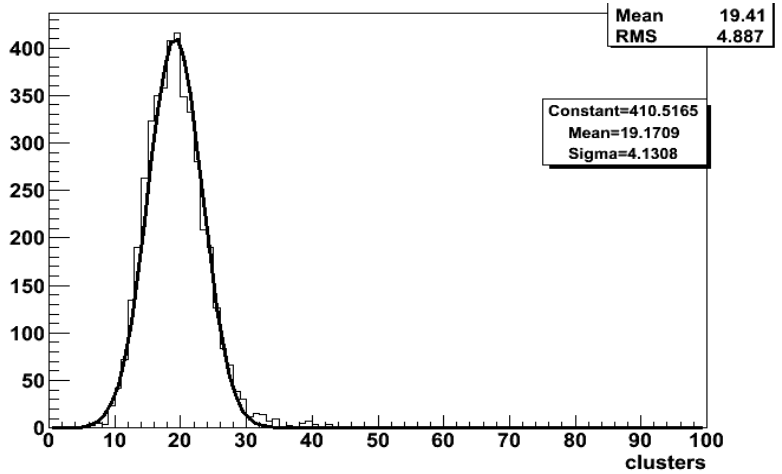




p=220MeV/c

4393 entries





ra

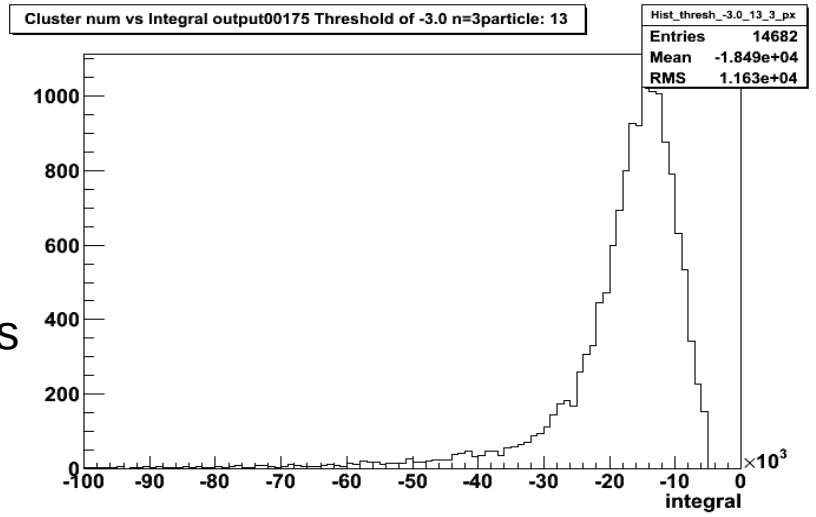
Threshold a=5
n=5
Particle = Muon
Gas: 90/10

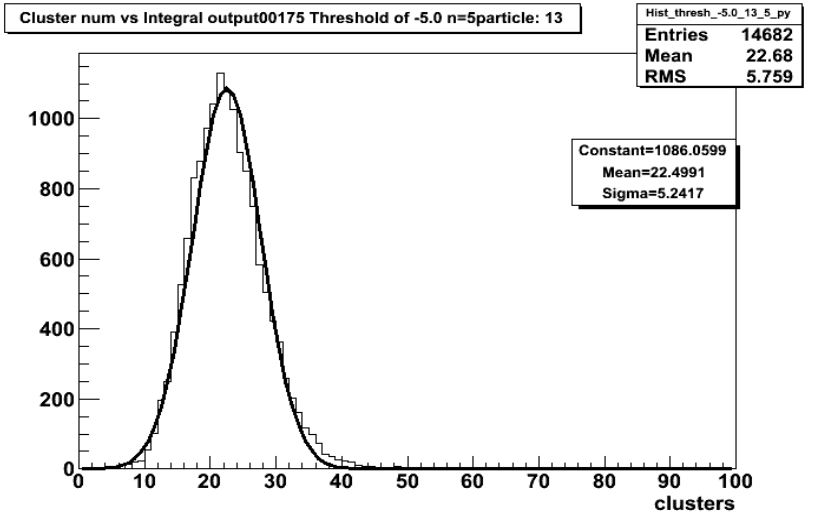
Integral of Signal

Distribution of detected clusters

p=140MeV/c

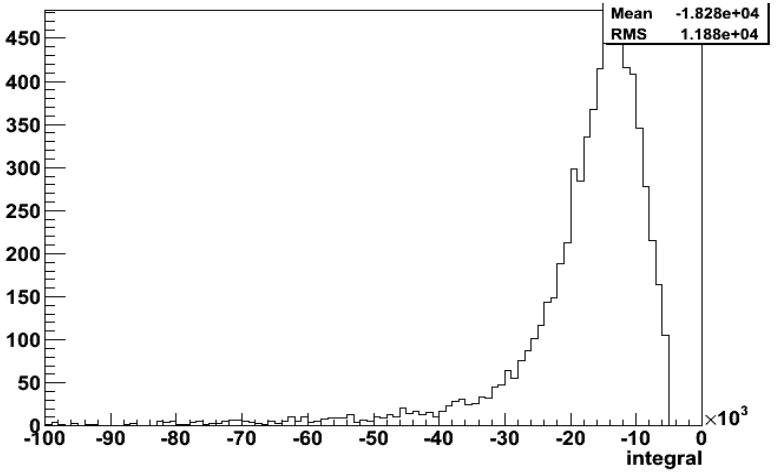
14682 entries

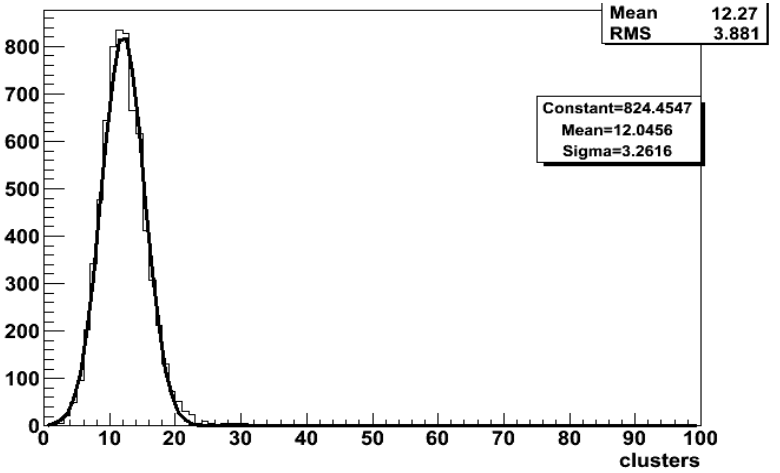




p=180MeV/c

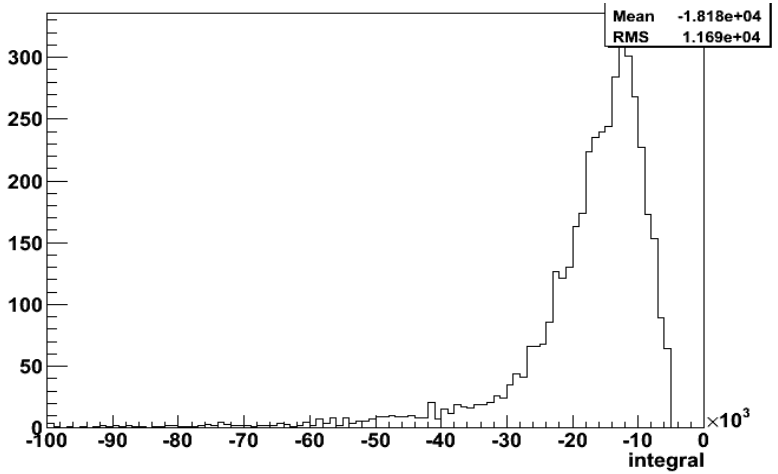
6892 entries

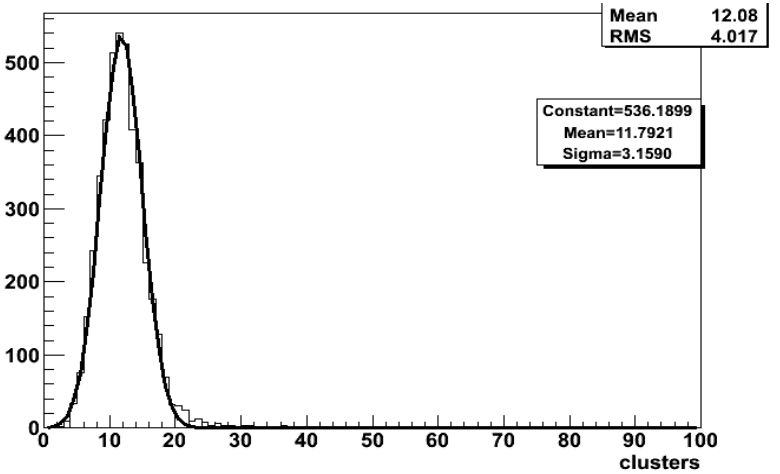




p=220MeV/c

4393 entries





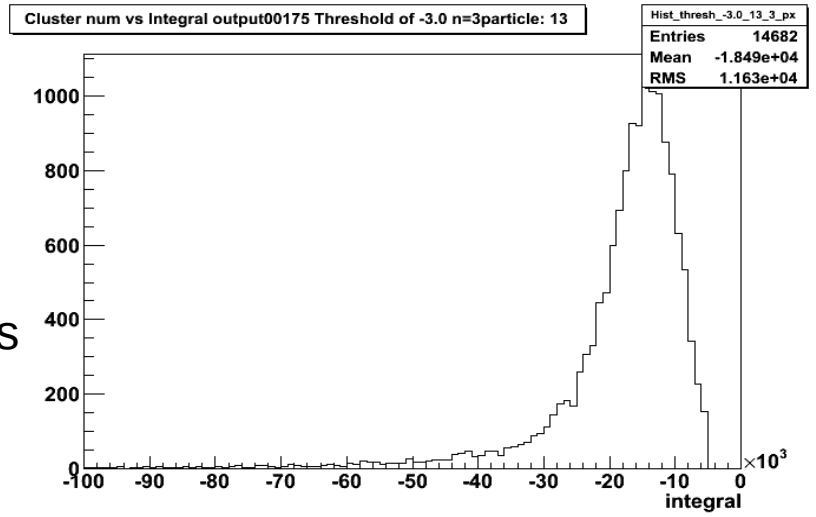
ra

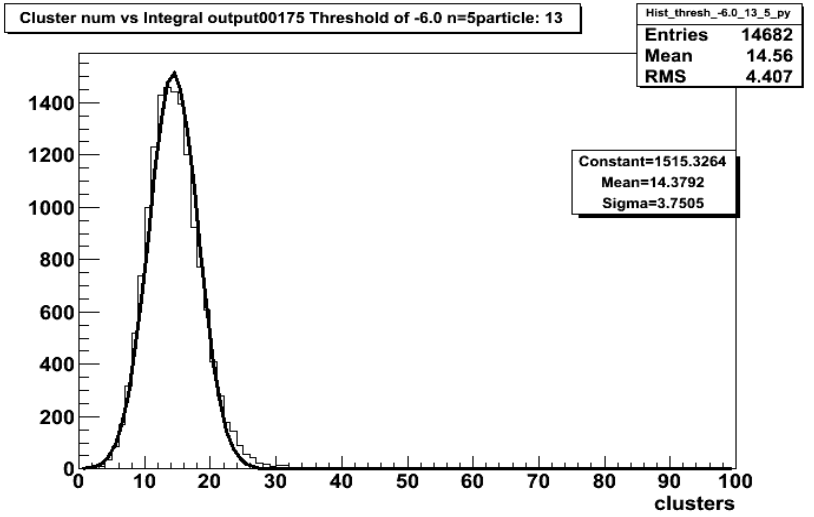
Threshold a=6
n=5
Particle = Muon
Gas: 90/10

Distribution of detected clusters

p=140MeV/c

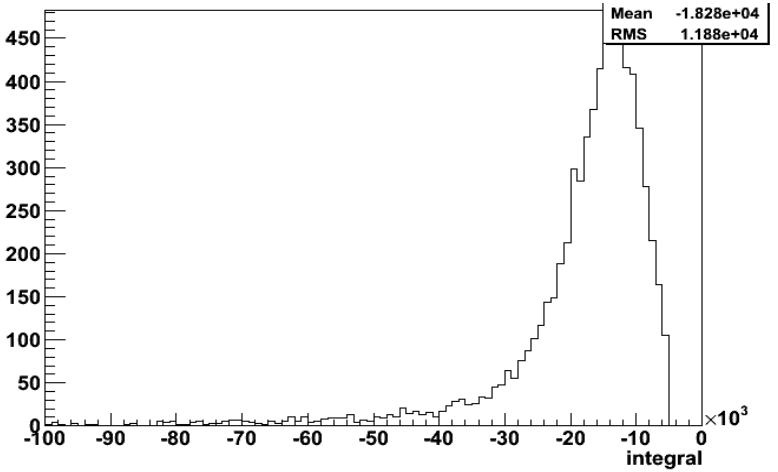
14682 entries

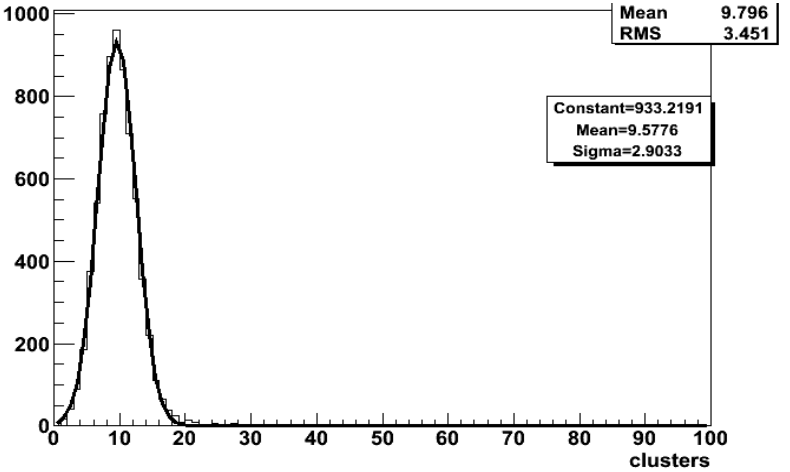




p=180MeV/c

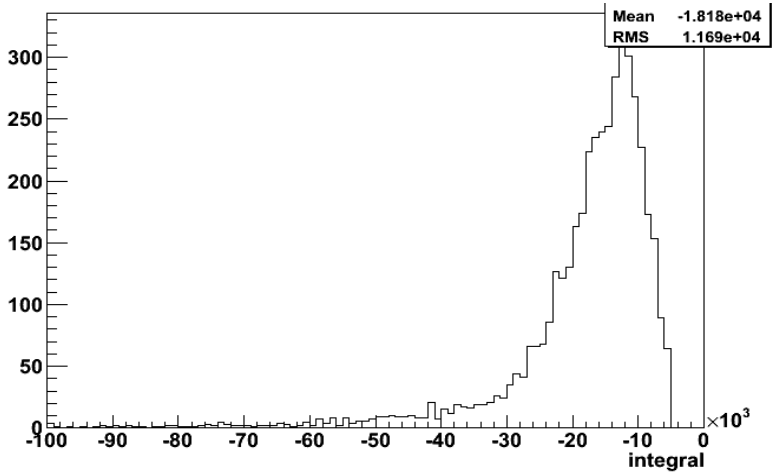
6892 entries

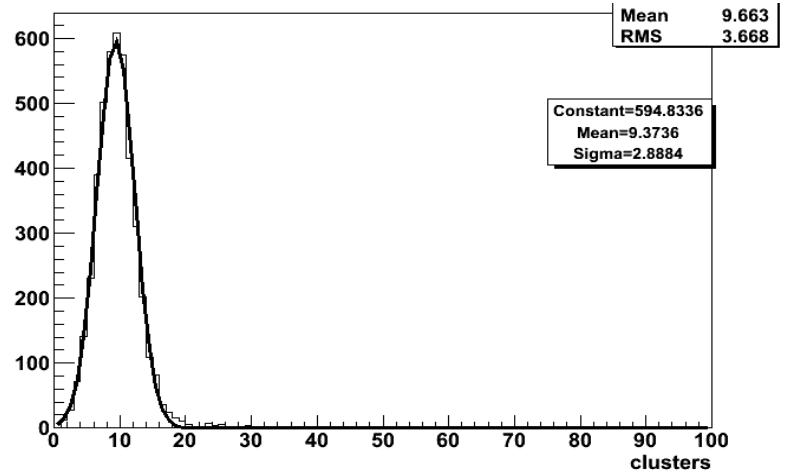




p=220MeV/c

4393 entries





ra

Muons, n=3
90/10

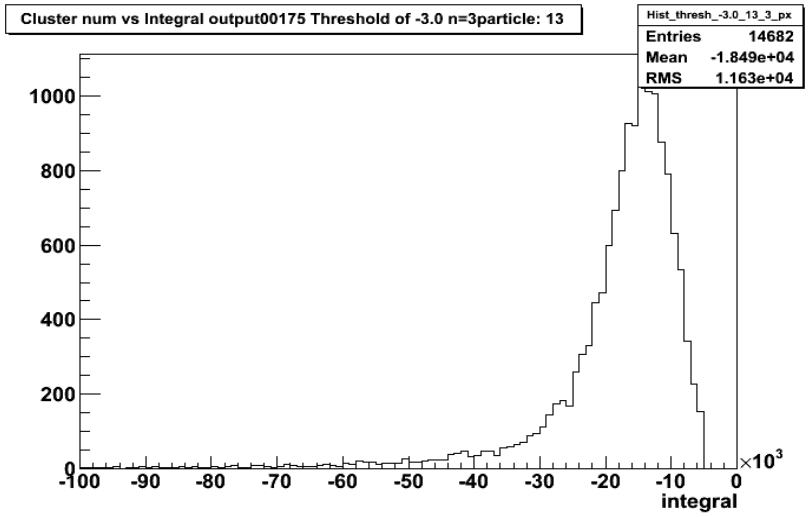
Threshold a=3
n=3
Particle = Muon
Gas: 90/10

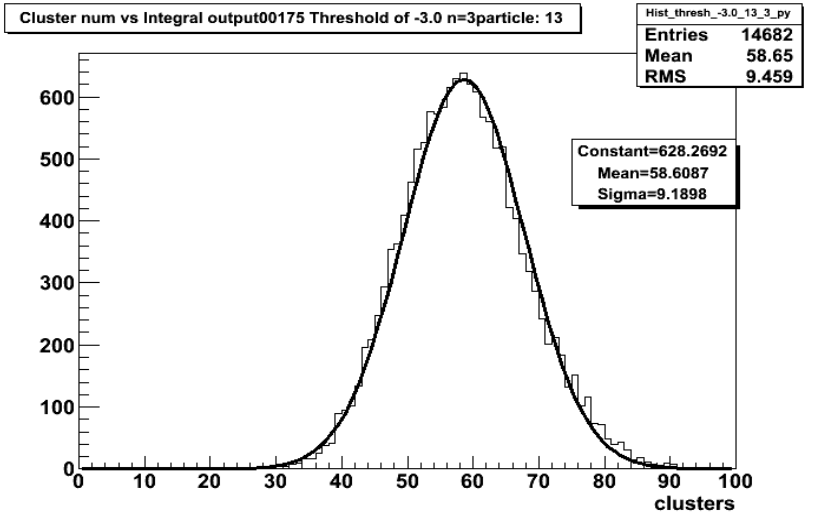
Integral of Signal

Distribution of detected clusters

p=140MeV/c

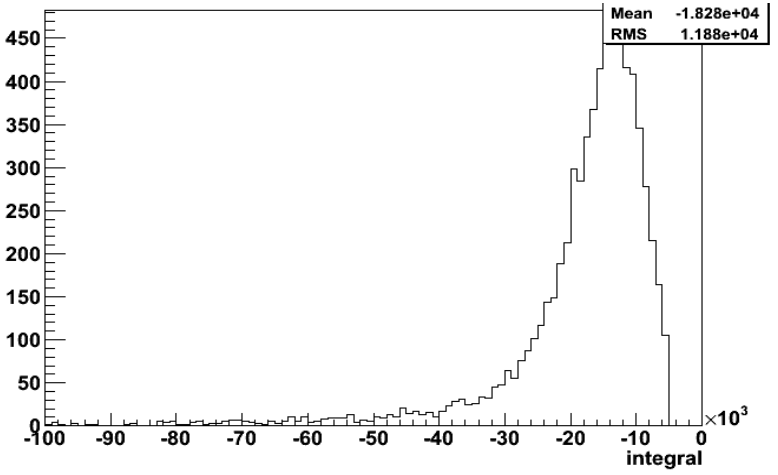
14682 entries

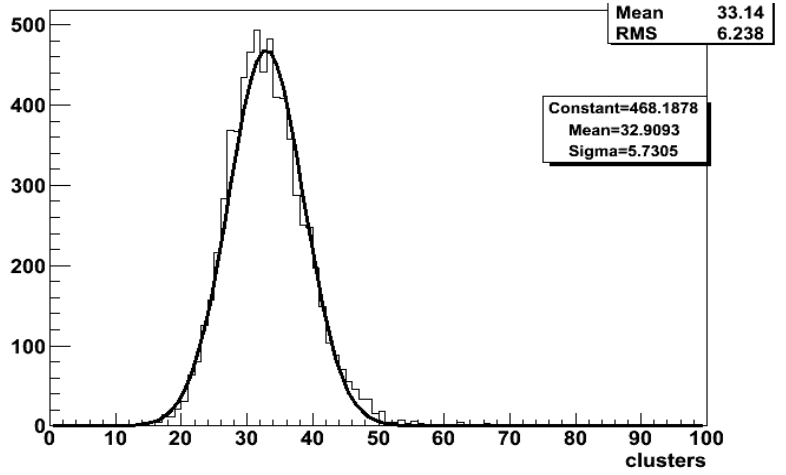




p=180MeV/c

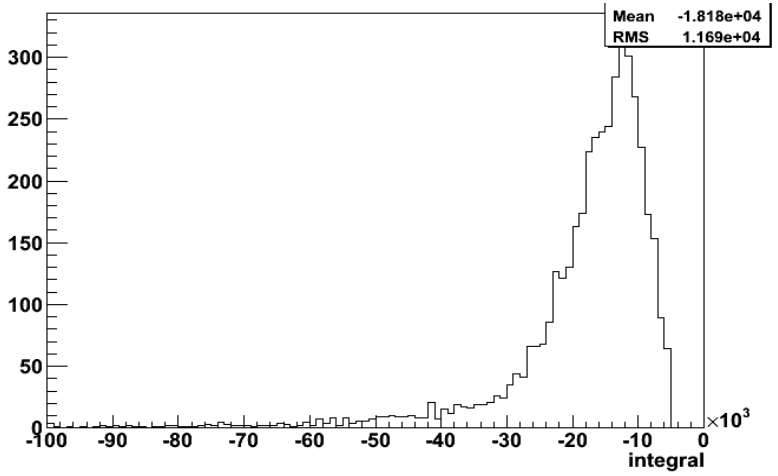
6892 entries

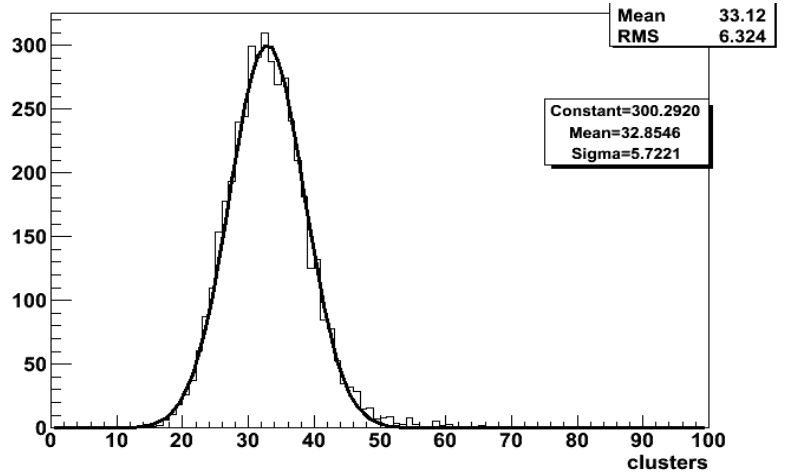




p=220MeV/c

4393 entries





ra

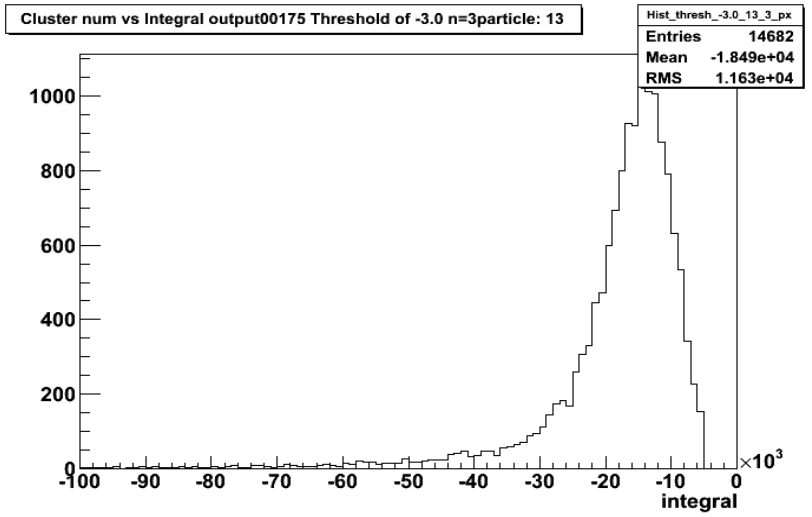
Threshold a=3.3
n=3
Particle = Muon
Gas: 90/10

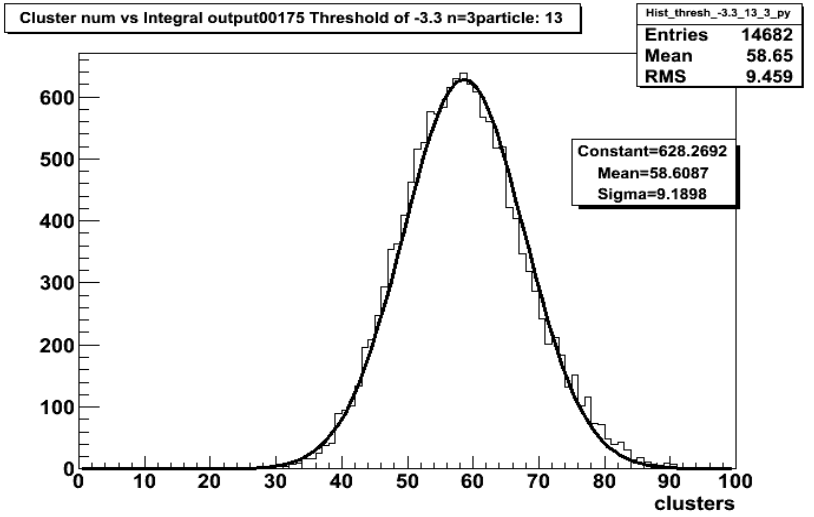
Integral of Signal

Distribution of detected clusters

p=140MeV/c

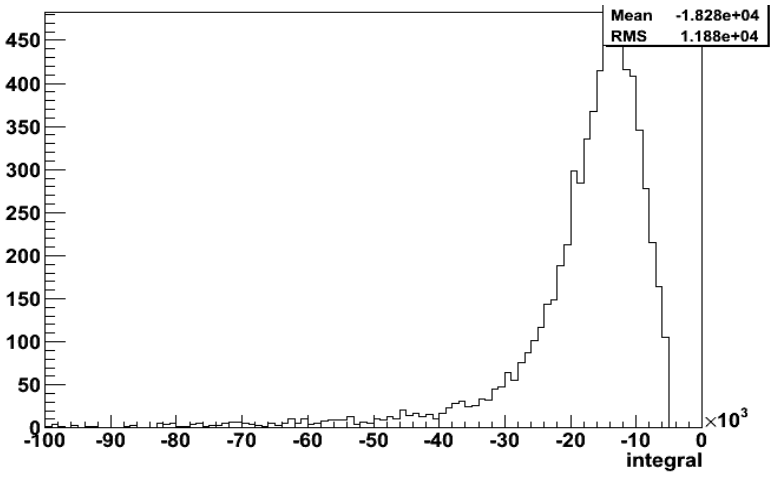
14682 entries

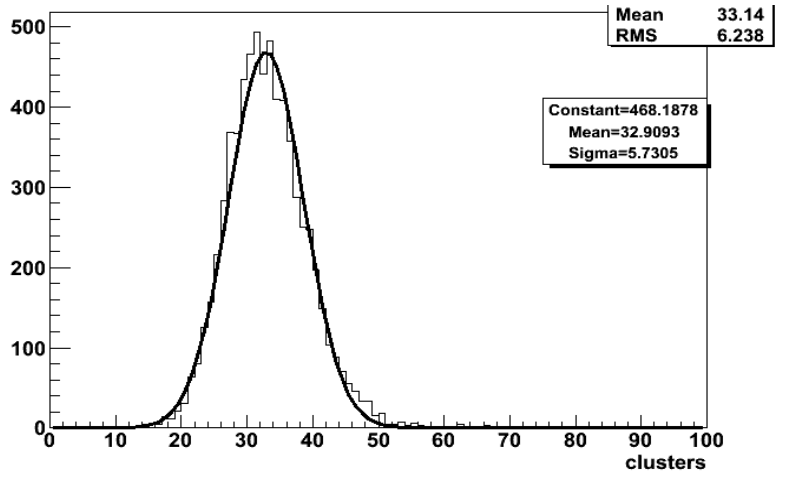




p=180MeV/c

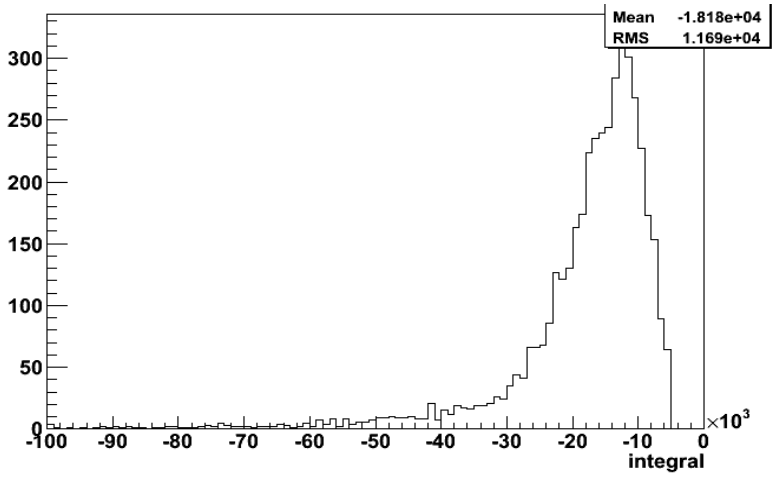
6892 entries

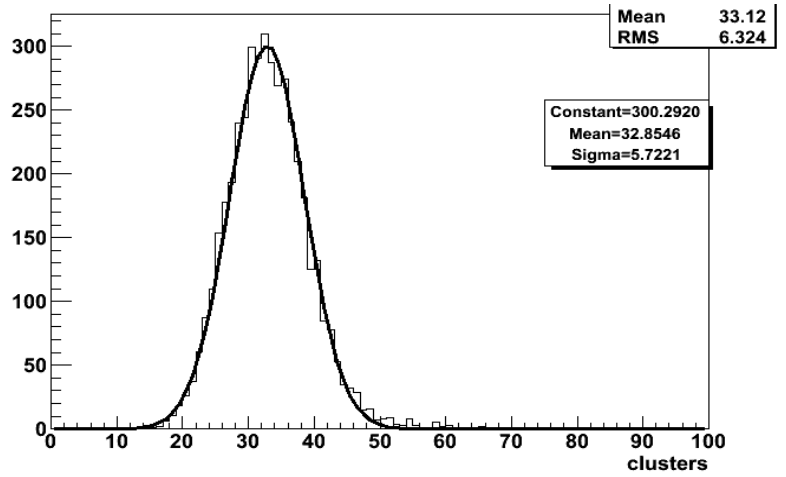




p=220MeV/c

4393 entries





ra

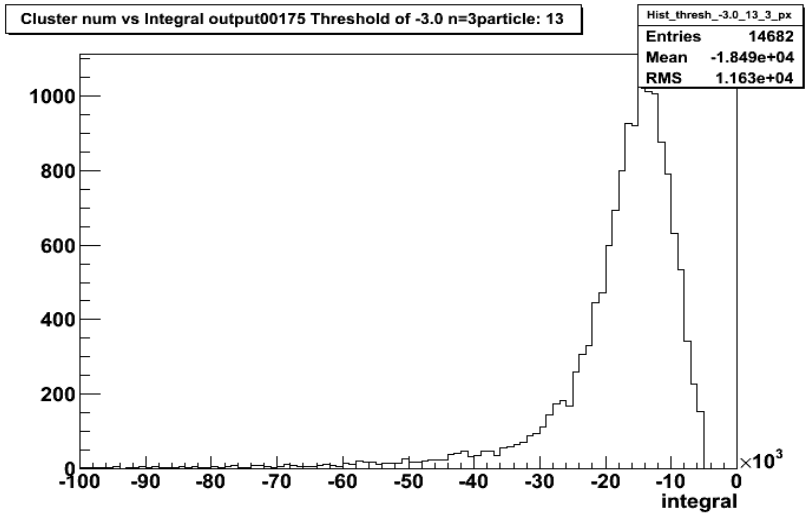
Threshold a=3.5
n=3
Particle = Muon
Gas: 90/10

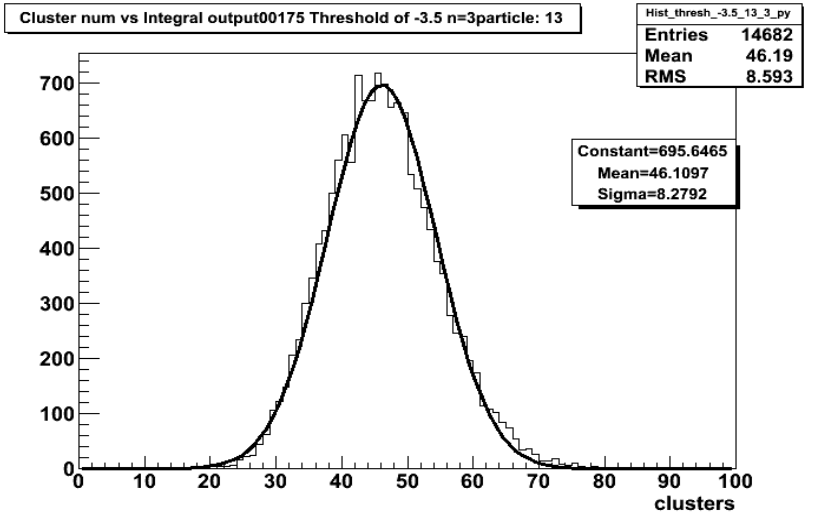
Integral of Signal

Distribution of detected clusters

p=140MeV/c

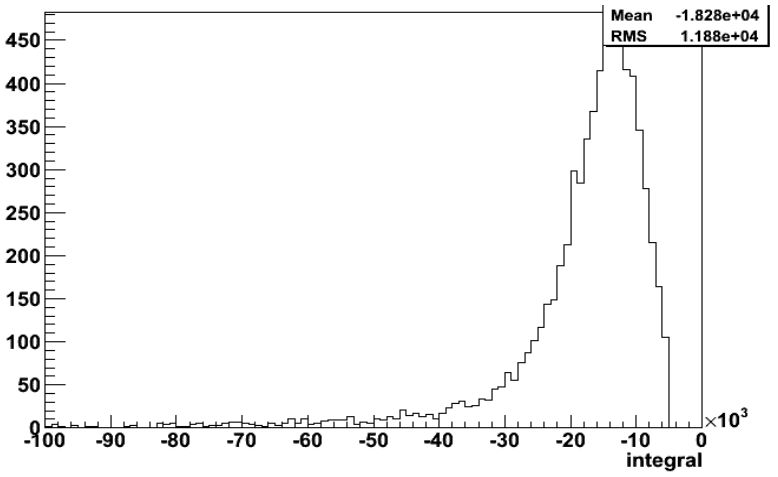
14682 entries

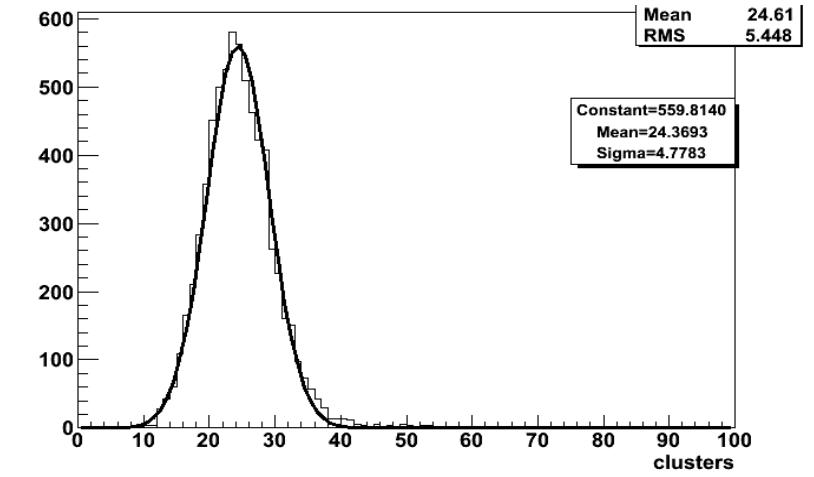




p=180MeV/c

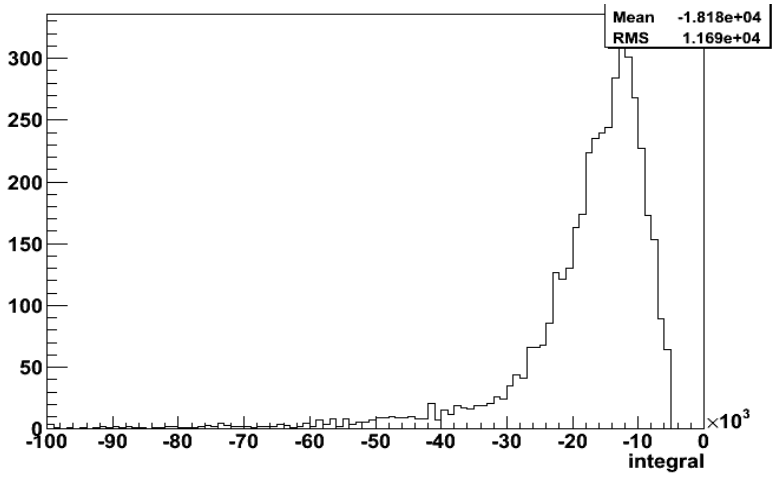
6892 entries

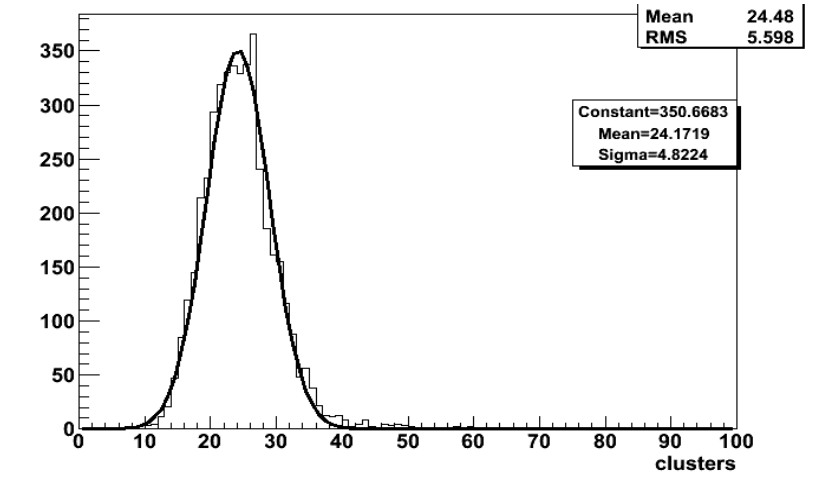




p=220MeV/c

4393 entries





ra

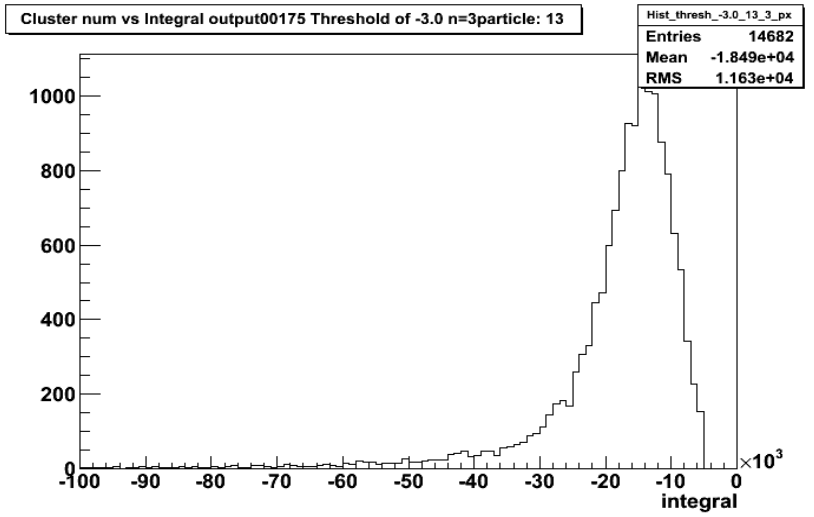
Threshold a=3.7
n=3
Particle = Muon
Gas: 90/10

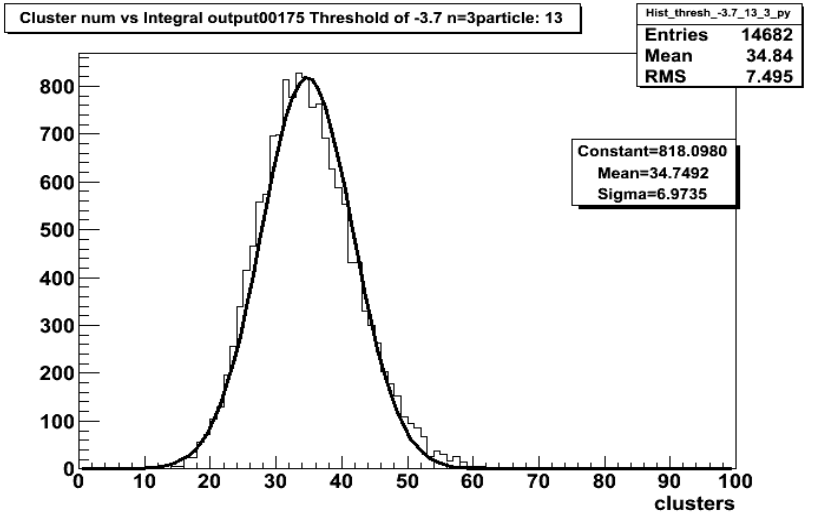
Integral of Signal

Distribution of detected clusters

p=140MeV/c

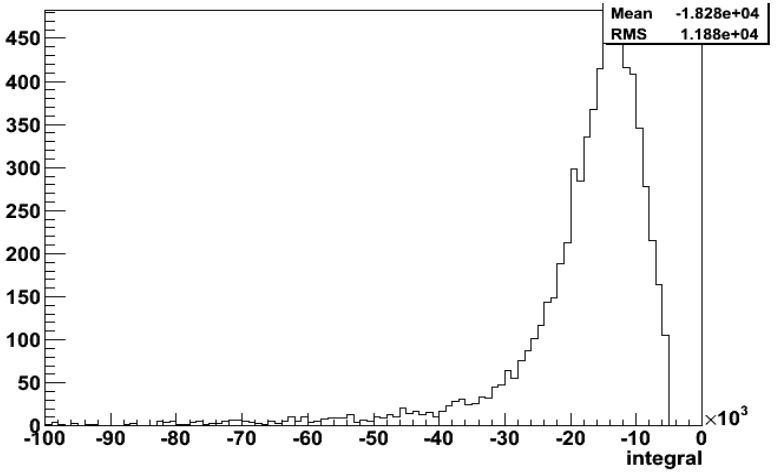
14682 entries

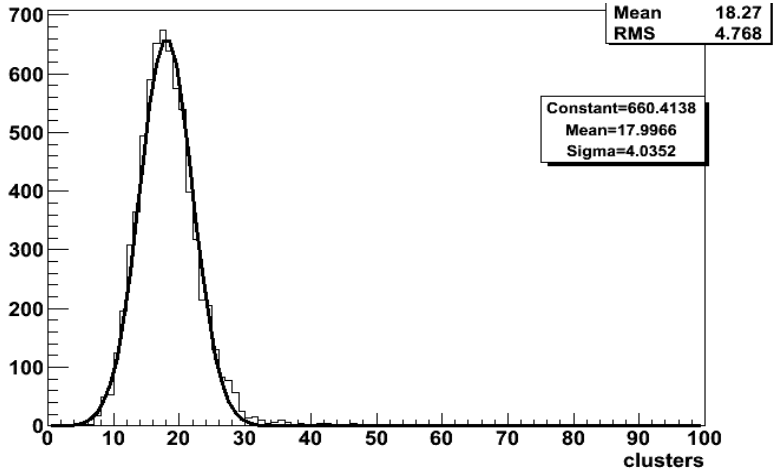




p=180MeV/c

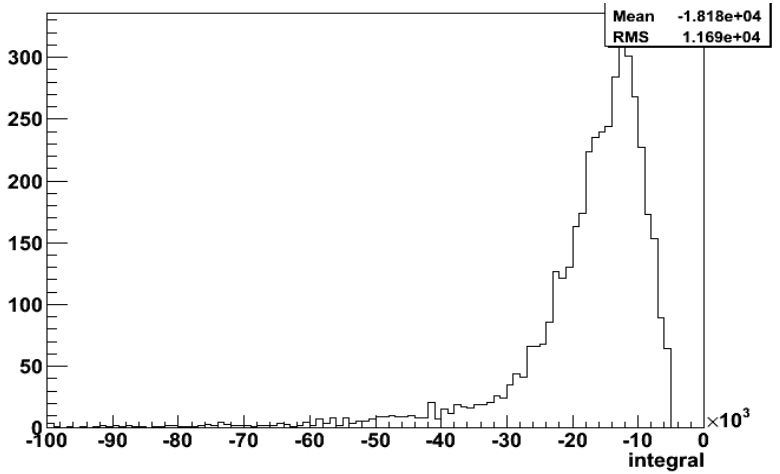
6892 entries

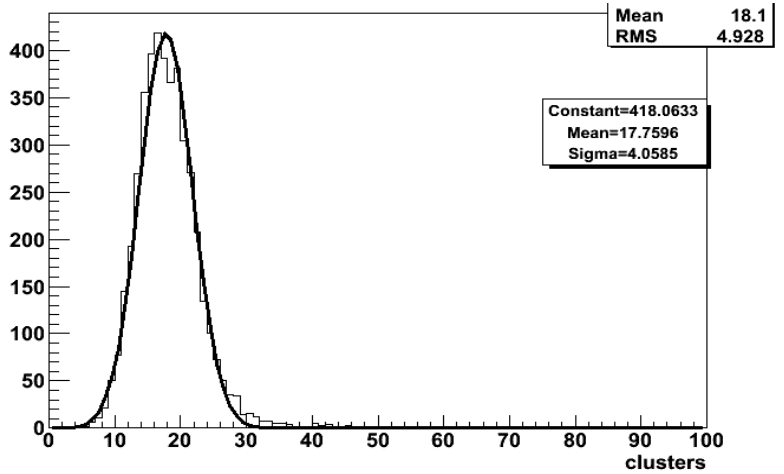




p=220MeV/c

4393 entries





ra

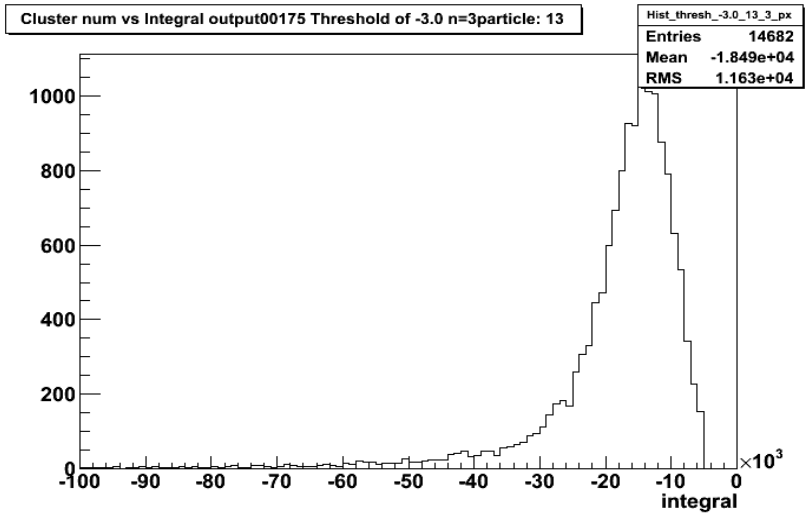
Threshold a=4
n=3
Particle = Muon
Gas: 90/10

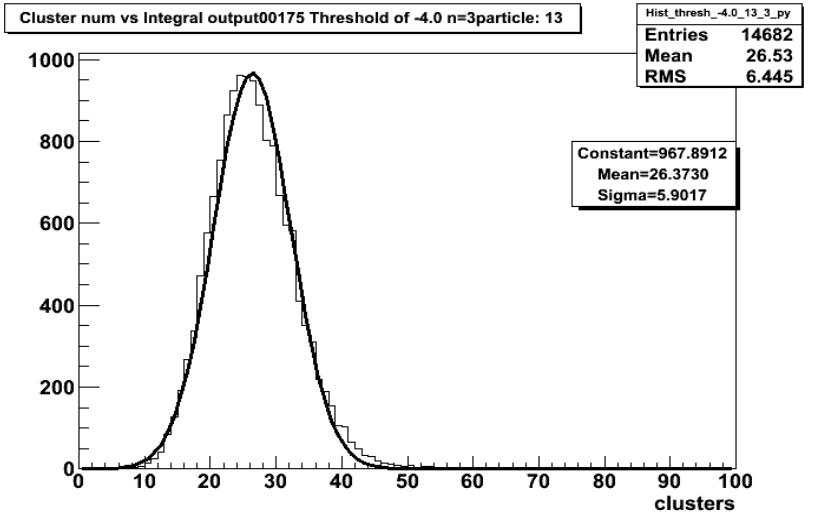
Integral of Signal

Distribution of detected clusters

p=140MeV/c

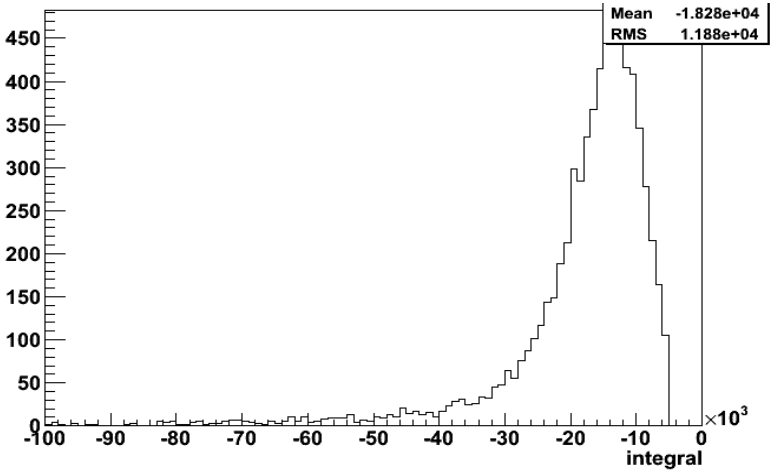
14682 entries

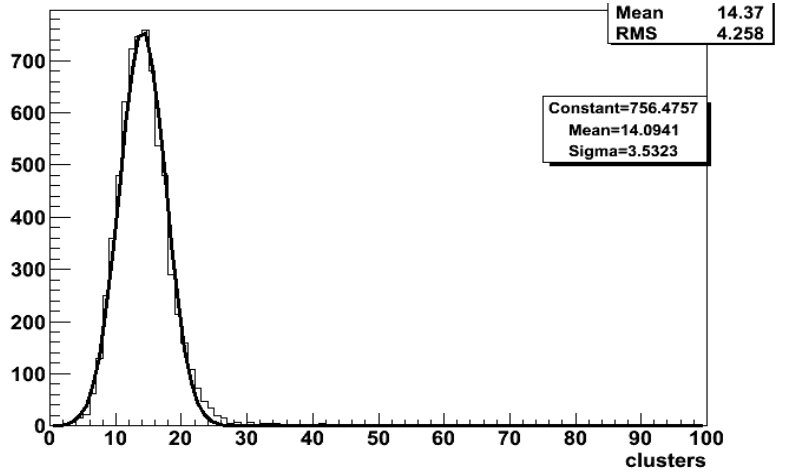




p=180MeV/c

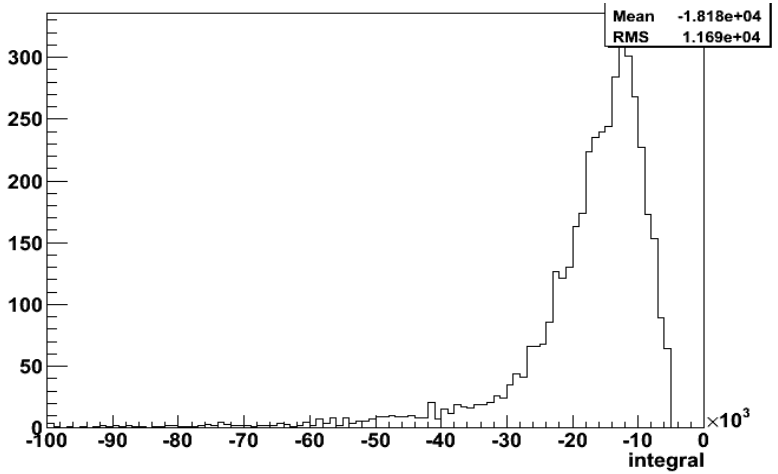
6892 entries

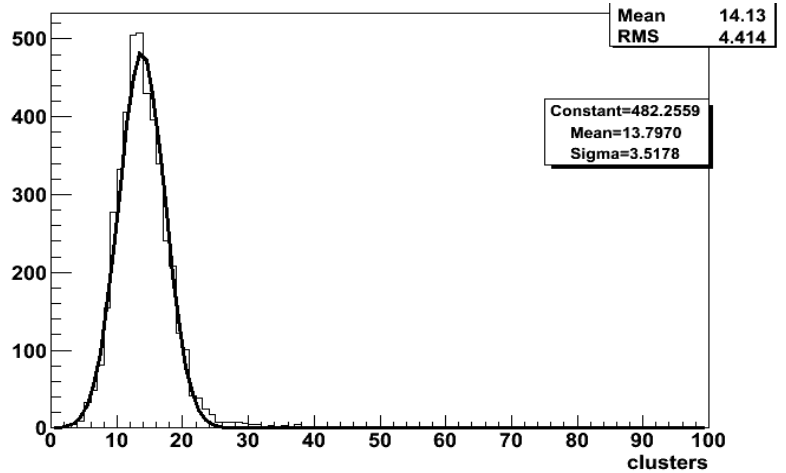




p=220MeV/c

4393 entries





ra

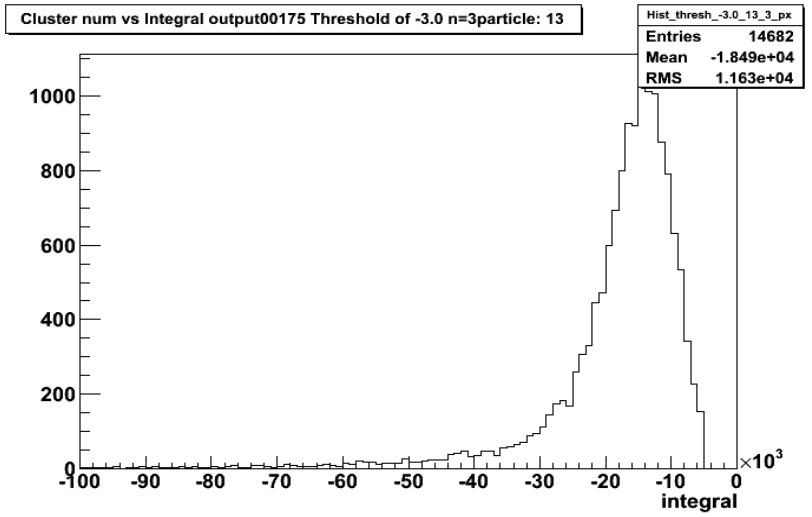
Threshold a=5
n=3
Particle = Muon
Gas: 90/10

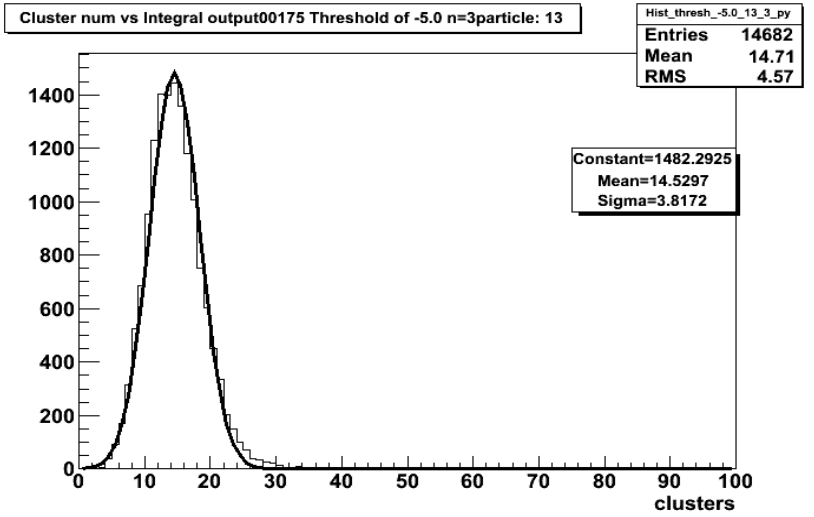
Integral of Signal

Distribution of detected clusters

p=140MeV/c

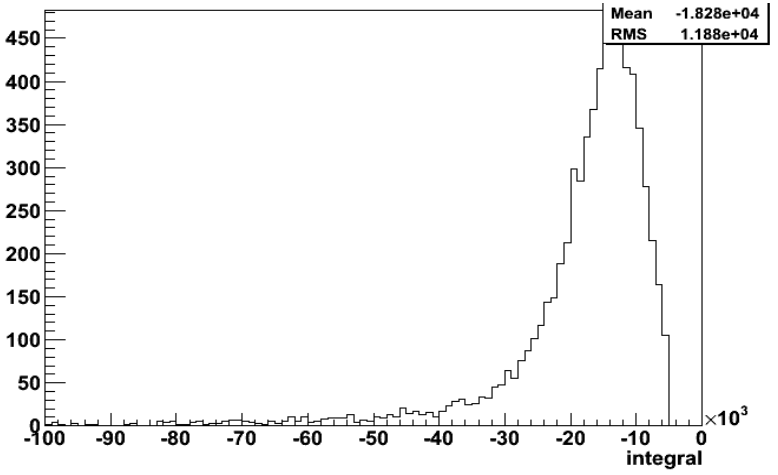
14682 entries

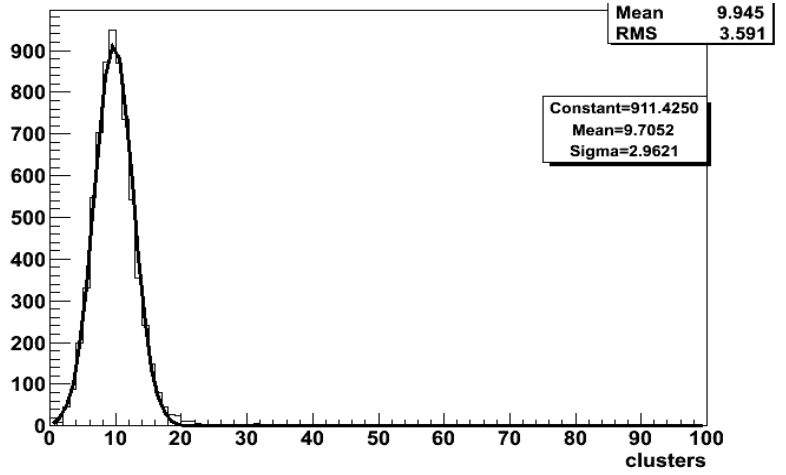




p=180MeV/c

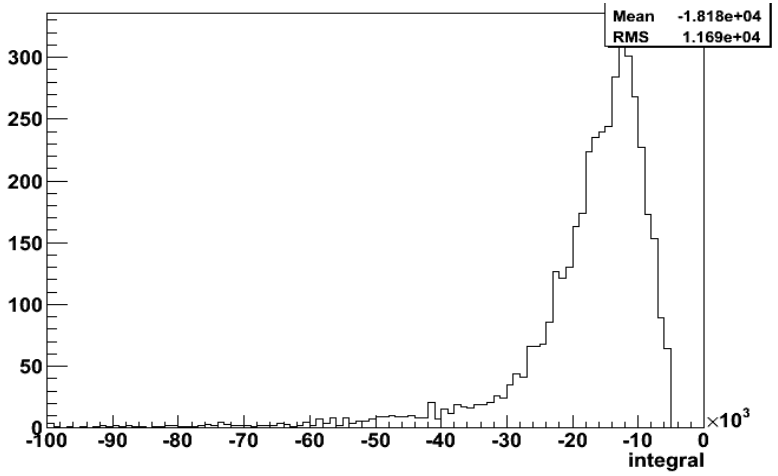
6892 entries

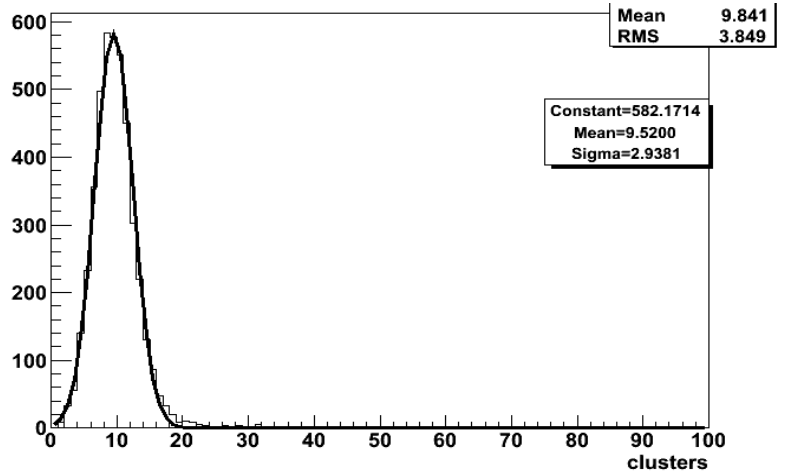




p=220MeV/c

4393 entries





ra

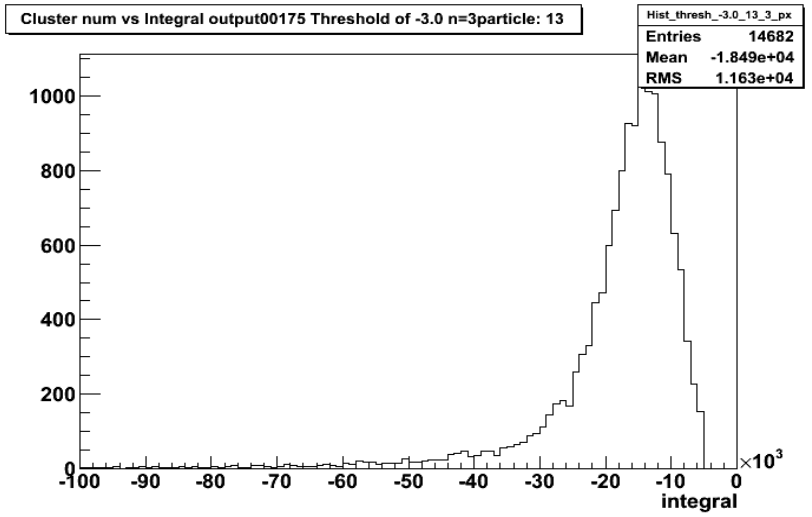
Threshold a=6
n=3
Particle = Muon
Gas: 90/10

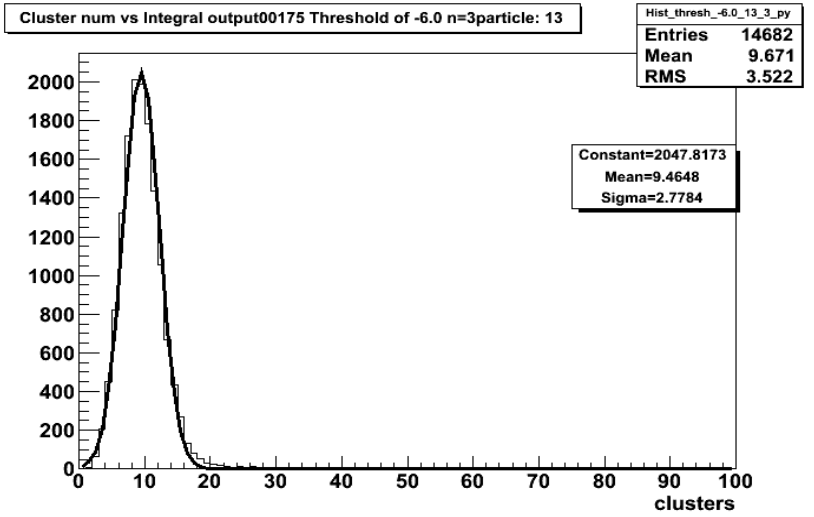
Integral of Signal

Distribution of detected clusters

p=140MeV/c

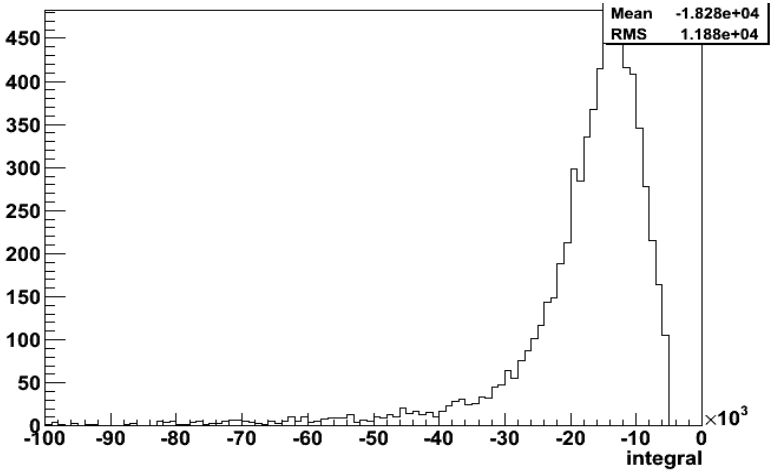
14682 entries

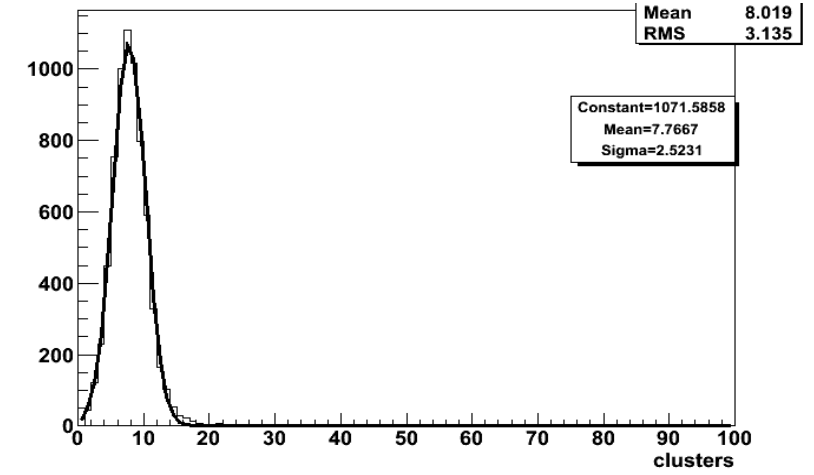




p=180MeV/c

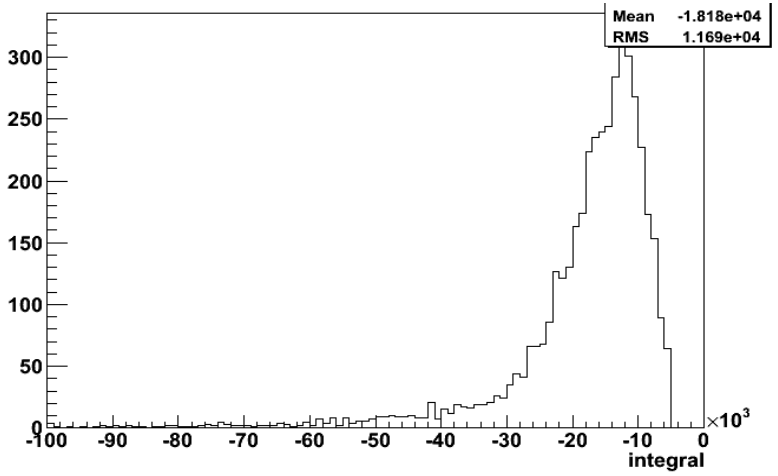
6892 entries

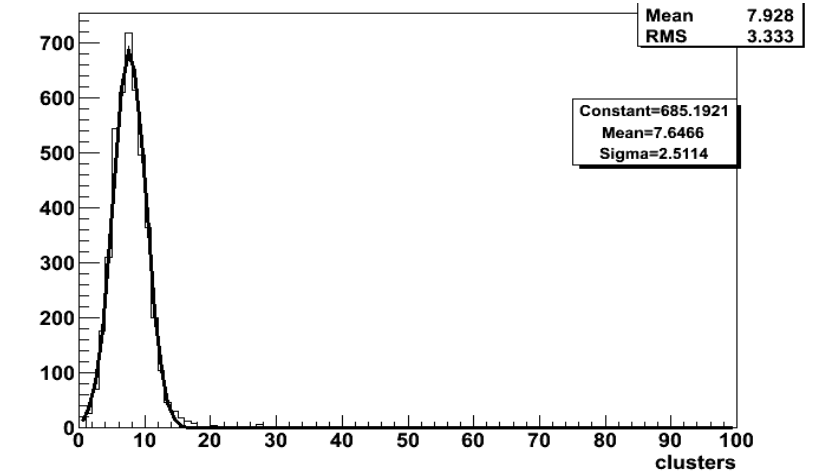




p=220MeV/c

4393 entries





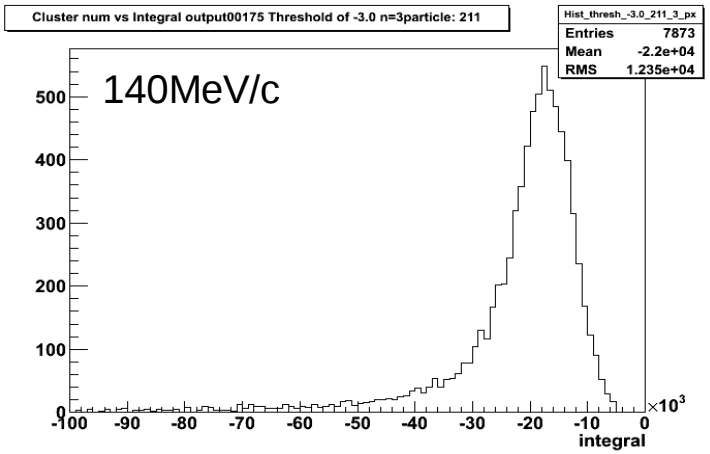
ra

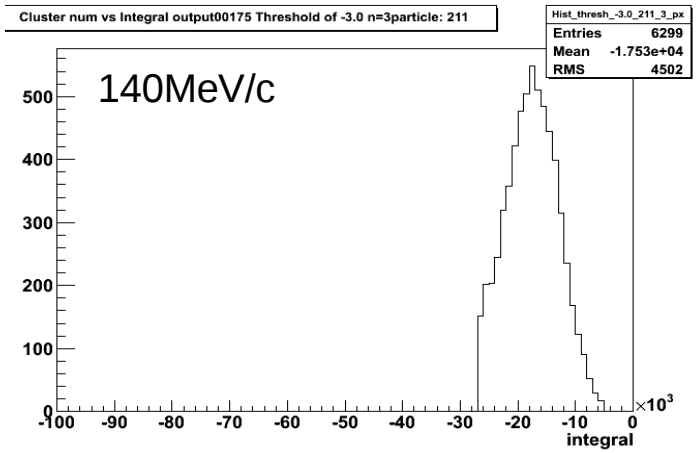
Truncated Integral for Pions in 90/10

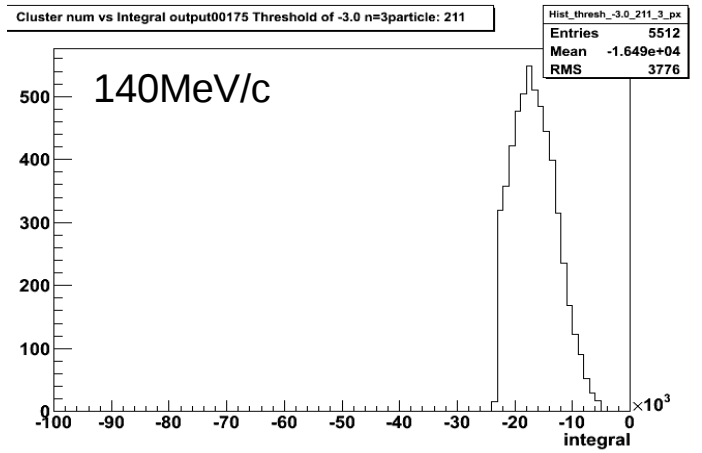
Full Integral

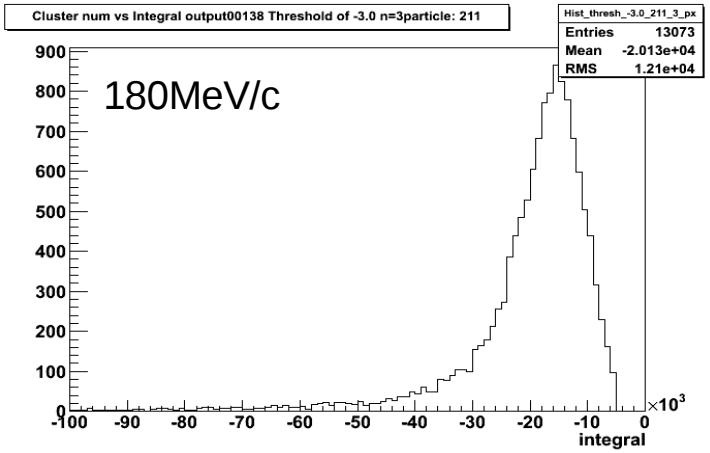
80% integral

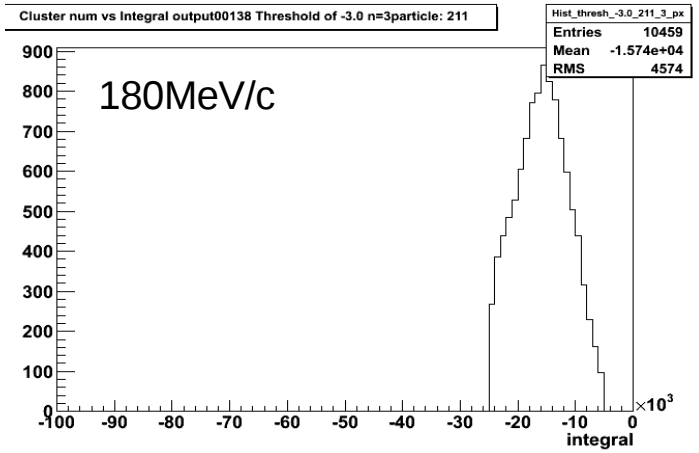
70% integral

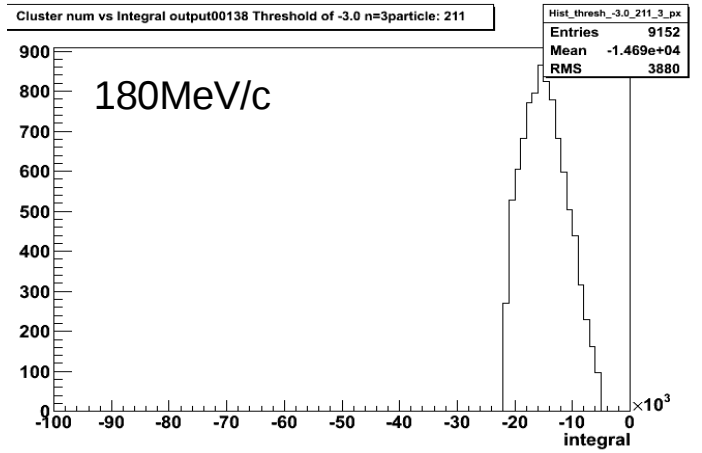


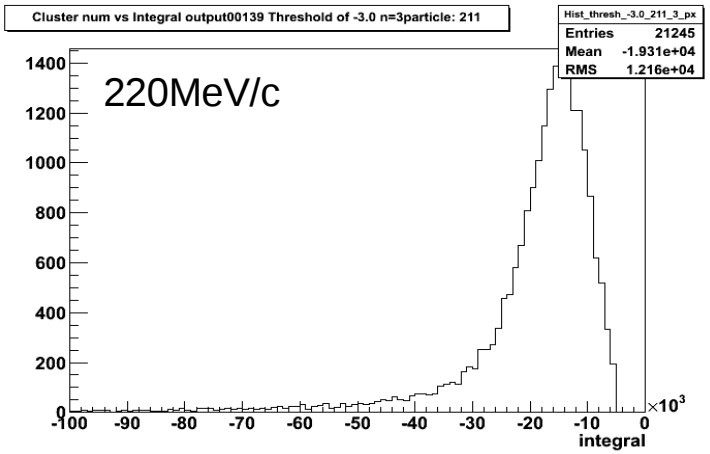


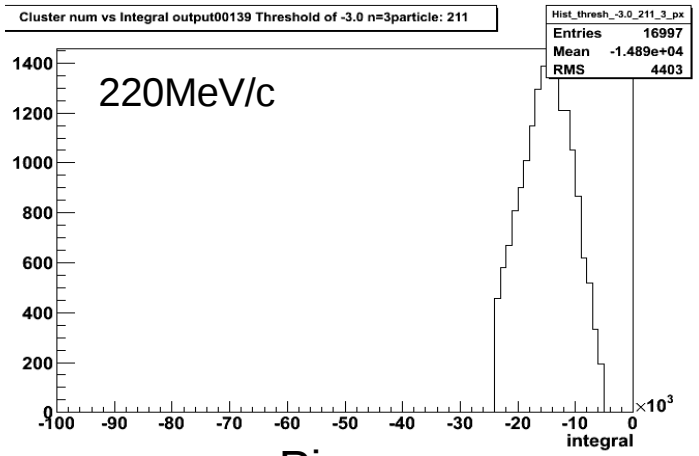


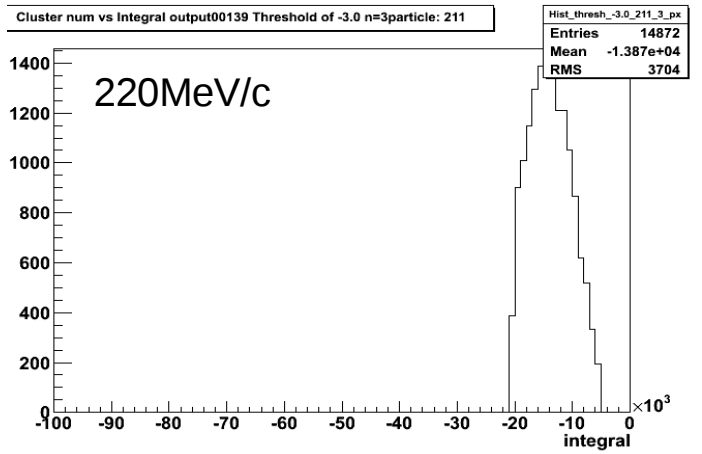












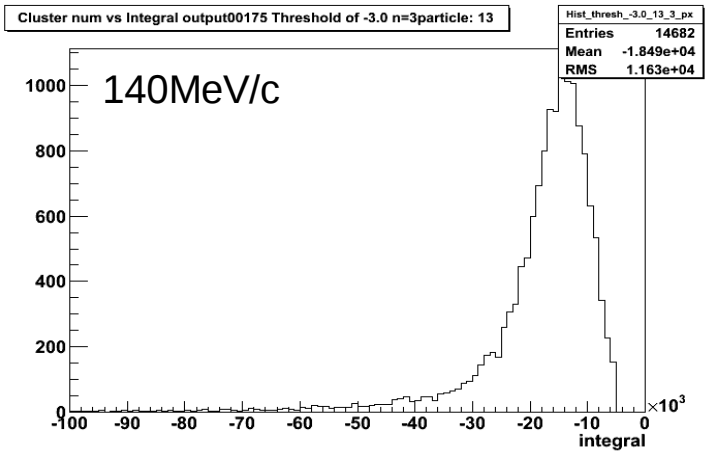
Pions

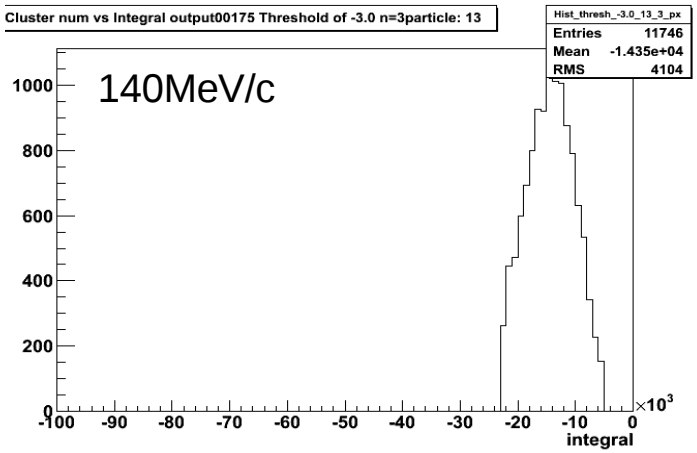
Truncated Integral for Muons in 90/10

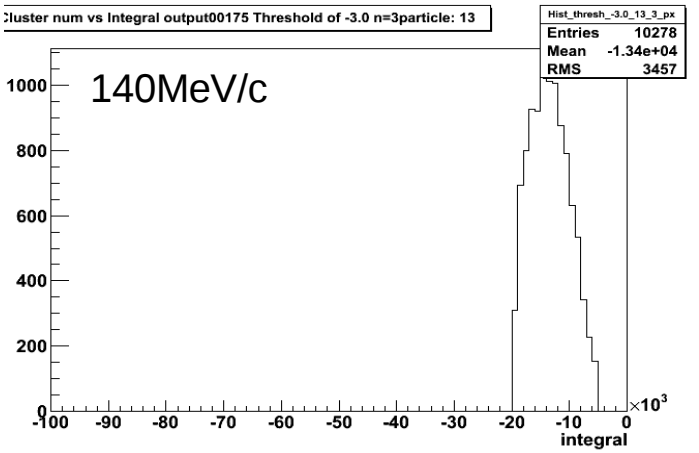
Full Integral

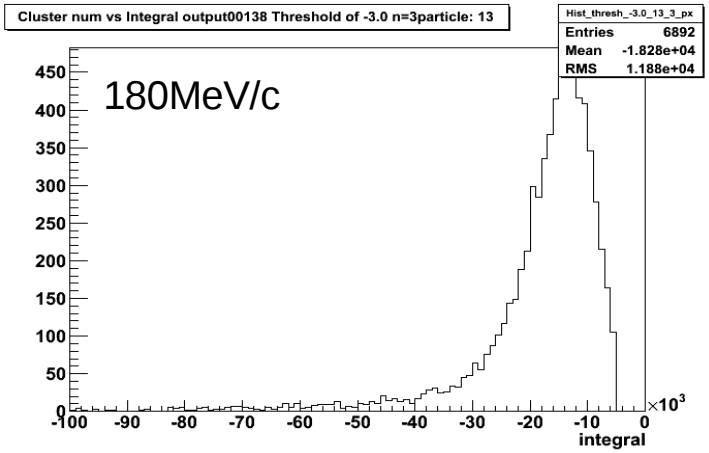
80% integral

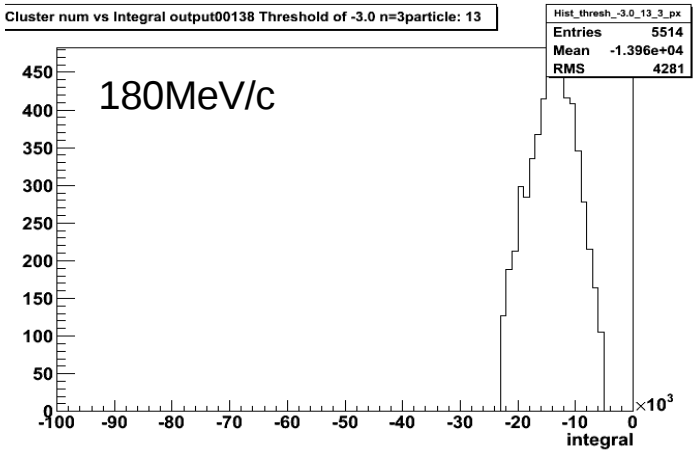
70% integral

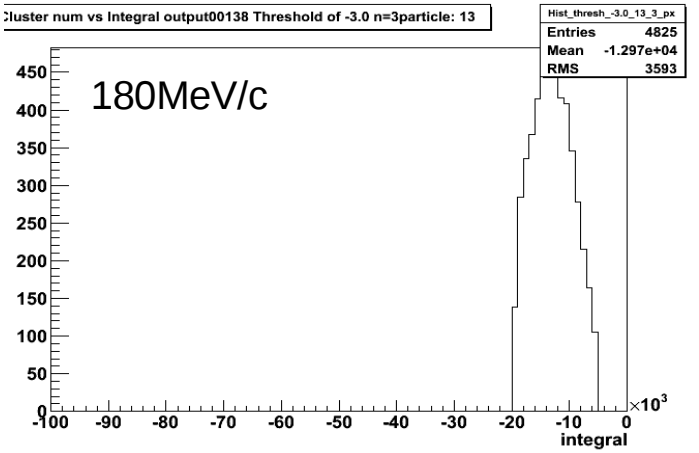


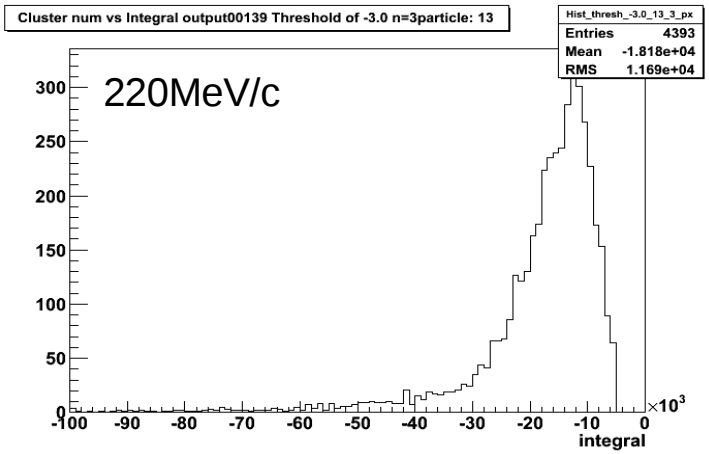


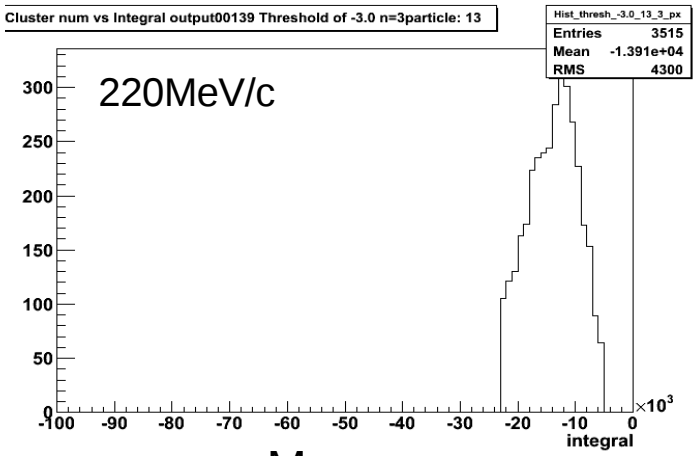


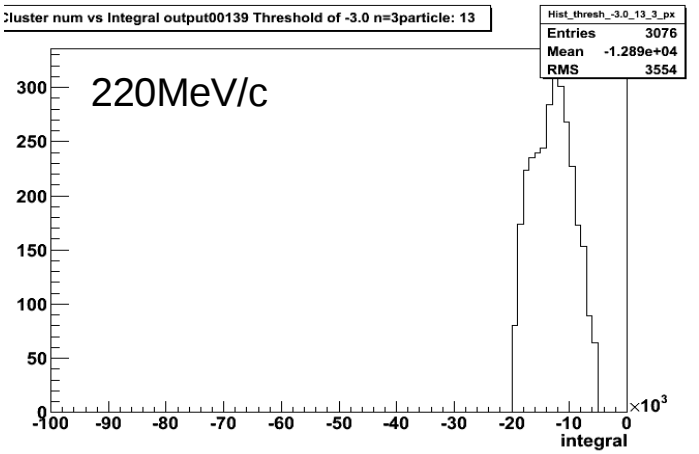








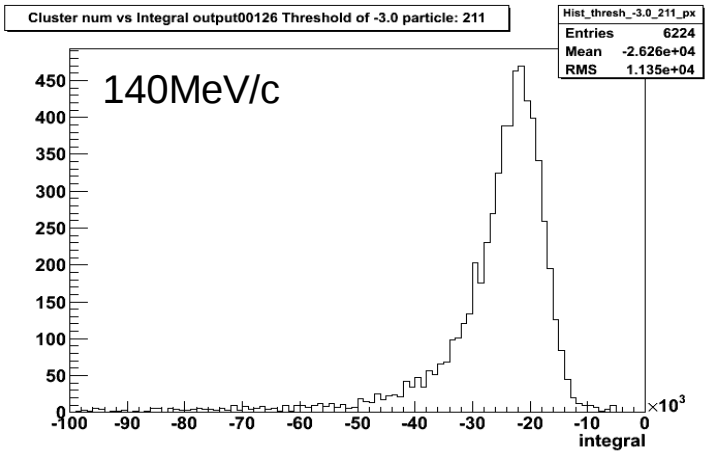


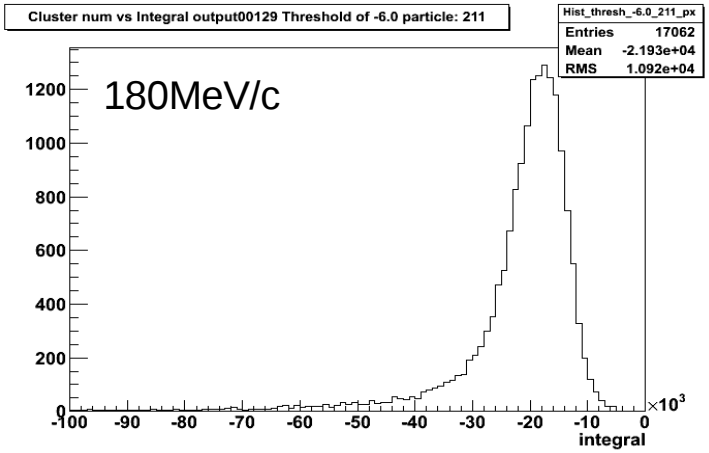


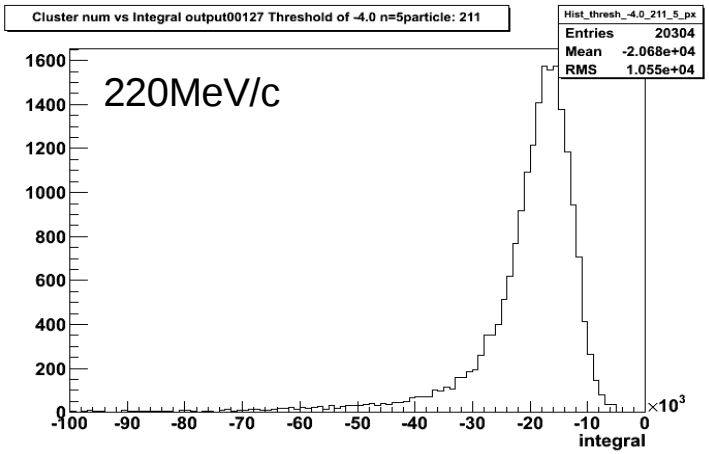
Muons

Truncated Integral for Pions in 80/20

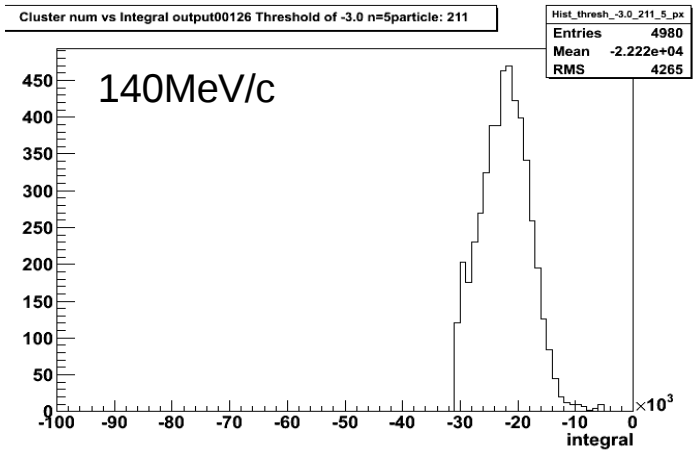
Full Integral

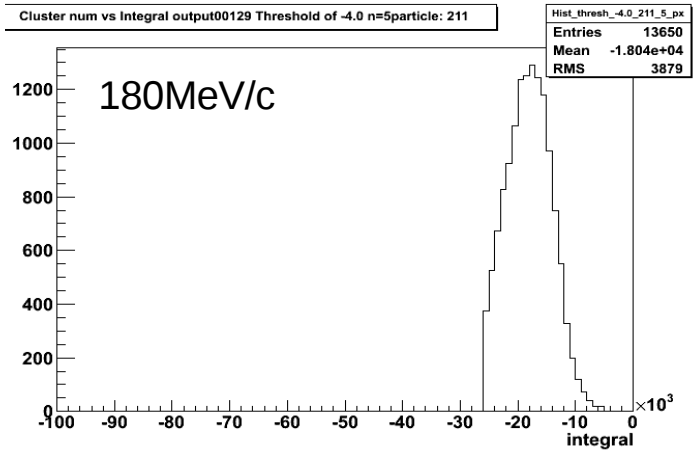


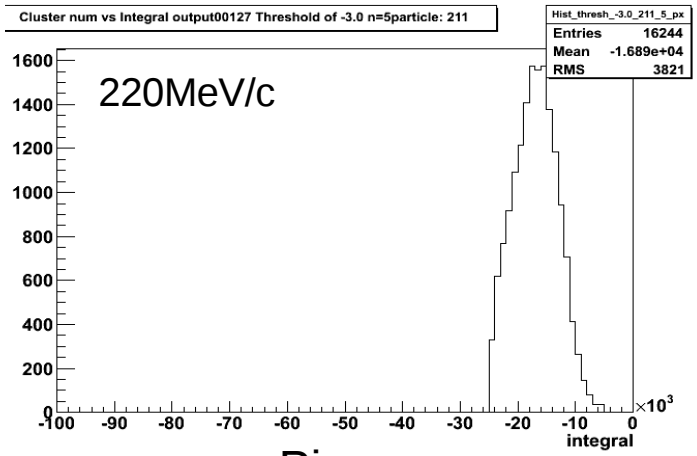




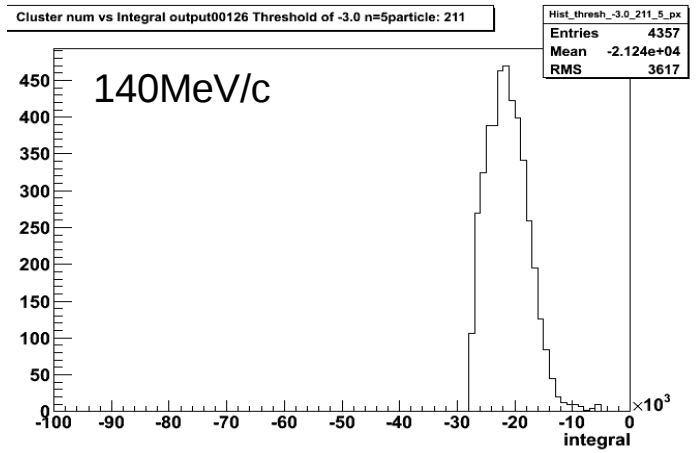
80% integral

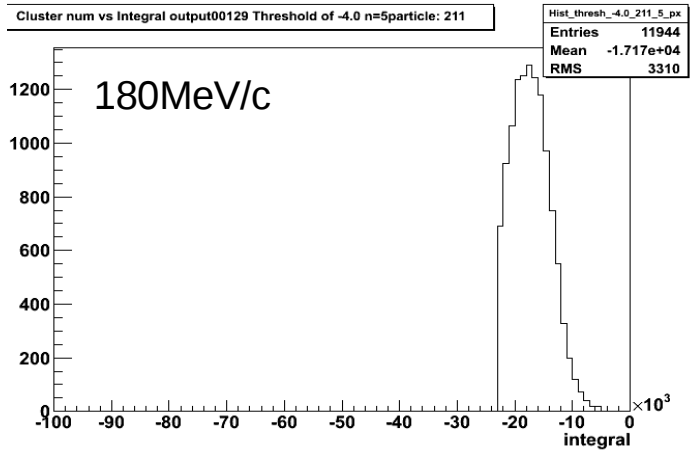


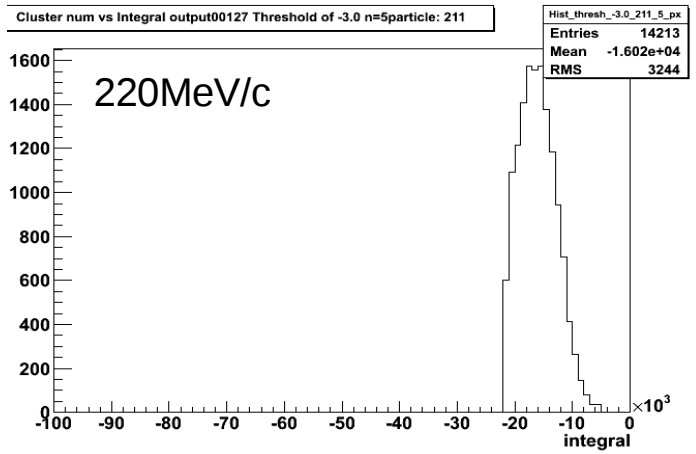




70% integral



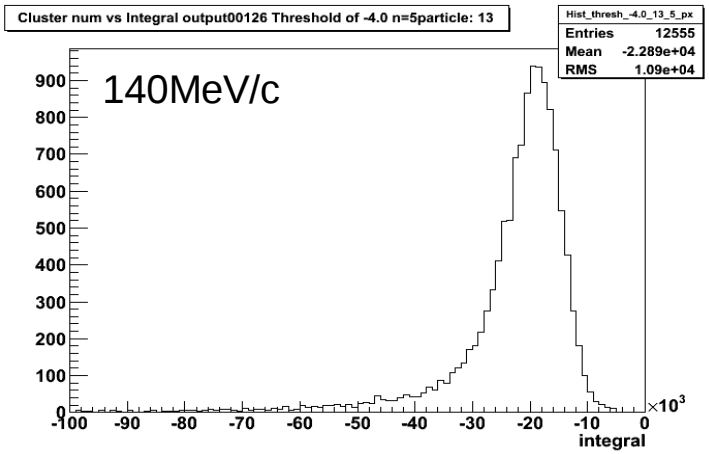


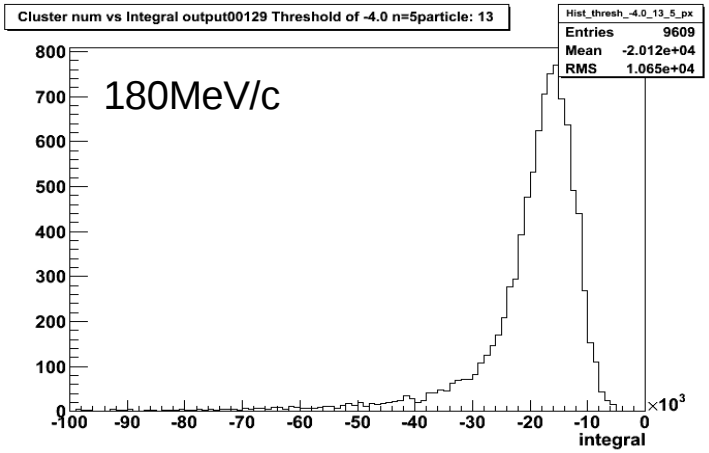


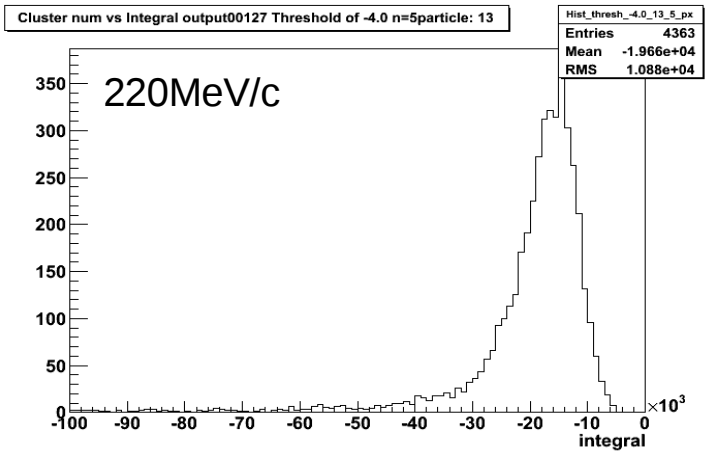
Pions

Truncated Integral for Muons in 80/20

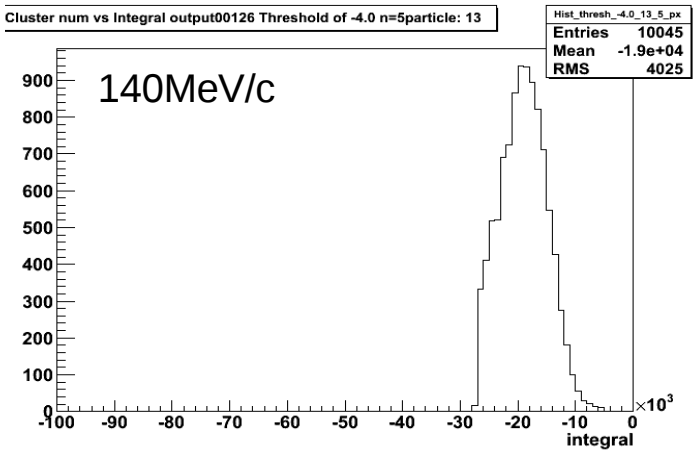
Full Integral

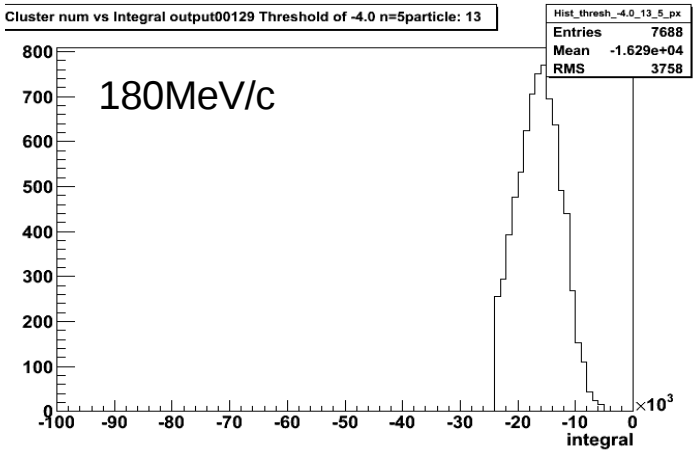


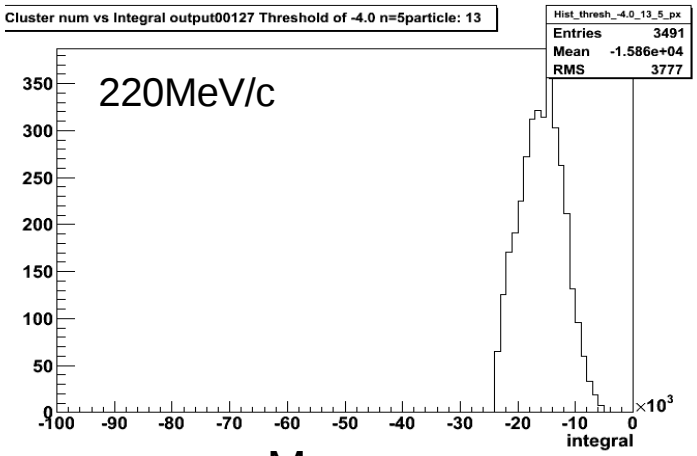




80% integral







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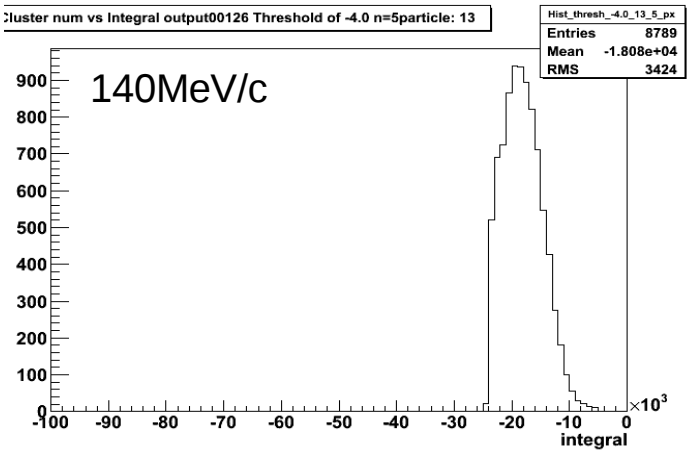

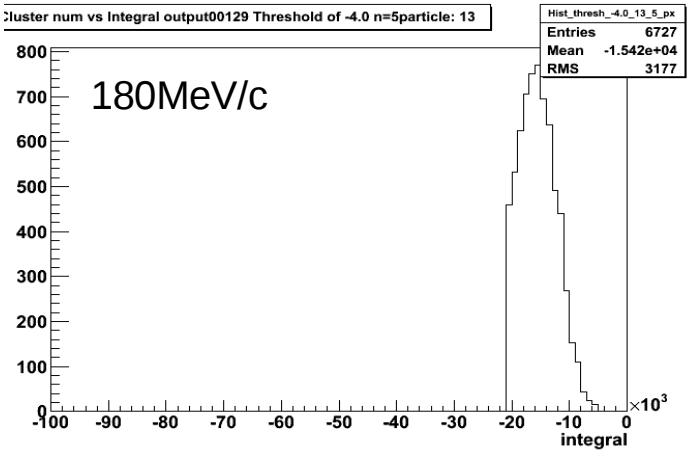

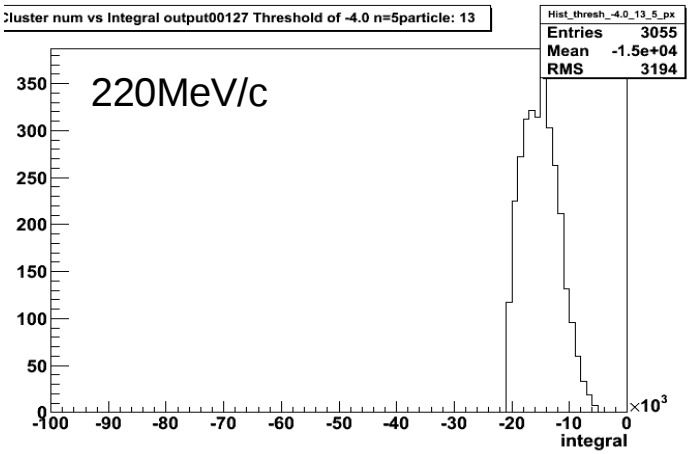

Muons