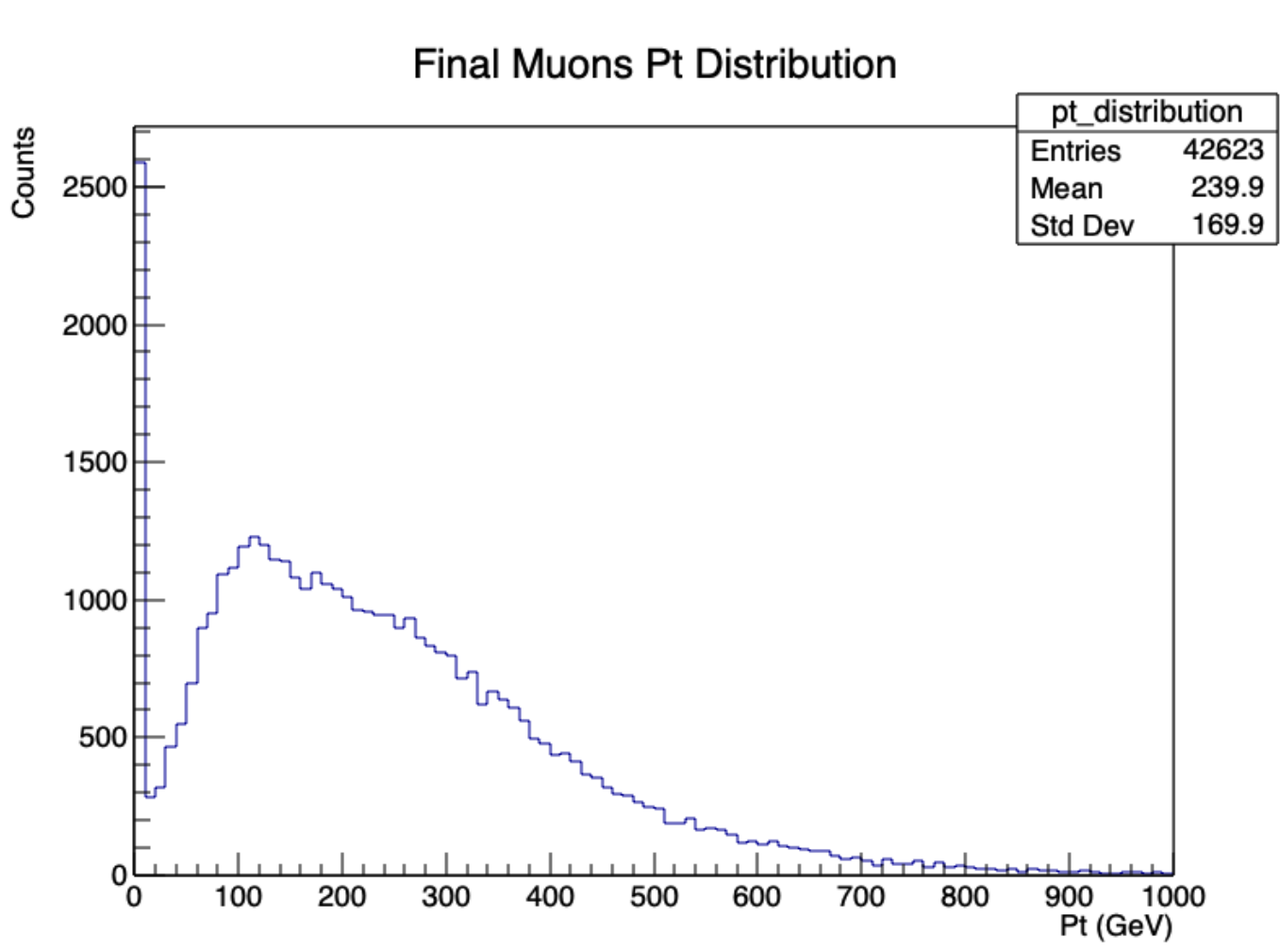
Alaa Weekly Update July 21st

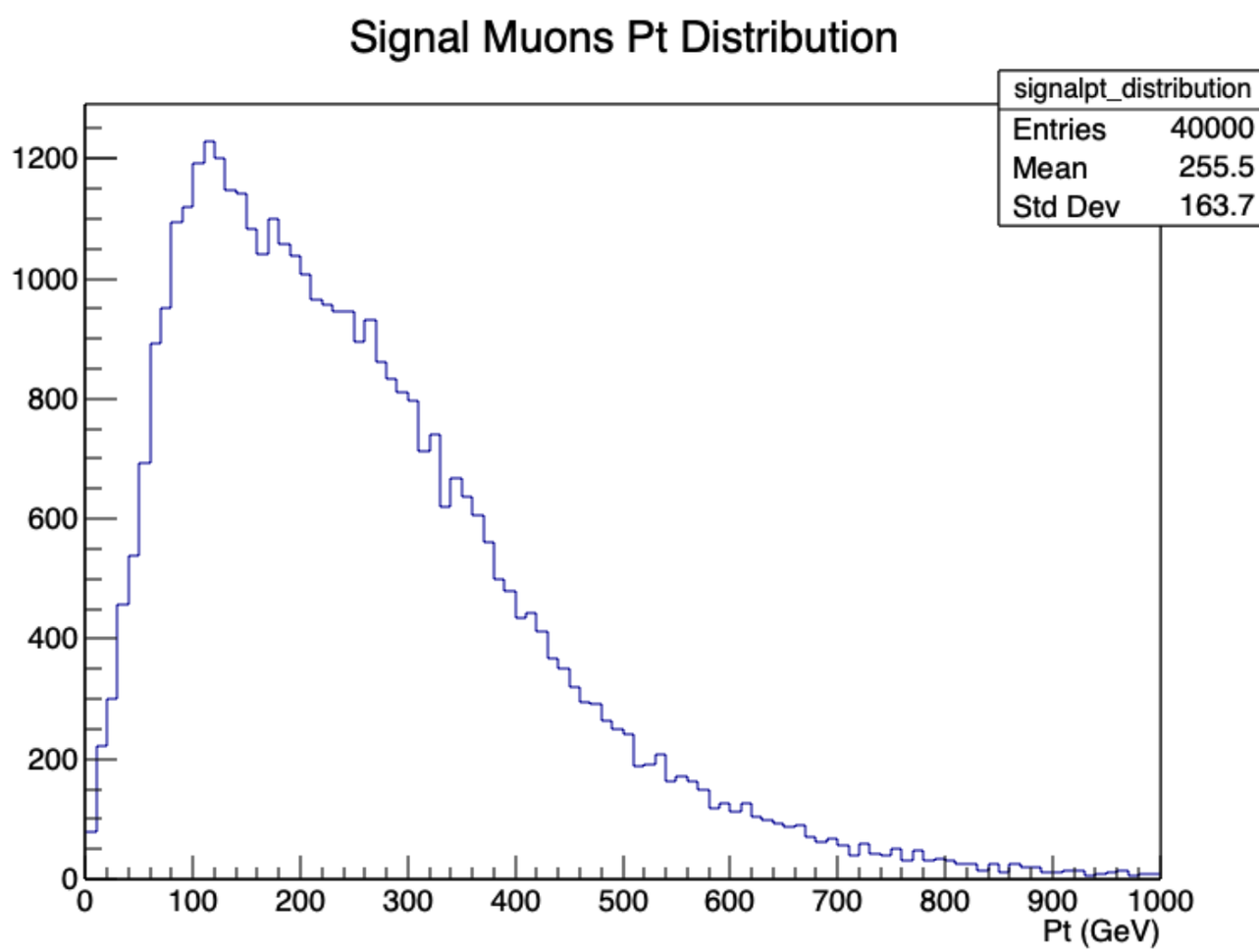
- Last week: Samples are validated, time to make the basic plots of variables for acceptance
  This week: More validation by looking into events with "unexpected decay outcomes"
- Last week: If they look good start cutting on acceptance variables
  This week: plotted pt and eta, found an issue with pt and fixed it, and applied their cuts.
- Last week: Compare to acceptances in the paper

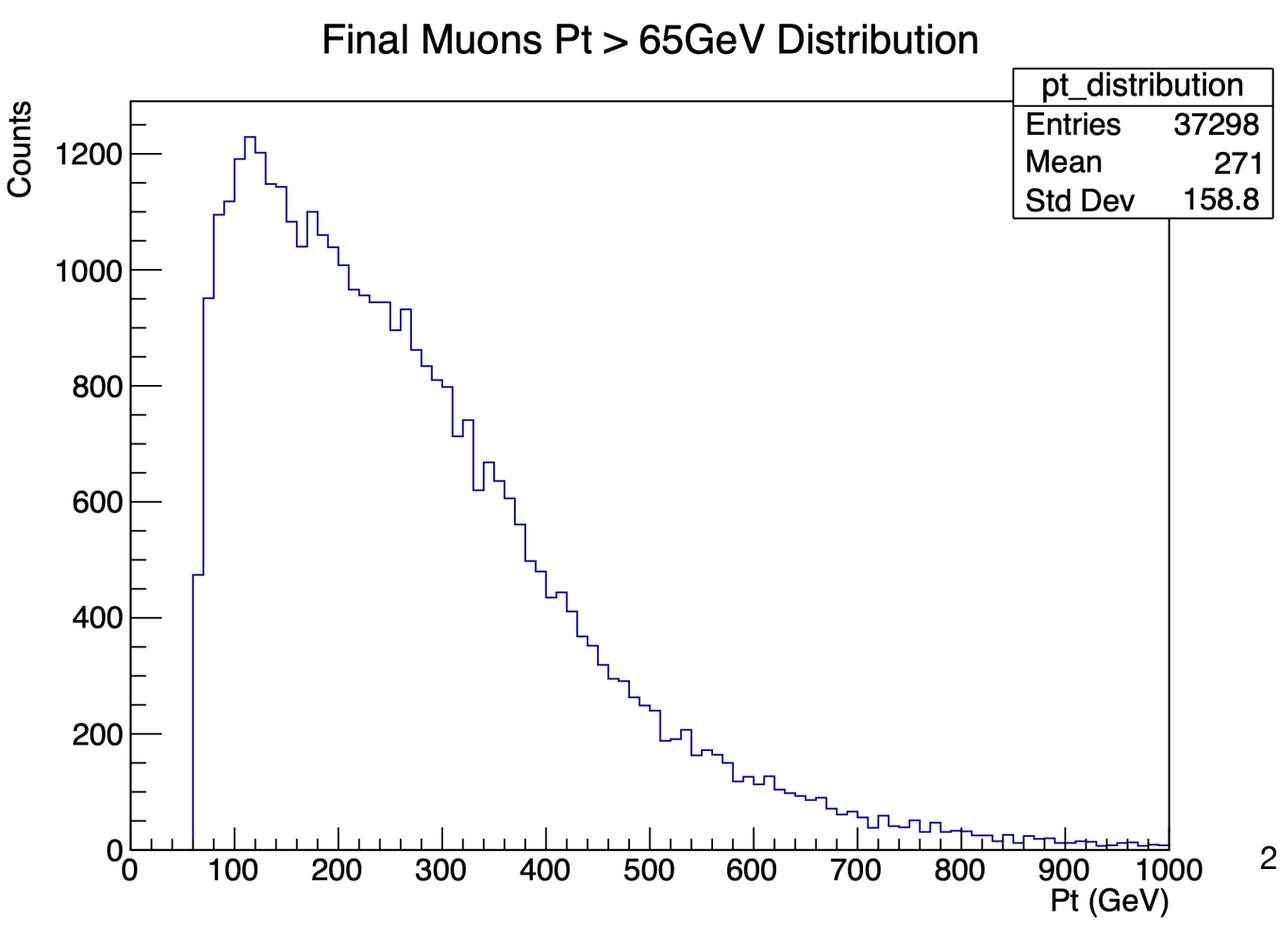
- This week: Currently plotting d0 and delta_R
- For each variable there are two plots before applying any cuts:

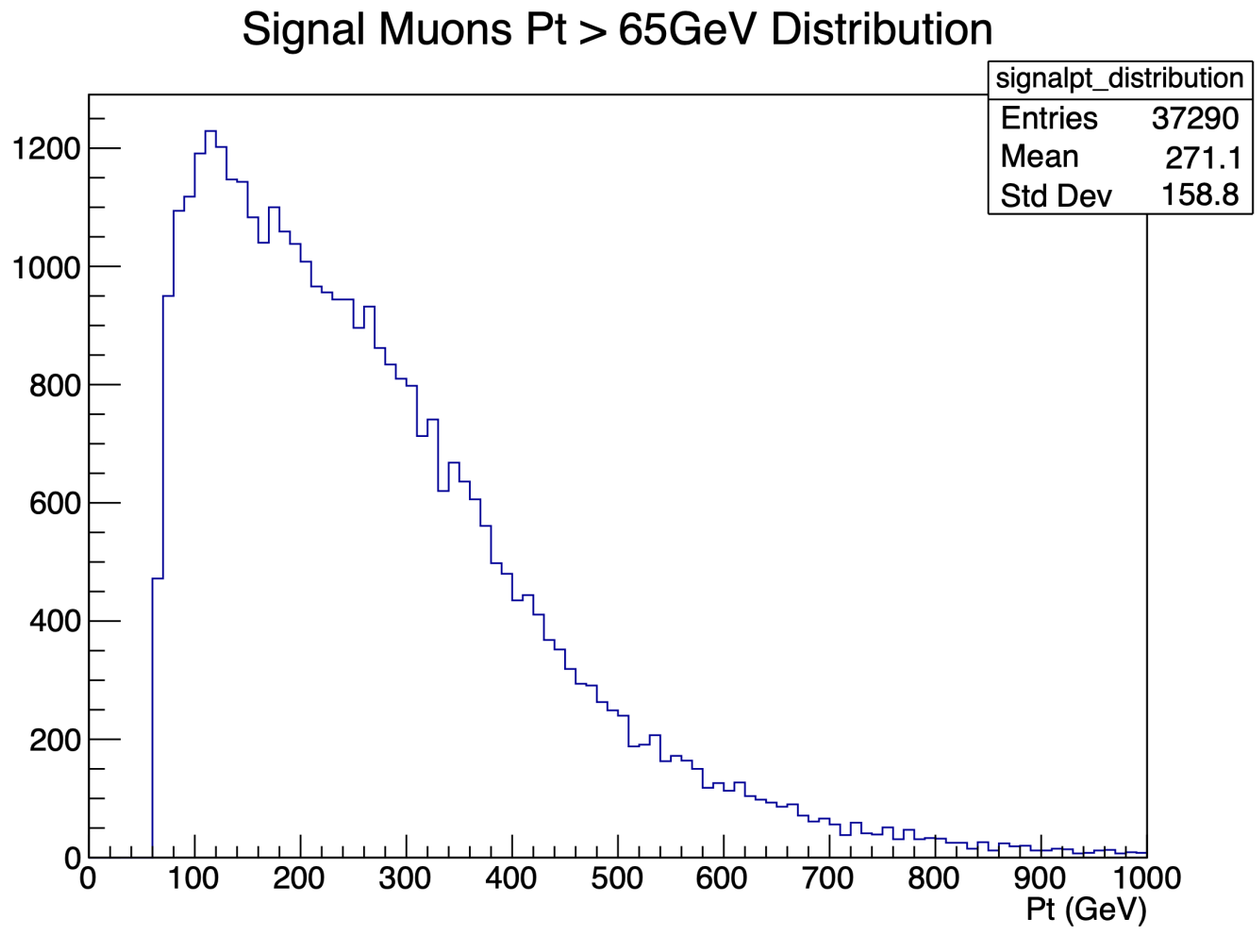
one for the signal muons (final status muons), and one for the truth signal muons (final status muons from smuon decay)

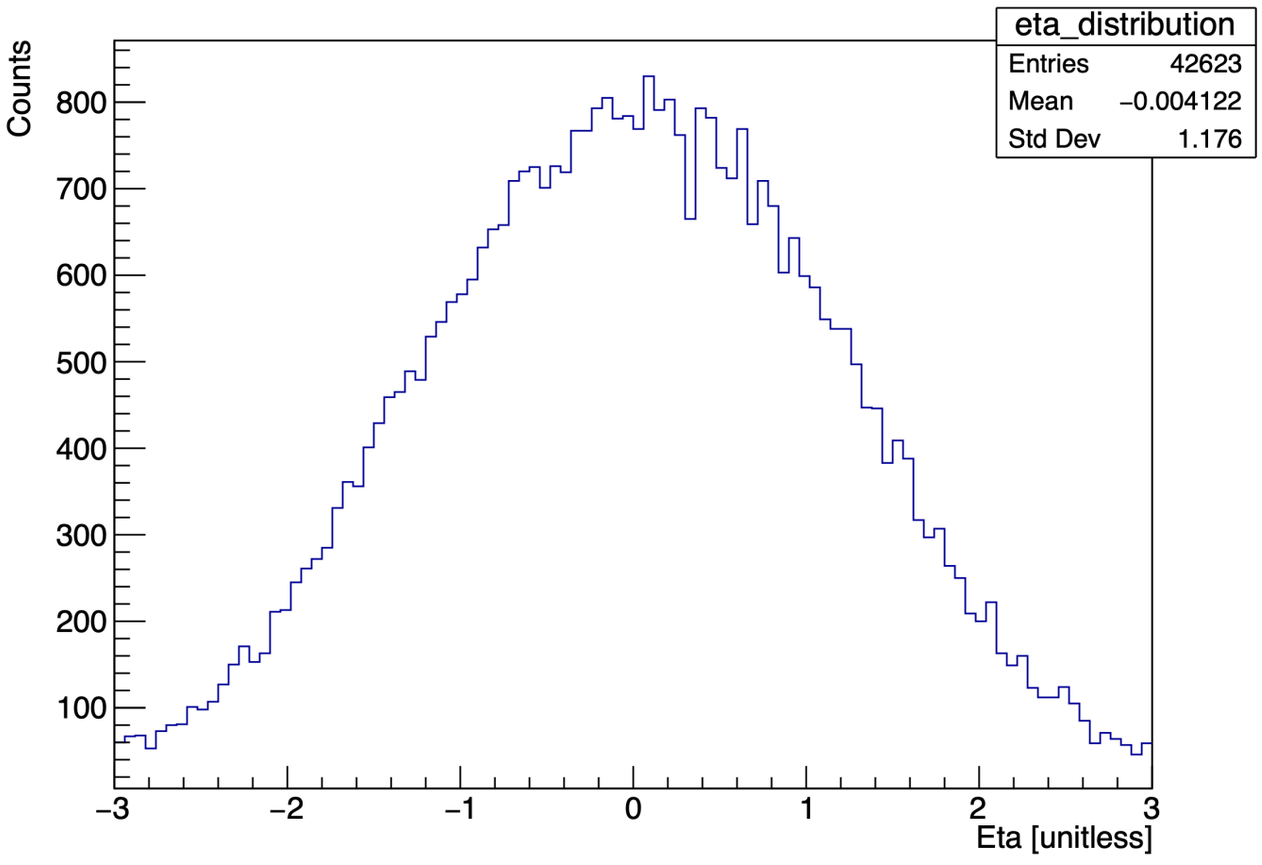
- Created a GitHub repo and started to write clean code

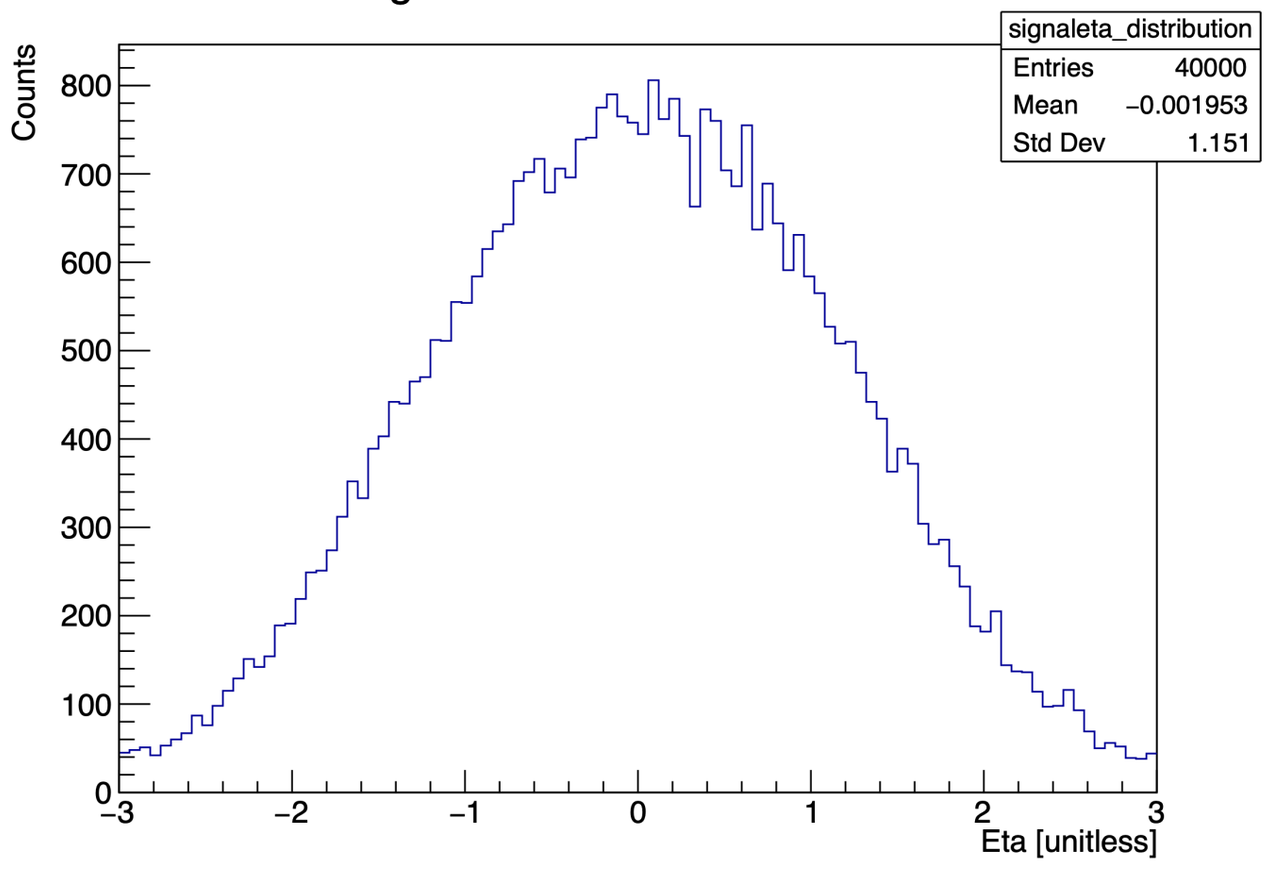

Final Muons Pt Distribution
pt_distribution
Entries 42623
Mean 239.9
Std Dev 169.9
Counts
Pt (GeV)

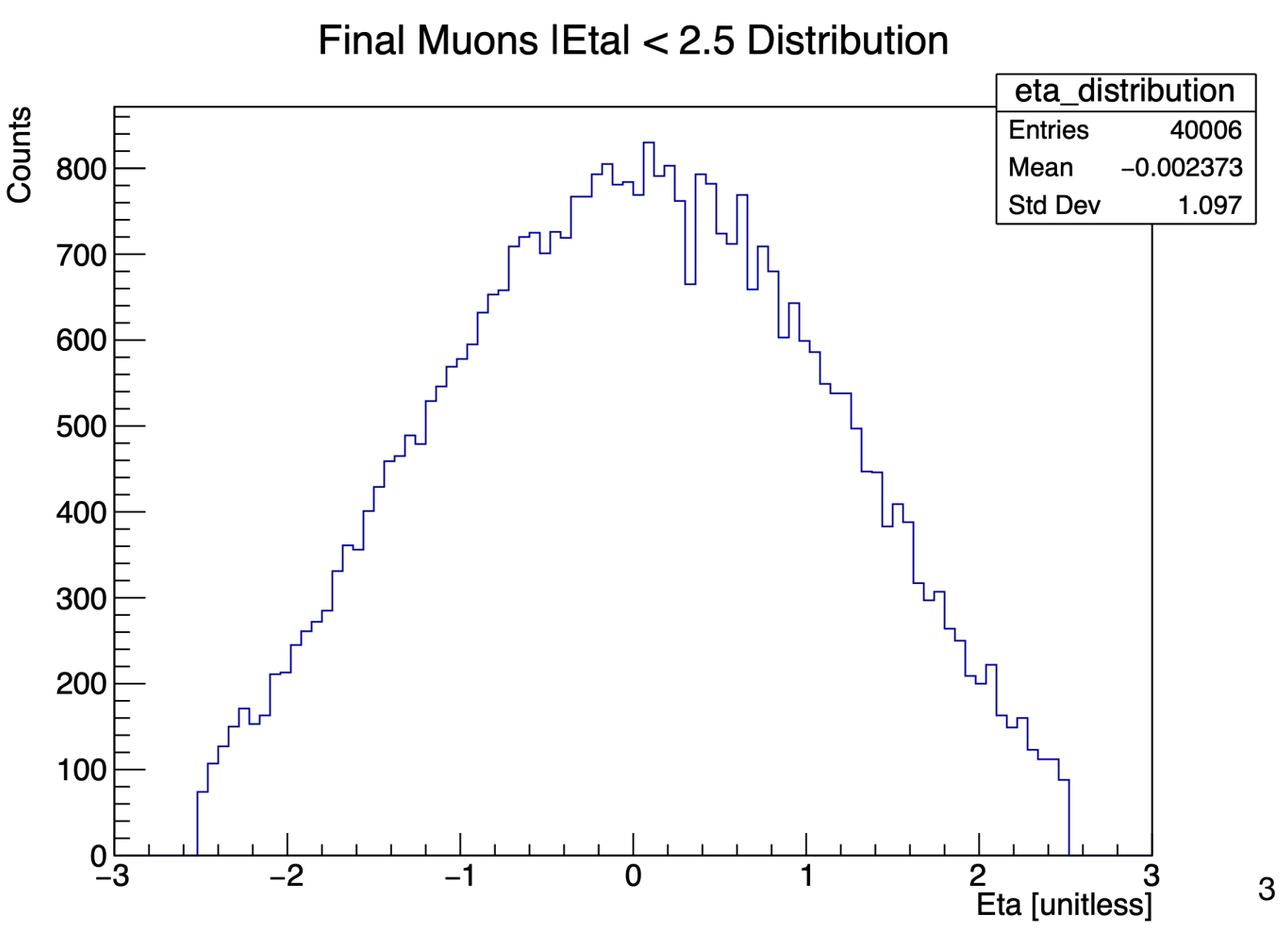

Signal Muons Pt Distribution
signalpt_distribution
Entries 40000
Mean 255.5
Std Dev 163.7
Pt (GeV)

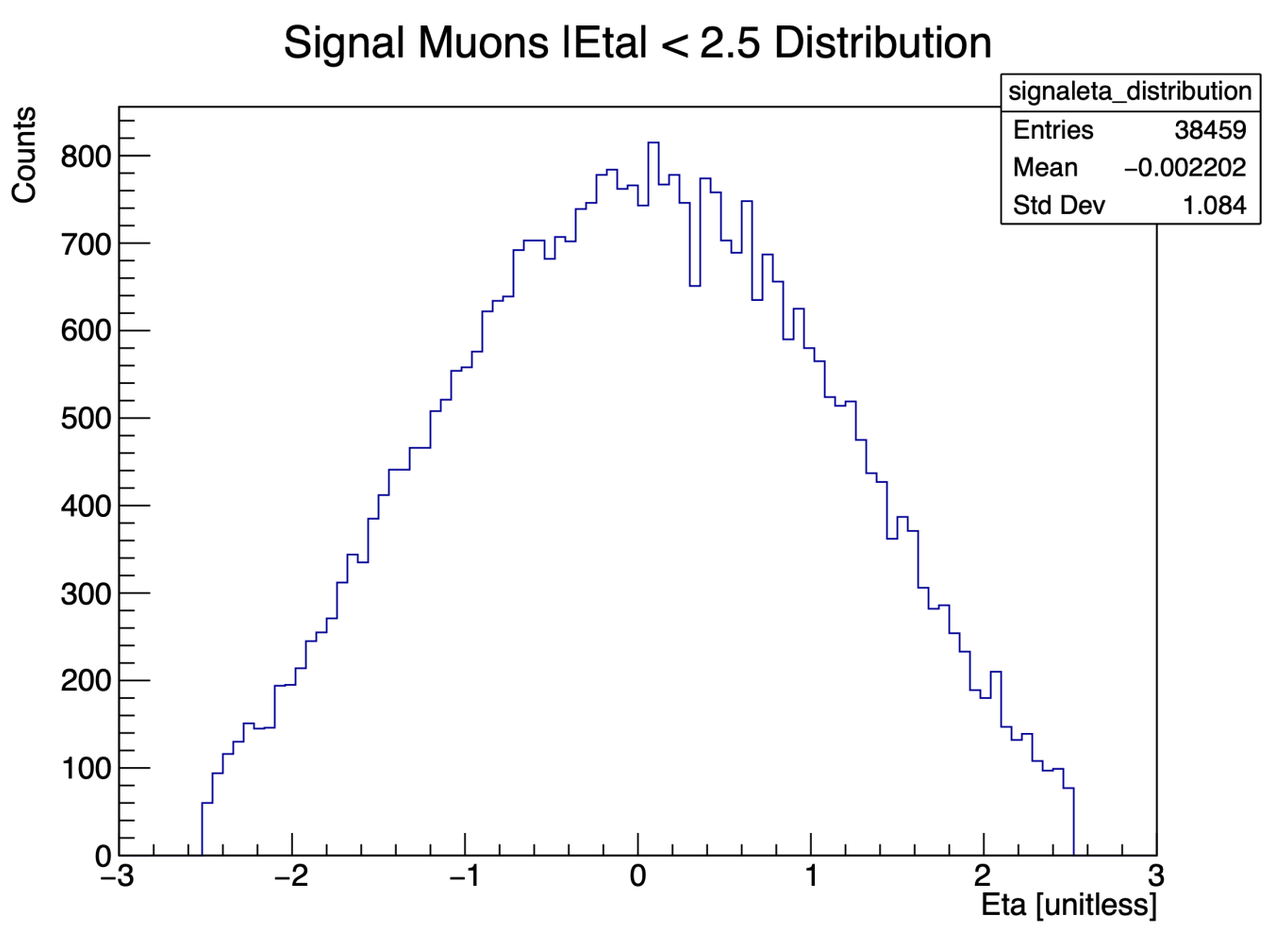

Final Muons Pt > 65GeV Distribution
pt_distribution
Entries 37298
Mean 271
Std Dev 158.8
Counts
Pt (GeV)


Signal Muons Pt > 65GeV Distribution
signalpt_distribution
Entries 37290
Mean 271.1
Std Dev 158.8
Pt (GeV)

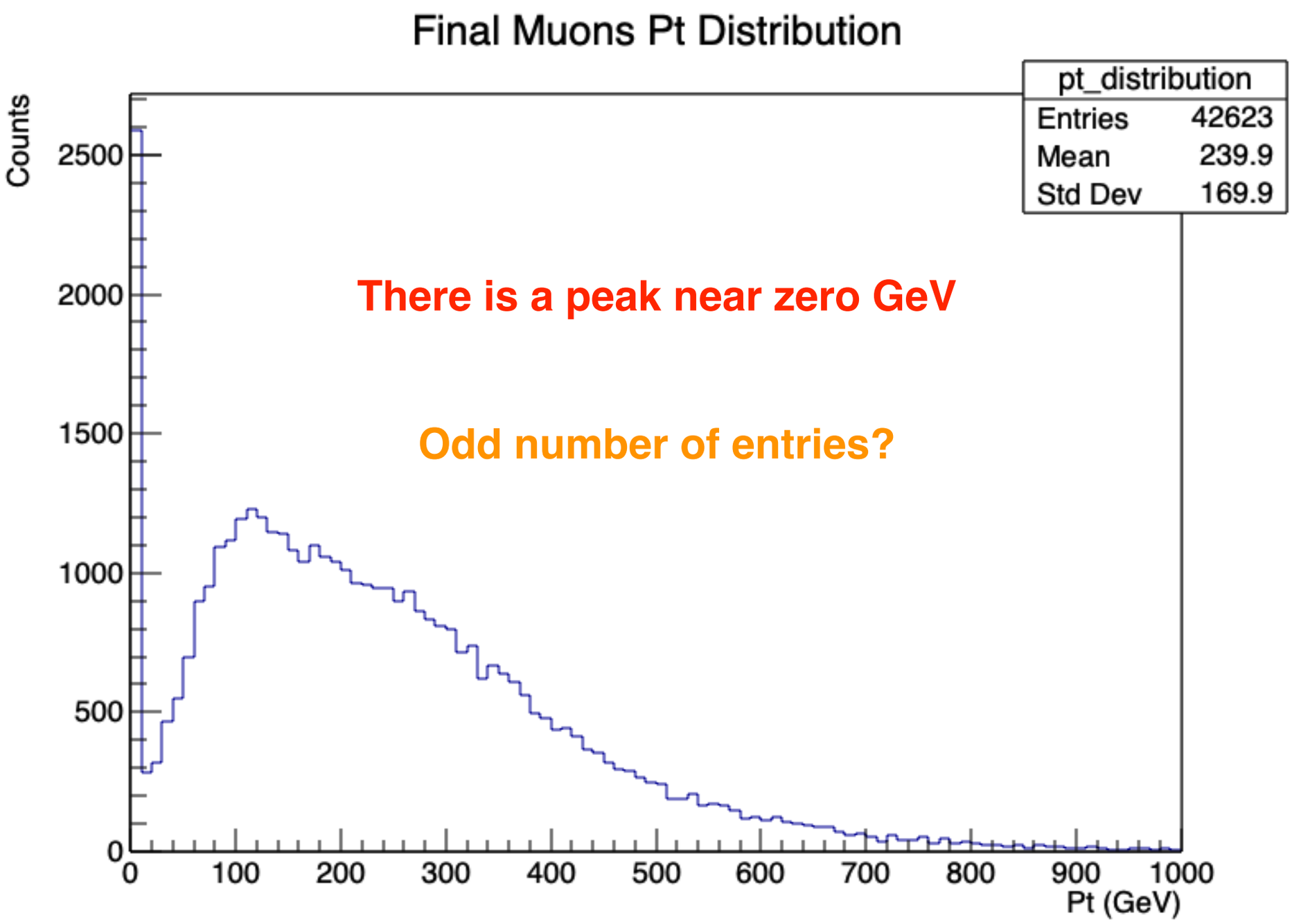

Final Muons Eta Distribution
eta_distribution
Entries 42623
Mean −0.004122
Std Dev 1.176
Counts
Eta [unitless]


Signal Muons Eta Distribution
signaleta_distribution
Entries 40000
Mean −0.001953
Std Dev 1.151
Counts
Eta [unitless]


Final Muons |Eta| < 2.5 Distribution
eta_distribution
Entries 40006
Mean −0.002373
Std Dev 1.097
Counts
Eta [unitless]


Signal Muons |Eta| < 2.5 Distribution
signaleta_distribution
Entries 38459
Mean −0.002202
Std Dev 1.084
Counts
Eta [unitless]

Back-up Slide #1



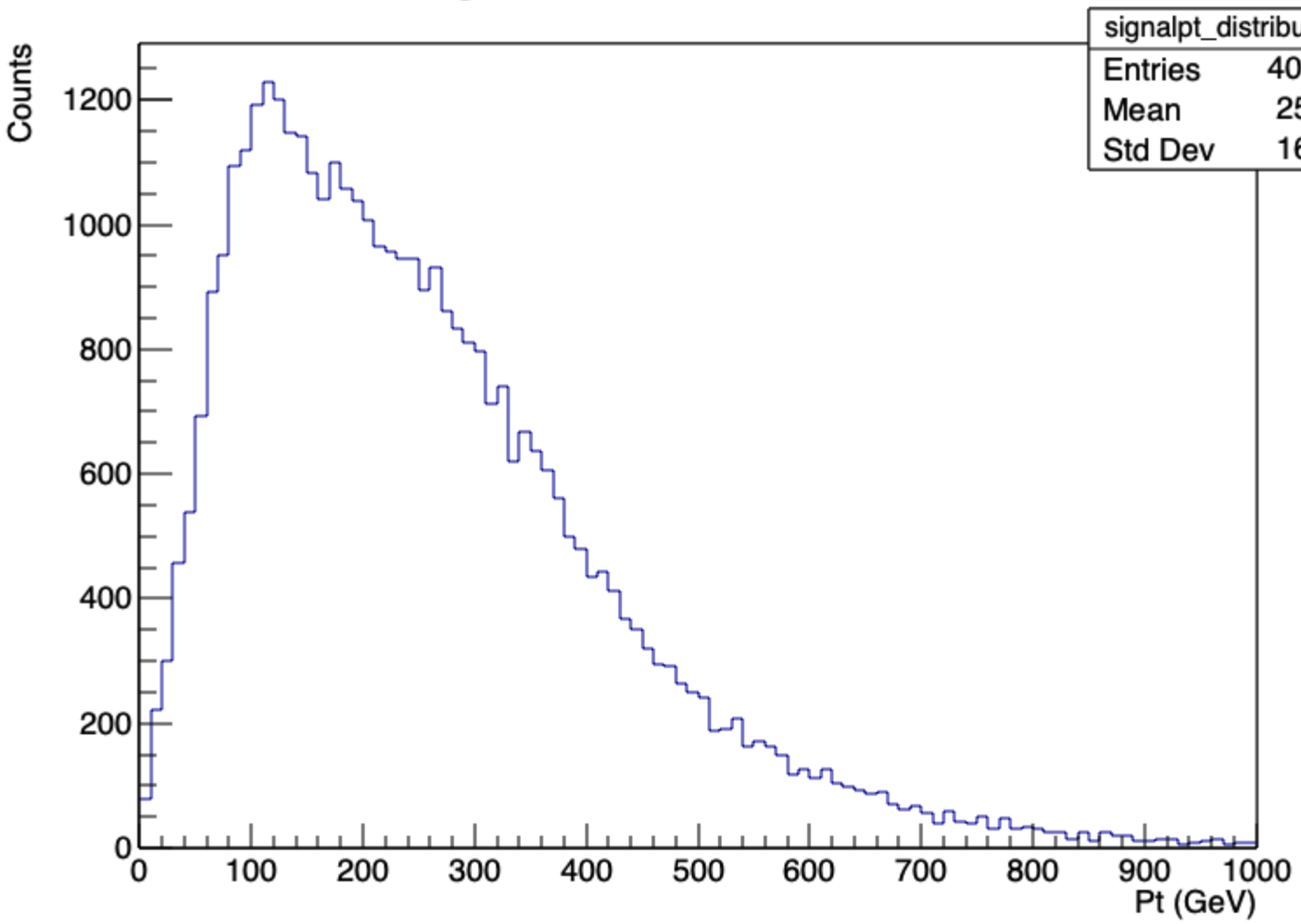
There is a peak near zero GeV

Odd number of entries?

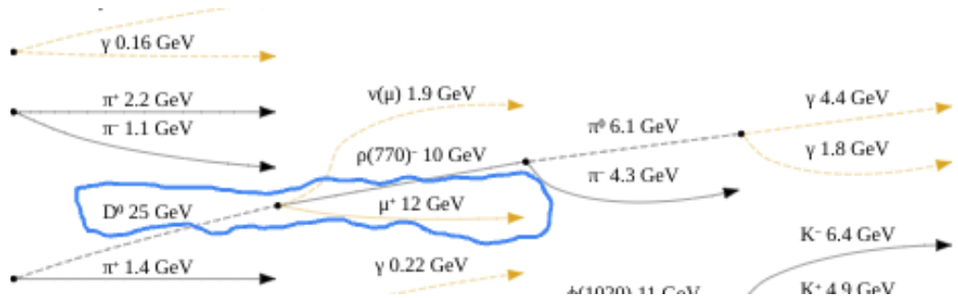
Back-up Slide #2

Signal muons,

“signal” means they are “final" status and produced by a smuon decay



An event with low pt final muon



Produced by a meson

A single (anti) muon, not a pair

pt ~ 1 GeV, total energy ~12 GeV

Only 40000 entries

No peak at zero GeV

Back-up Slide #3

All unexpected particles come from photon interactions