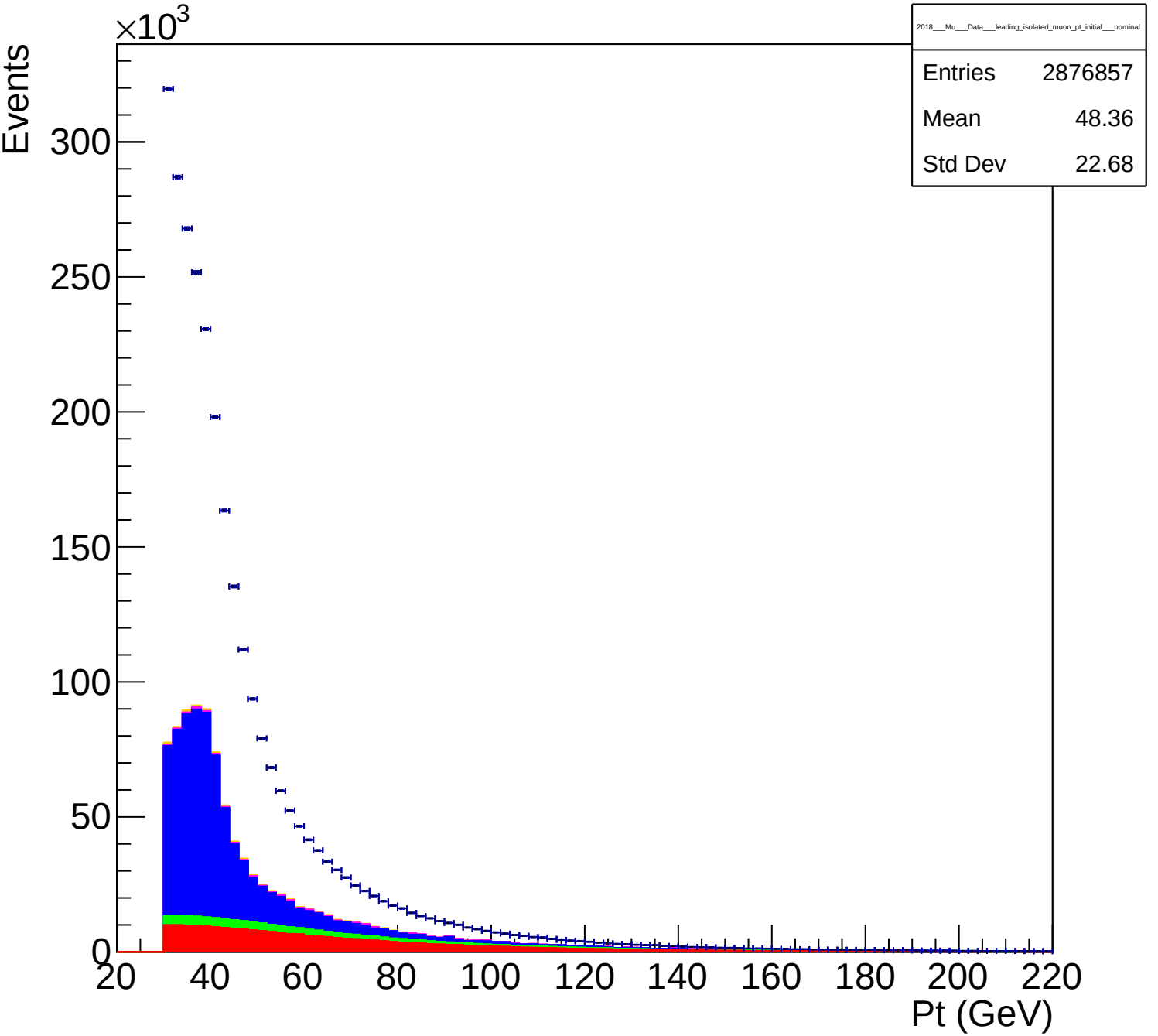
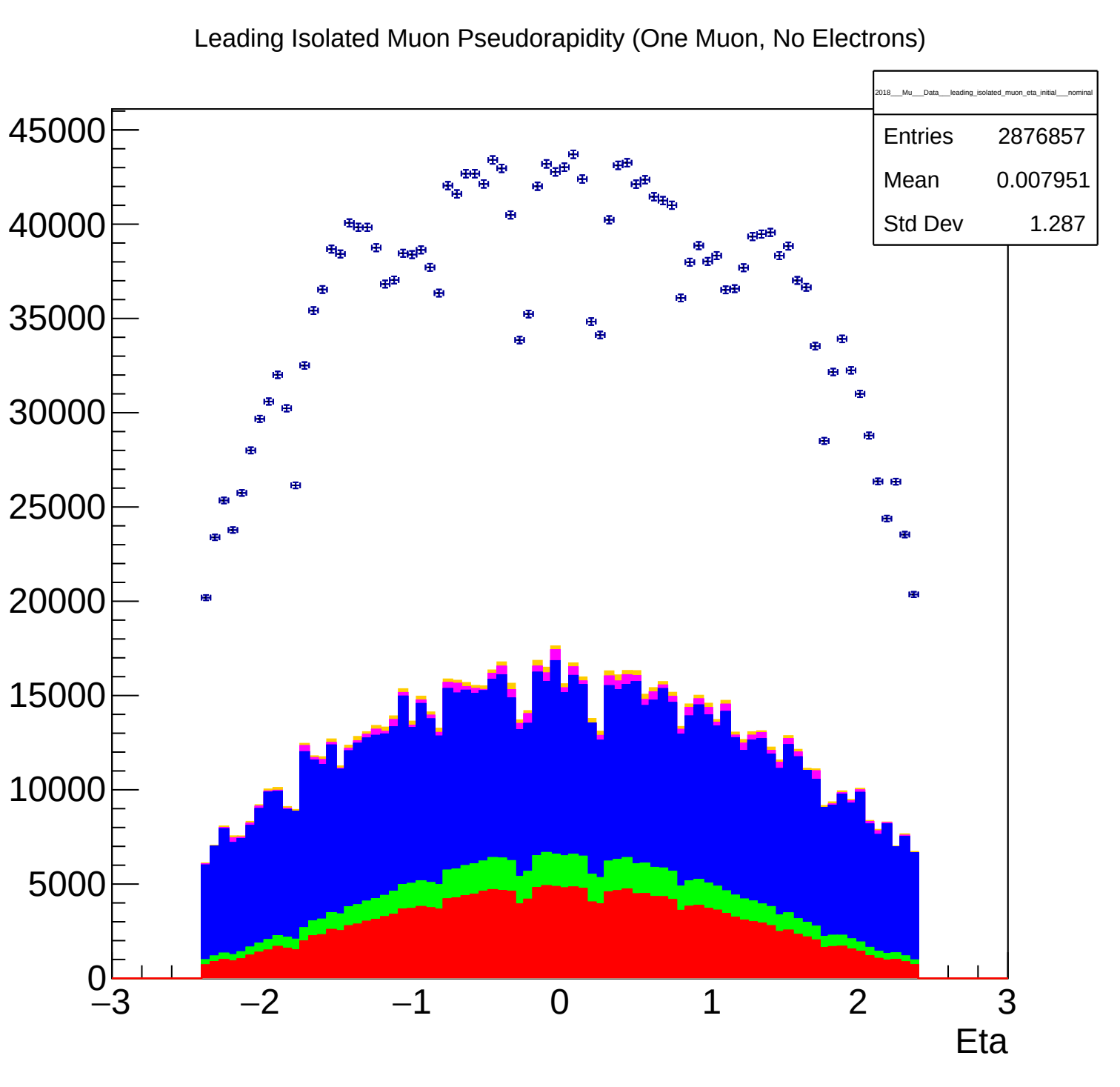
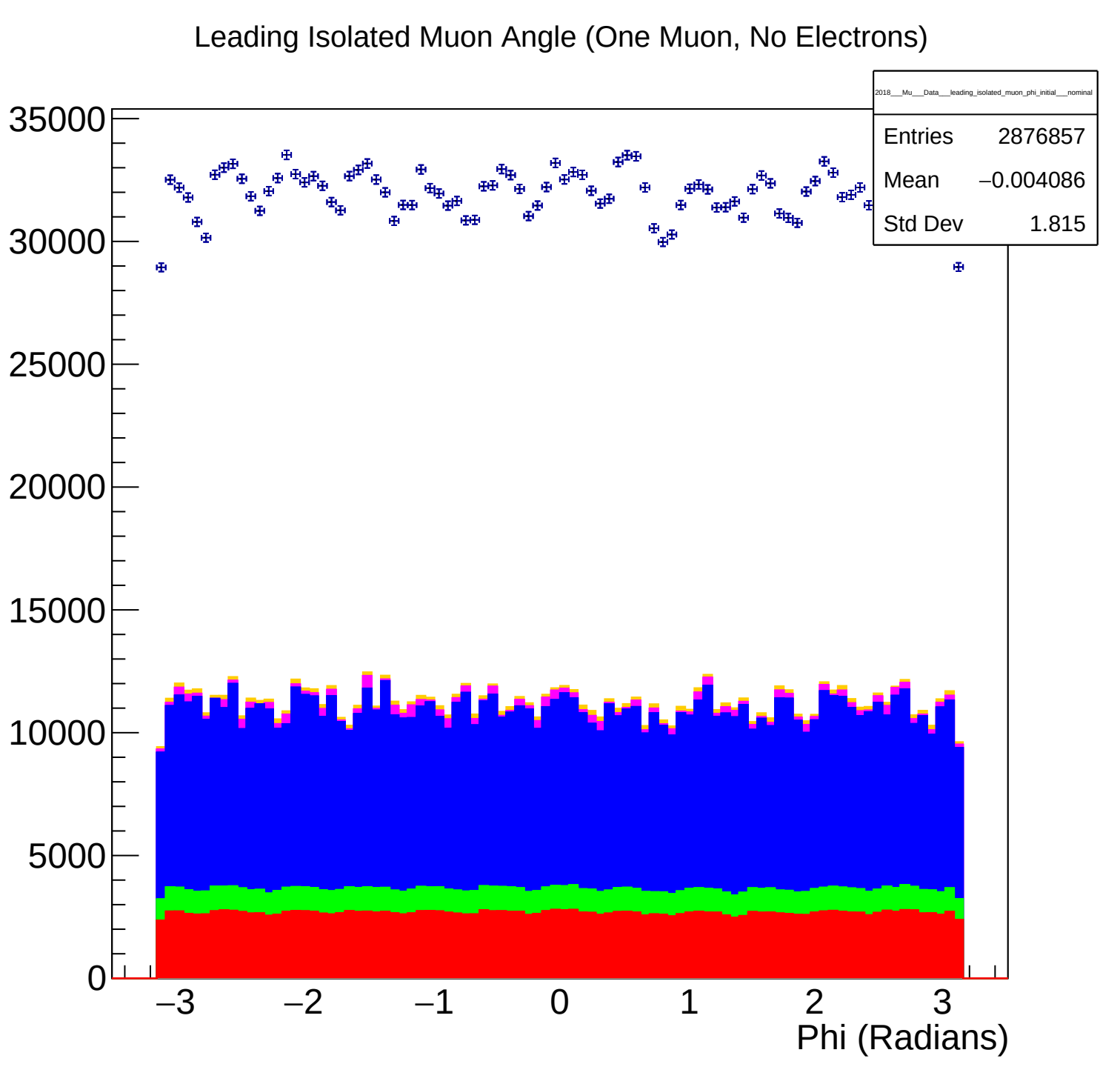
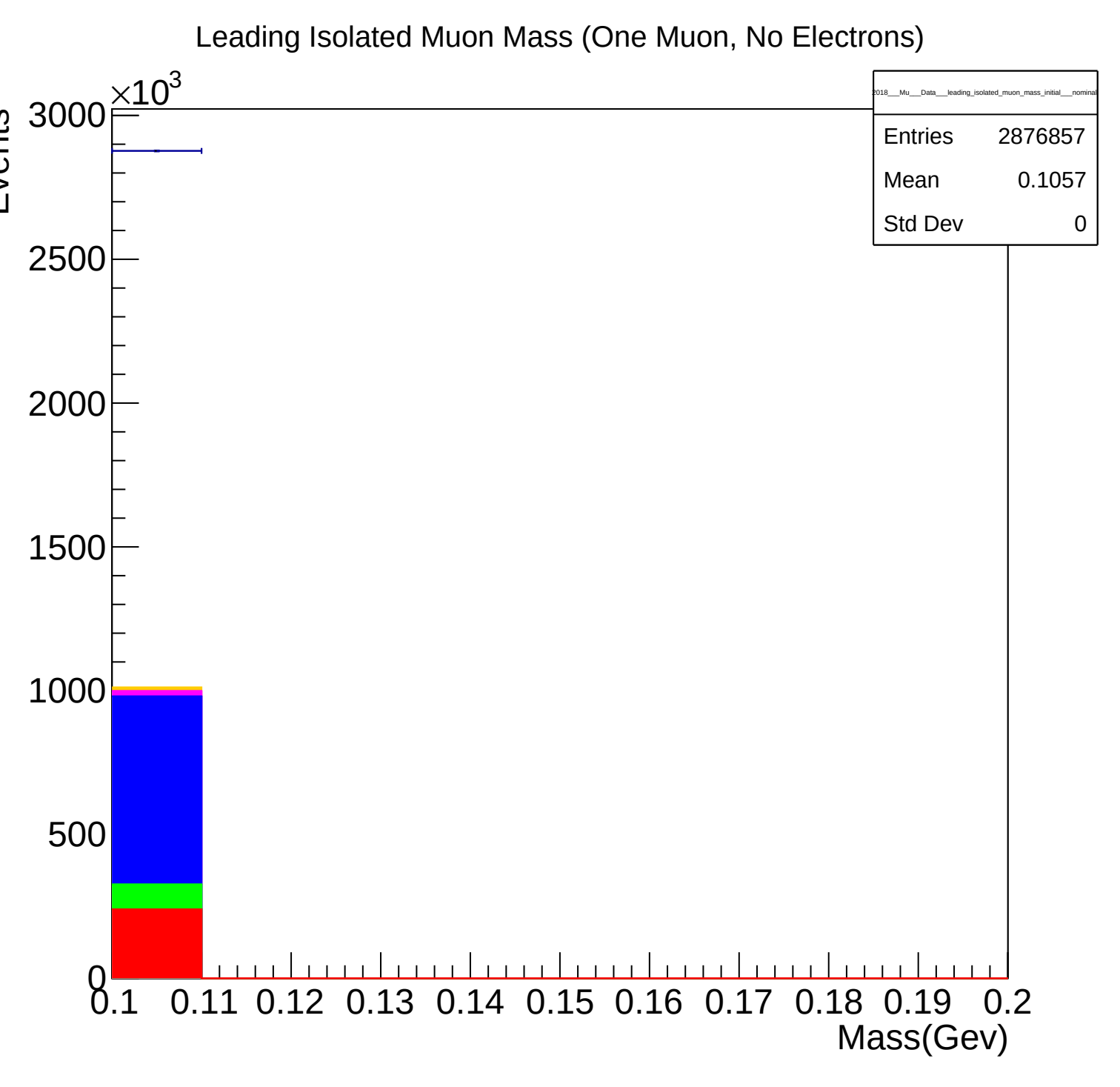
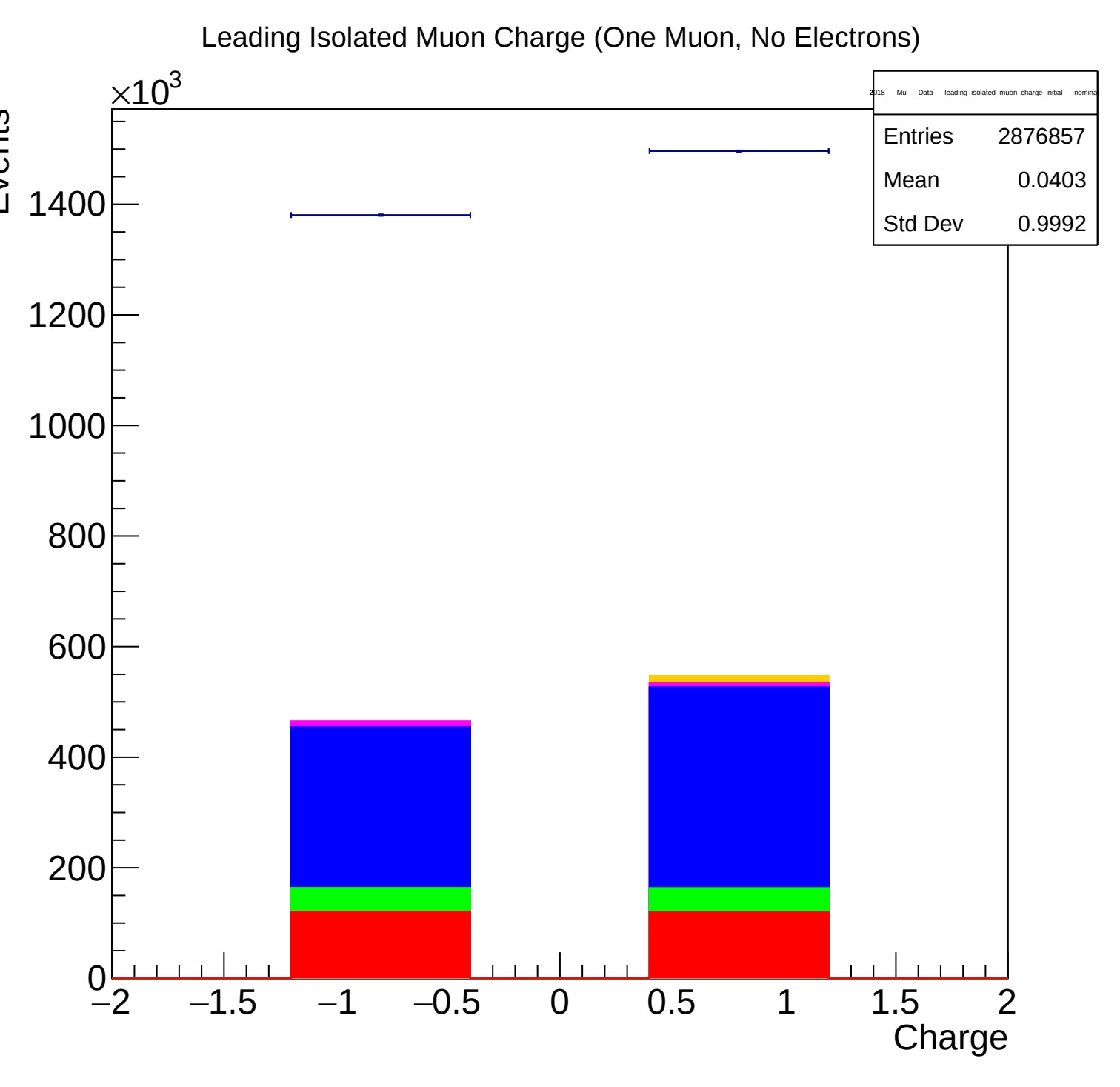
Leading Isolated Muon Transverse Momentum (One Muon, No Electrons)



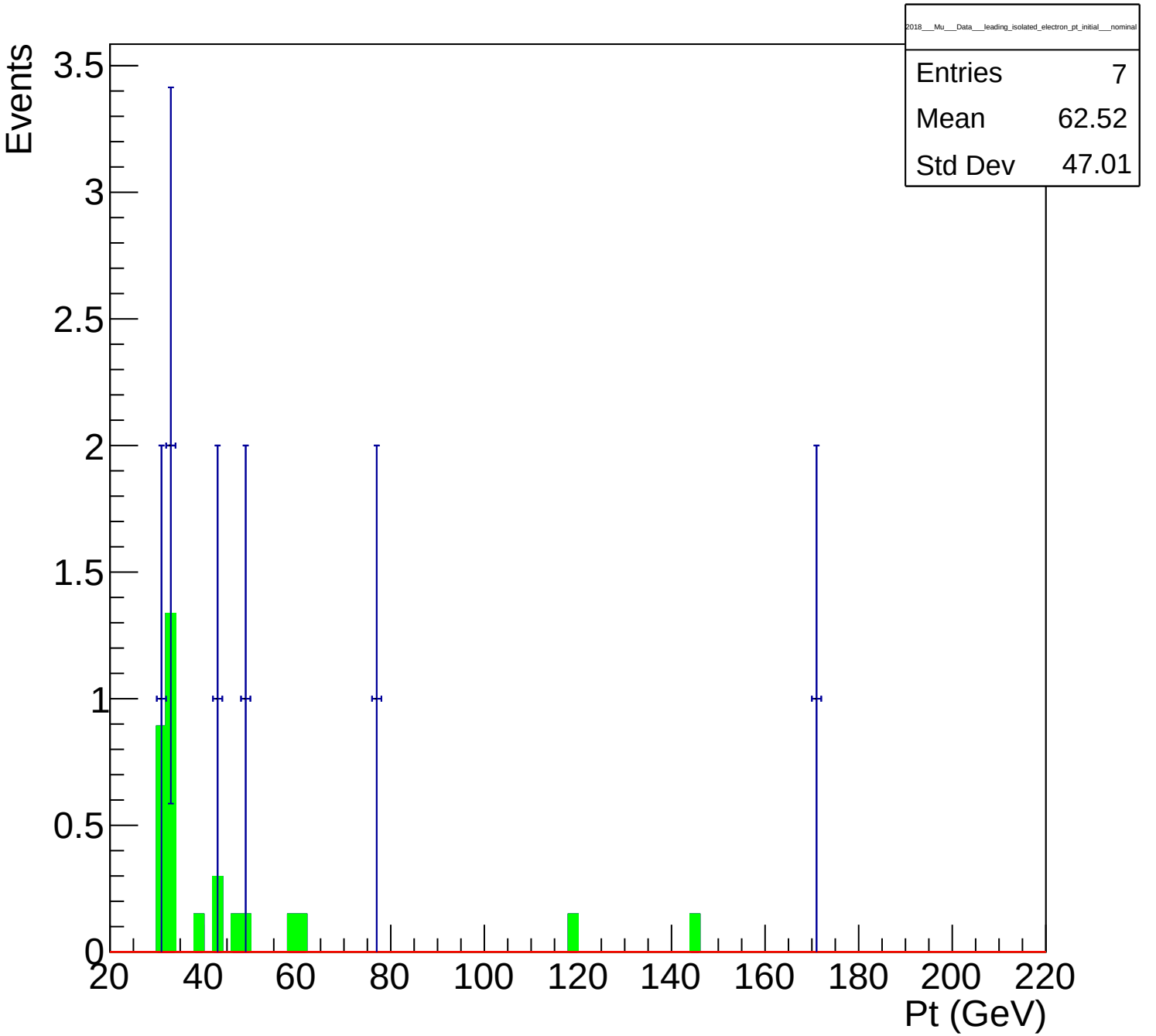

Leading Isolated Muon Pseudorapidity (One Muon, No Electrons)
2018___Mu___Data___leading_isolated_muon_eta_initial___nominal
Entries 2876857
Mean 0.007951
Std Dev 1.287
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
−3
−2
−1
0
1
2
3
Eta


Leading Isolated Muon Angle (One Muon, No Electrons)
2018___Mu___Data___leading_isolated_muon_phi_initial___nominal
Entries 2876857
Mean −0.004086
Std Dev 1.815
35000
30000
25000
20000
15000
10000
5000
0
−3
−2
−1
0
1
2
3
Phi (Radians)

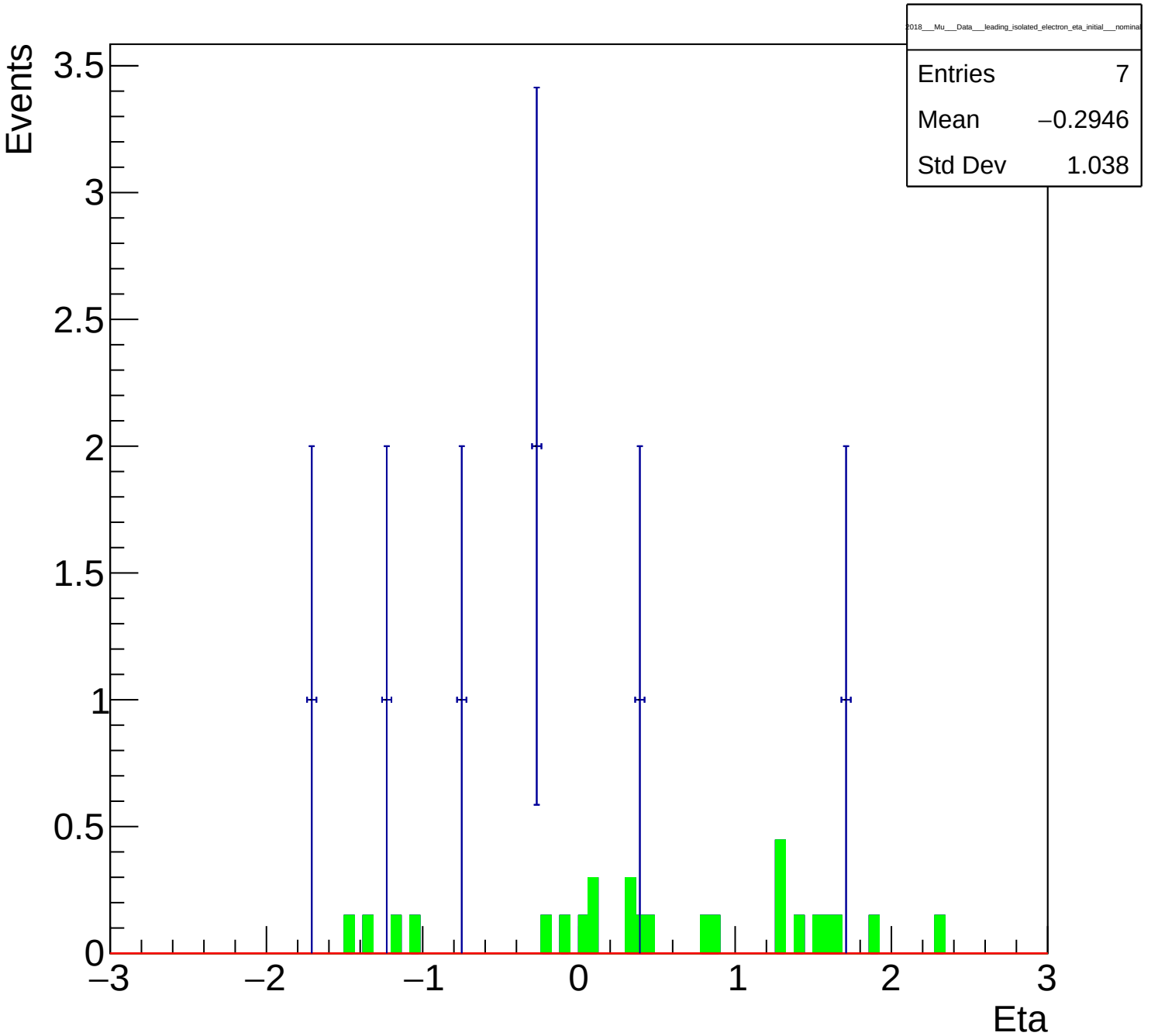

Leading Isolated Muon Mass (One Muon, No Electrons)
2018___Mu___Data___leading_isolated_muon_mass_initial___nominal
Entries 2876857
Mean 0.1057
Std Dev 0
×10^3
Events
3000
2500
2000
1500
1000
500
0
0.1
0.11
0.12
0.13
0.14
0.15
0.16
0.17
0.18
0.19
0.2
Mass(Gev)

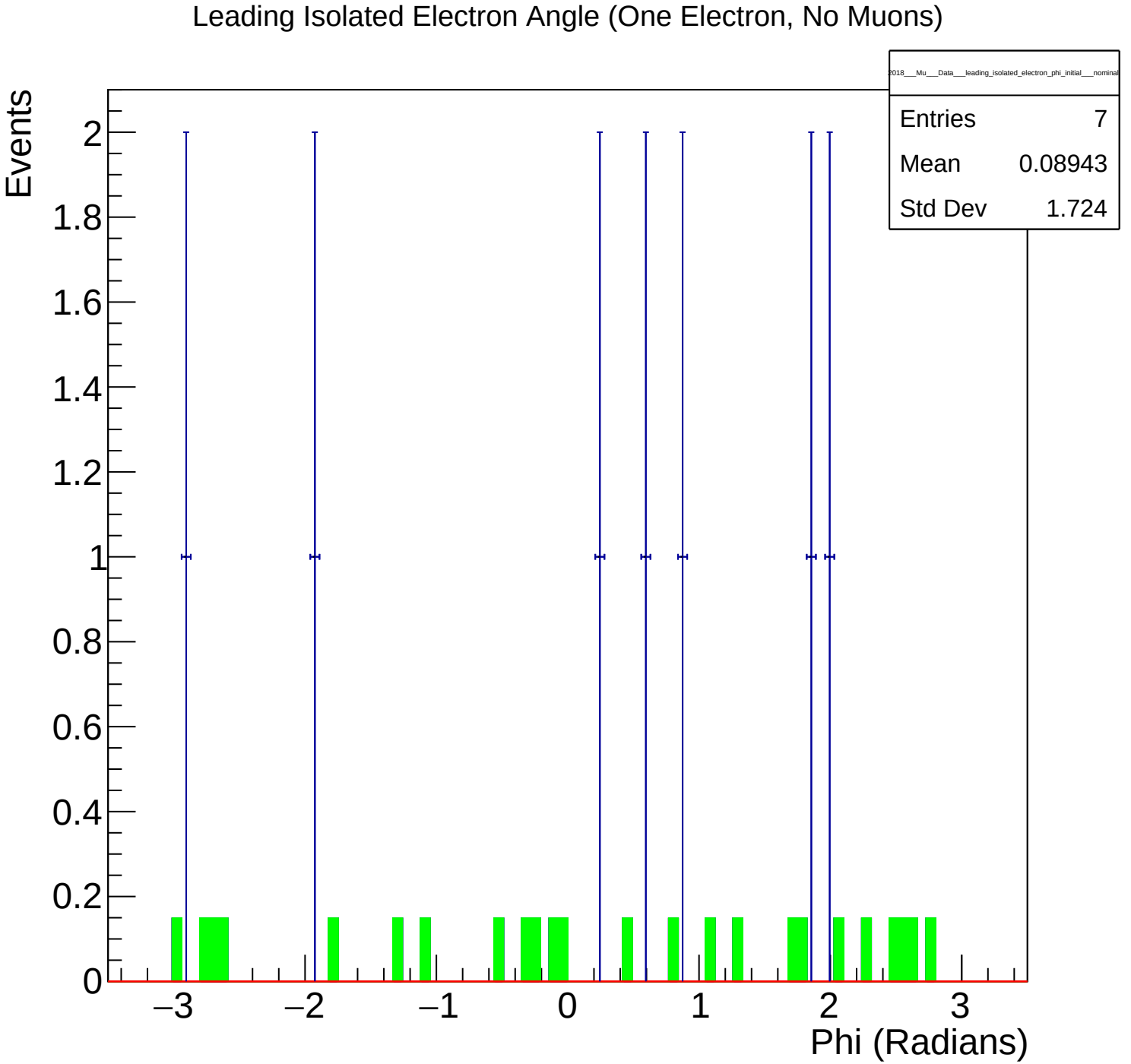

Leading Isolated Muon Charge (One Muon, No Electrons)
×10^3
Events
1400
1200
1000
800
600
400
200
0
–2
–1.5
–1
–0.5
0
0.5
1
1.5
2
Charge
2018___Mu___Data___leading_isolated_muon_charge_initial___nomina
Entries 2876857
Mean 0.0403
Std Dev 0.9992

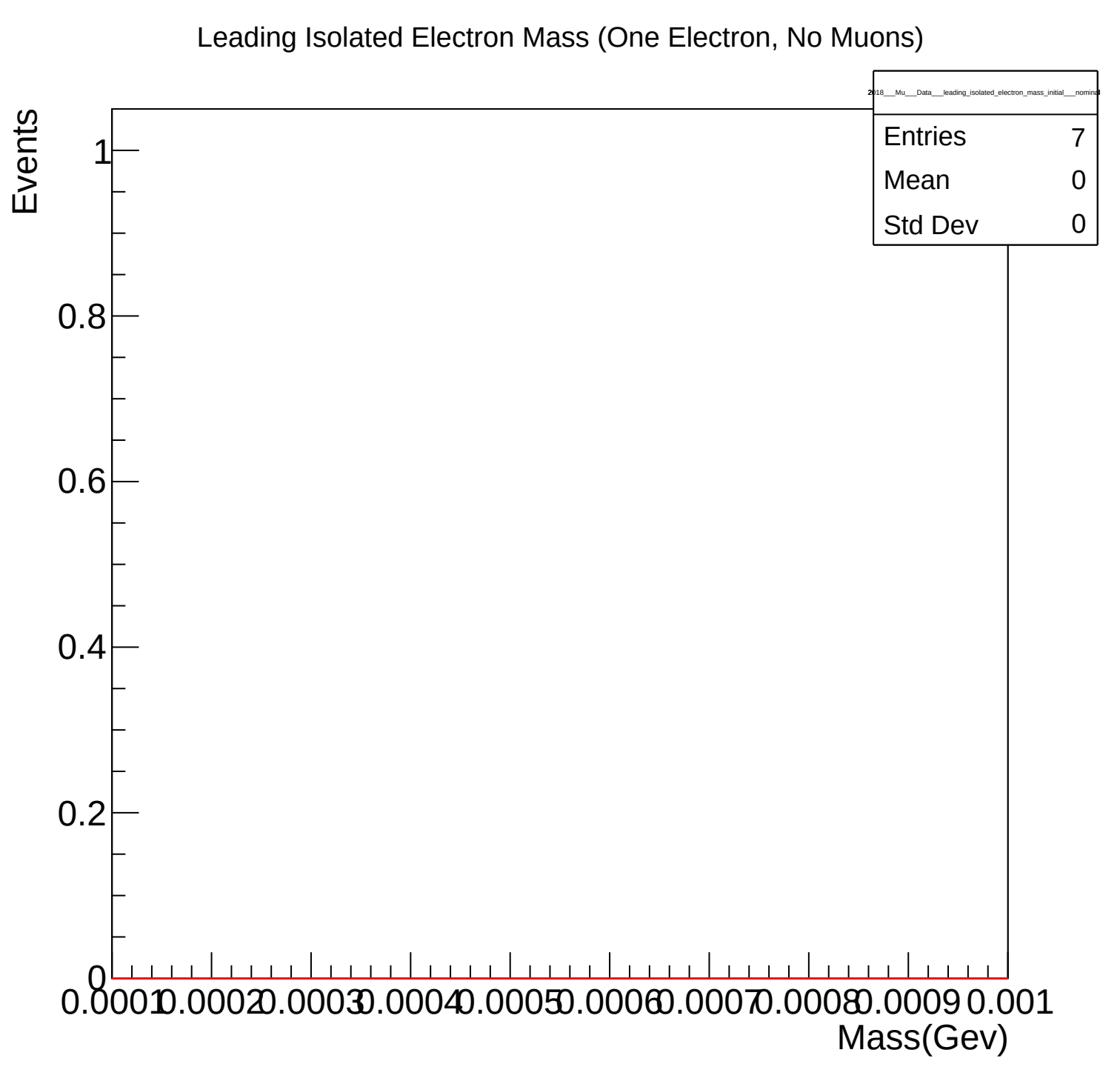
Leading Isolated Electron Transverse Momentum (One Electron, No Muons)

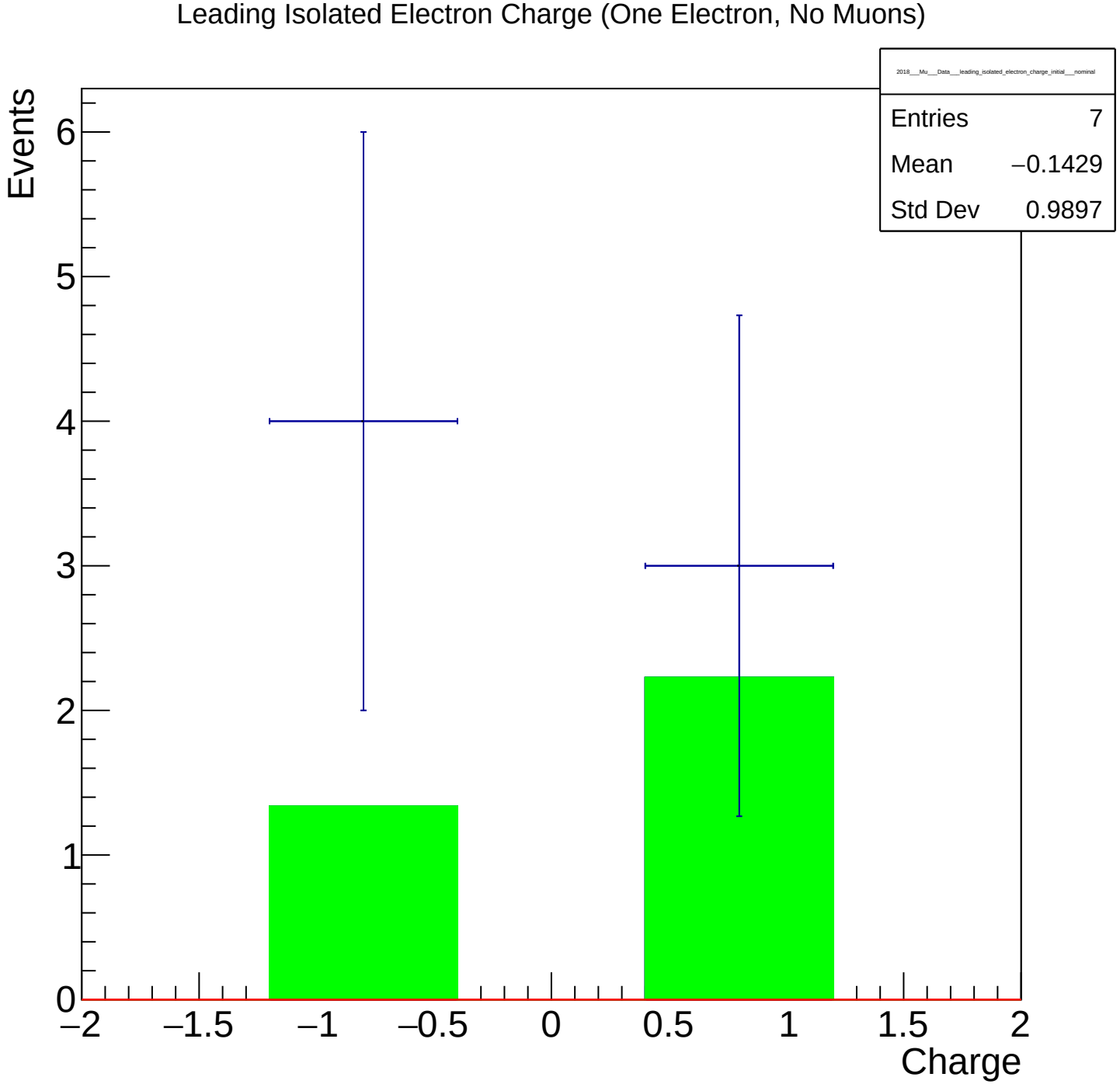


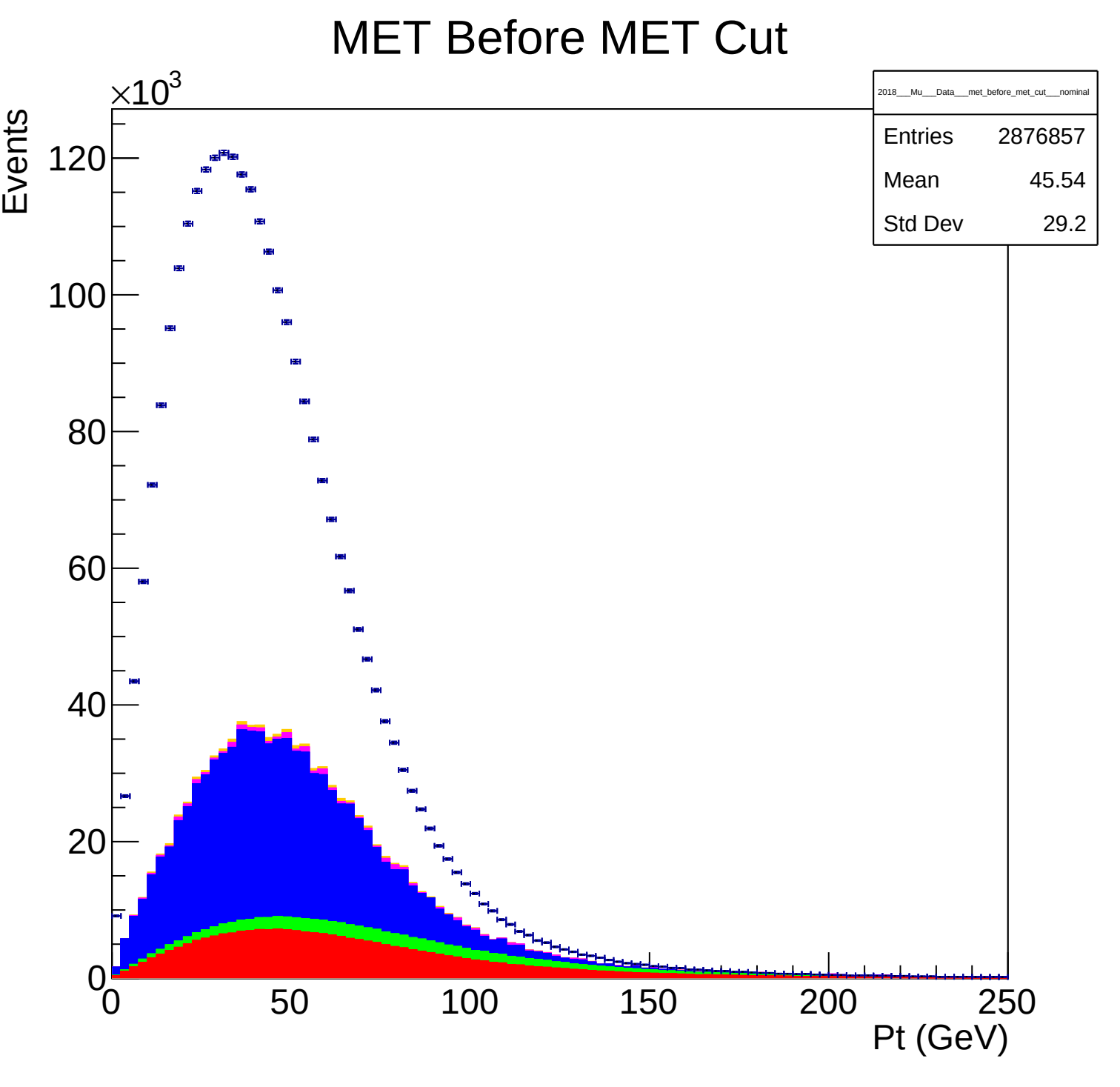
Leading Isolated Electron Pseudorapidity (One Electron, No Muons)

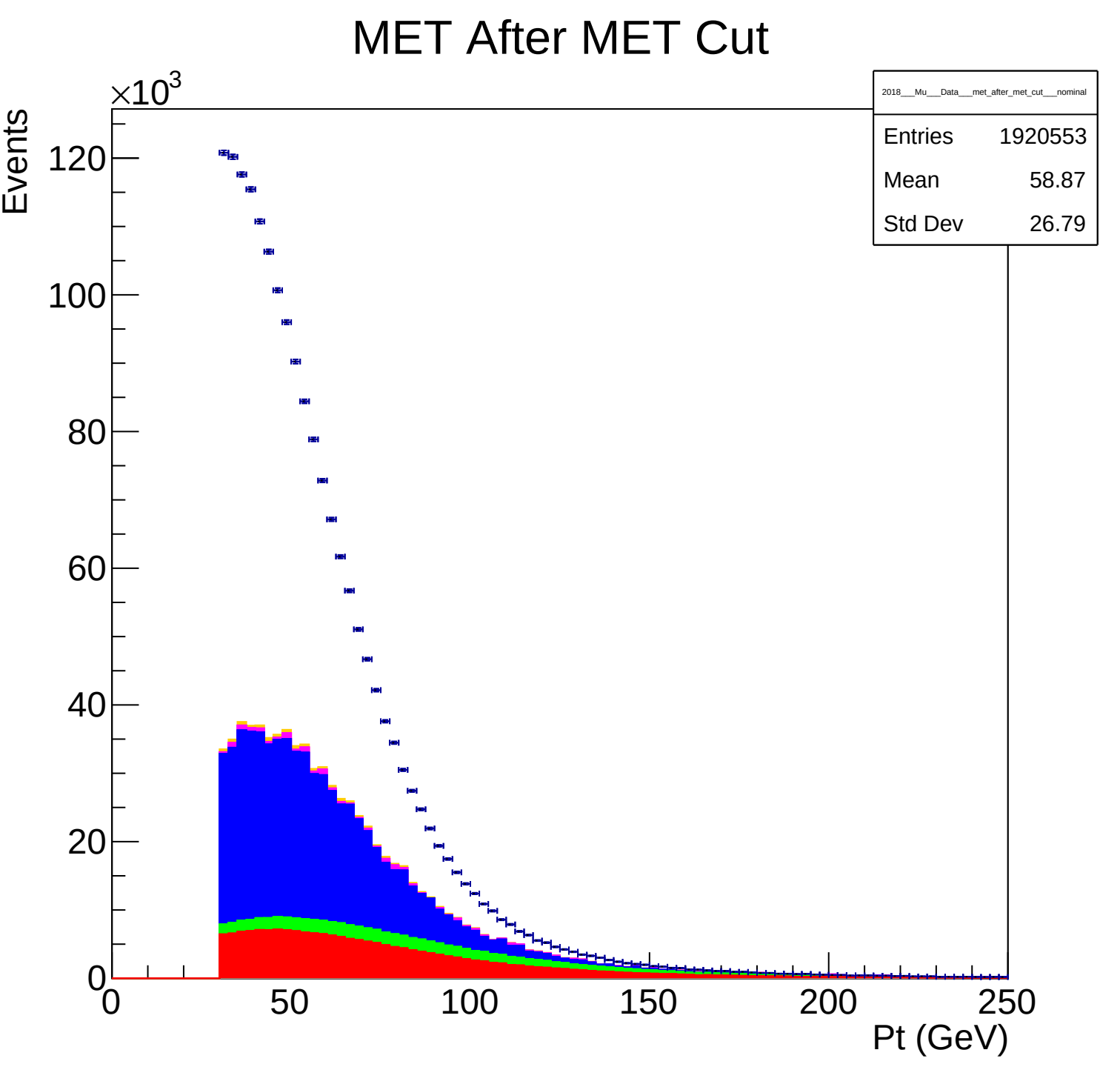


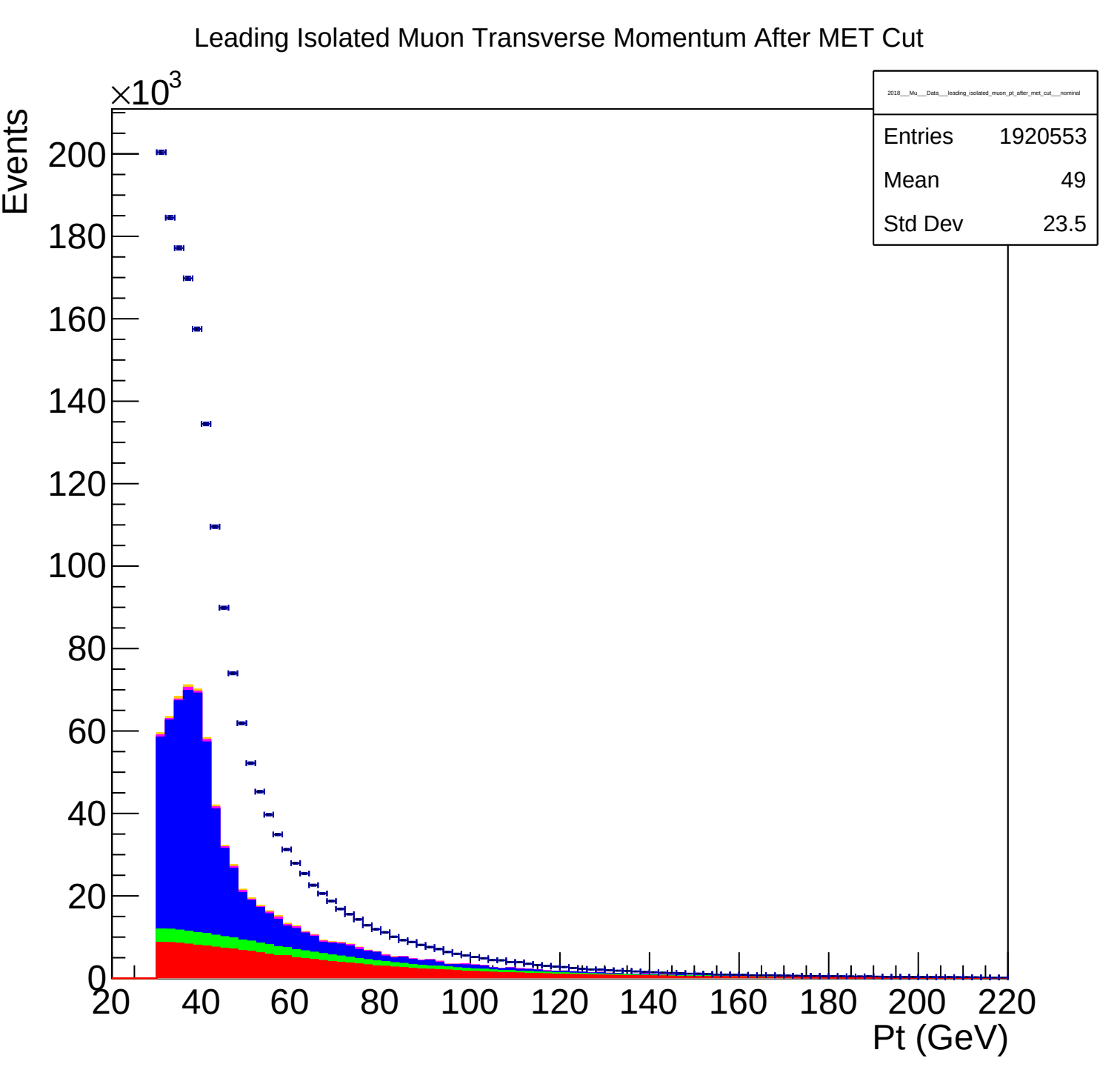

Leading Isolated Electron Angle (One Electron, No Muons)
2018___Mu___Data___leading_isolated_electron_phi_initial___nominal
Entries 7
Mean 0.08943
Std Dev 1.724
Events
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
−3
−2
−1
0
1
2
3
Phi (Radians)

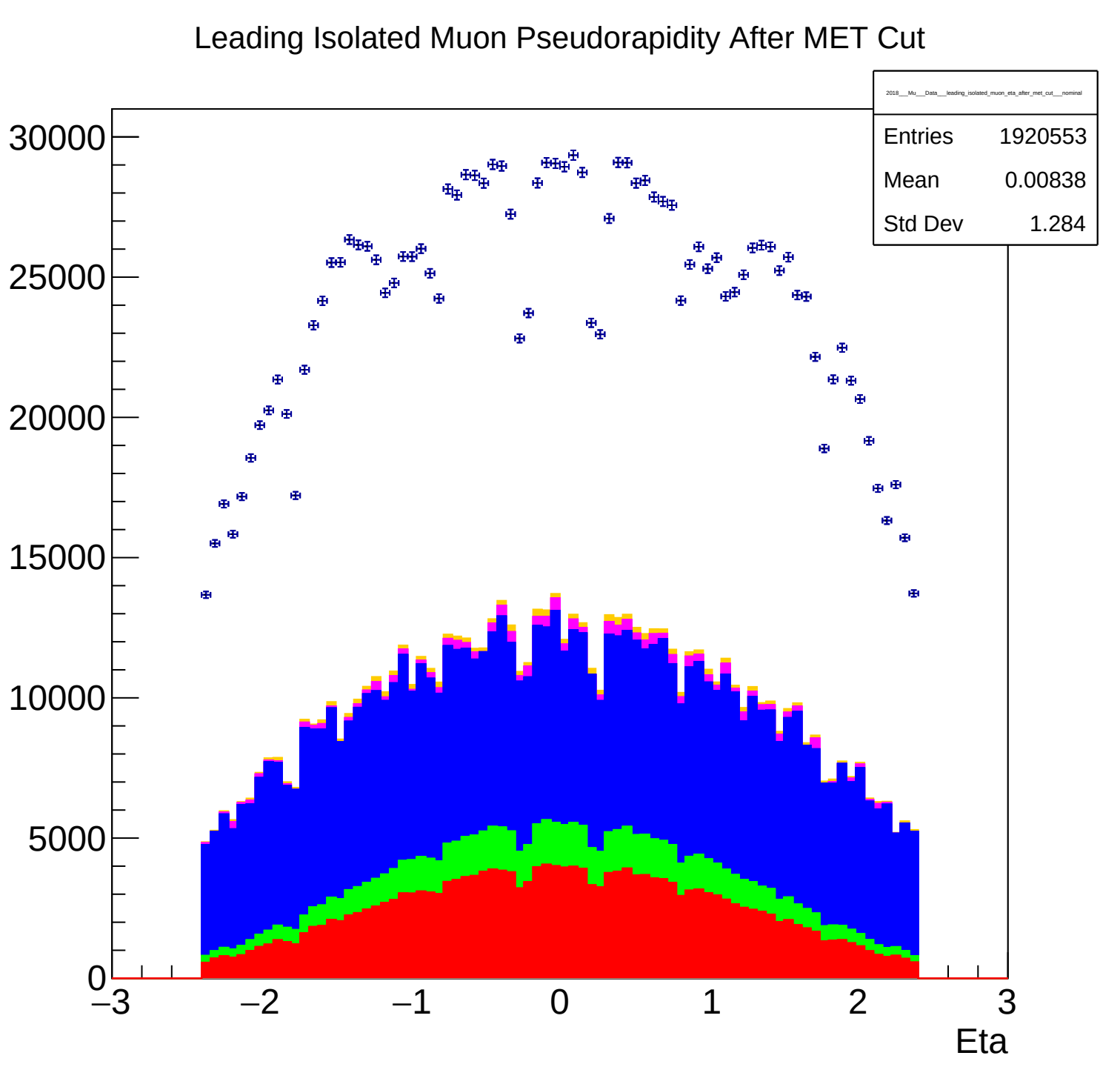

Leading Isolated Electron Mass (One Electron, No Muons)
2018___Mu___Data___leading_isolated_electron_mass_initial___nominal
Entries 7
Mean 0
Std Dev 0
Events
1
0.8
0.6
0.4
0.2
0
0.0001
0.0002
0.0003
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.001
Mass(Gev)


Leading Isolated Electron Charge (One Electron, No Muons)
2018___Mu___Data___leading_isolated_electron_charge_initial___nominal
Entries 7
Mean −0.1429
Std Dev 0.9897
Events
0
1
2
3
4
5
6
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Charge

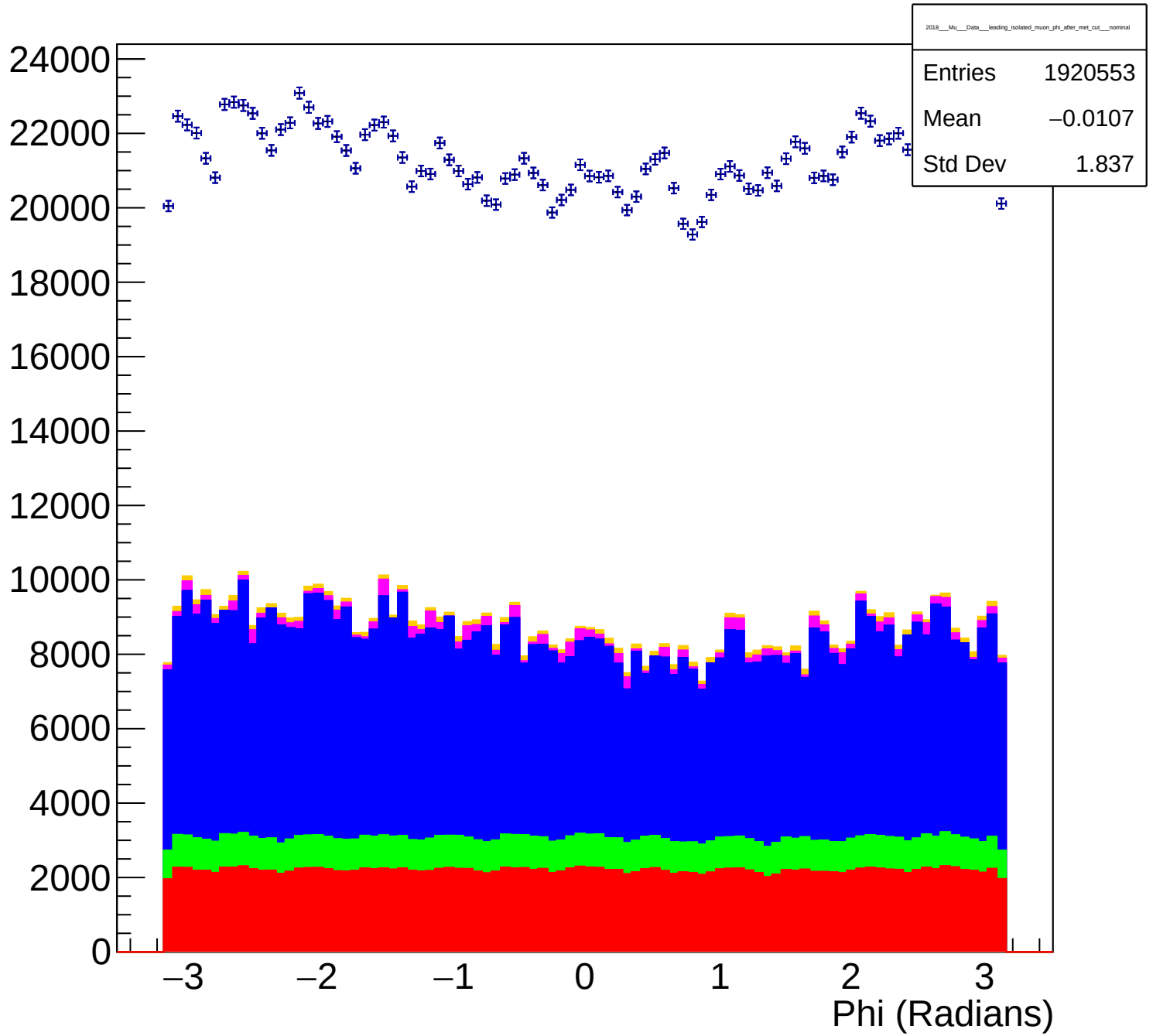

MET Before MET Cut
2018___Mu___Data___met_before_met_cut___nominal
Entries 2876857
Mean 45.54
Std Dev 29.2
×10^3
Events
120
100
80
60
40
20
0
0
50
100
150
200
250
Pt (GeV)


MET After MET Cut
2018___Mu___Data___met_after_met_cut___nominal
Entries 1920553
Mean 58.87
Std Dev 26.79
×10^3
Events
120
100
80
60
40
20
0
0
50
100
150
200
250
Pt (GeV)

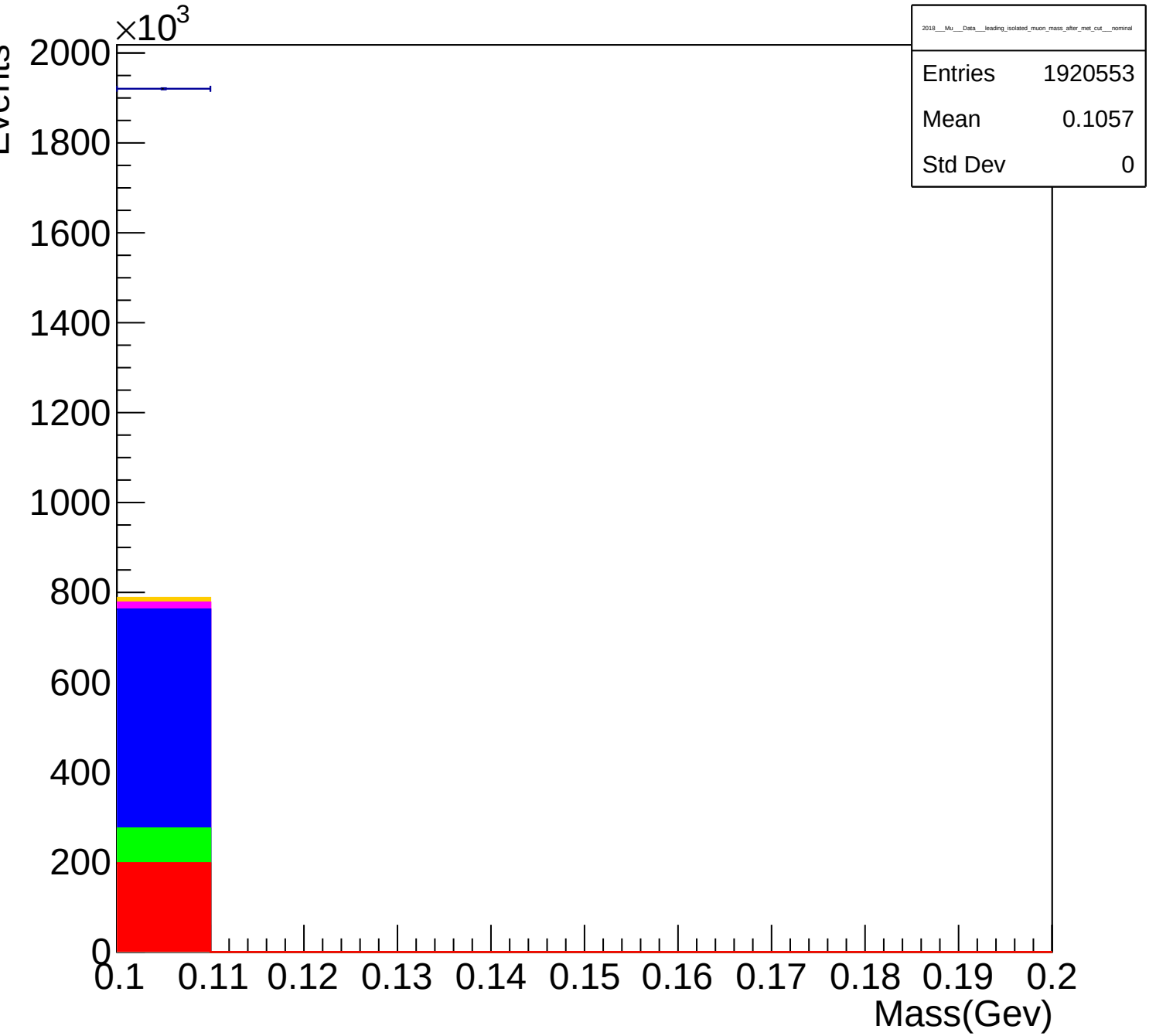

Leading Isolated Muon Transverse Momentum After MET Cut
2018___Mu___Data___leading_isolated_muon_pt_after_met_cut___nominal
Entries 1920553
Mean 49
Std Dev 23.5
×10^3
Events
200
180
160
140
120
100
80
60
40
20
0
20
40
60
80
100
120
140
160
180
200
220
Pt (GeV)

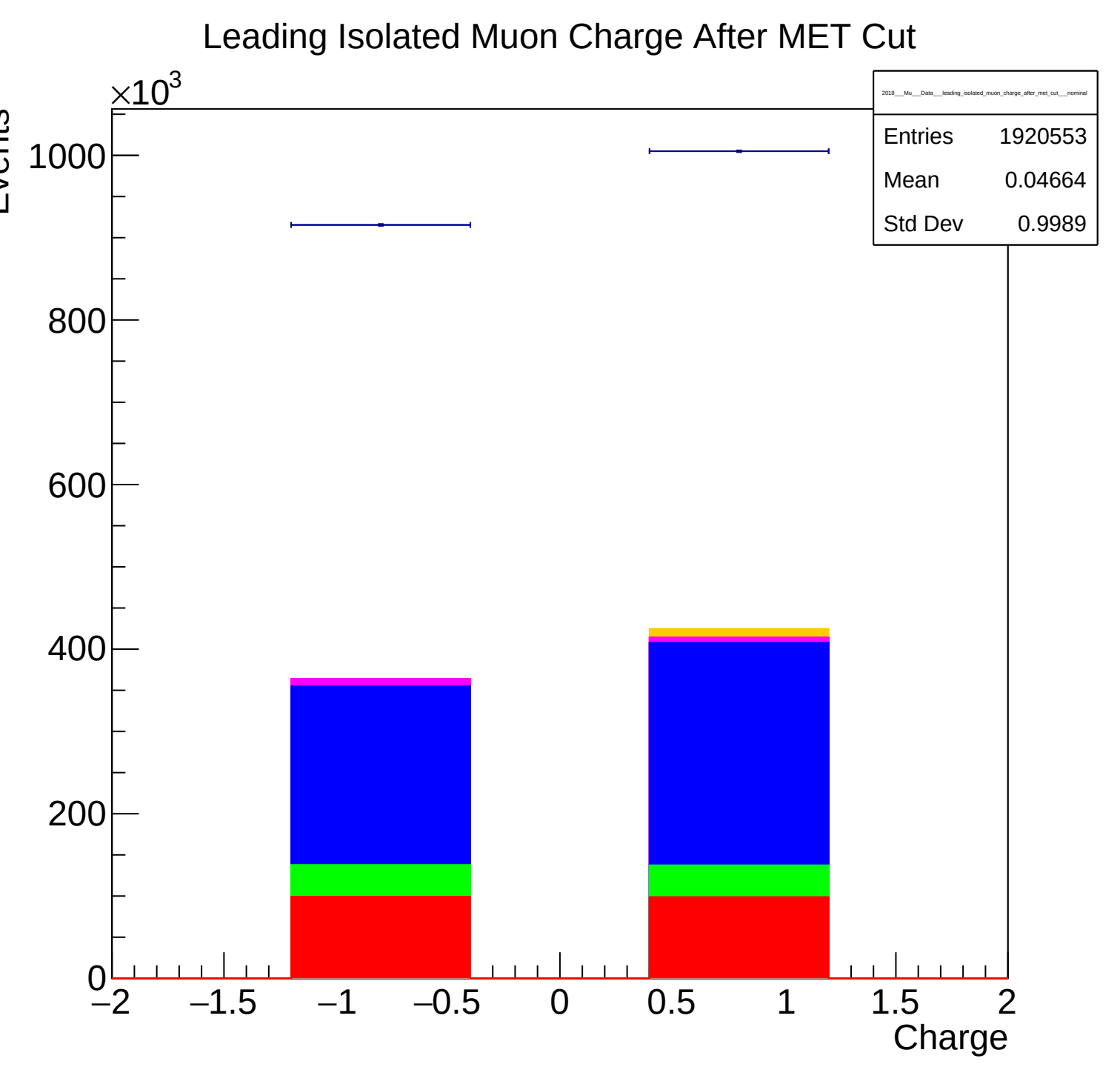

Leading Isolated Muon Pseudorapidity After MET Cut
2018___Mu___Data___leading_isolated_muon_eta_after_met_cut___nominal
Entries 1920553
Mean 0.00838
Std Dev 1.284
30000
25000
20000
15000
10000
5000
0
−3
−2
−1
0
1
2
3
Eta

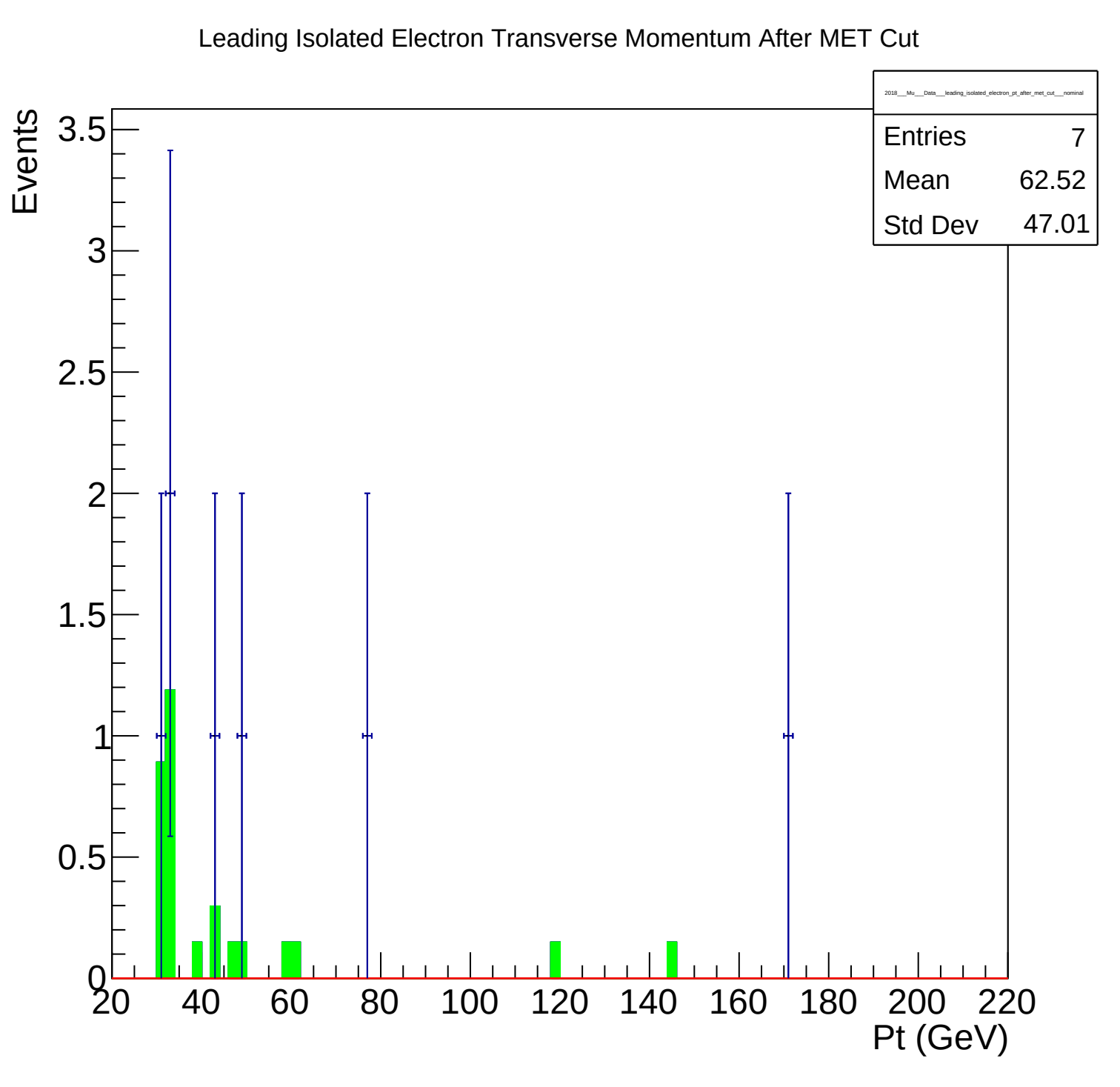
Leading Isolated Muon Angle After MET Cut

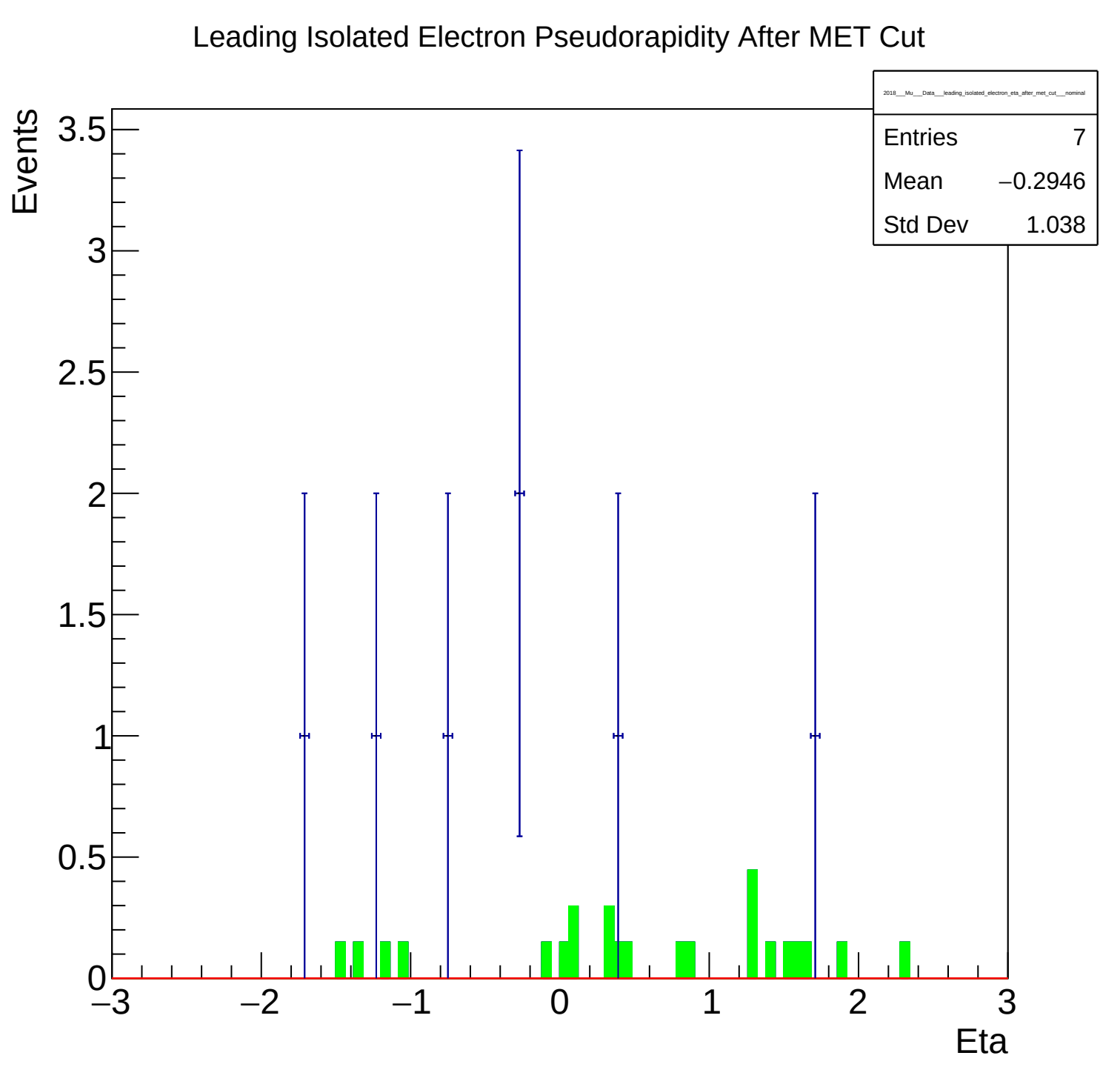


Leading Isolated Muon Mass After MET Cut

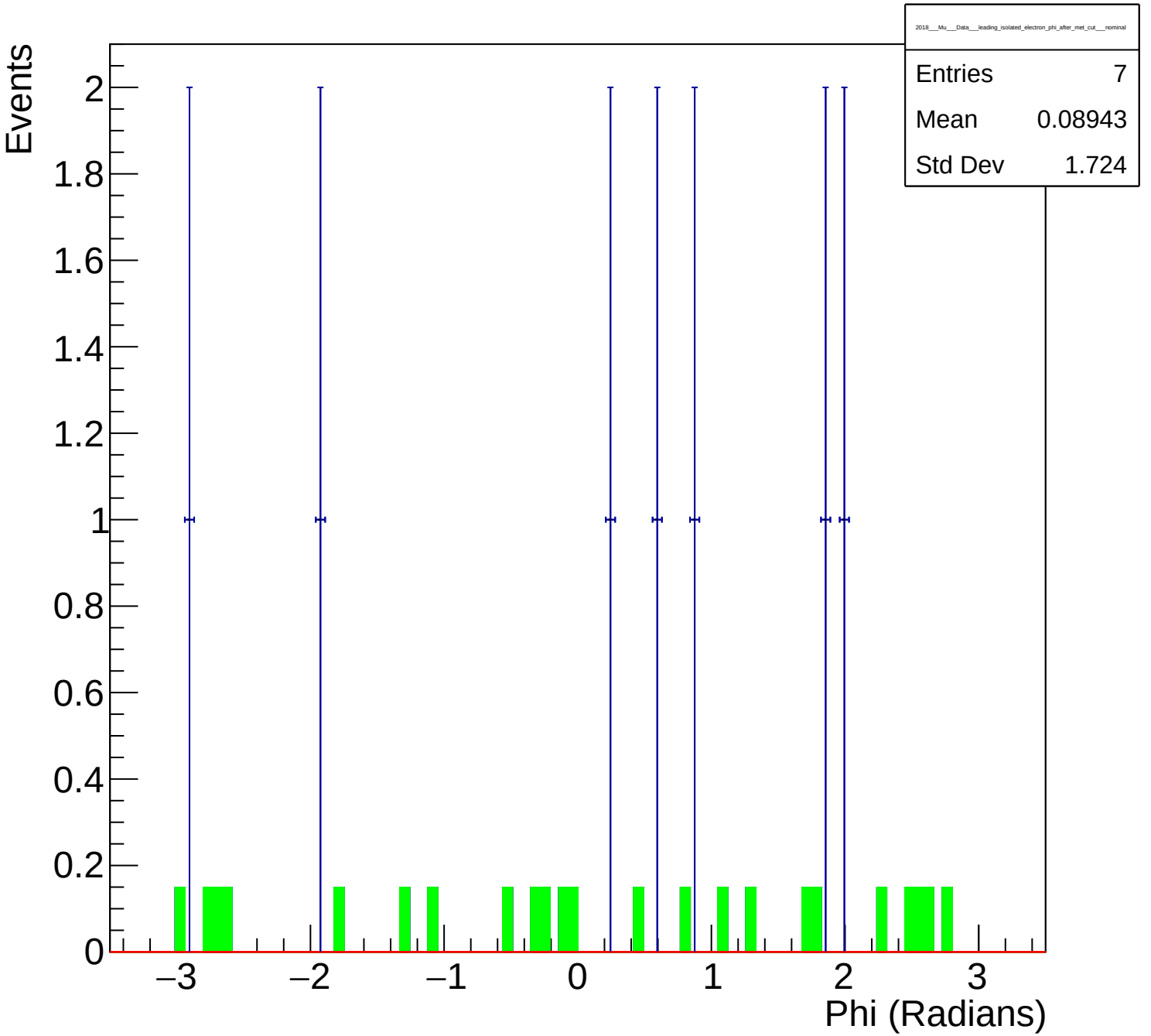


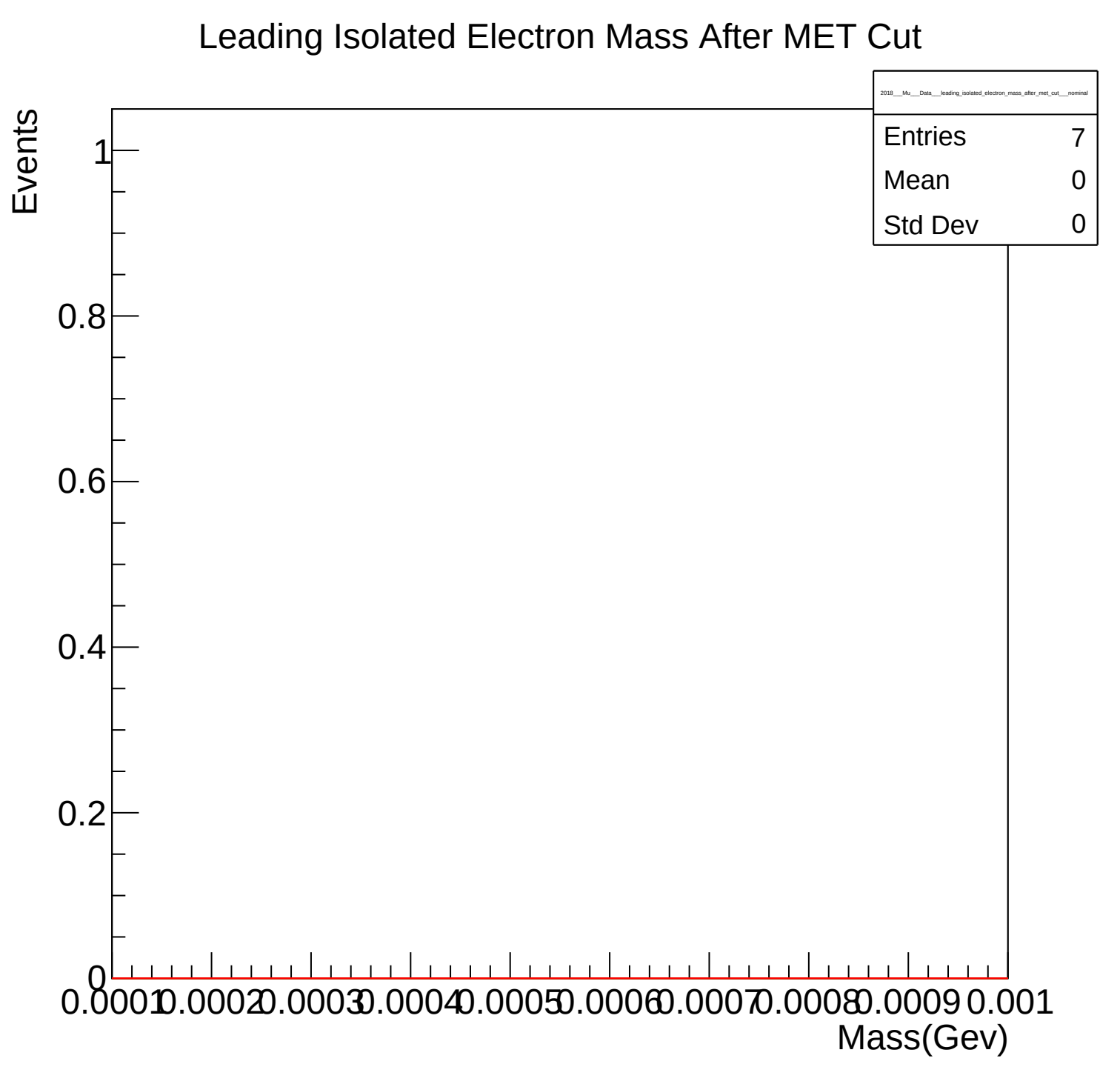

Leading Isolated Muon Charge After MET Cut
×10^3
Events
1000
800
600
400
200
0
–2
–1.5
–1
–0.5
0
0.5
1
1.5
2
Charge
2018___Mu___Data___leading_isolated_muon_charge_after_met_cut___nominal
Entries 1920553
Mean 0.04664
Std Dev 0.9989

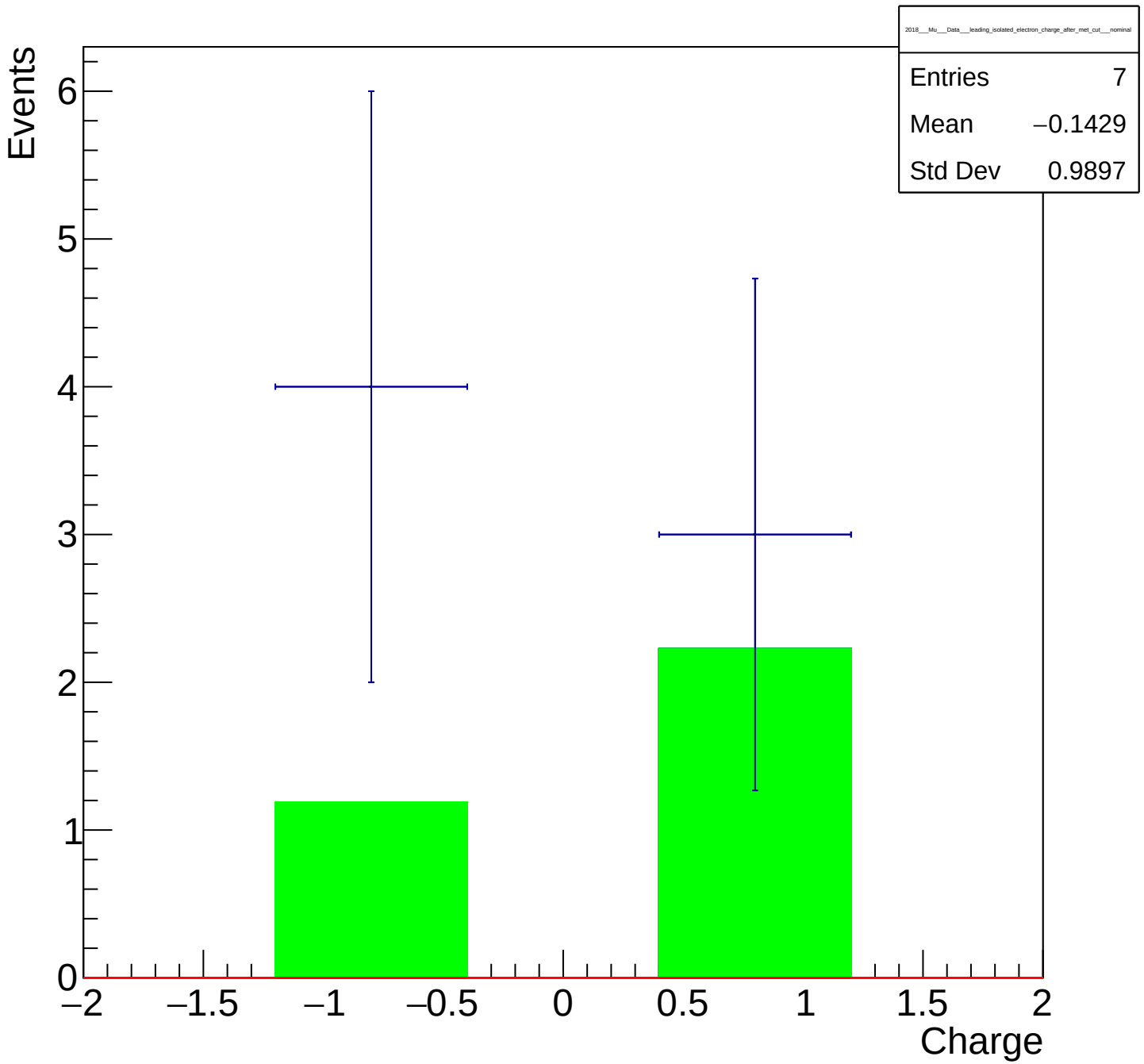

Leading Isolated Electron Transverse Momentum After MET Cut
2018___Mu___Data___leading_isolated_electron_pt_after_met_cut___nominal
Entries 7
Mean 62.52
Std Dev 47.01
Events
3.5
3
2.5
2
1.5
1
0.5
0
20
40
60
80
100
120
140
160
180
200
220
Pt (GeV)


Leading Isolated Electron Pseudorapidity After MET Cut
2018___Mu___Data___leading_isolated_electron_eta_after_met_cut___nominal
Entries 7
Mean −0.2946
Std Dev 1.038
Events
Eta
0
0.5
1
1.5
2
2.5
3
3.5
−3
−2
−1
0
1
2
3

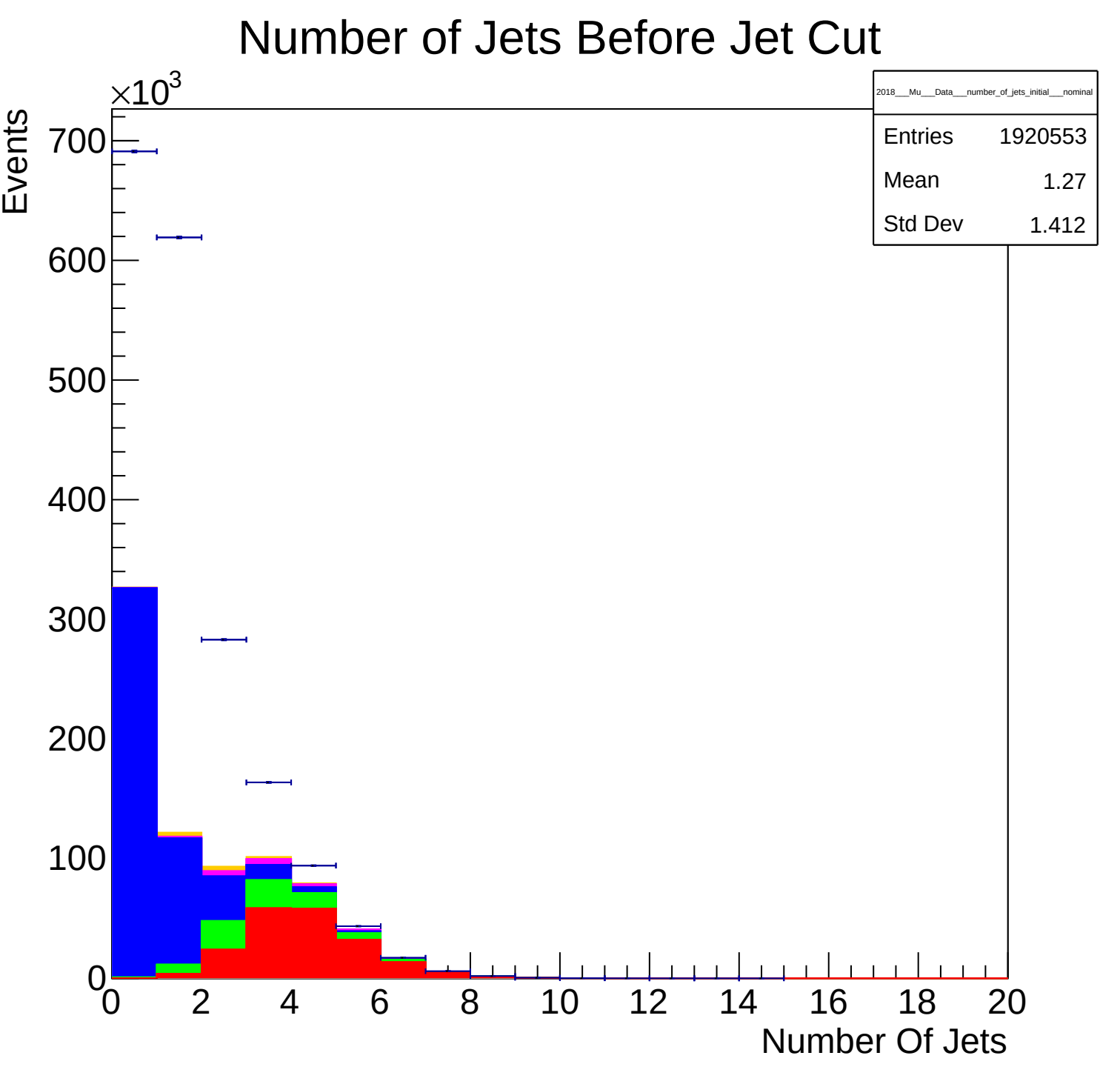
Leading Isolated Electron Angle After MET Cut

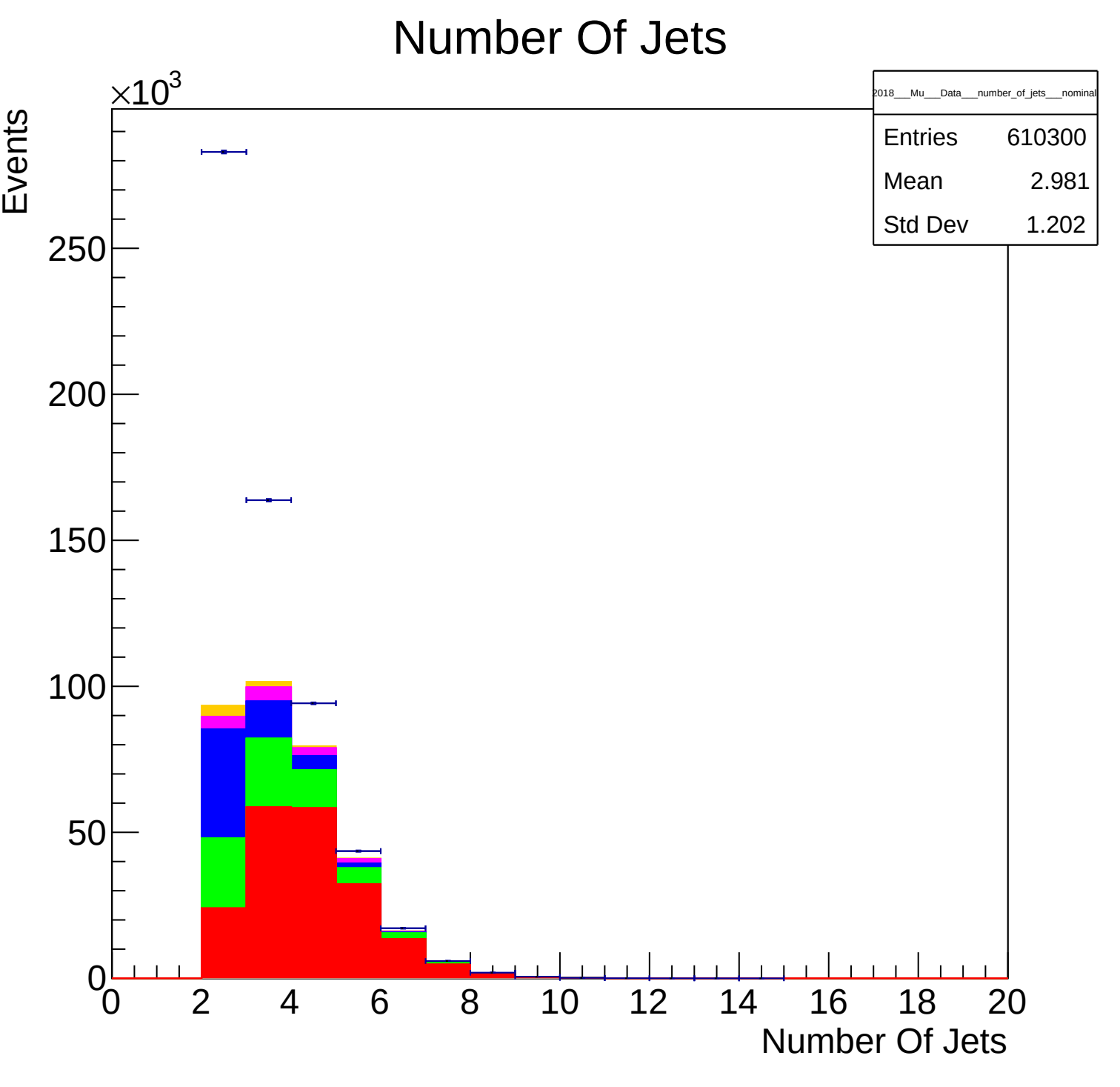


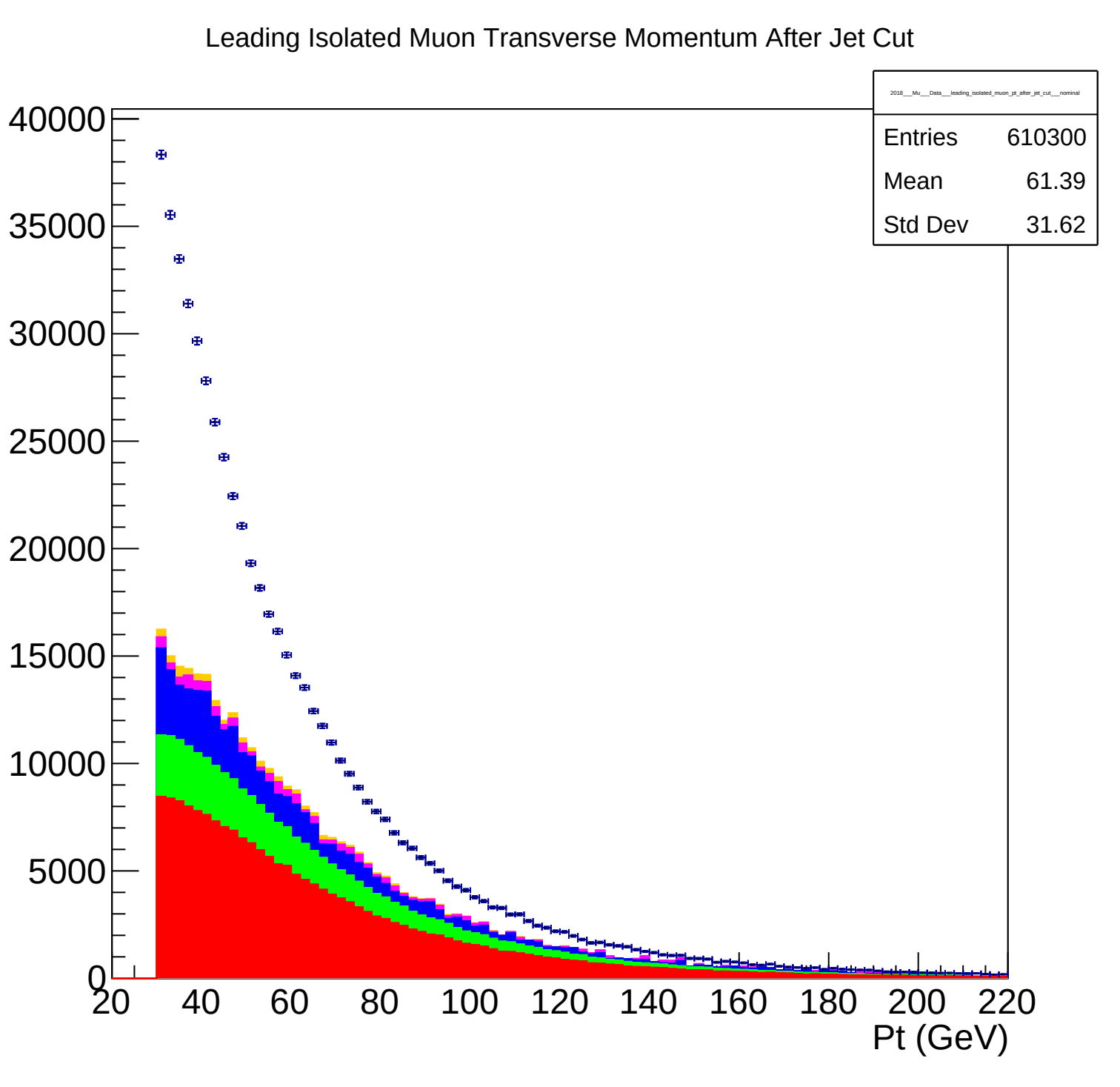

Leading Isolated Electron Mass After MET Cut
2018___Mu___Data___leading_isolated_electron_mass_after_met_cut___nominal
Entries 7
Mean 0
Std Dev 0
Events
1
0.8
0.6
0.4
0.2
0
0.0001
0.0002
0.0003
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.001
Mass(Gev)


Leading Isolated Electron Charge After MET Cut
2018___Mu___Data___leading_isolated_electron_charge_after_met_cut___nominal
Entries 7
Mean −0.1429
Std Dev 0.9897
Events
0
1
2
3
4
5
6
−2
−1.5
−1
−0.5
0
0.5
1
1.5
2
Charge

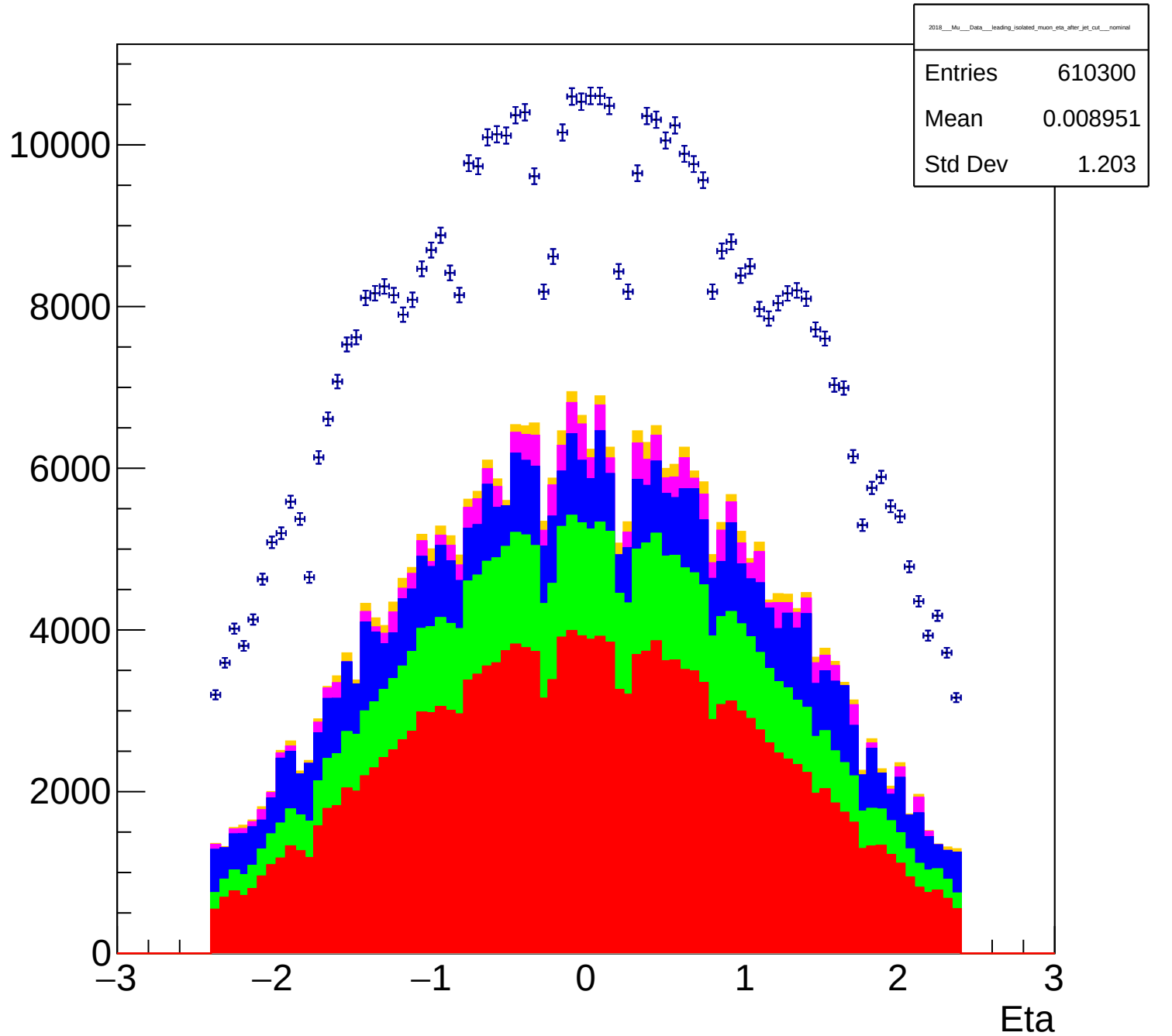
Number of Jets Before Jet Cut



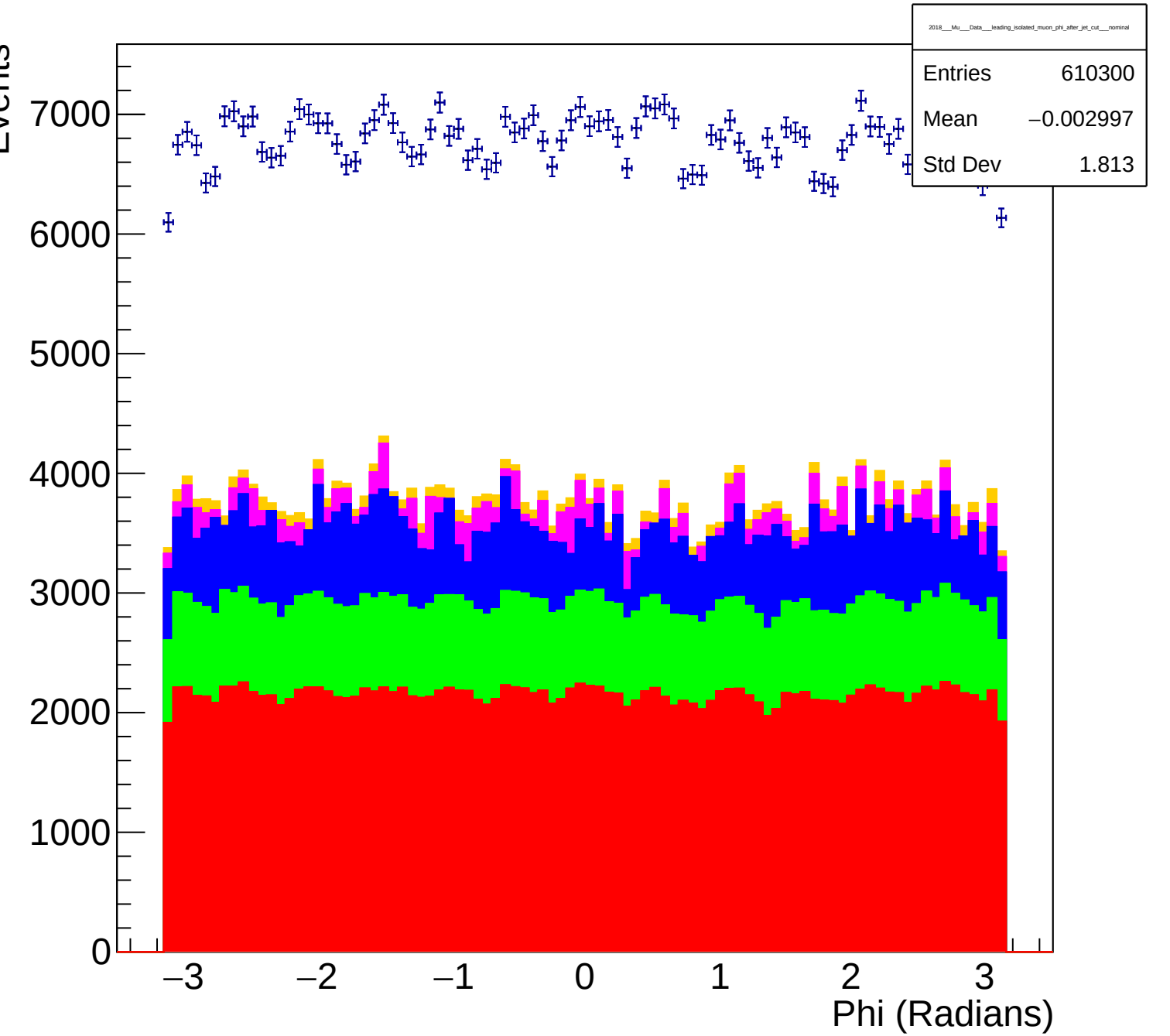

Number Of Jets
×10^3
Events
2018___Mu___Data___number_of_jets___nominal
Entries 610300
Mean 2.981
Std Dev 1.202
250
200
150
100
50
0
0
2
4
6
8
10
12
14
16
18
20
Number Of Jets

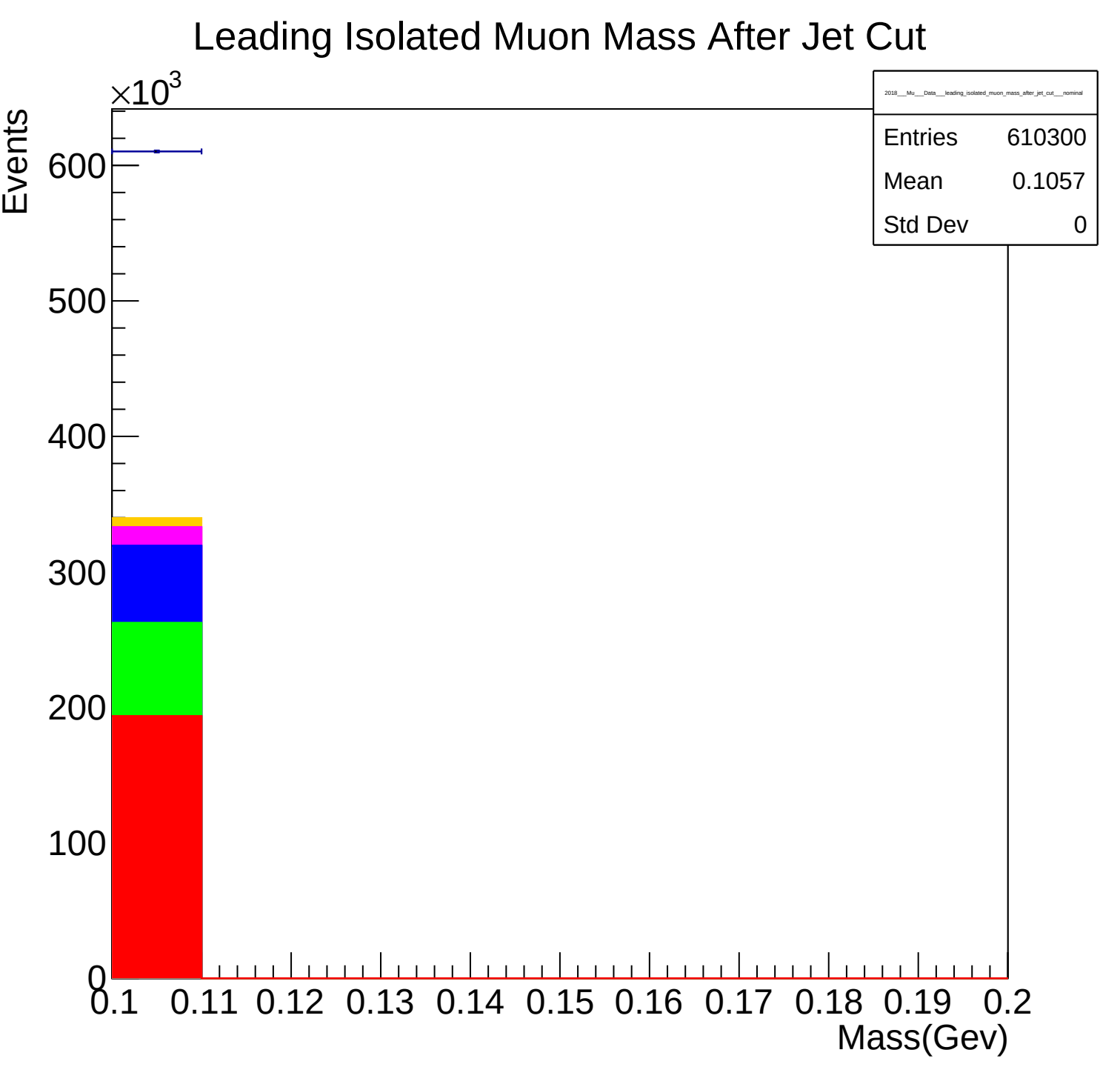

Leading Isolated Muon Transverse Momentum After Jet Cut
2018___Mu___Data___leading_isolated_muon_pt_after_jet_cut___nominal
Entries 610300
Mean 61.39
Std Dev 31.62
40000
35000
30000
25000
20000
15000
10000
5000
0
20
40
60
80
100
120
140
160
180
200
220
Pt (GeV)

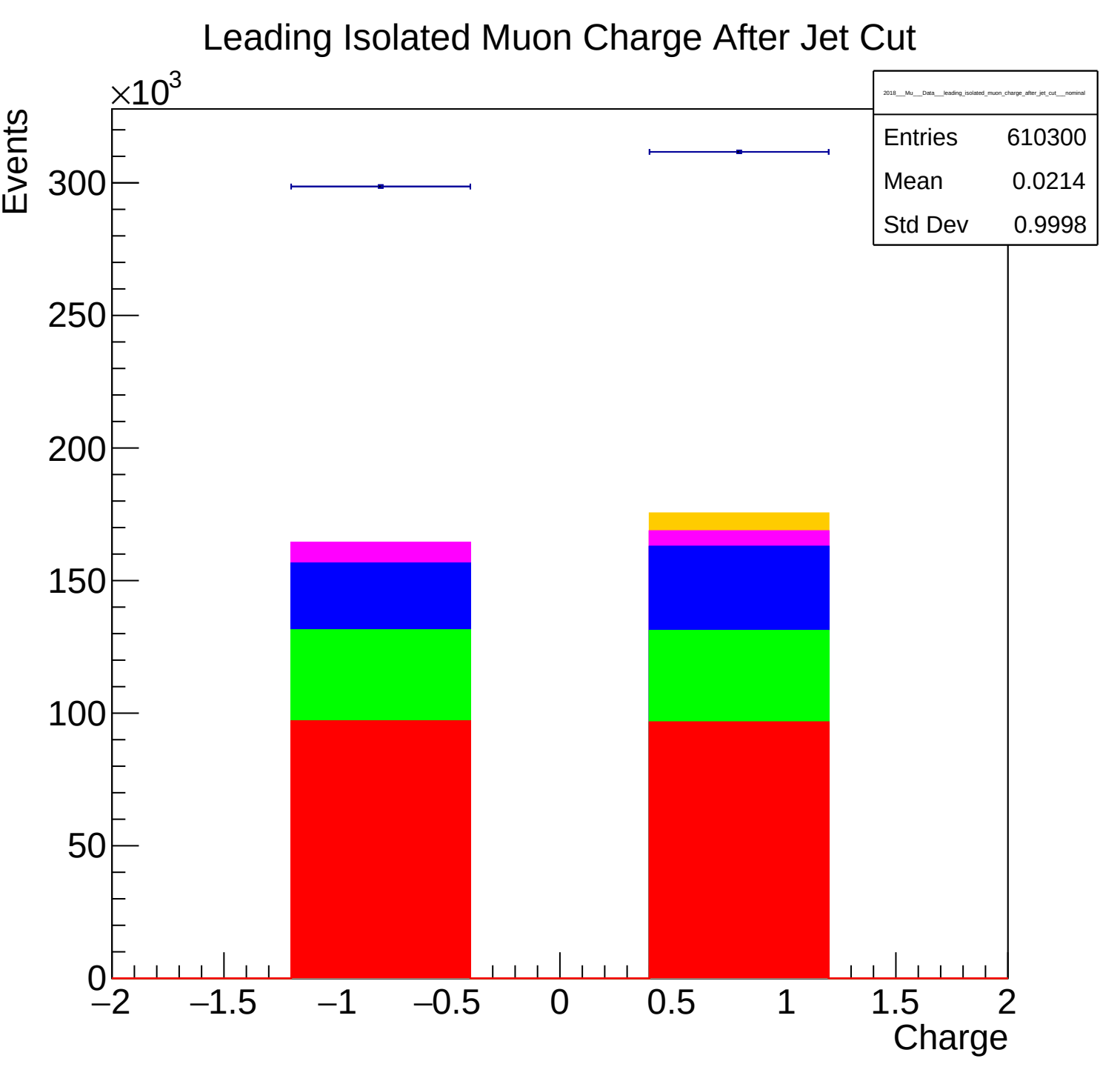
Leading Isolated Muon Pseudorapidity After Jet Cut

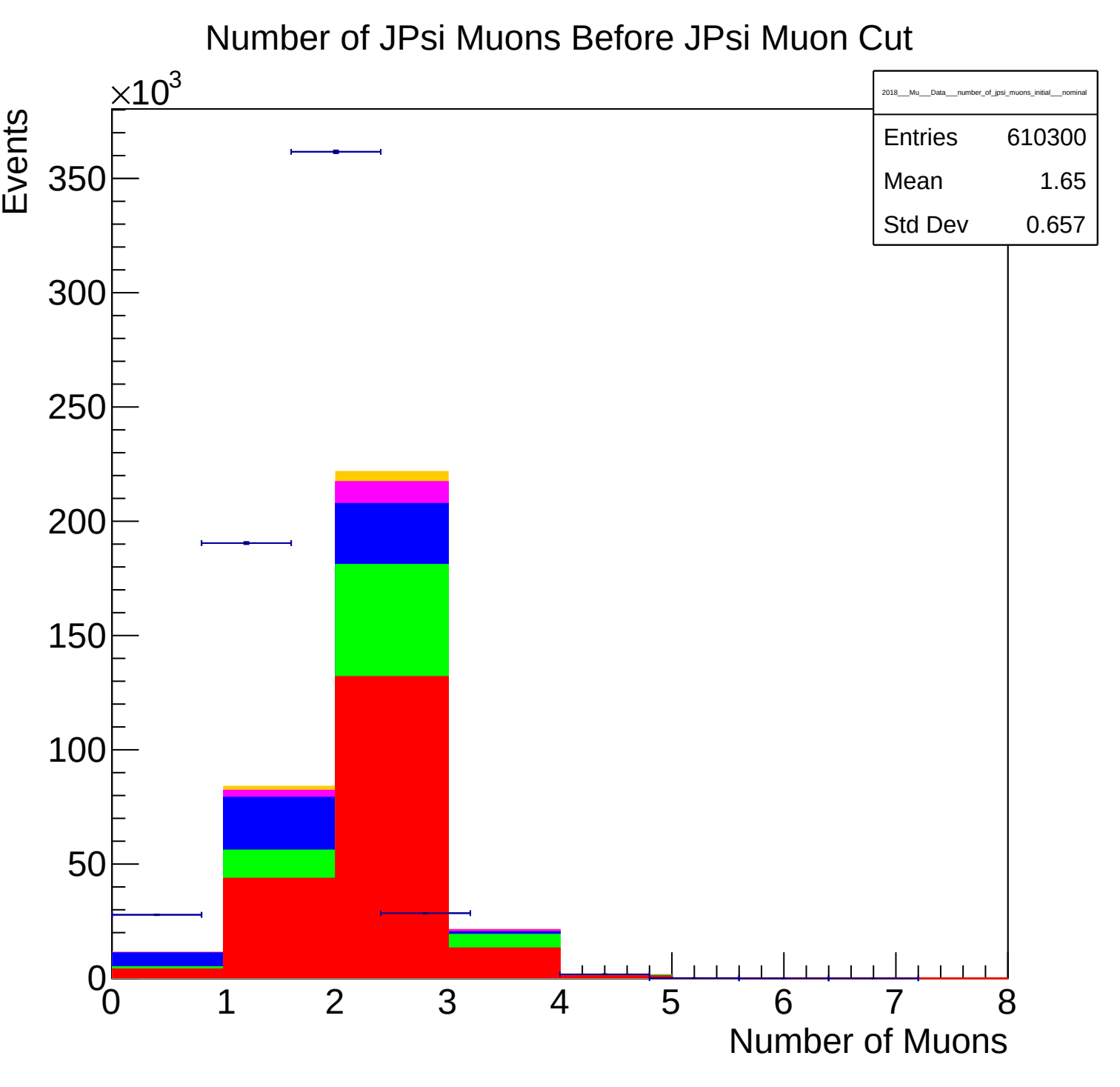


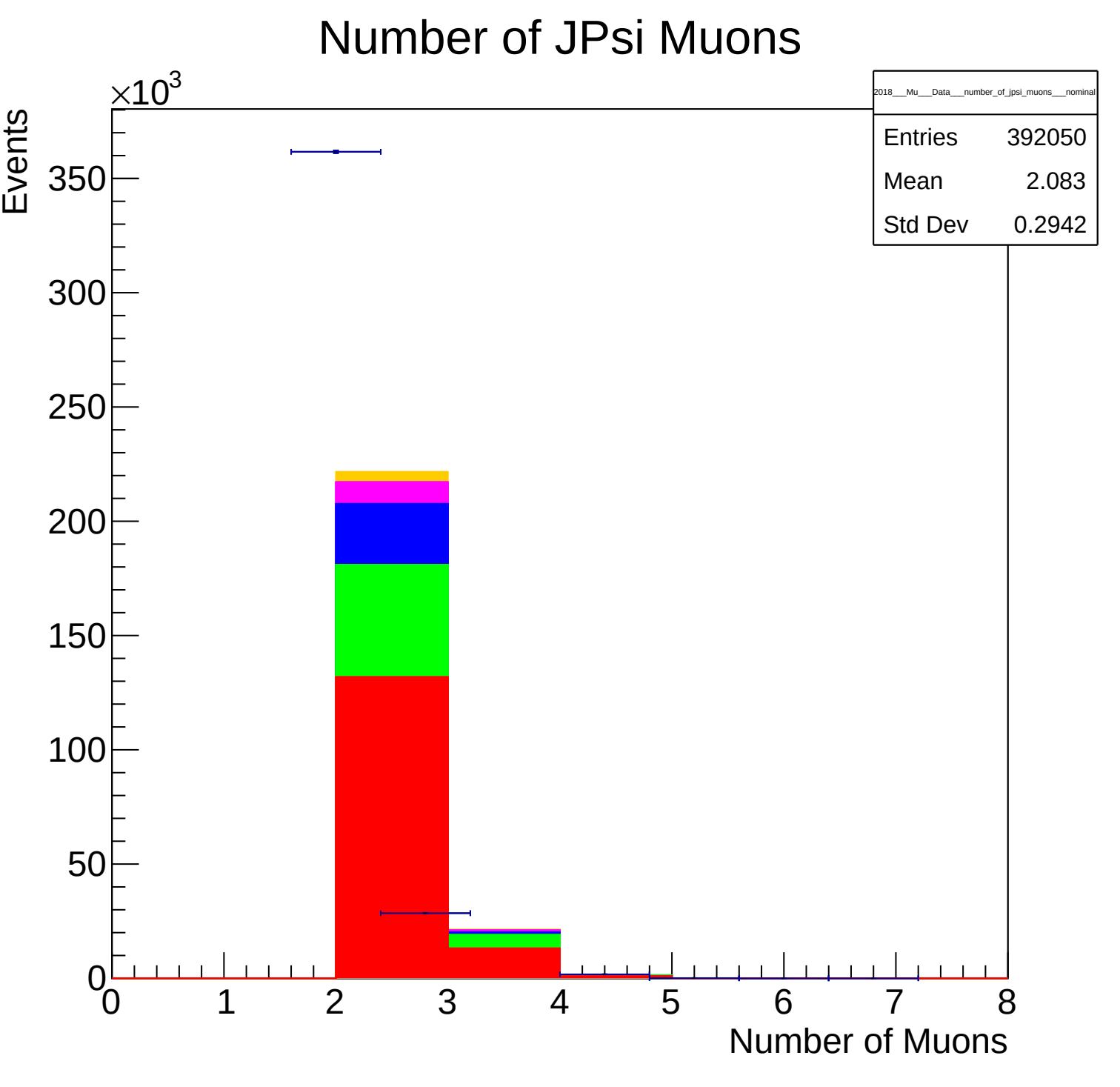
Leading Isolated Muon Angle After Jet Cut



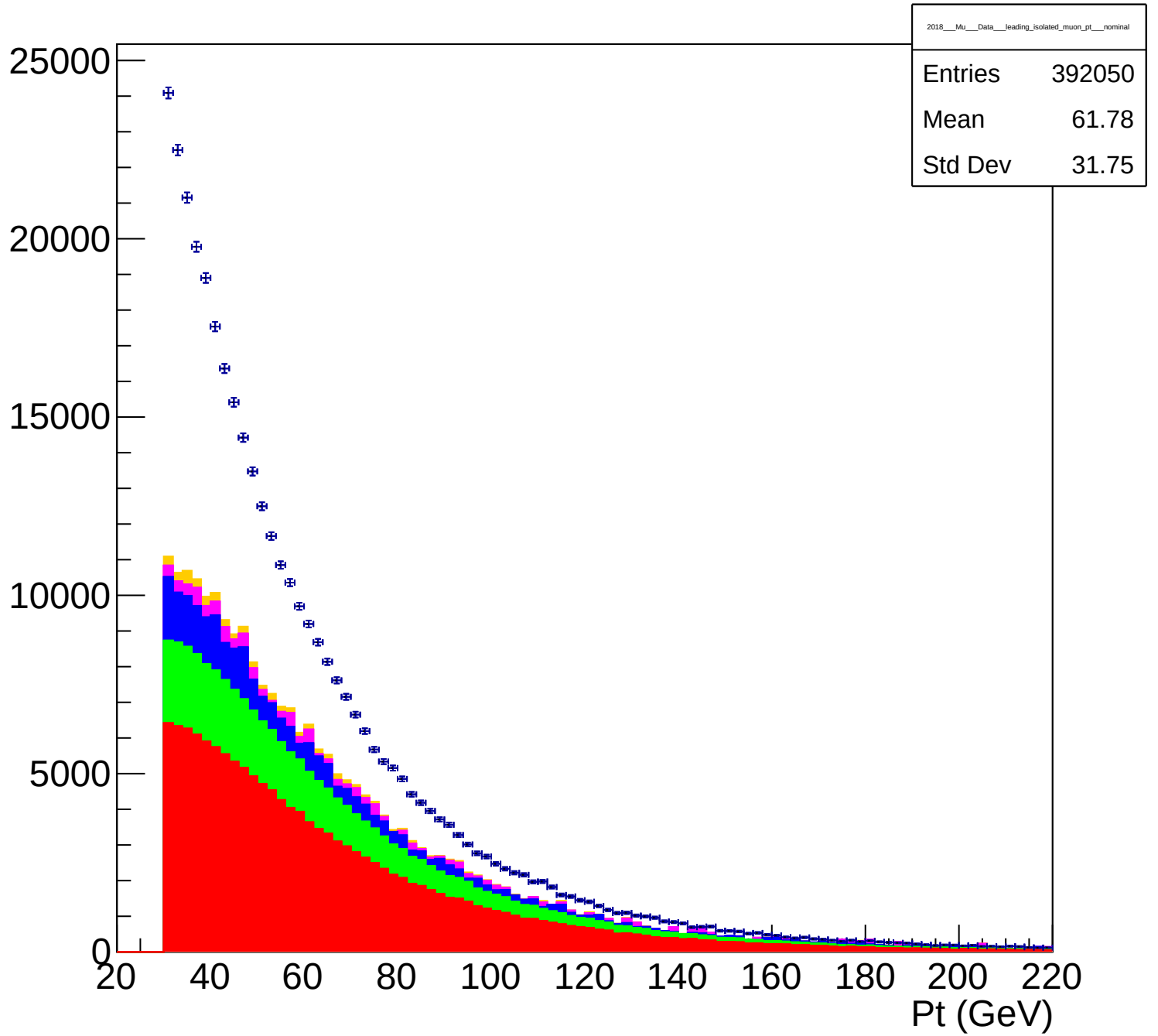

Leading Isolated Muon Mass After Jet Cut
2018___Mu___Data___leading_isolated_muon_mass_after_jet_cut___nominal
Entries 610300
Mean 0.1057
Std Dev 0
×10^3
Events
600
500
400
300
200
100
0
0.1
0.11
0.12
0.13
0.14
0.15
0.16
0.17
0.18
0.19
0.2
Mass(Gev)


Leading Isolated Muon Charge After Jet Cut
2018___Mu___Data___leading_isolated_muon_charge_after_jet_cut___nominal
Entries 610300
Mean 0.0214
Std Dev 0.9998
×10^3
Events
300
250
200
150
100
50
0
–2
–1.5
–1
–0.5
0
0.5
1
1.5
2
Charge

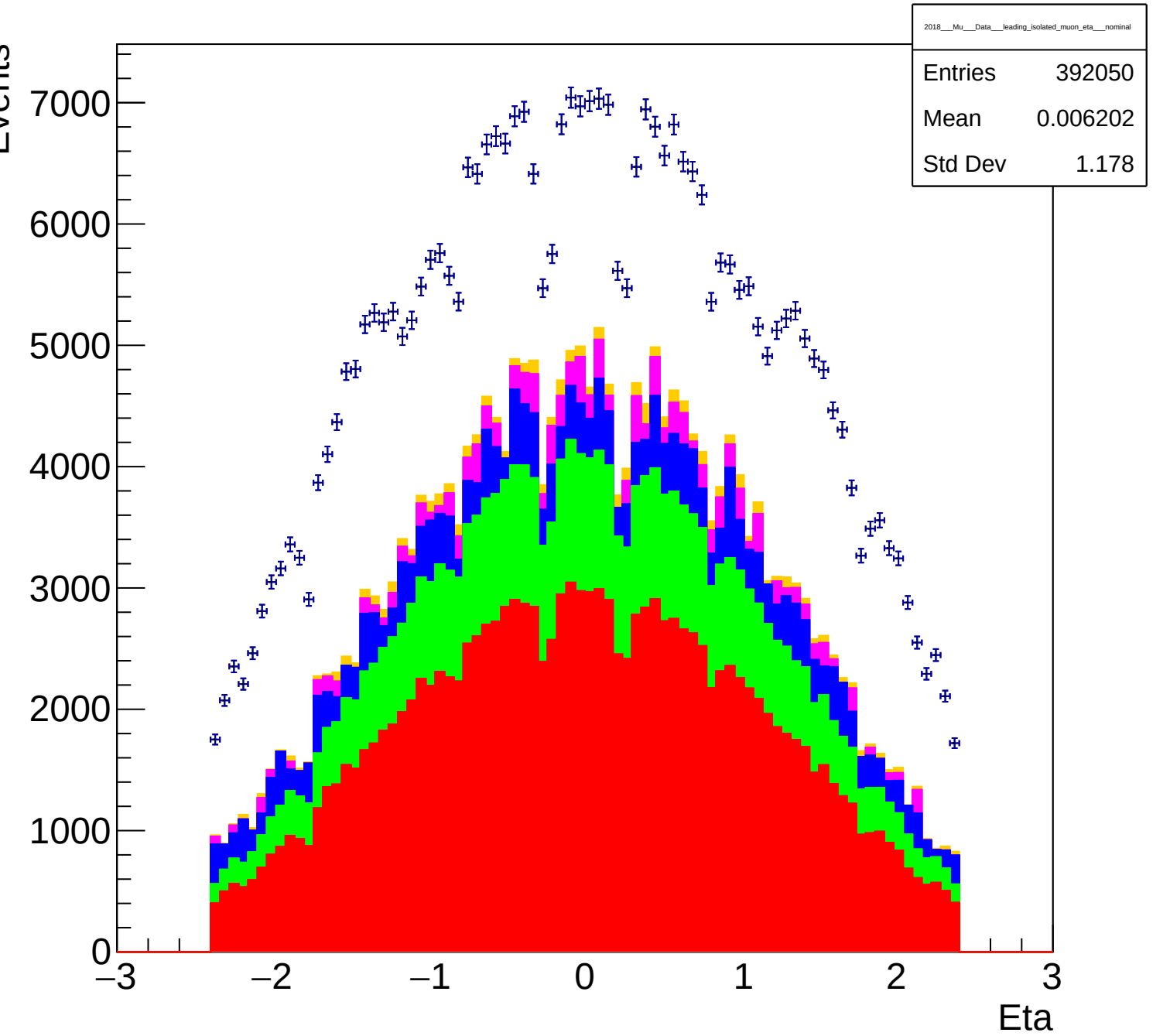

Number of JPsi Muons Before JPsi Muon Cut
2018___Mu___Data___number_of_jpsi_muons_initial___nominal
Entries 610300
Mean 1.65
Std Dev 0.657
×10^3
Events
350
300
250
200
150
100
50
0
0
1
2
3
4
5
6
7
8
Number of Muons


Number of JPsi Muons
×10^3
Events
350
300
250
200
150
100
50
0
0
1
2
3
4
5
6
7
8
Number of Muons
2018___Mu___Data___number_of_jpsi_muons___nominal
Entries 392050
Mean 2.083
Std Dev 0.2942

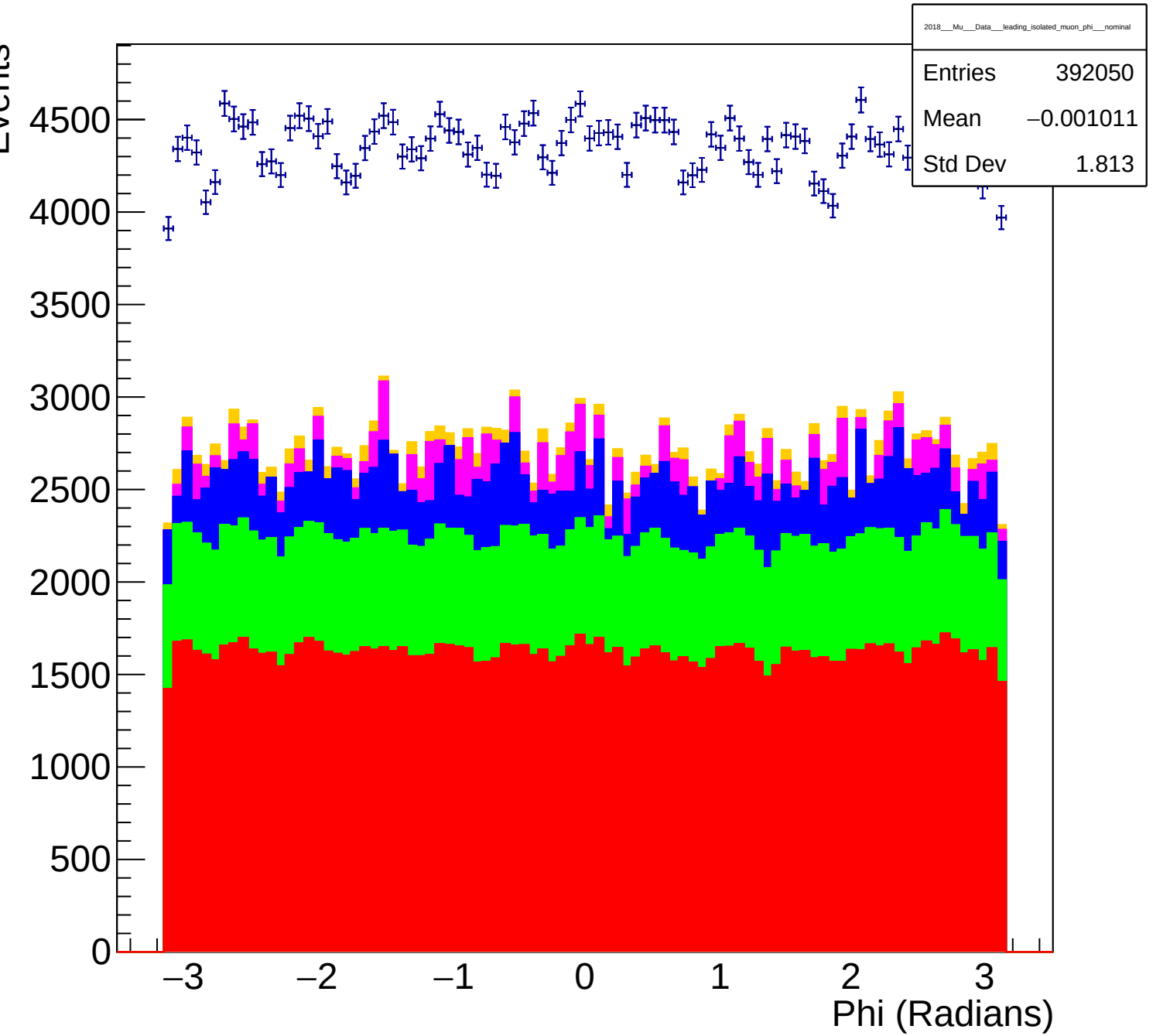
Leading Isolated Muon Transverse Momentum



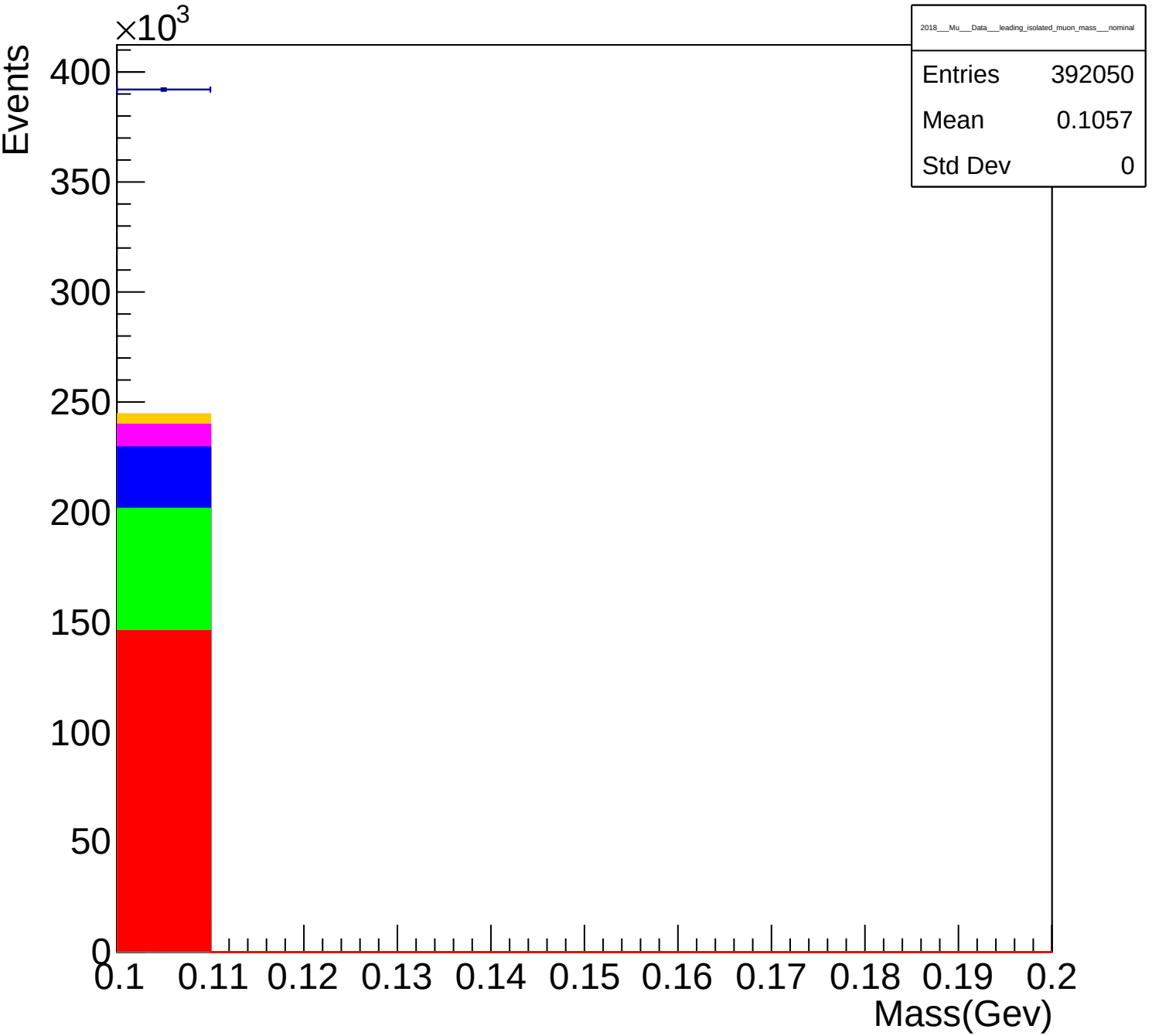
Leading Isolated Muon Pseudorapidity



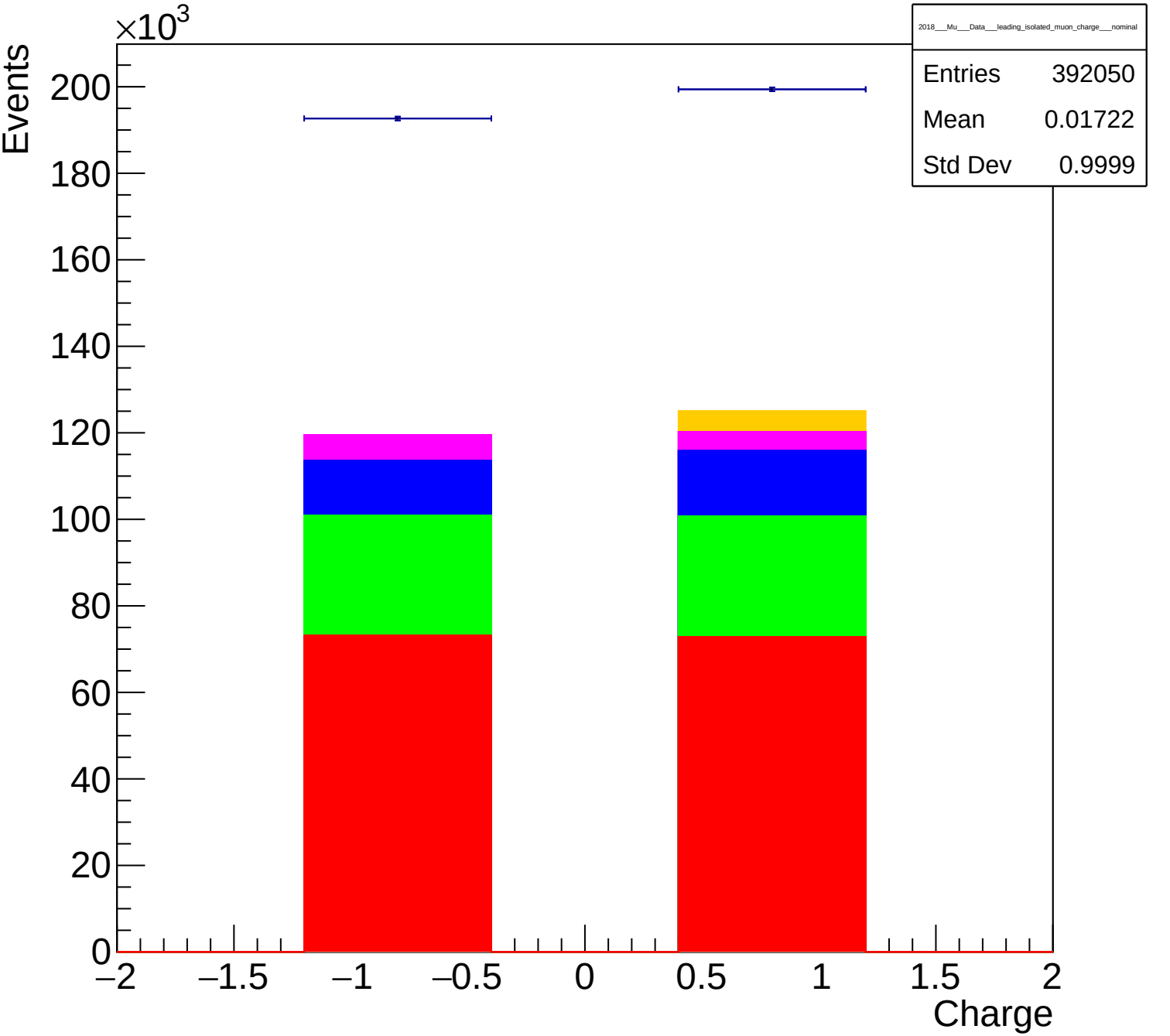
Leading Isolated Muon Angle



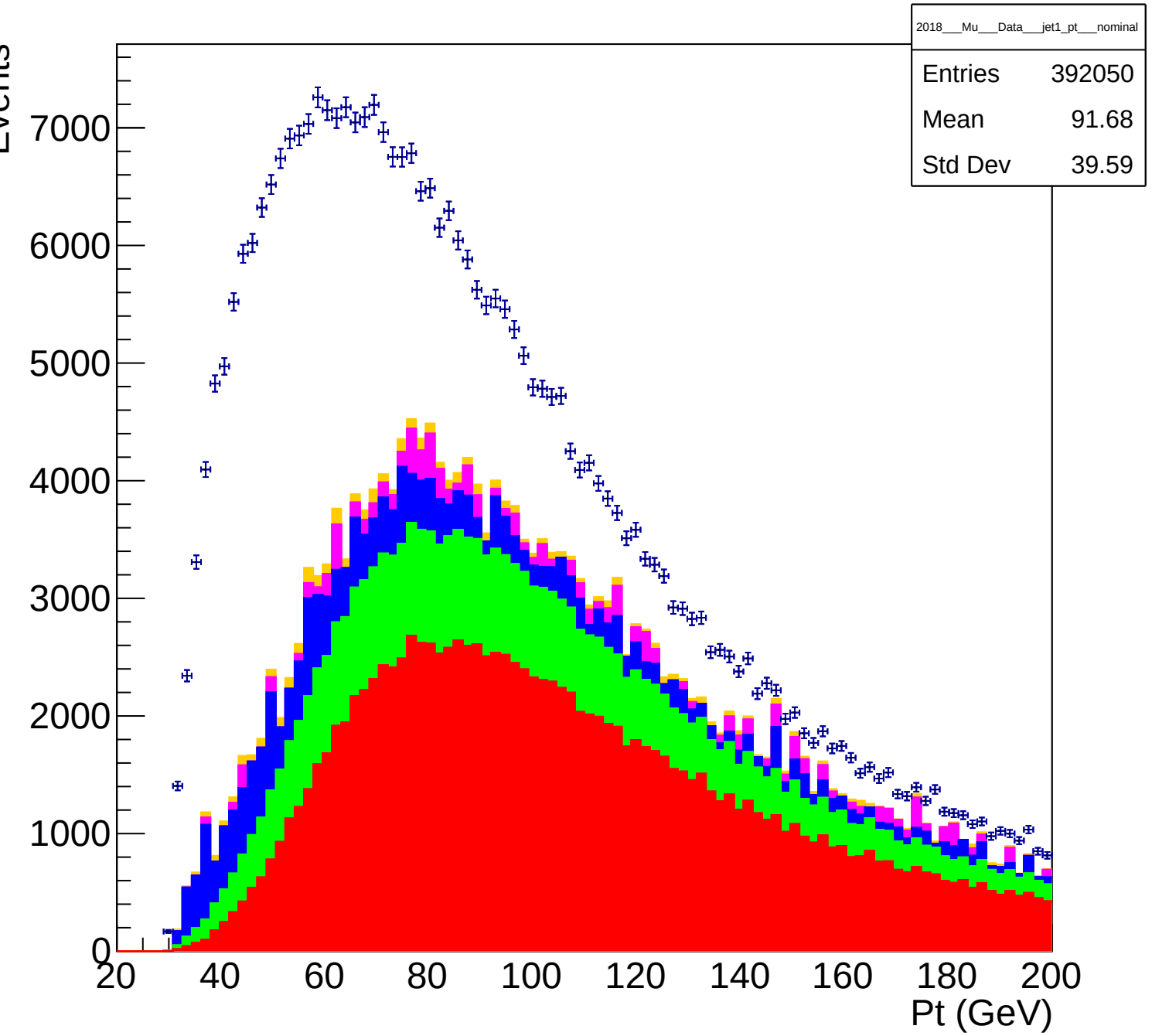
Leading Isolated Muon Mass

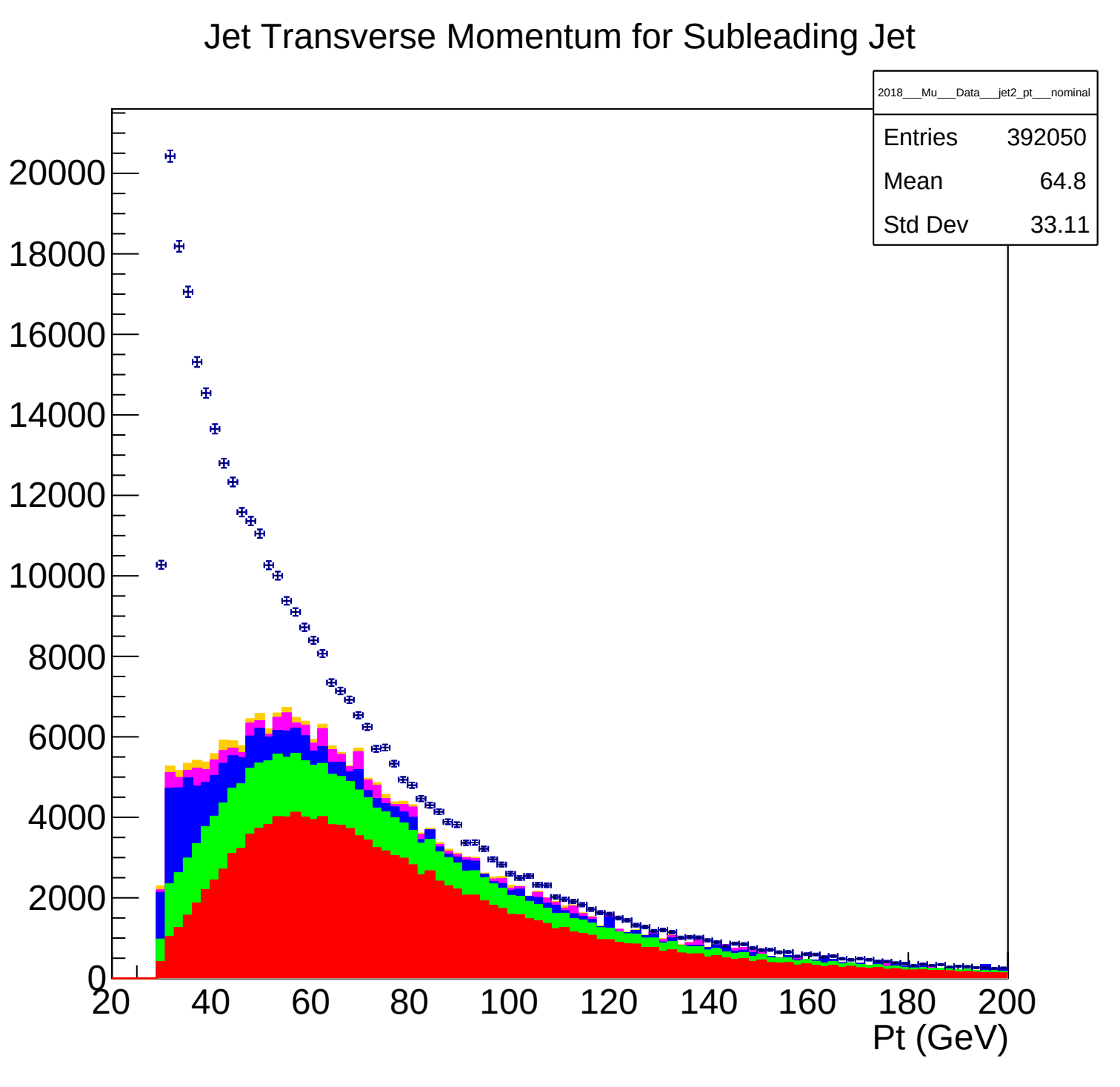


Leading Isolated Muon Charge

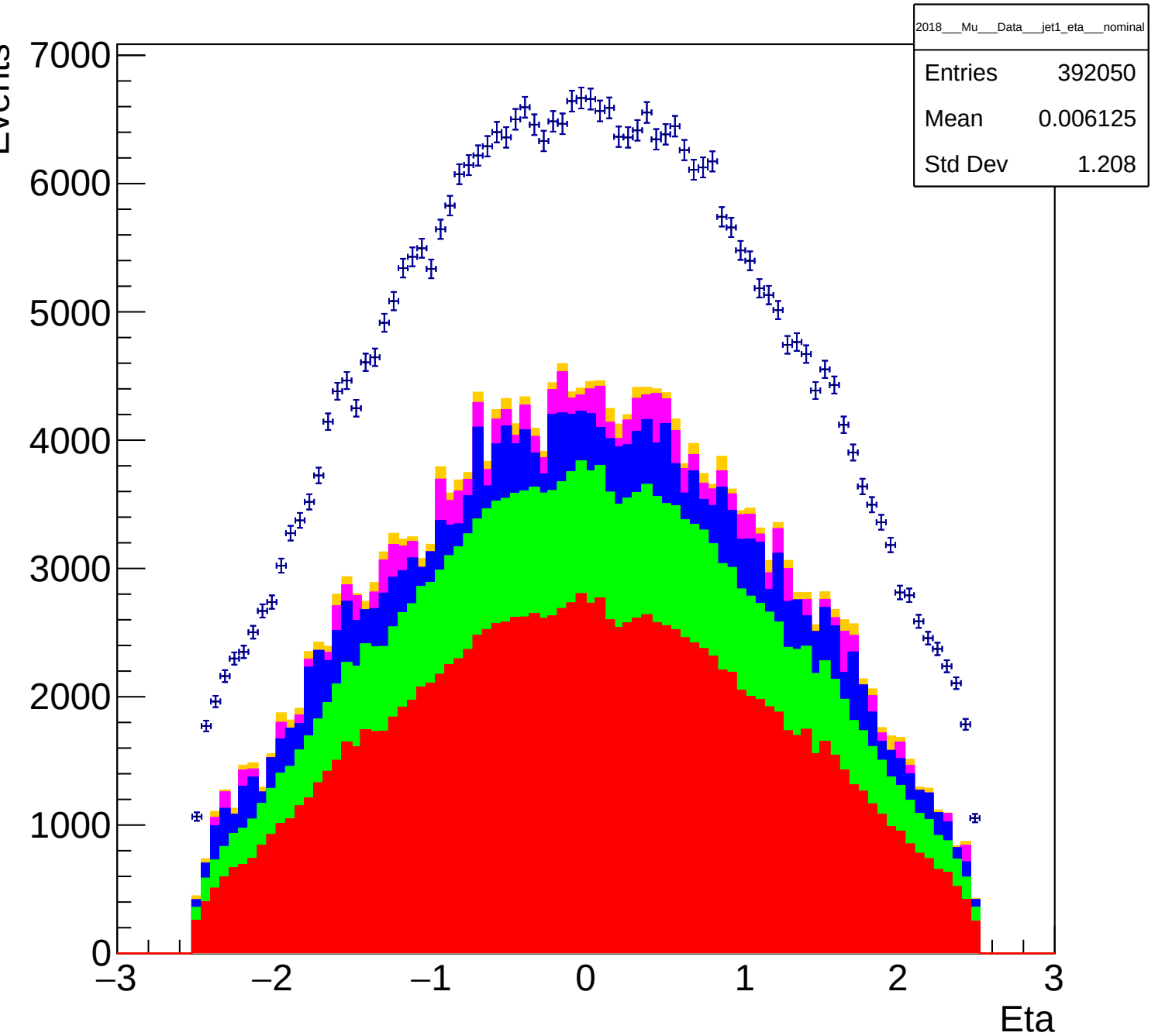


Jet Transverse Momentum for Leading Jet

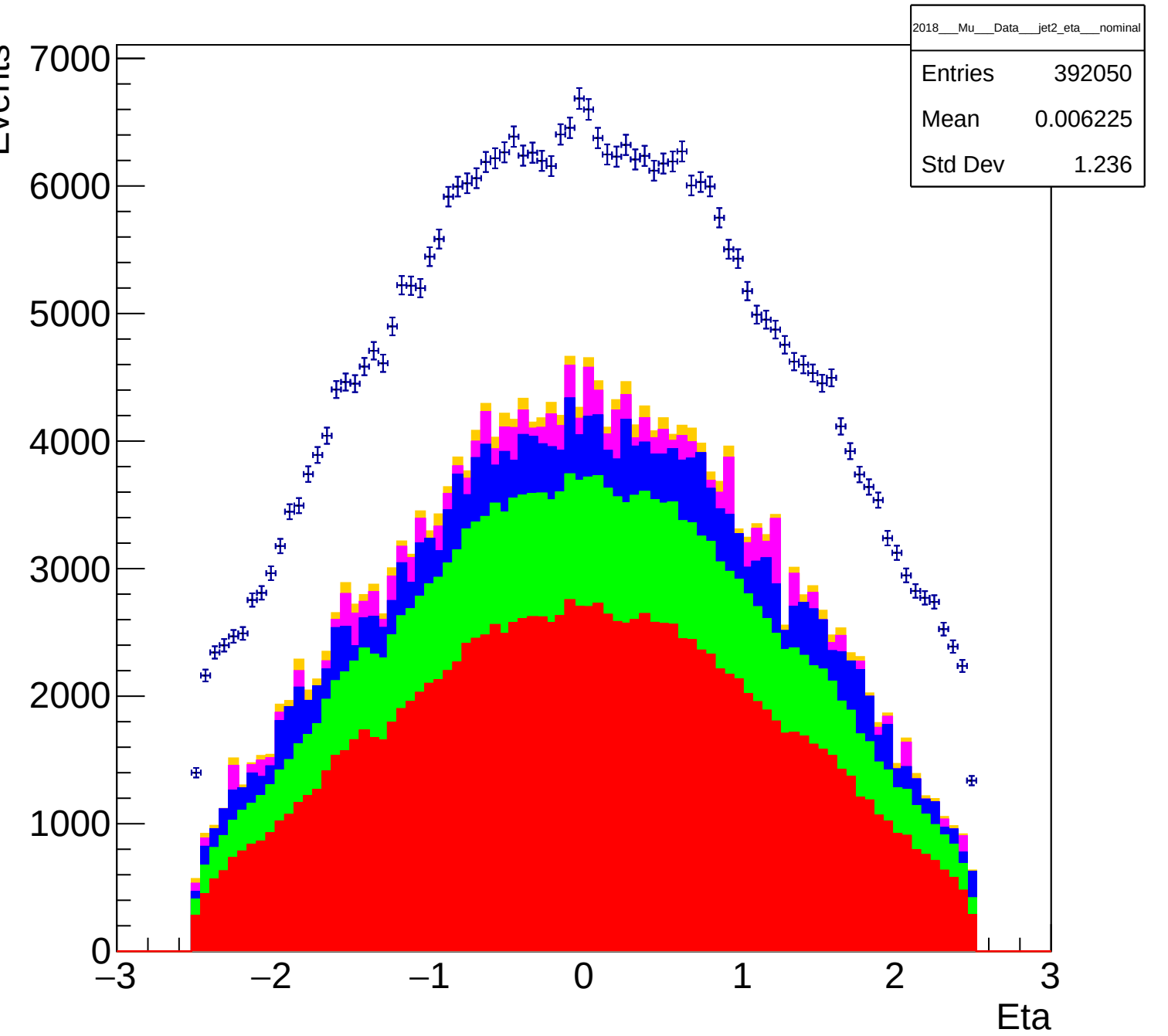



Jet Transverse Momentum for Subleading Jet
2018___Mu___Data___jet2_pt___nominal
Entries 392050
Mean 64.8
Std Dev 33.11
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
20
40
60
80
100
120
140
160
180
200
Pt (GeV)

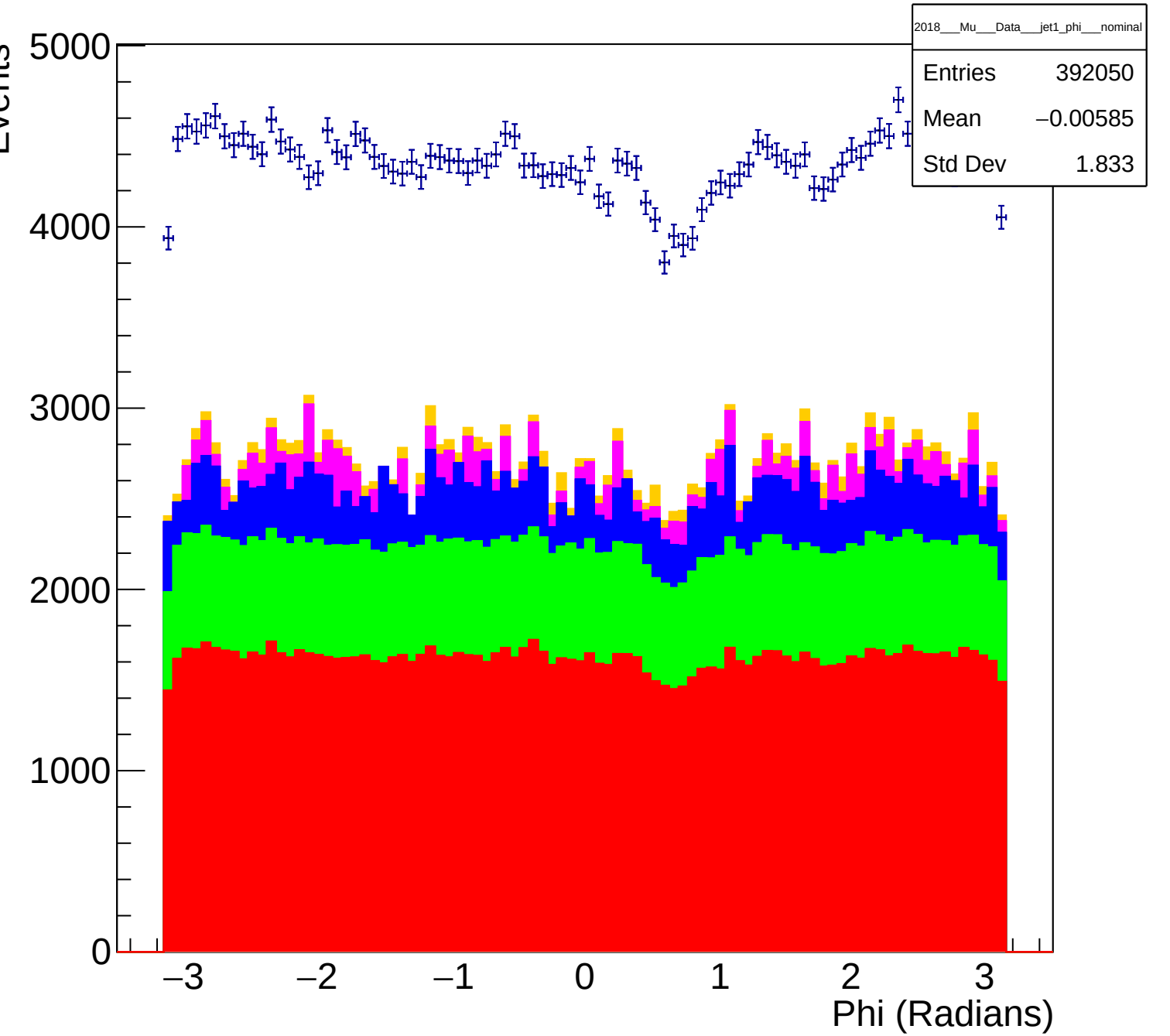
Jet Pseudorapidity for Leading Jet



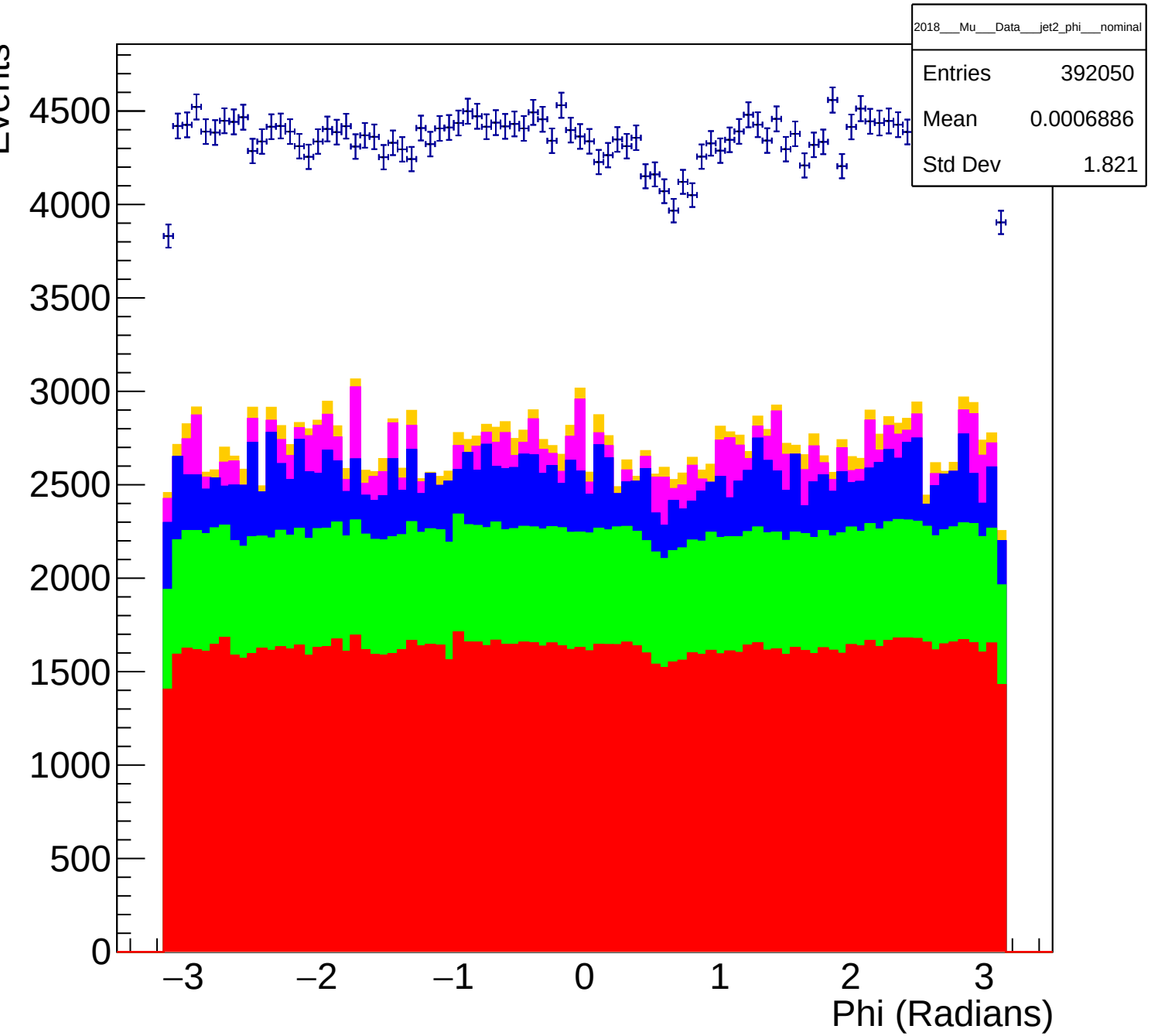
Jet Pseudorapidity for Subleading Jet



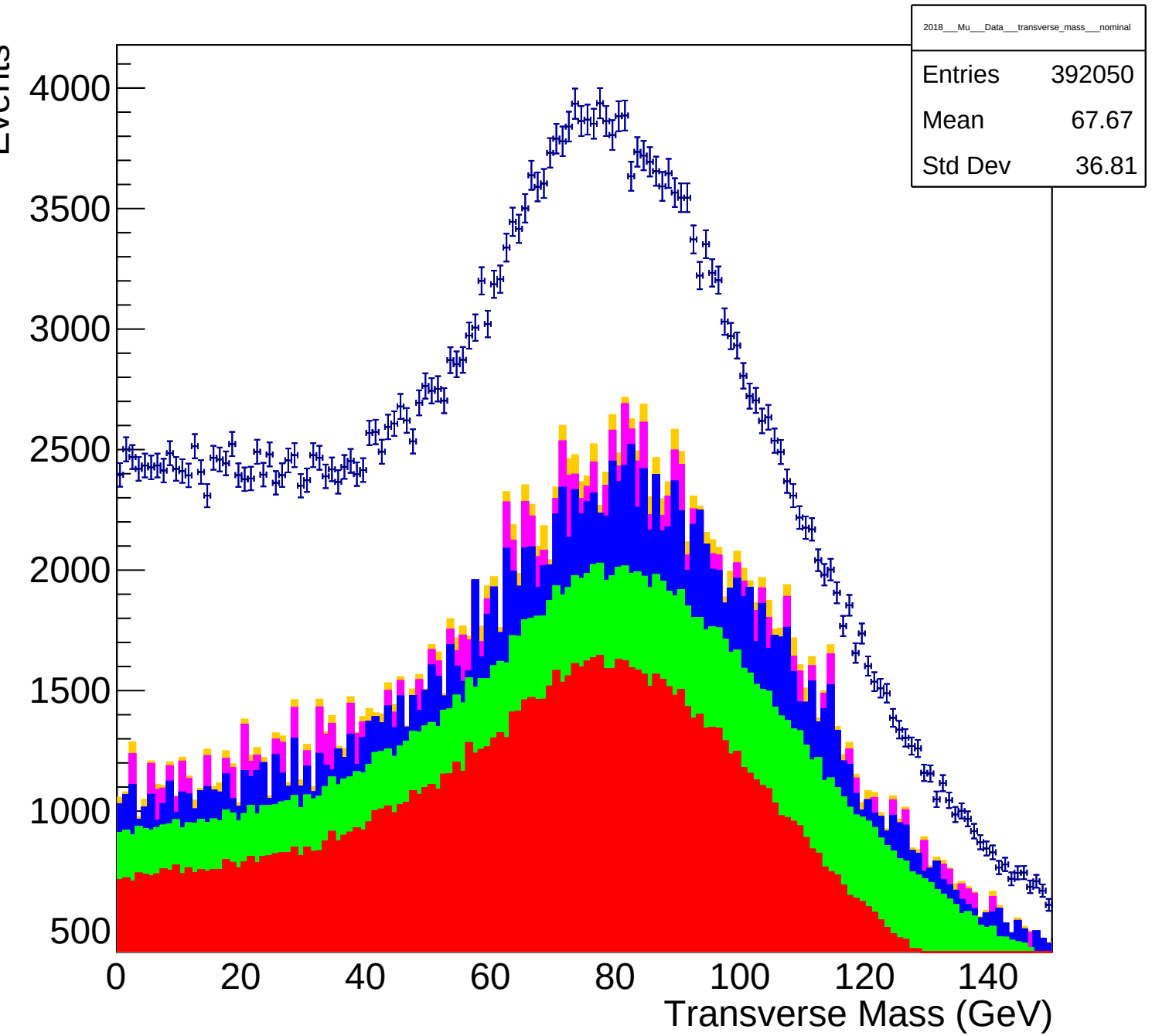
Jet Angle for Leading Jet

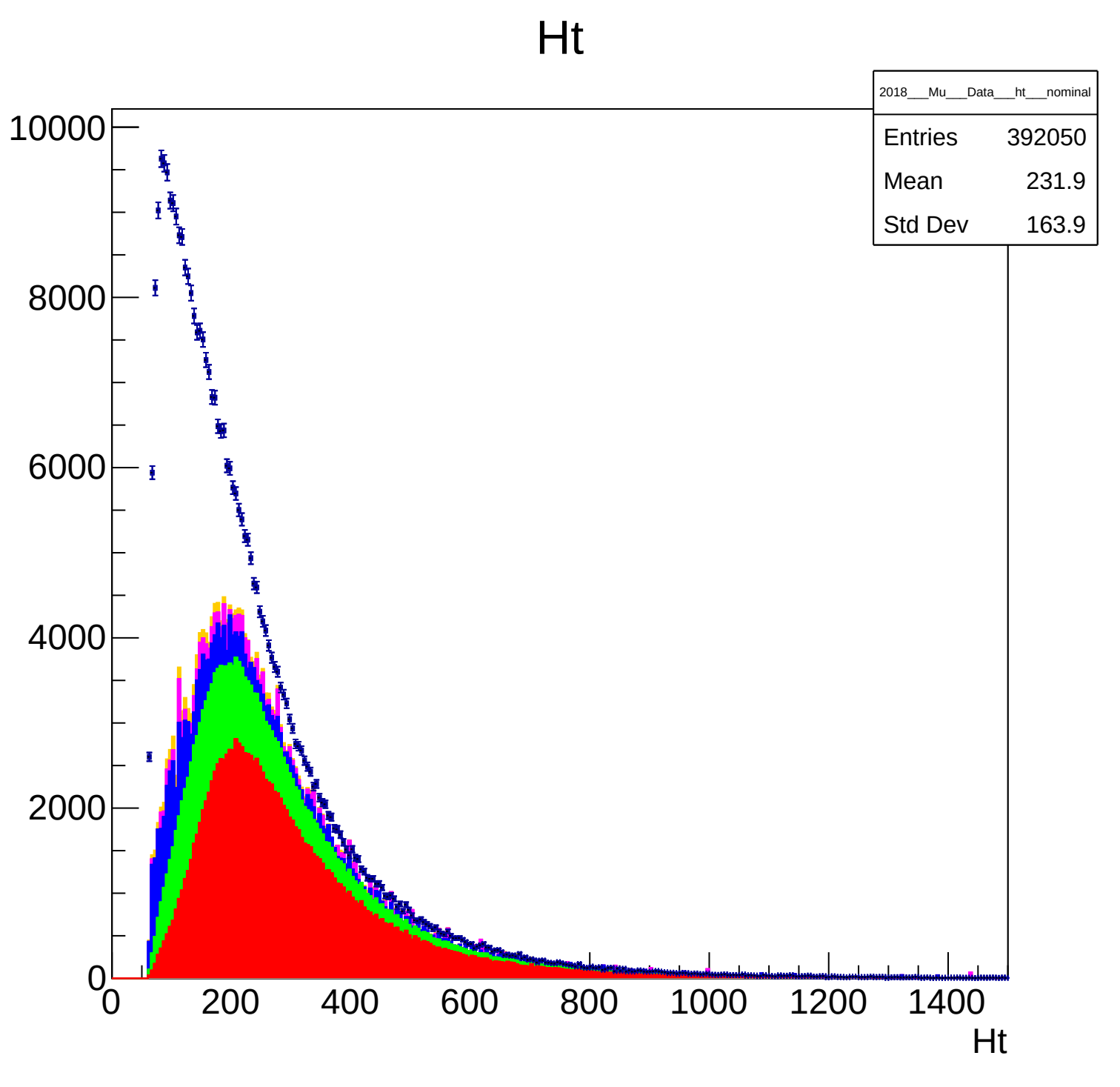


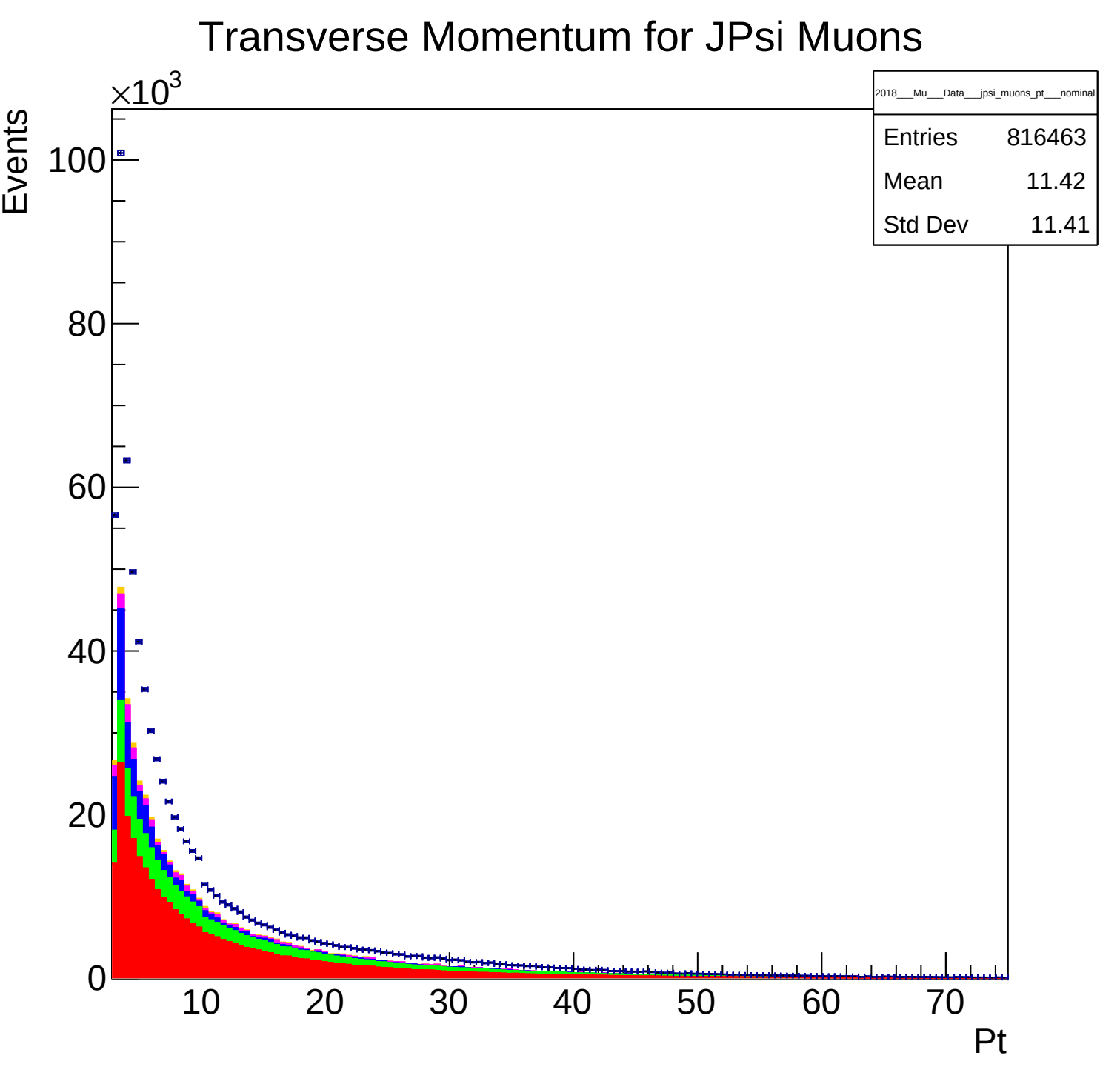
Jet Angle for Subleading Jet



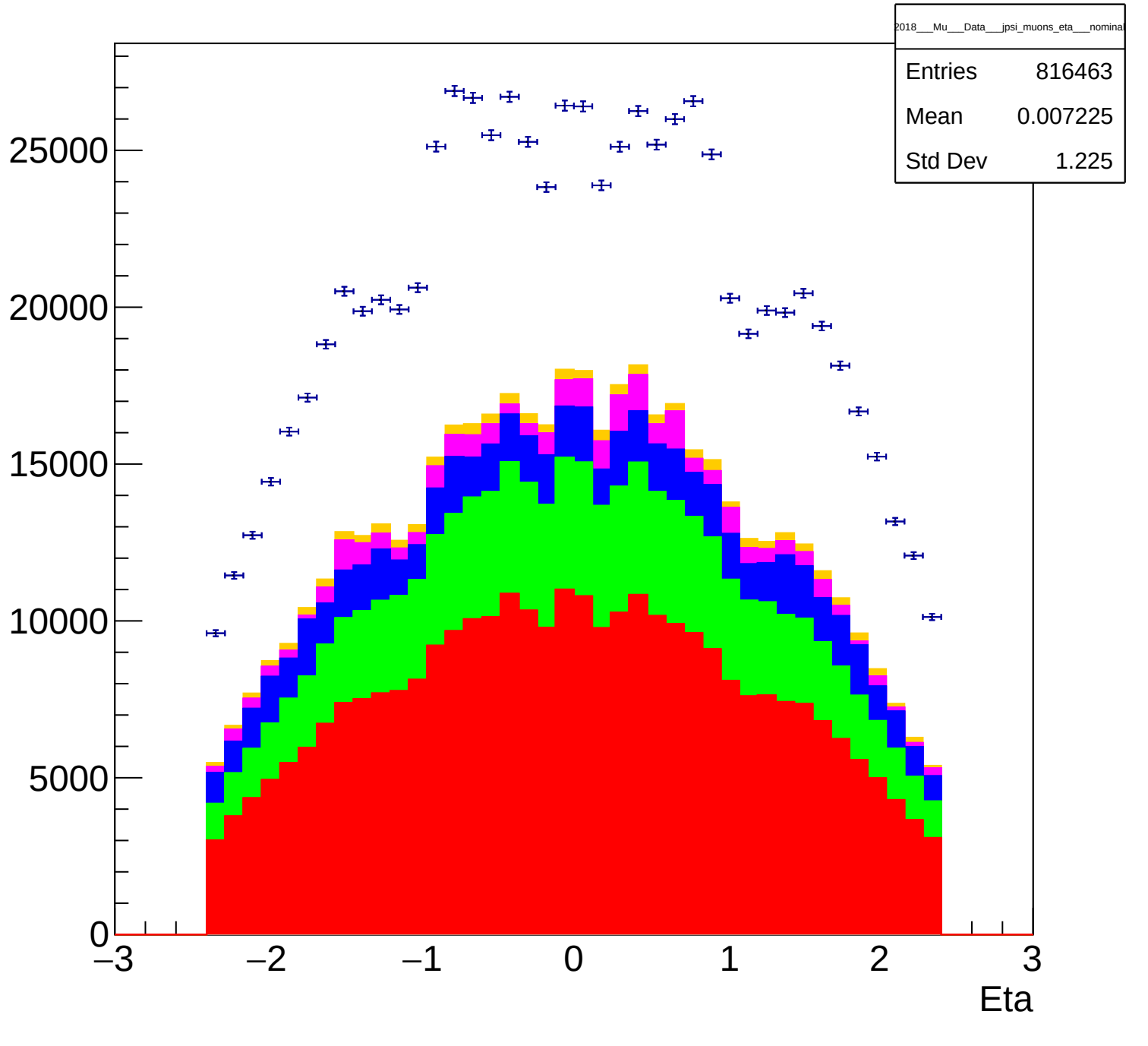
Transverse Mass



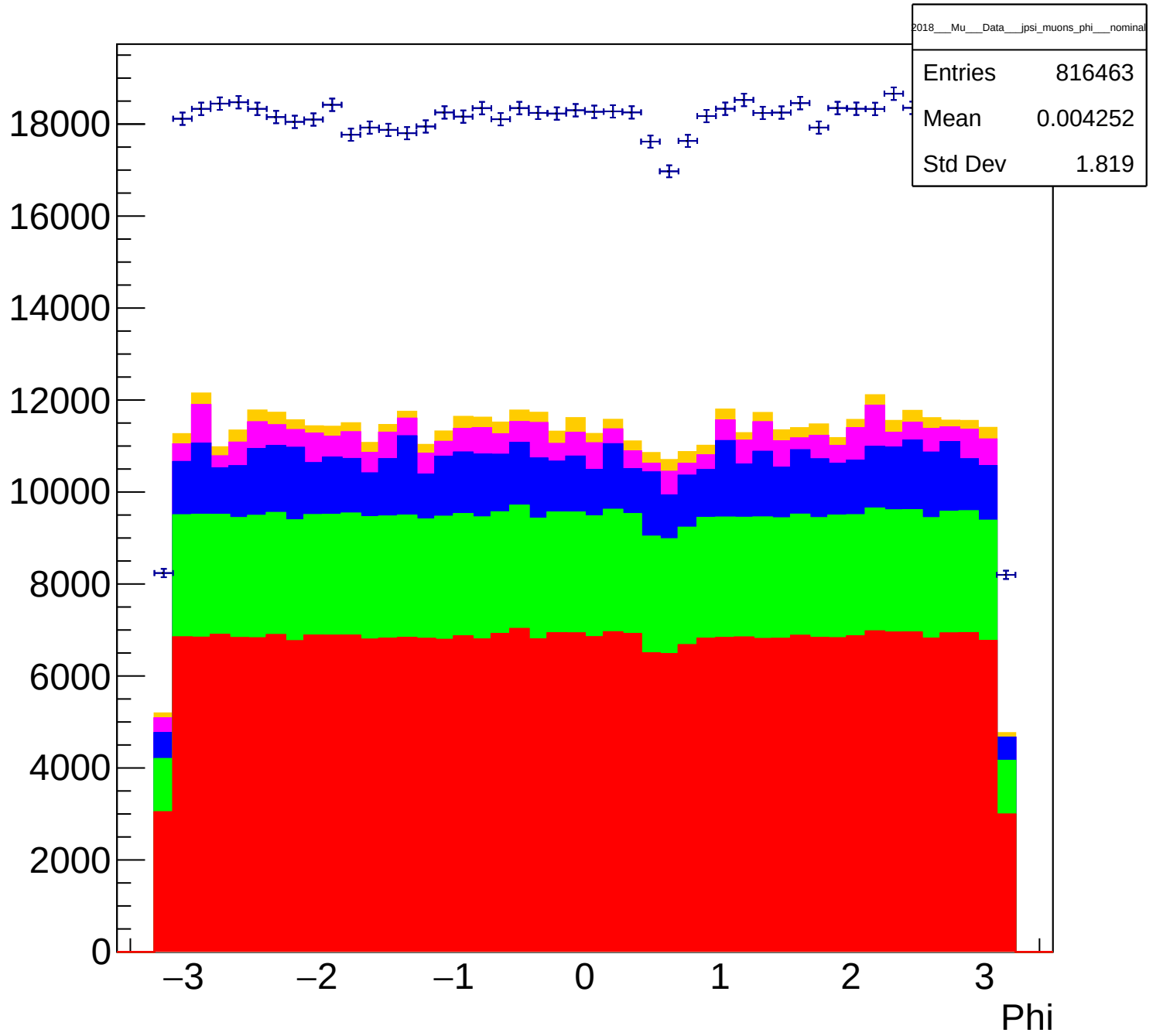

Ht
2018___Mu___Data___ht___nominal
Entries 392050
Mean 231.9
Std Dev 163.9
10000
8000
6000
4000
2000
0
0
200
400
600
800
1000
1200
1400
Ht

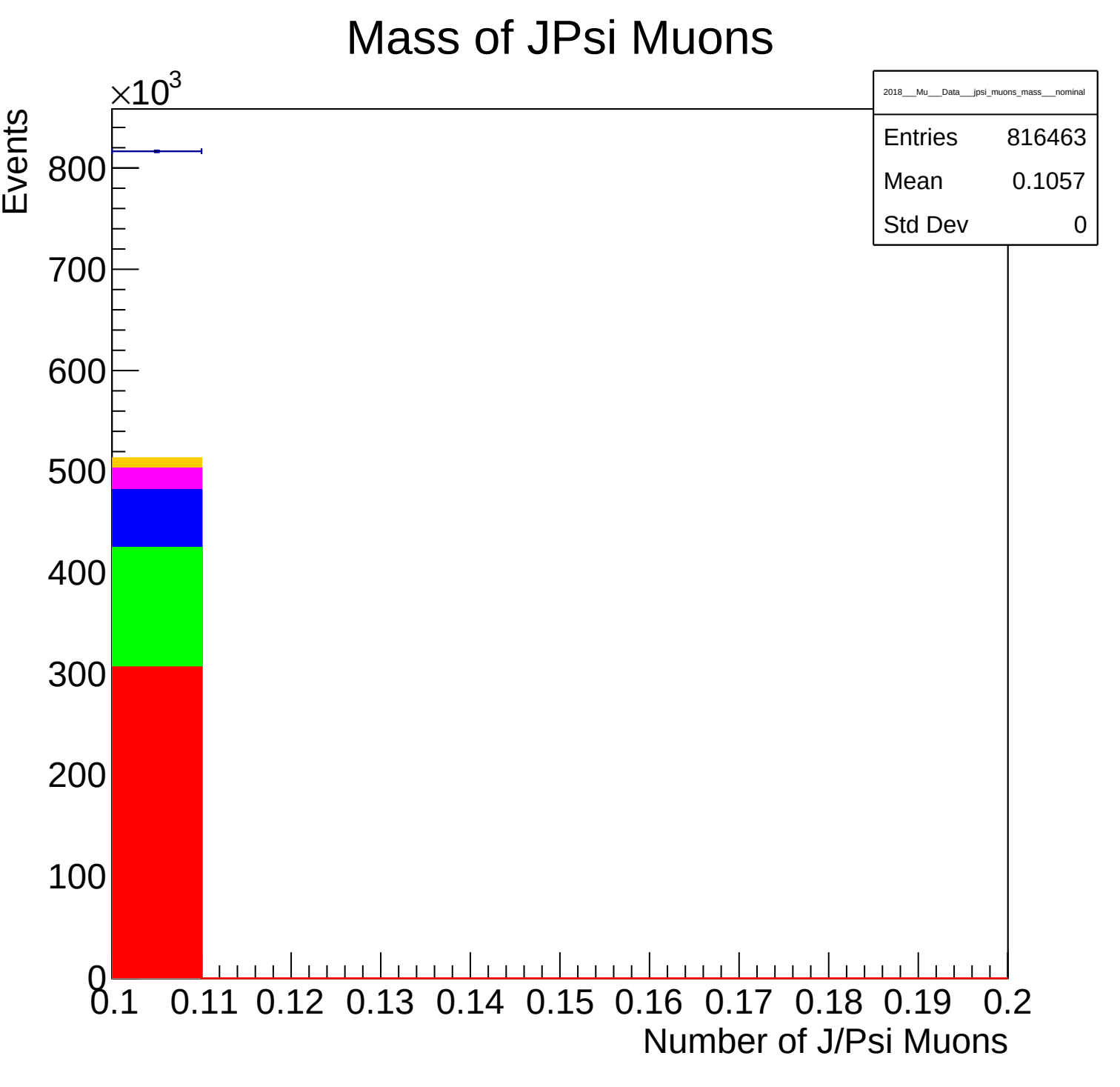

Transverse Momentum for JPsi Muons
×10^3
Events
100
80
60
40
20
0
10
20
30
40
50
60
70
Pt
2018___Mu___Data___jpsi_muons_pt___nominal
Entries 816463
Mean 11.42
Std Dev 11.41

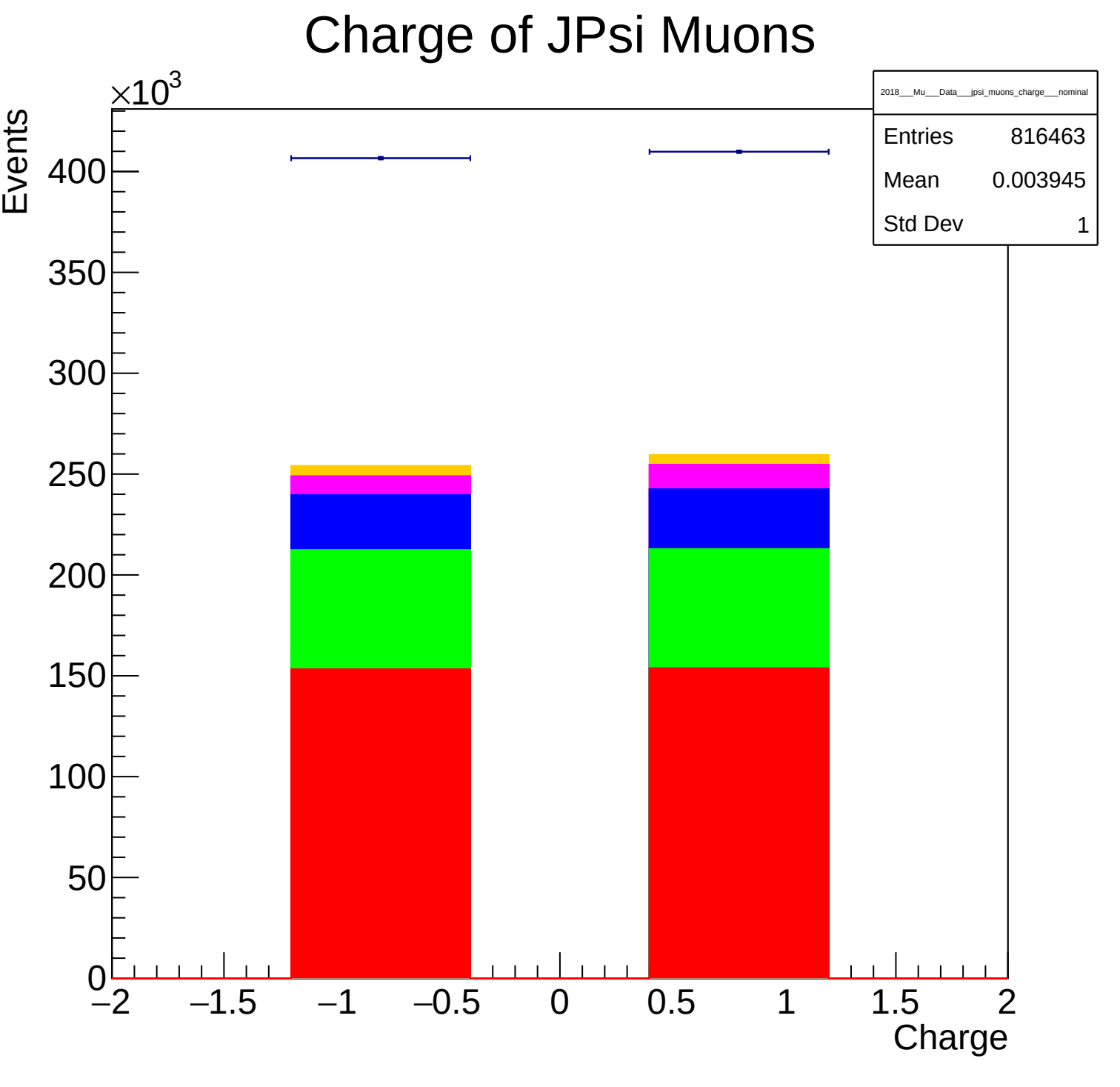
Pseudorapidity for JPsi Muons

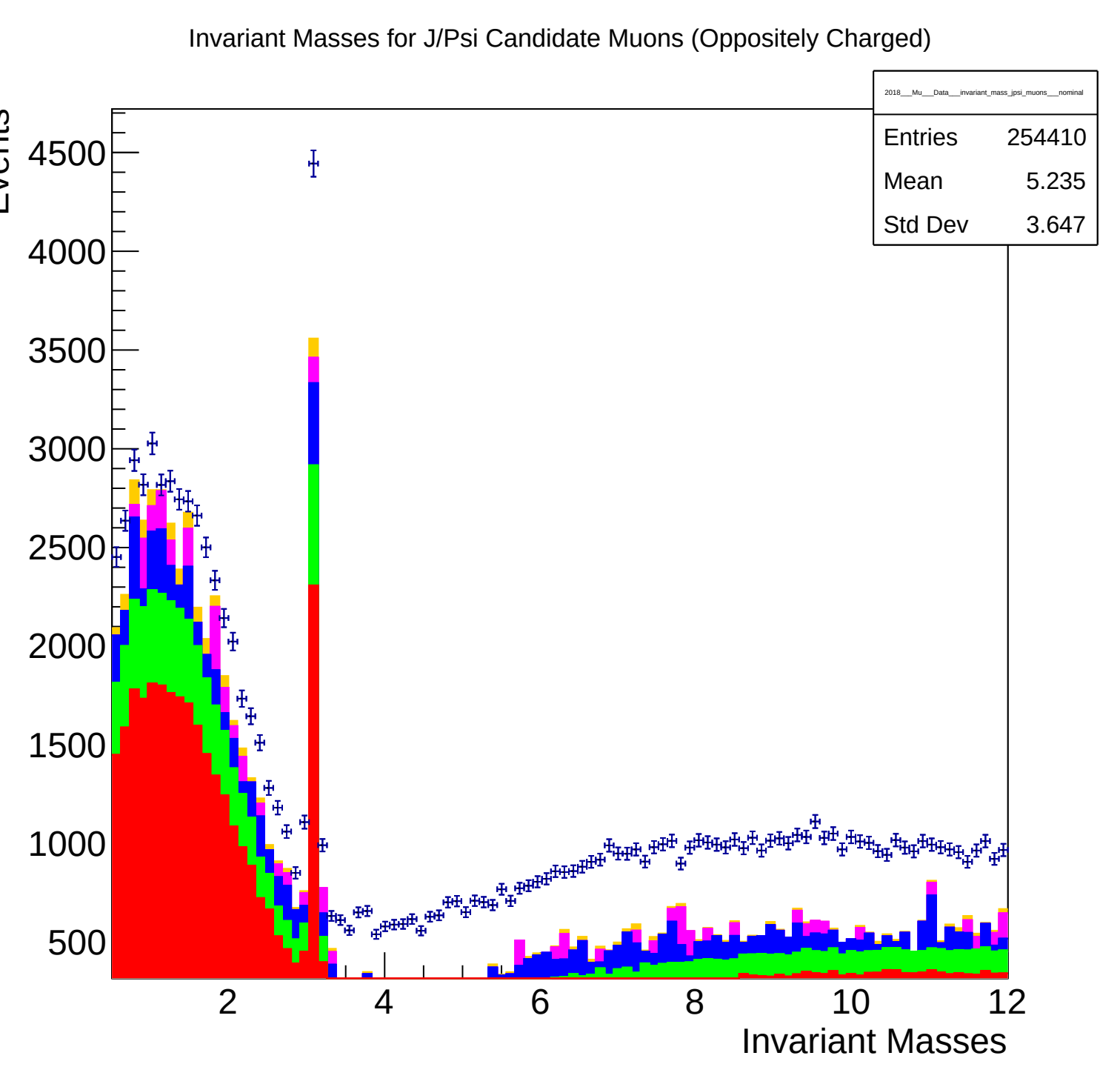


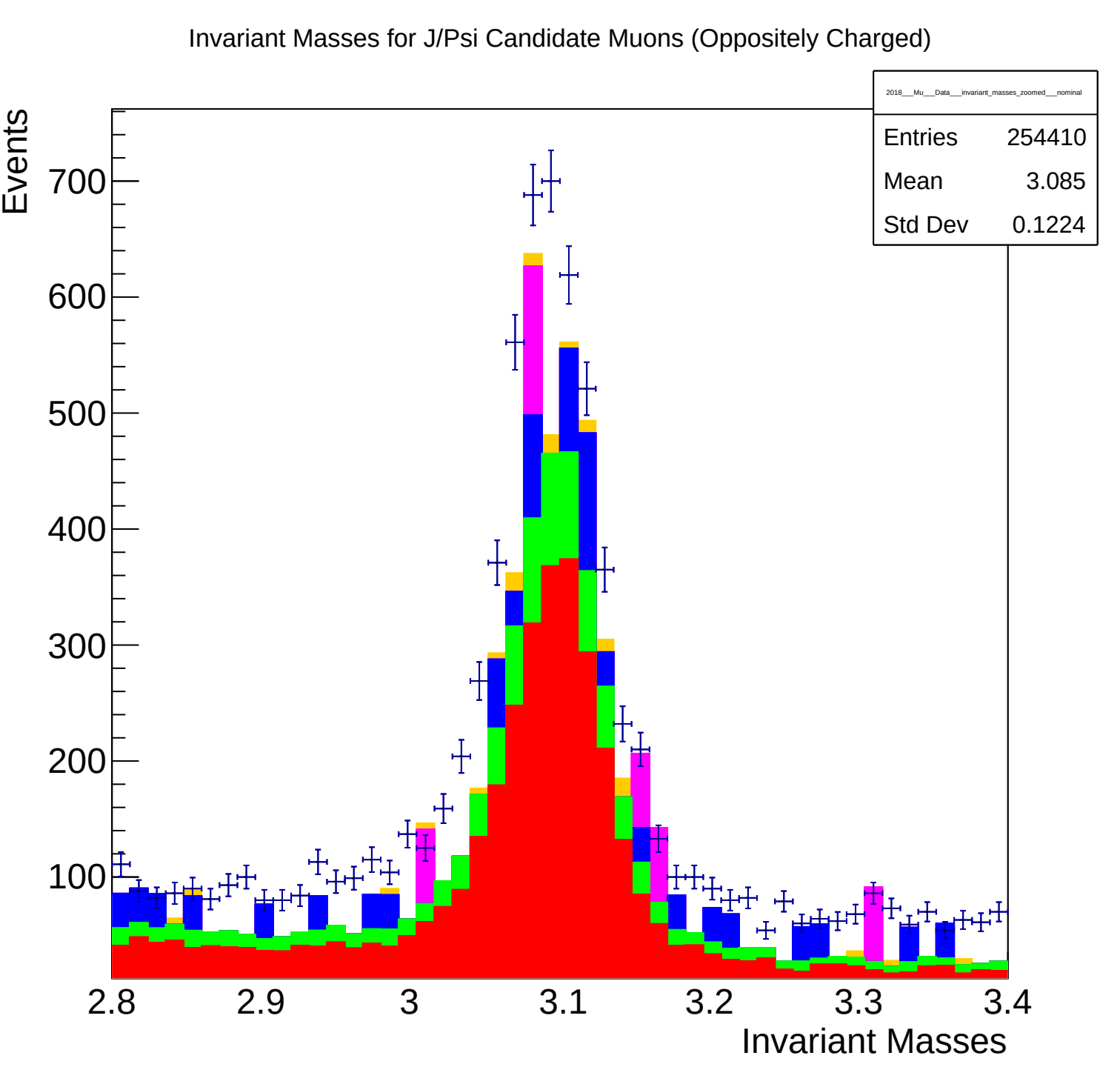
Angle for JPsi Muons

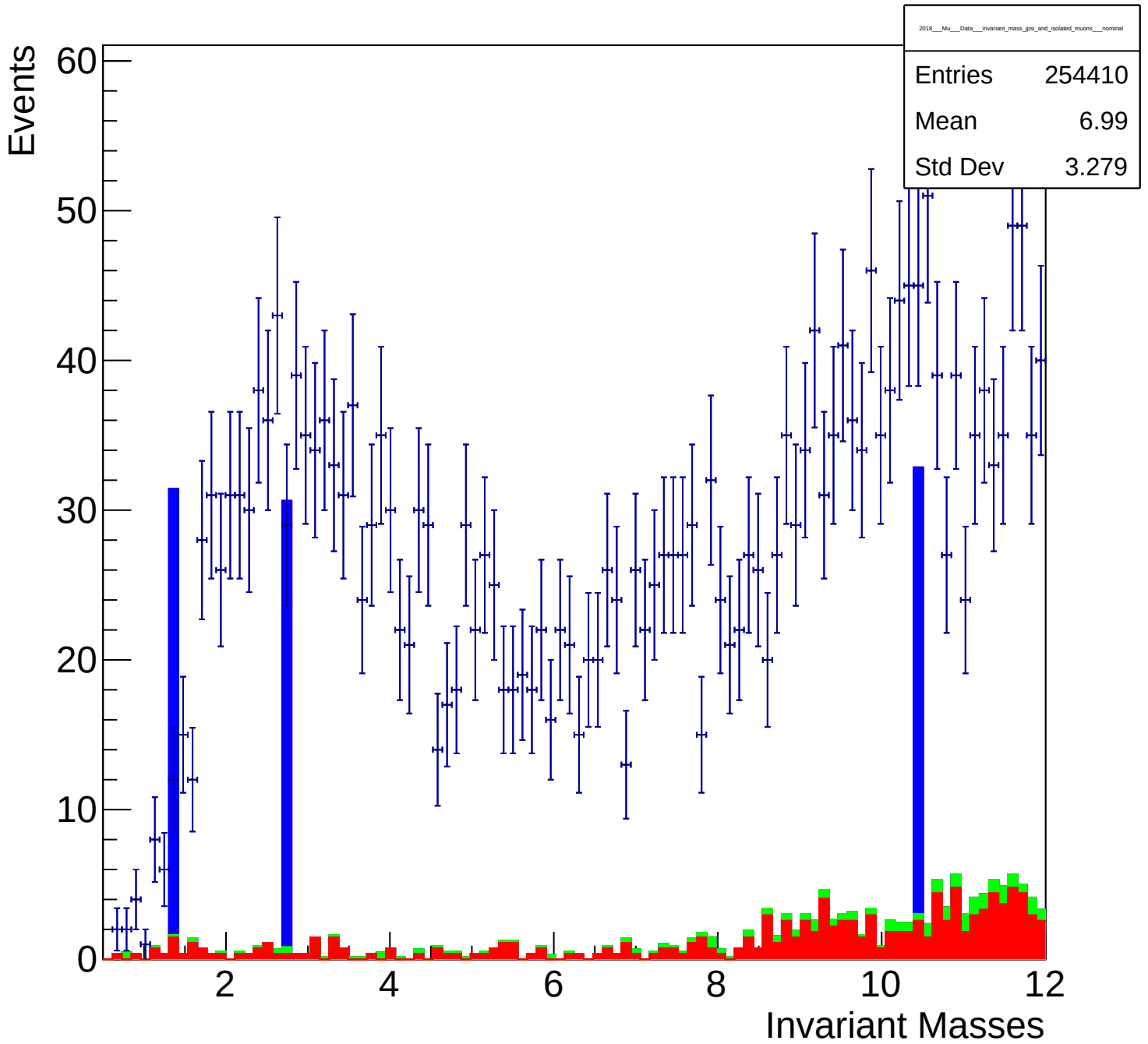



Mass of JPsi Muons
×10^3
Events
800
700
600
500
400
300
200
100
0
0.1
0.11
0.12
0.13
0.14
0.15
0.16
0.17
0.18
0.19
0.2
Number of J/Psi Muons
2018___Mu___Data___jpsi_muons_mass___nominal
Entries 816463
Mean 0.1057
Std Dev 0

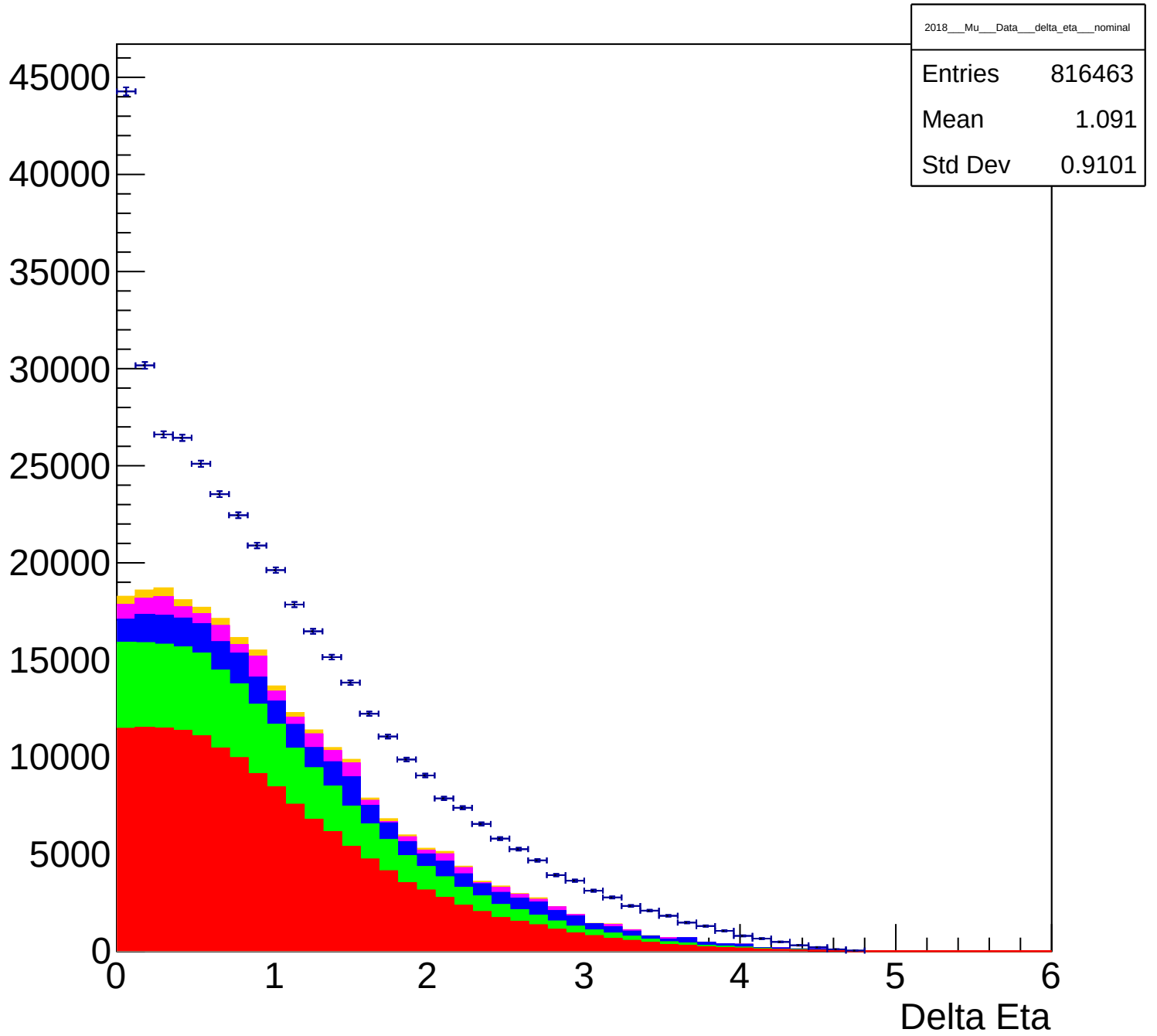

Charge of JPsi Muons
2018___Mu___Data___jpsi_muons_charge___nominal
Entries 816463
Mean 0.003945
Std Dev 1
×10^3
Events
400
350
300
250
200
150
100
50
0
–2
–1.5
–1
–0.5
0
0.5
1
1.5
2
Charge


Invariant Masses for J/Psi Candidate Muons (Oppositely Charged)
2018___Mu___Data___invariant_mass_jpsi_muons___nominal
Entries 254410
Mean 5.235
Std Dev 3.647
Events
4500
4000
3500
3000
2500
2000
1500
1000
500
2
4
6
8
10
12
Invariant Masses

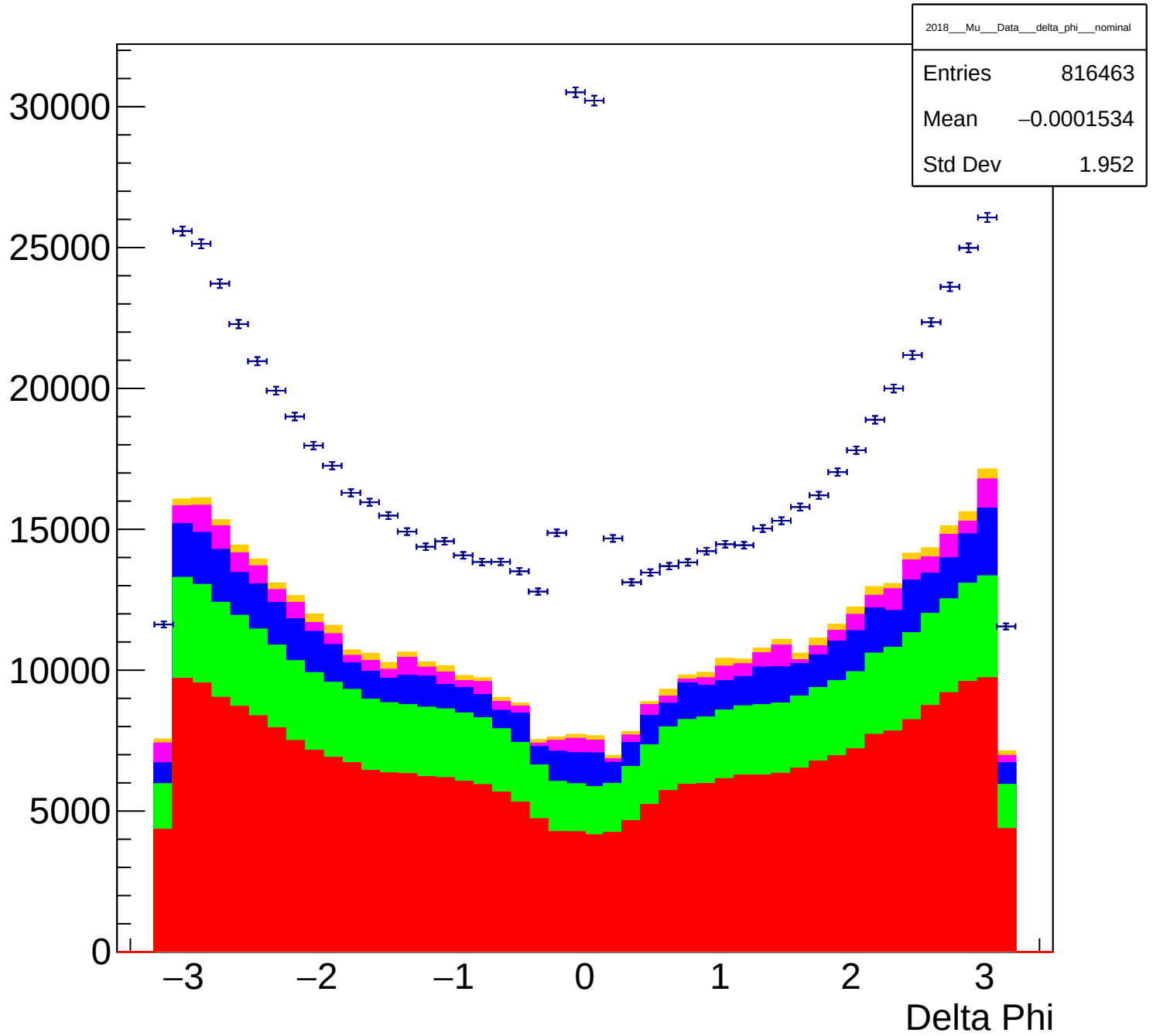

Invariant Masses for J/Psi Candidate Muons (Oppositely Charged)
2018___Mu___Data___invariant_masses_zoomed___nominal
Entries 254410
Mean 3.085
Std Dev 0.1224
Events
700
600
500
400
300
200
100
2.8
2.9
3
3.1
3.2
3.3
3.4
Invariant Masses


Invariant Masses for J/Psi Candidate And Isolated Muons
2018___Mu___Data___invariant_mass_jpsi_and_isolated_muons___nominal
Entries 254410
Mean 6.99
Std Dev 3.279
Events
0
10
20
30
40
50
60
2
4
6
8
10
12
Invariant Masses

Delta Eta for Isolated Muon - JPsi Muons



Delta Phi for Isolated Muon - JPsi Muons



Delta R for Isolated and JPsi Muons