

Summary on the BCAL gain calibrations

Date : 24 January 2019

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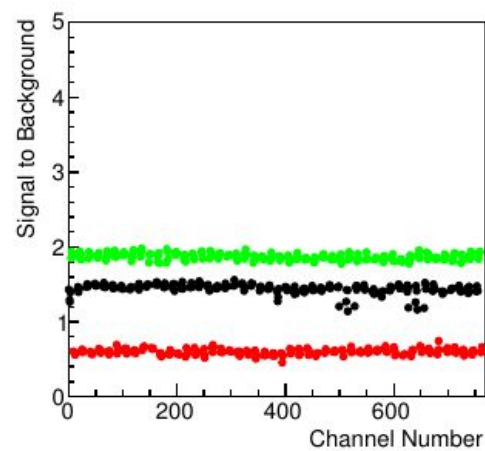
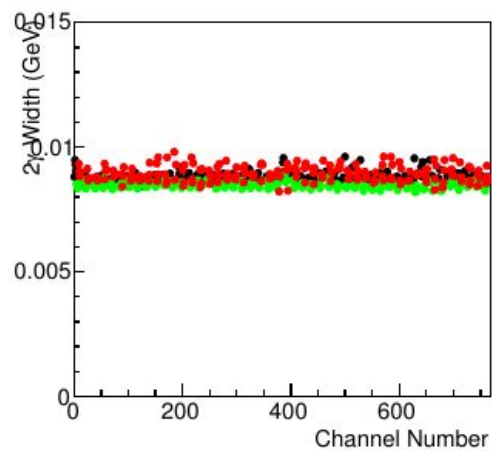
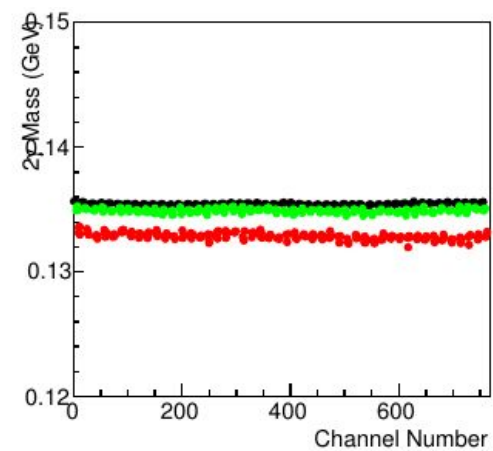
- Mark determined the position constants for the spring and fall 2018
- A calibration on the spring 2018 data was done in order to check if the new position constants affect the gain calibration and to determine new gains.
- The run range for calibration is 40864 to 41102
- The gains converged to the right π^0 mass after 6 iterations.

Fit Mass vs. Channel (L1 - BLACK, L2 - GREEN, L3 - RED, L4 - BLUE)

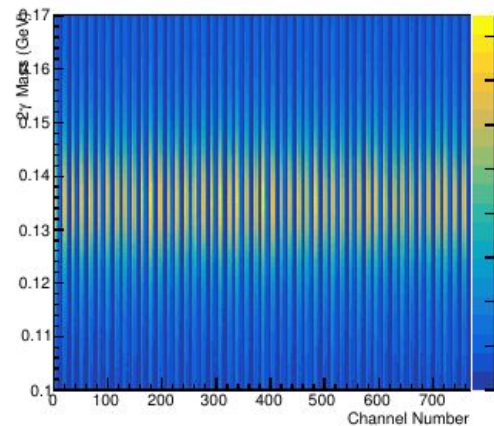
Fit Width vs. Channel (L1 - BLACK, L2 - GREEN, L3 - RED, L4 - BLUE)

S/B vs. Channel (L1 - BLACK, L2 - GREEN, L3 - RED, L4 - BLUE)

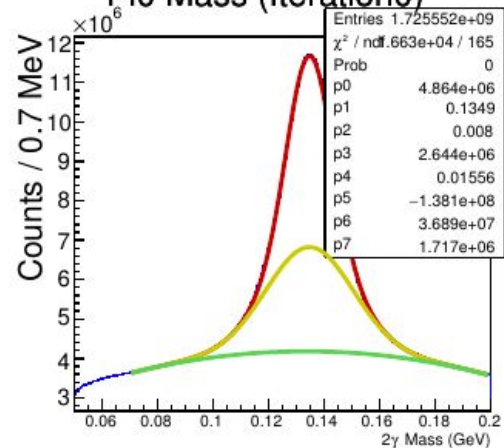
Iteration 0



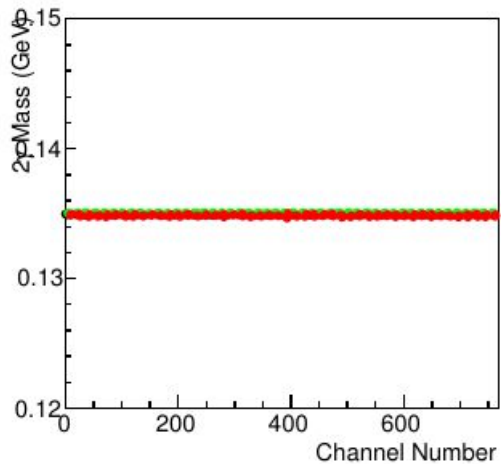
Pi0 Mass vs. Channel Number (Iteration0)



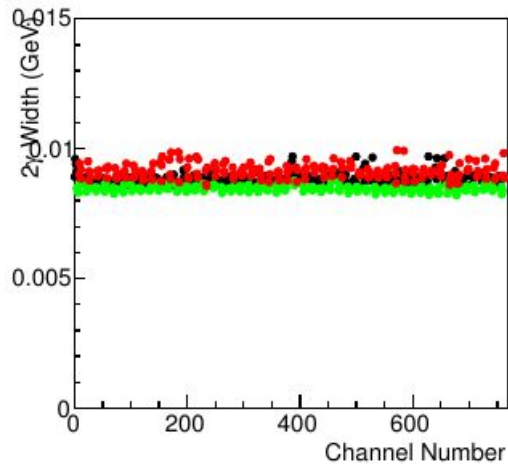
Pi0 Mass (Iteration0)



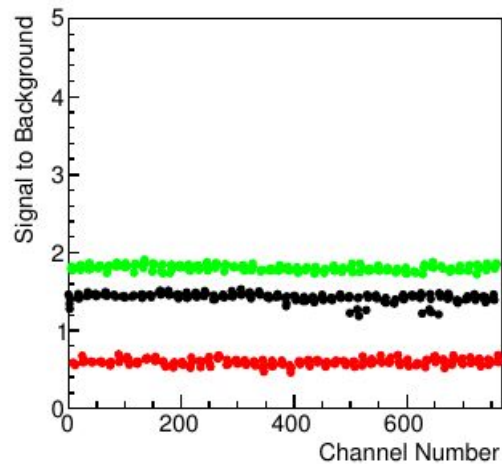
Fit Mass vs. Channel (L1 - BLACK, L2 - GREEN, L3 - RED, L4 - BLUE)



Fit Width vs. Channel (L1 - BLACK, L2 - GREEN, L3 - RED, L4 - BLUE)

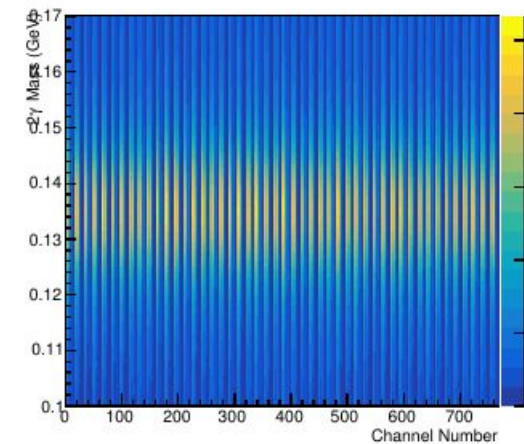


S/B vs. Channel (L1 - BLACK, L2 - GREEN, L3 - RED, L4 - BLUE)

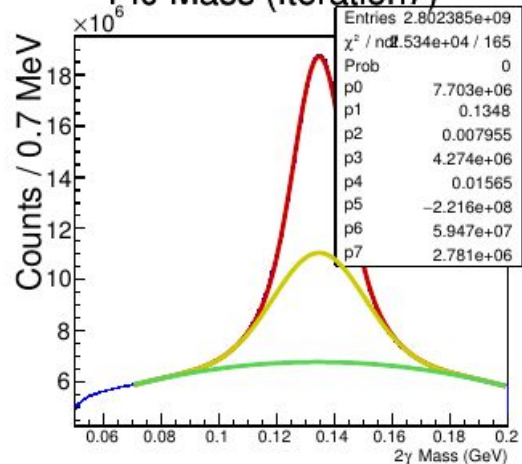


Iteration 7

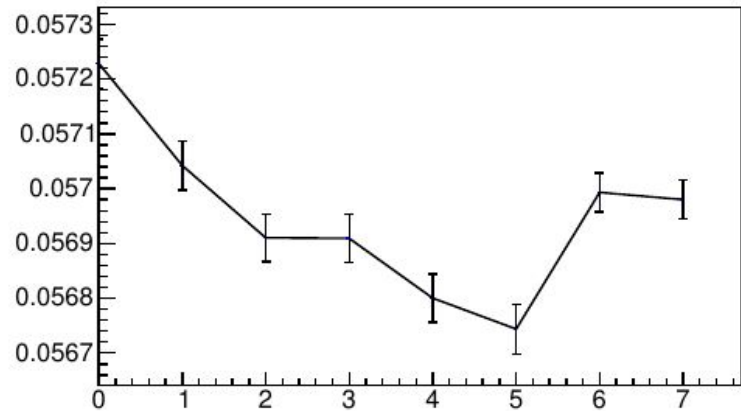
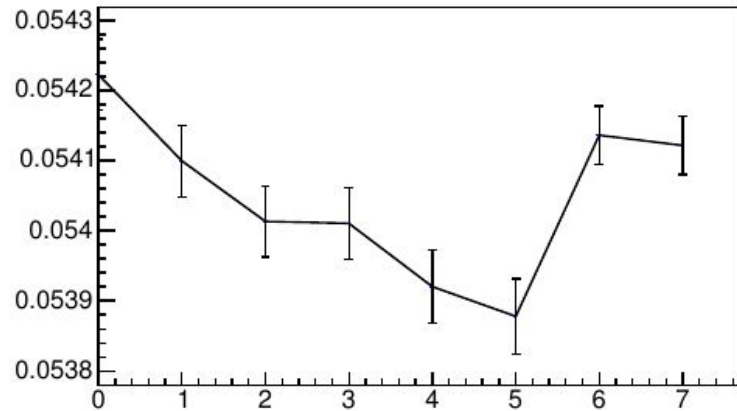
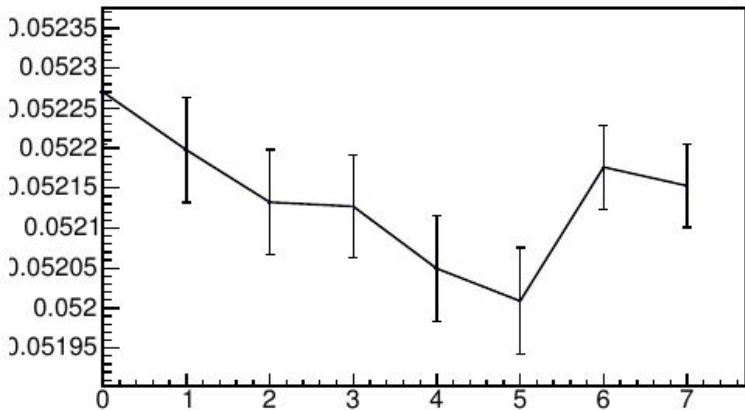
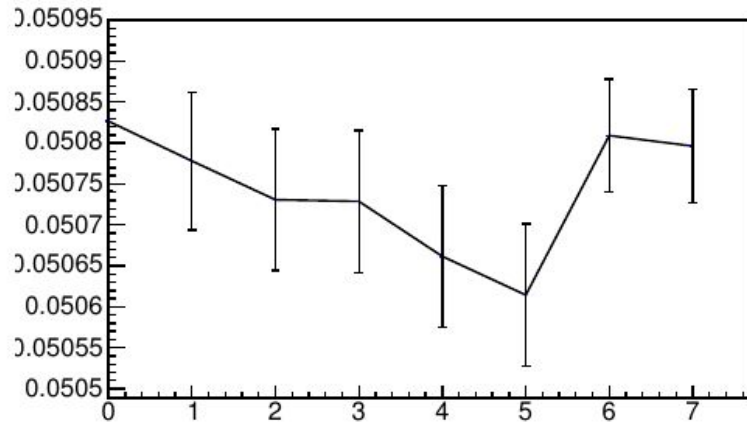
Pi0 Mass vs. Channel Number (Iteration7)

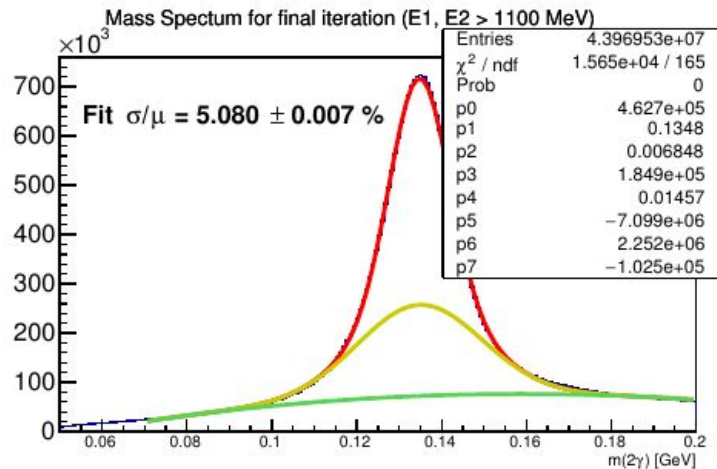
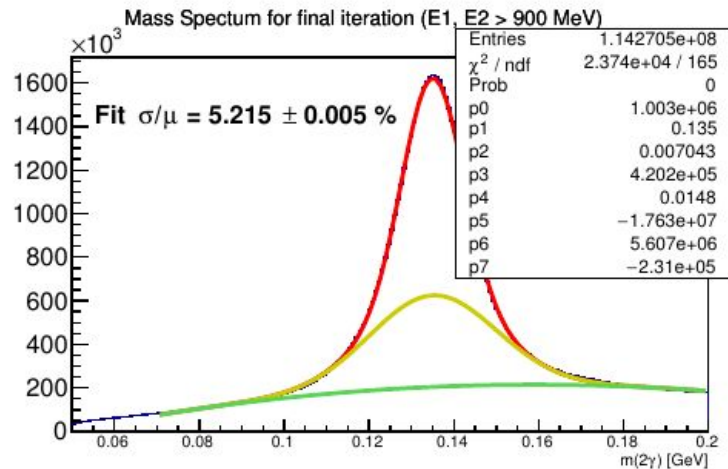
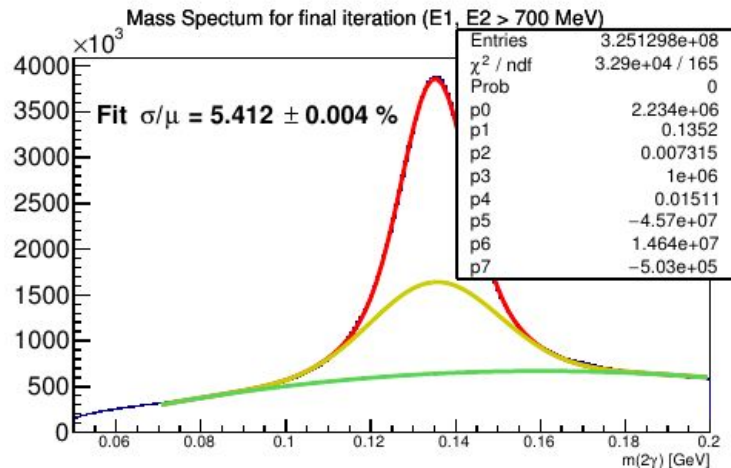
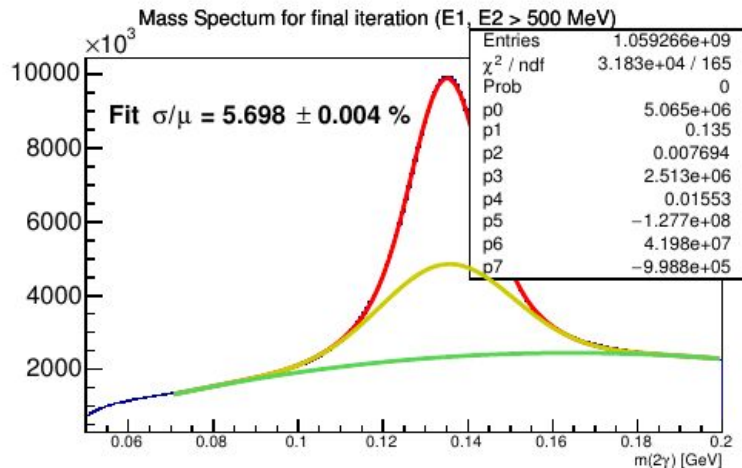


Pi0 Mass (Iteration7)



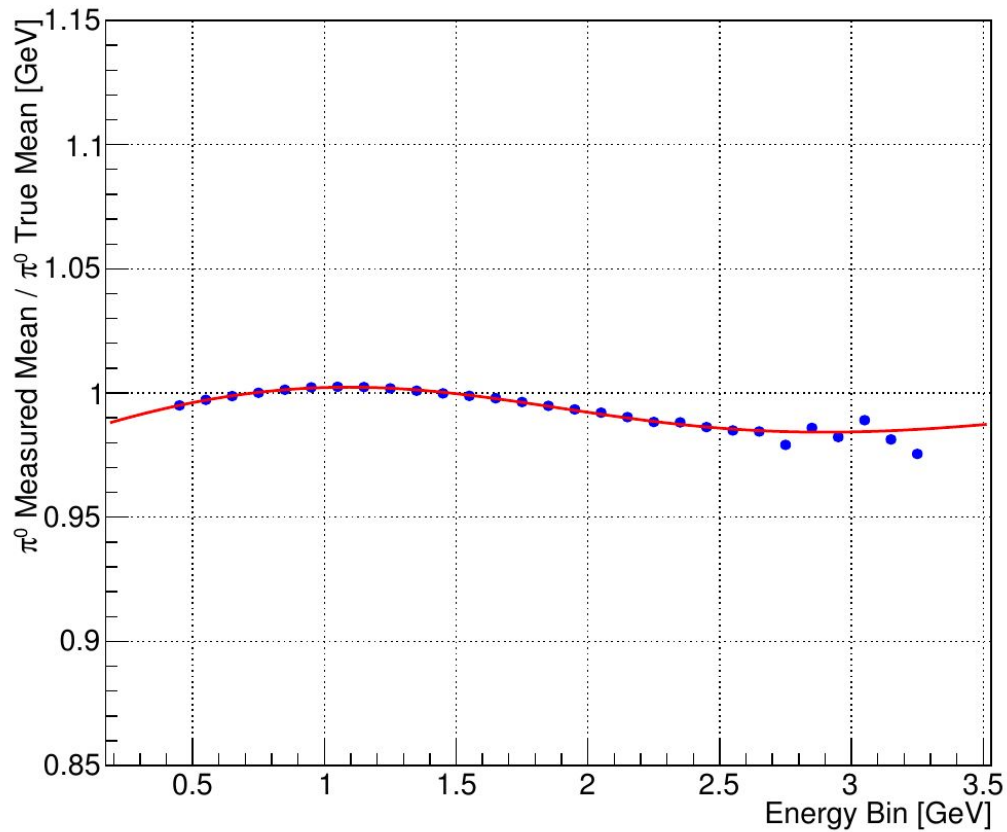
Pi0 peak at 0.1348 GeV

σ/μ vs. Iteration (E1, E2 > 500 MeV) σ/μ vs. Iteration (E1, E2 > 700 MeV) σ/μ vs. Iteration (E1, E2 > 900 MeV) σ/μ vs. Iteration (E1, E2 > 1100 MeV)



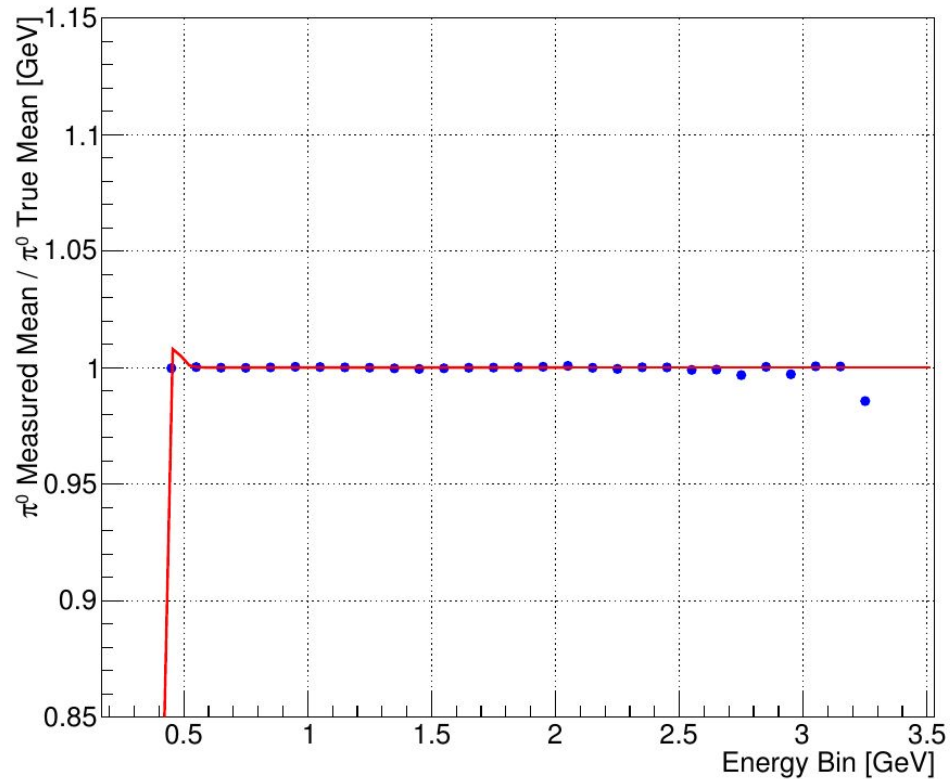
Pre - nonlinear correction

π^0 Mean vs Energy bin



Post - nonlinear correction

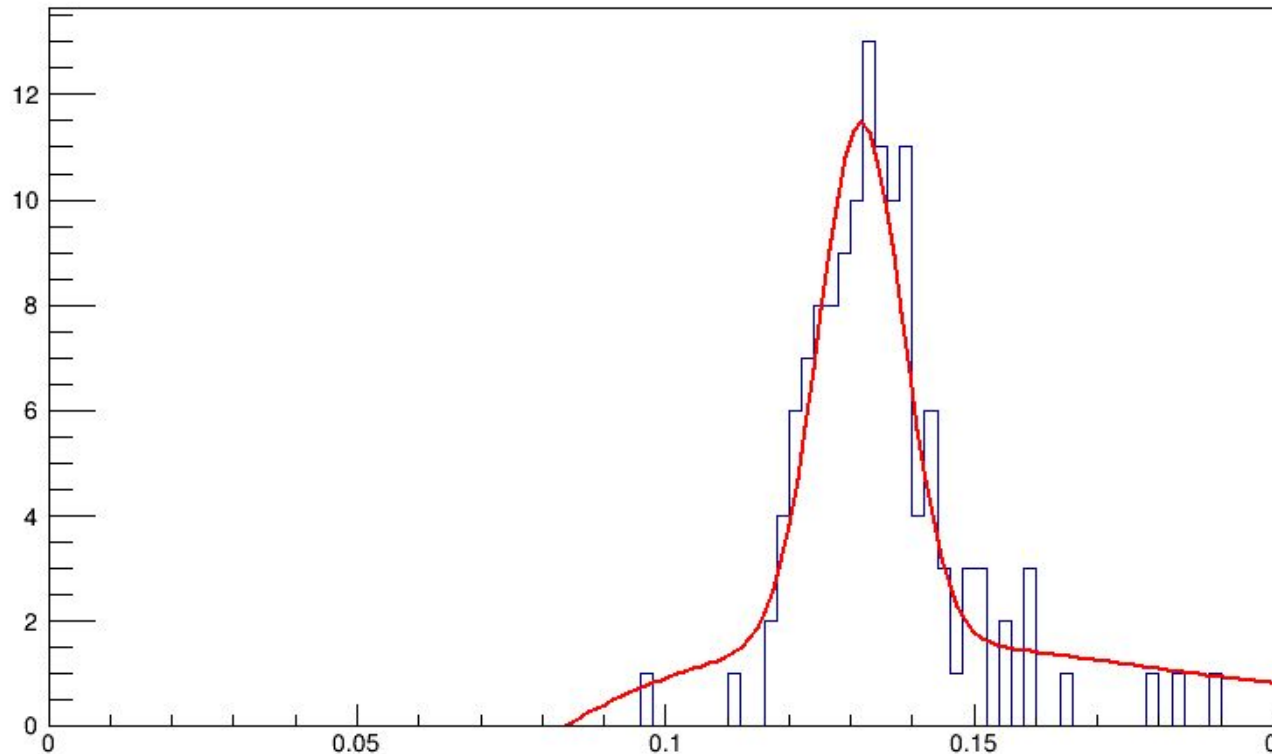
π^0 Mean vs Energy bin



BACKUP

3200 MeV < E < 3300 MeV

Counts/1 MeV



3200 MeV < E < 3300 MeV

Entries	228
Mean	0.1403
Std Dev	0.02579
χ^2 / ndf	8.541 / 19
p0	9.882 ± 1.570
p1	0.1317 ± 0.0011
p2	0.006872 ± 0.001020
p3	-14.58 ± 4.75
p4	301.6 ± 38.3
p5	-1811 ± 308.1
p6	3435 ± 1752.9

3200 MeV < E < 3300 MeV

