File : MC inbending with vertex correction

Number of generated events: 2 000 000

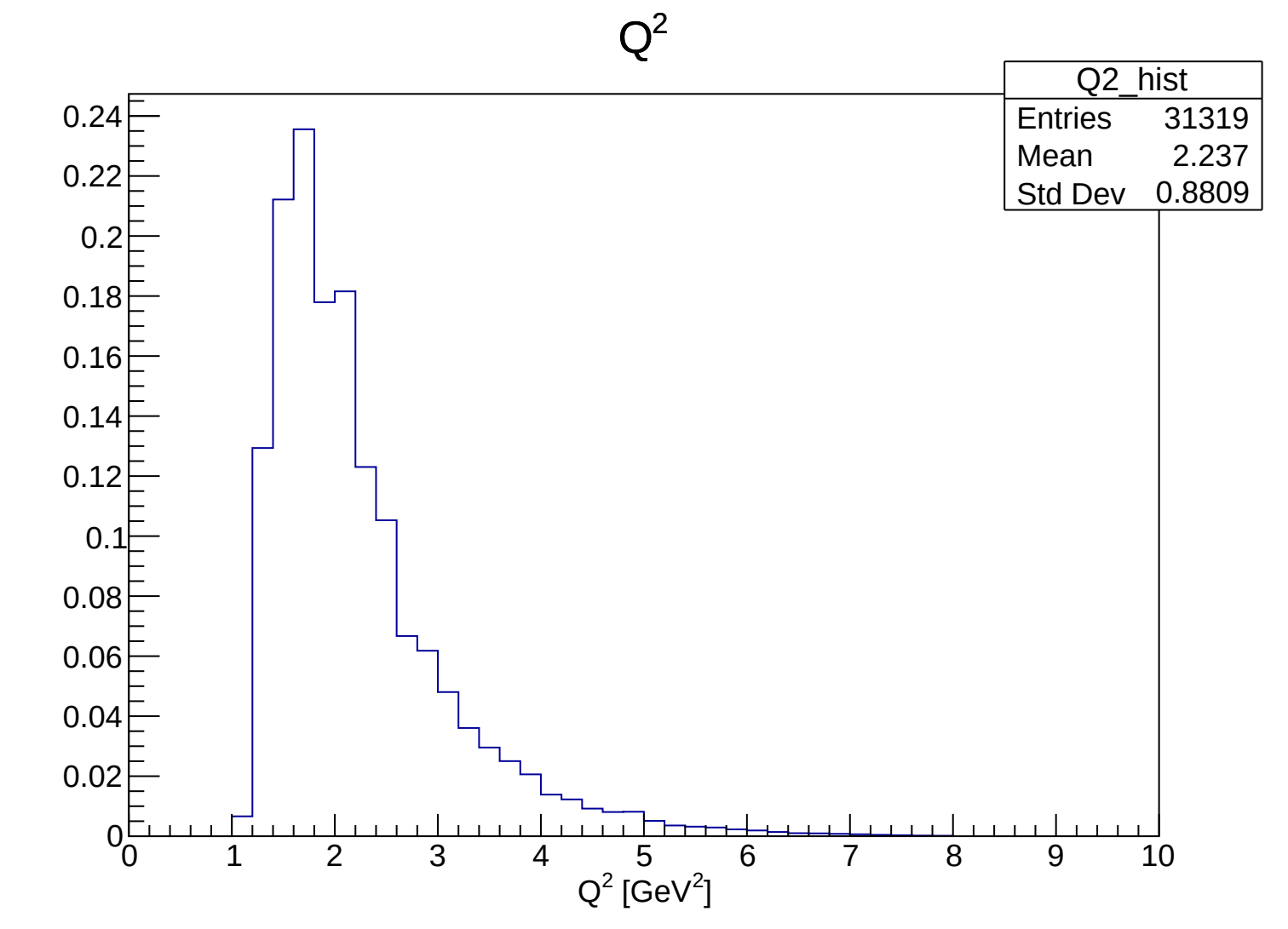
Summary of cuts for the next plots:

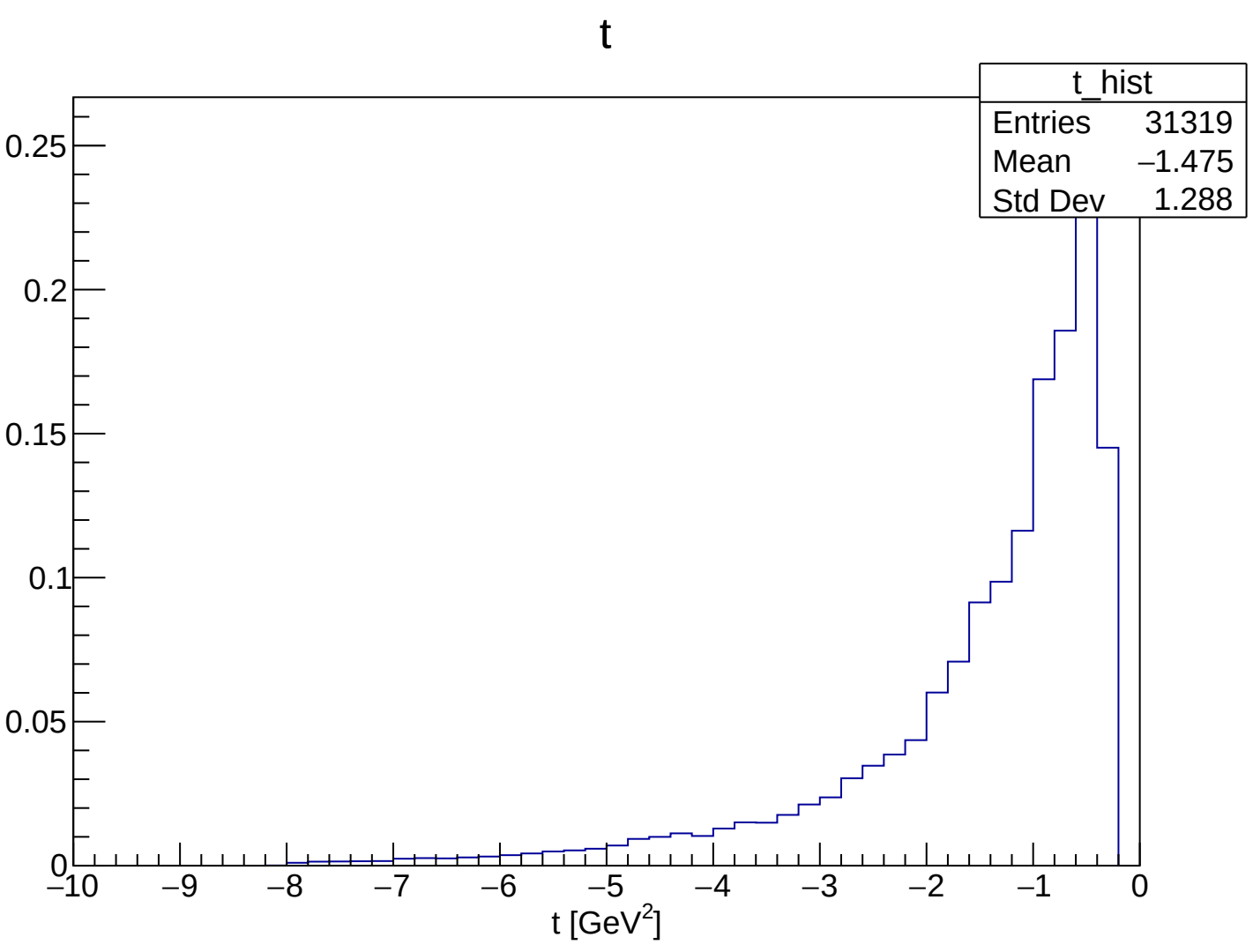
- Only 1 proton, $1\pi^+$, $1\pi^-$, and 1 e^-

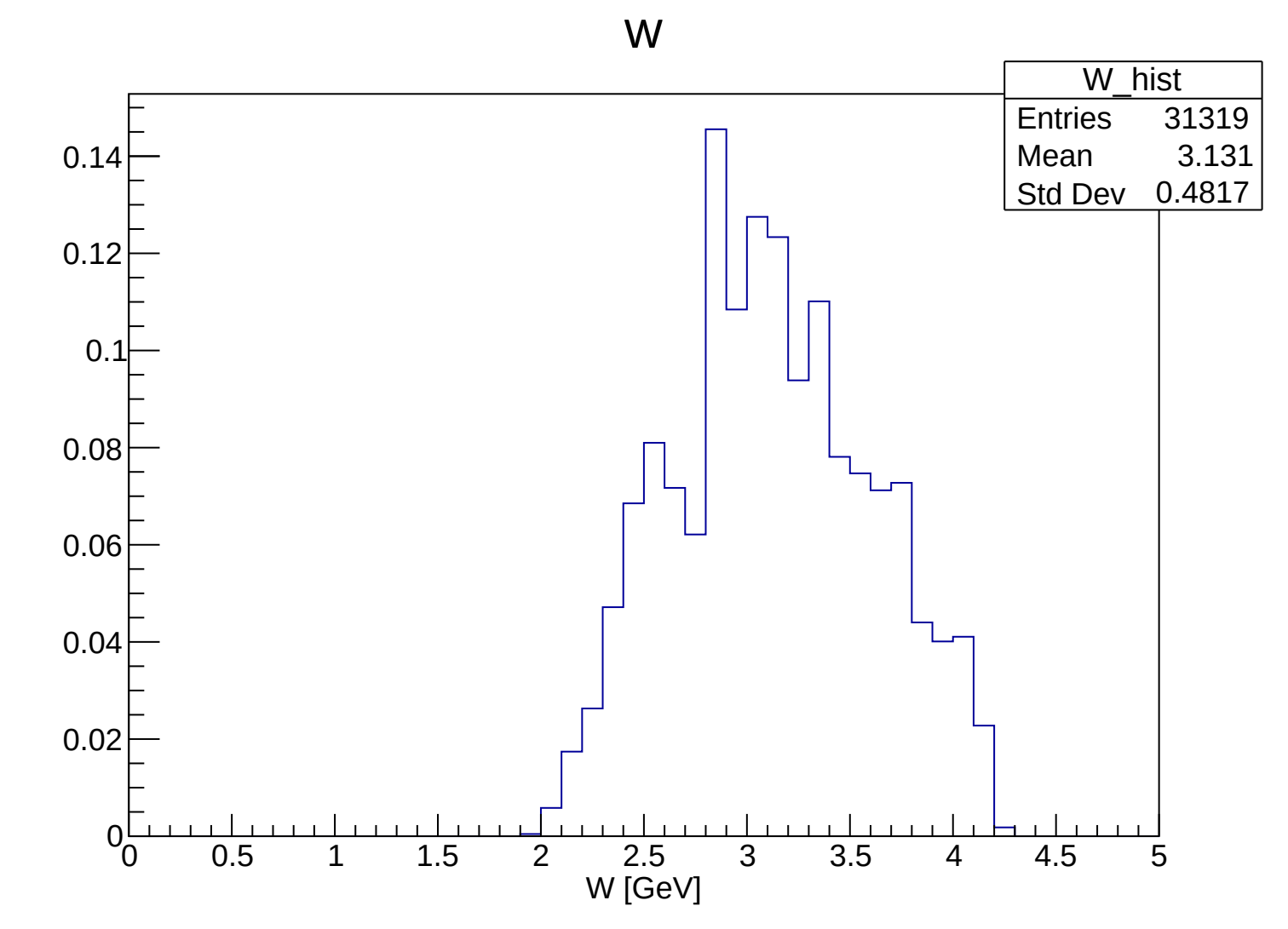
- $Q^2 > 1$ -> electron FD

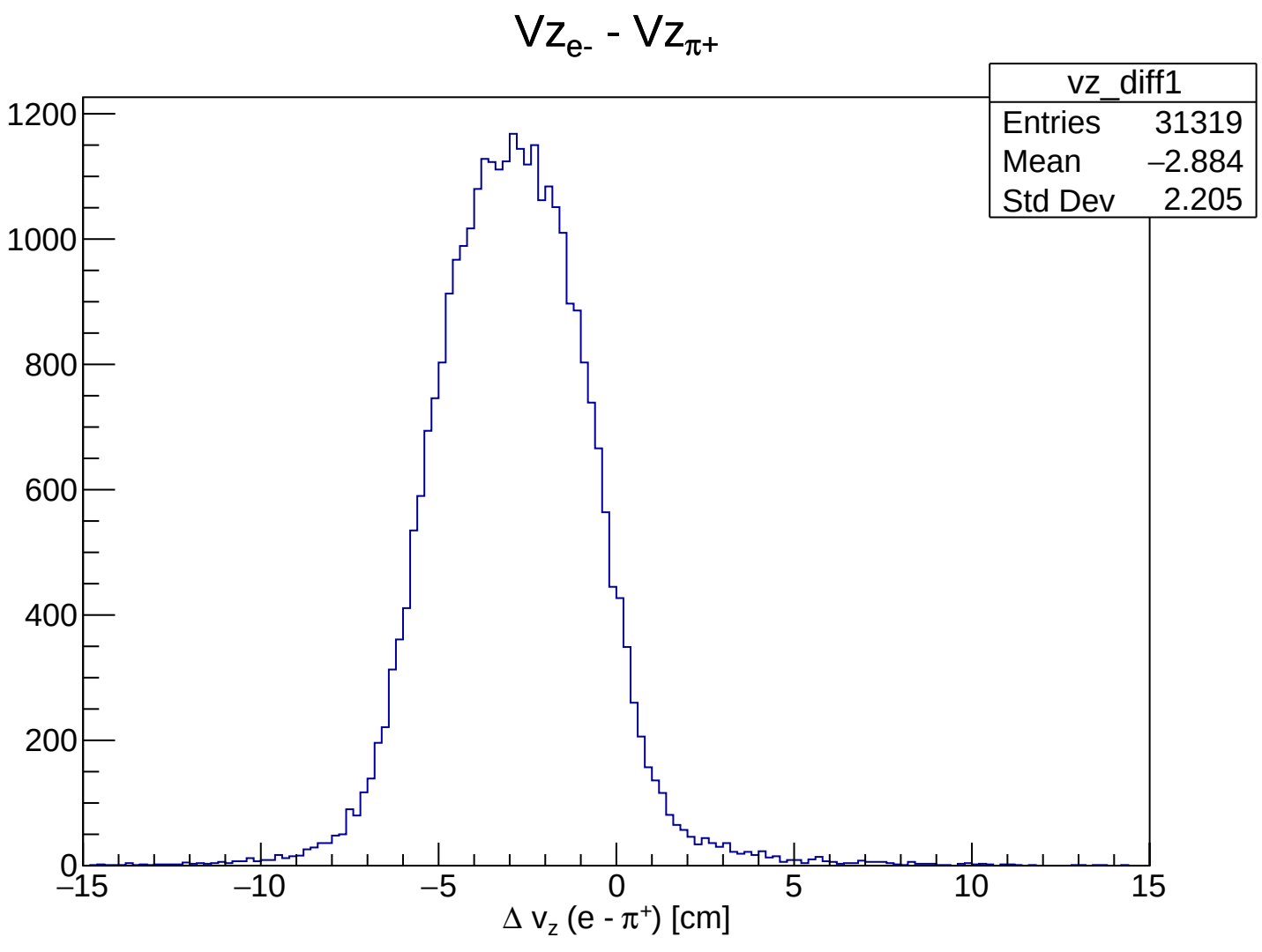
- Very large cut on Missing mass, Invariant mass π^+ π^-

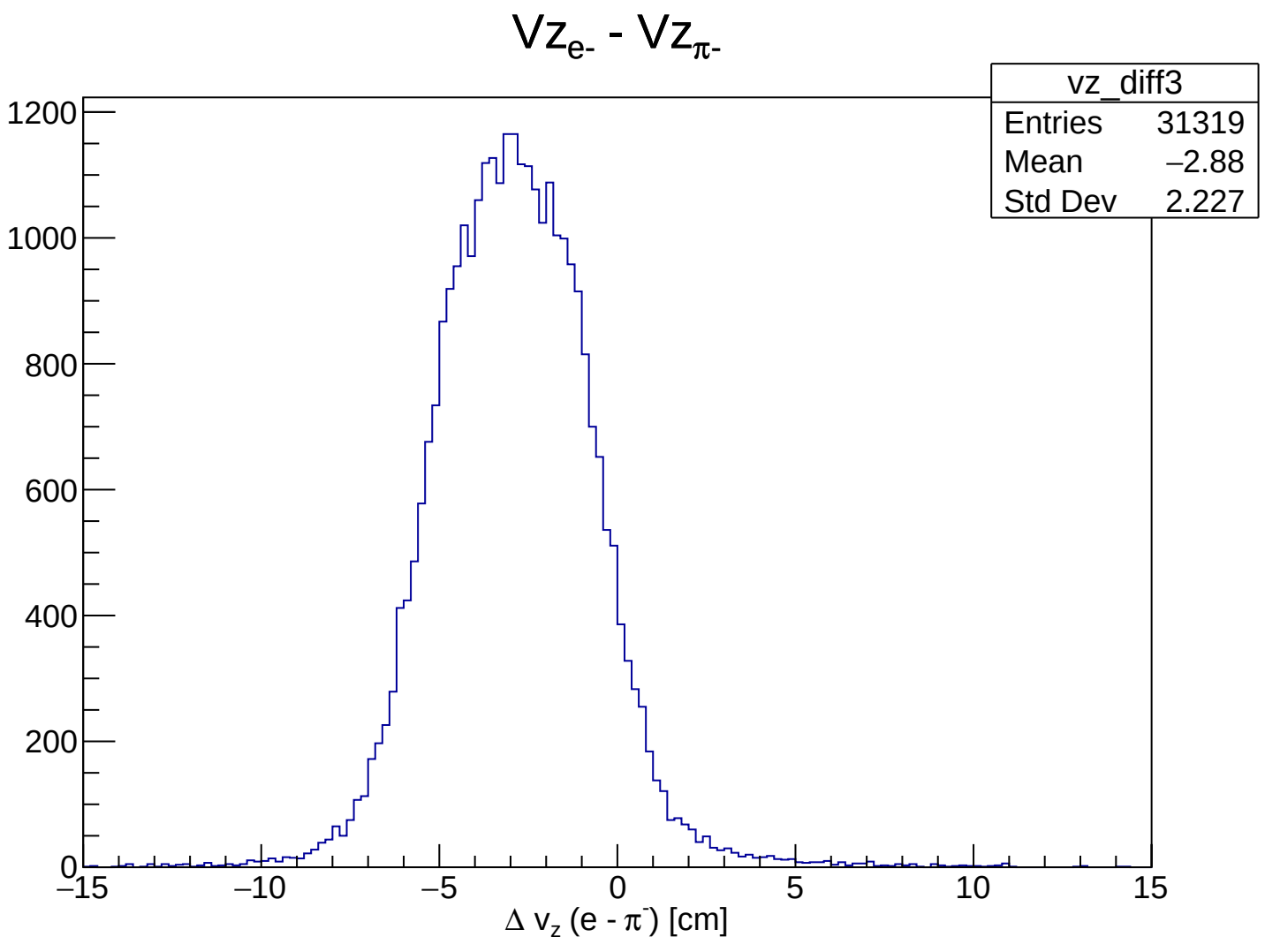
and Invariant mass Ks Kl (cut between 0 and 3 GeV)

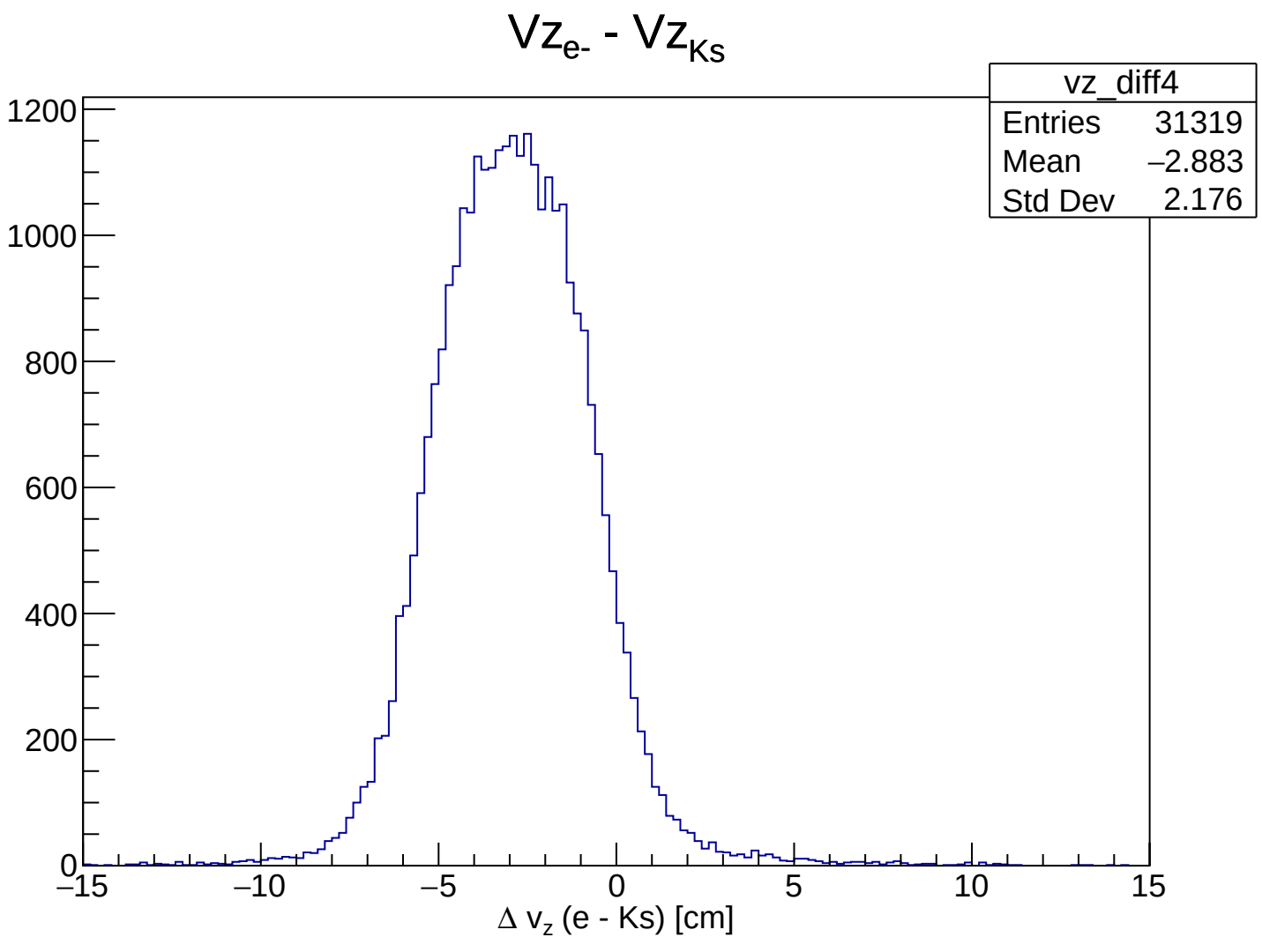

Q^2
Q2_hist
Entries 31319
Mean 2.237
Std Dev 0.8809
0.24
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 1 2 3 4 5 6 7 8 9 10
Q^2 [GeV^2]

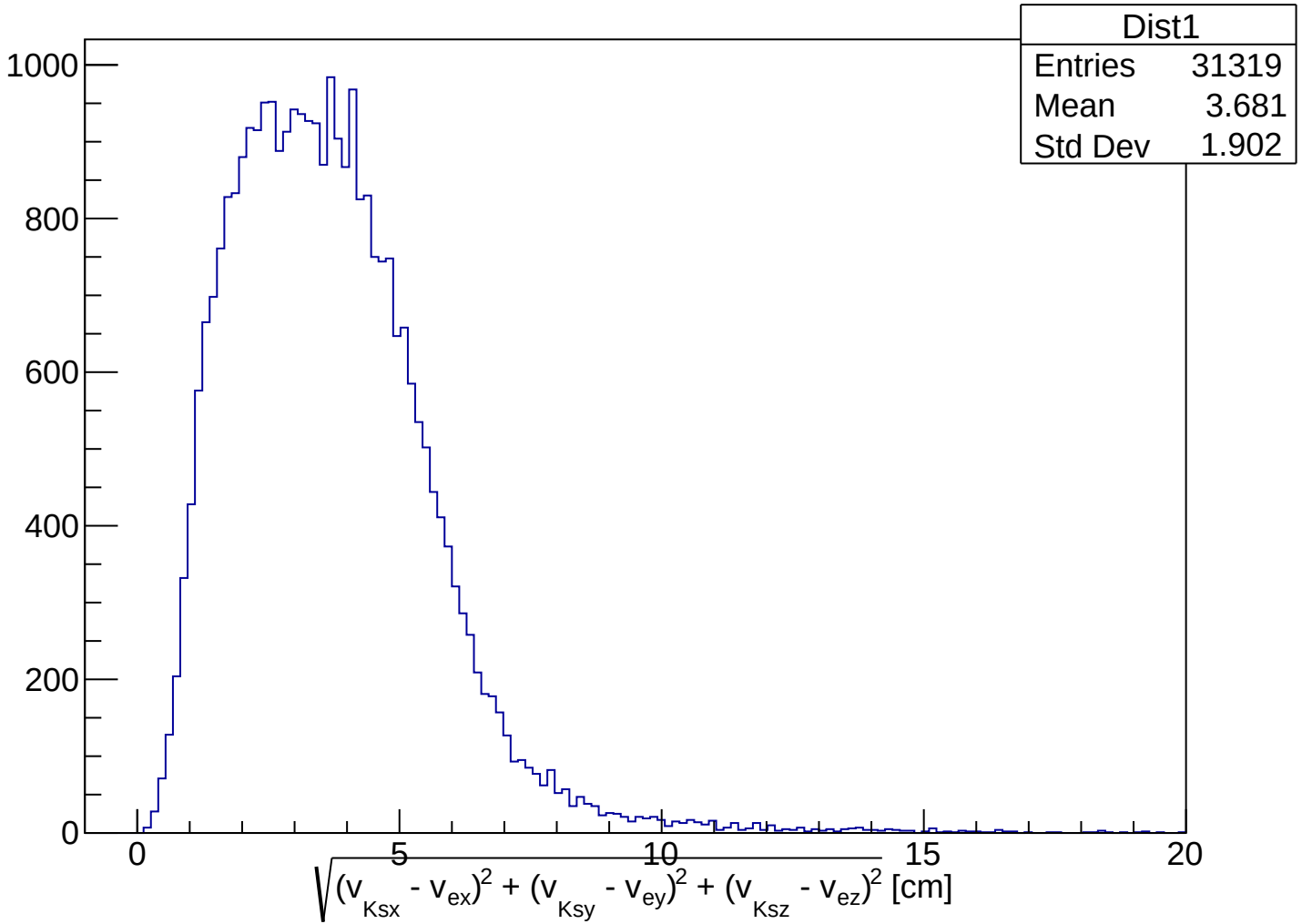

t
t_hist
Entries 31319
Mean –1.475
Std Dev 1.288
0.25
0.2
0.15
0.1
0.05
0
–10
–9
–8
–7
–6
–5
–4
–3
–2
–1
0
t [GeV^2]

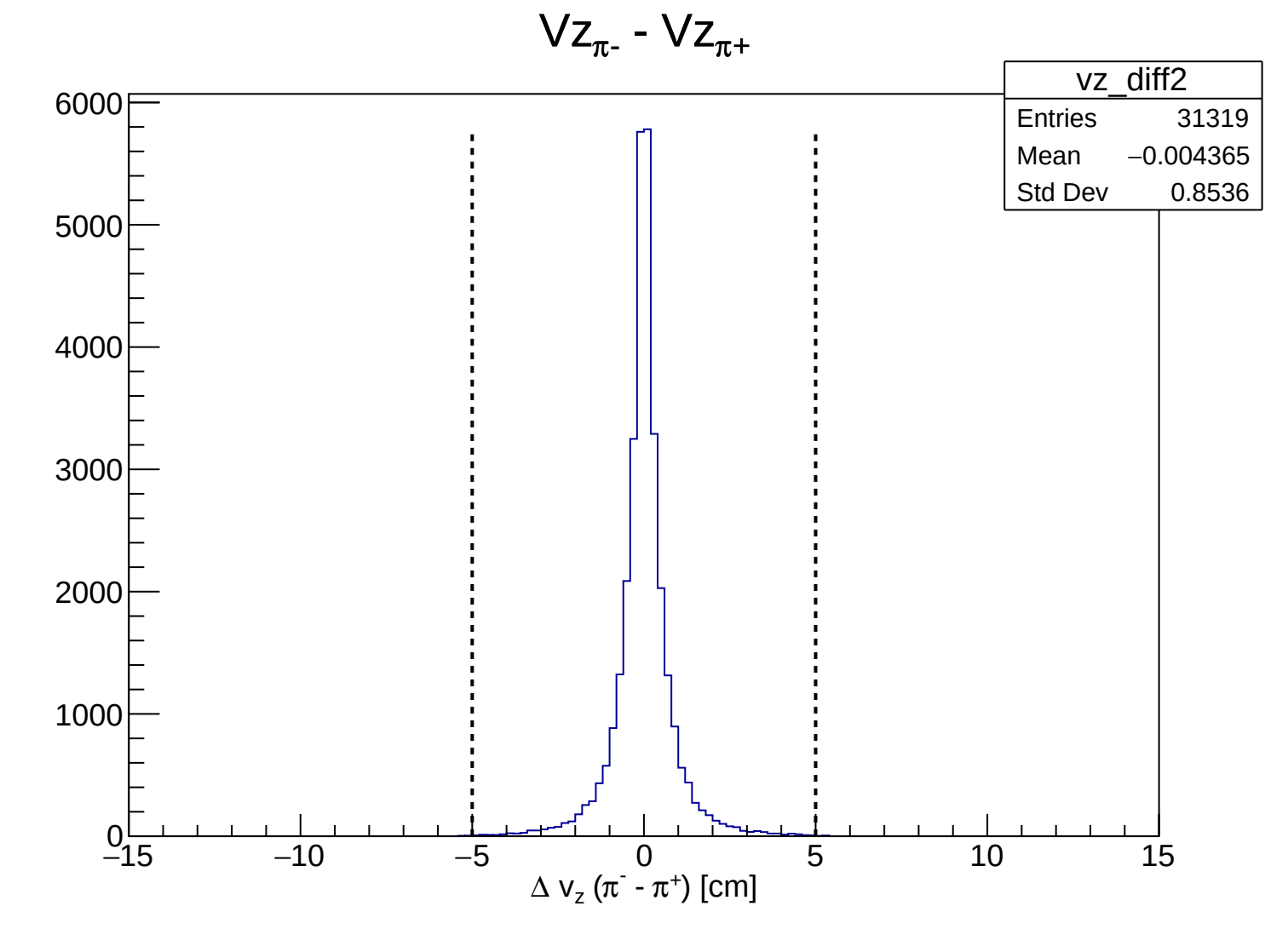

W
W_hist
Entries 31319
Mean 3.131
Std Dev 0.4817
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5
W [GeV]

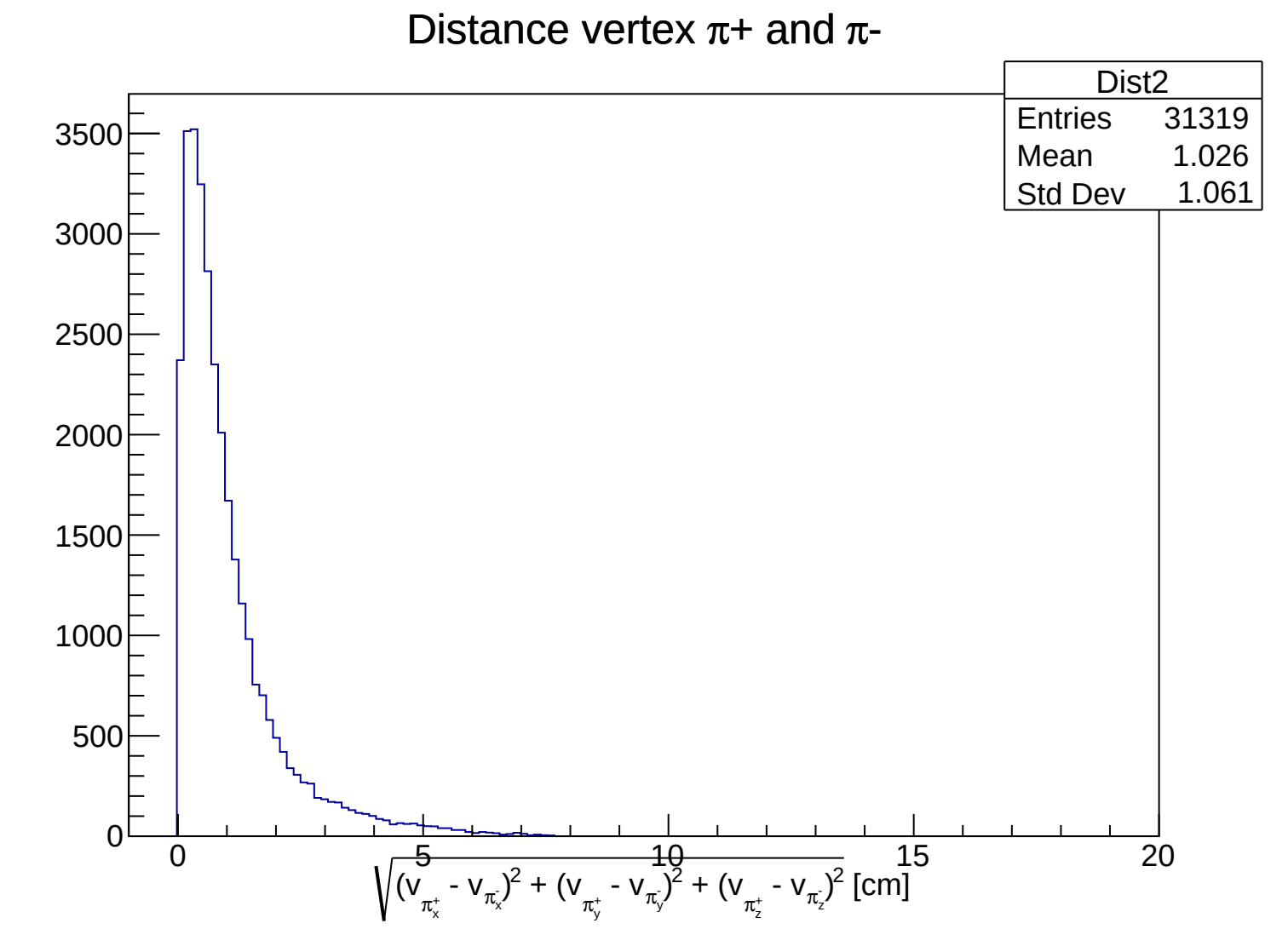

Vz$_{e-}$ - Vz$_{\pi+}$
vz_diff1
Entries 31319
Mean −2.884
Std Dev 2.205
1200
1000
800
600
400
200
0
−15
−10
−5
0
5
10
15
Δ v$_z$ (e - π$^+$) [cm]

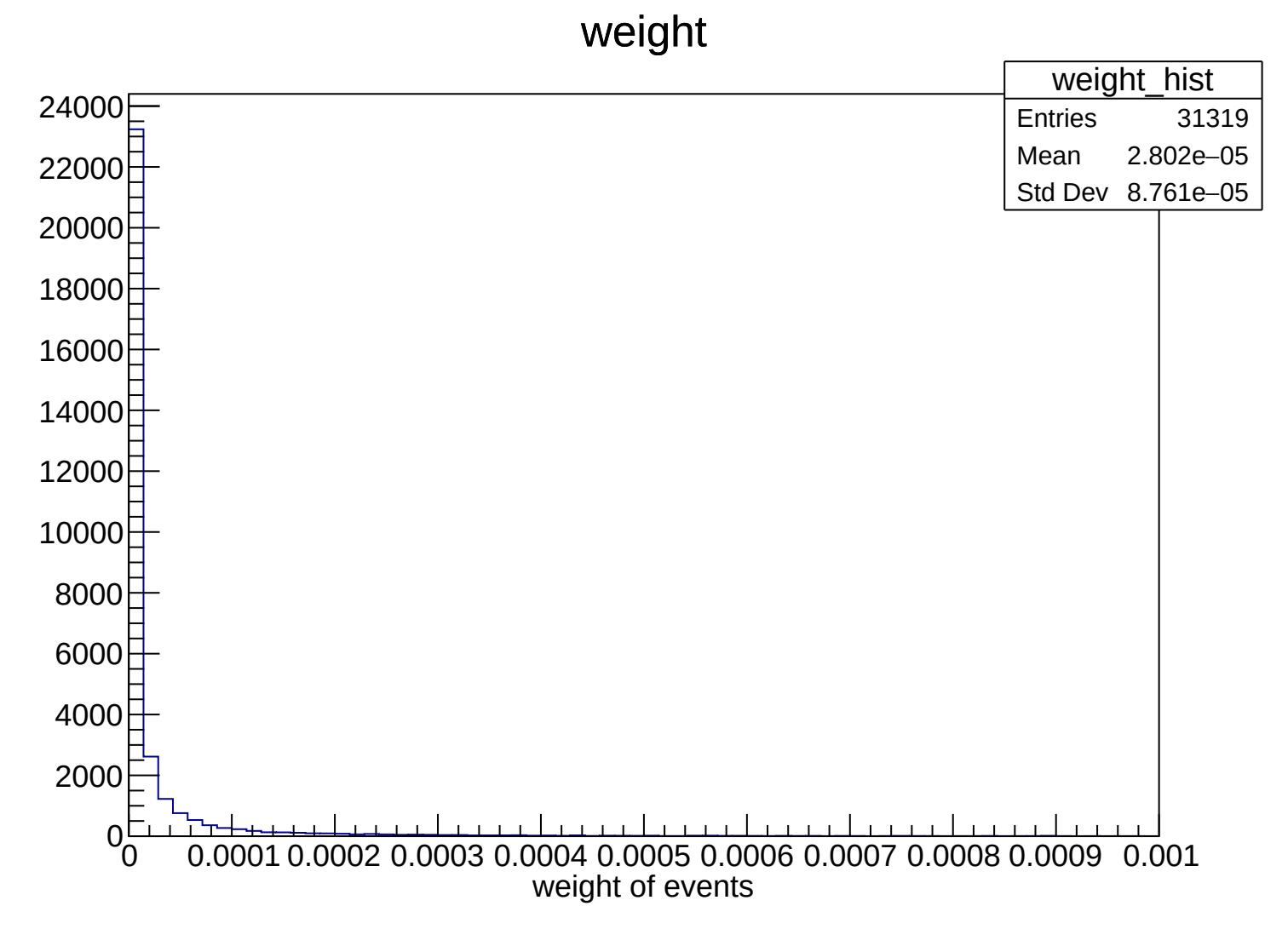

$Vz_{e^-} - Vz_{\pi^-}$
vz_diff3
Entries 31319
Mean −2.88
Std Dev 2.227
1200
1000
800
600
400
200
0
−15
−10
−5
0
5
10
15
$\Delta\ v_z$ (e - π^-) [cm]

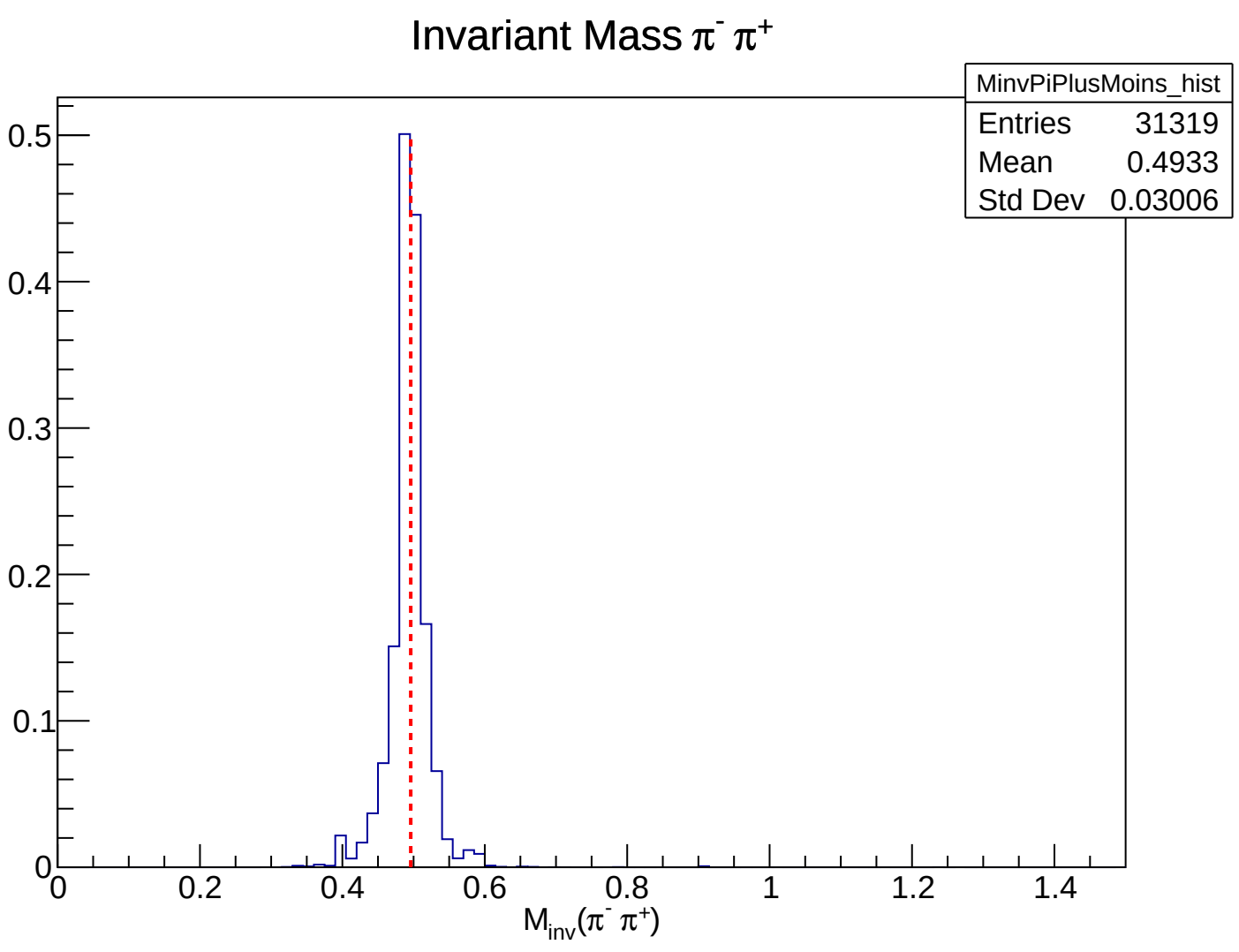

Vz_{e-} - Vz_{Ks}
vz_diff4
Entries 31319
Mean –2.883
Std Dev 2.176
1200
1000
800
600
400
200
0
–15
–10
–5
0
5
10
15
Δ v_z (e - Ks) [cm]

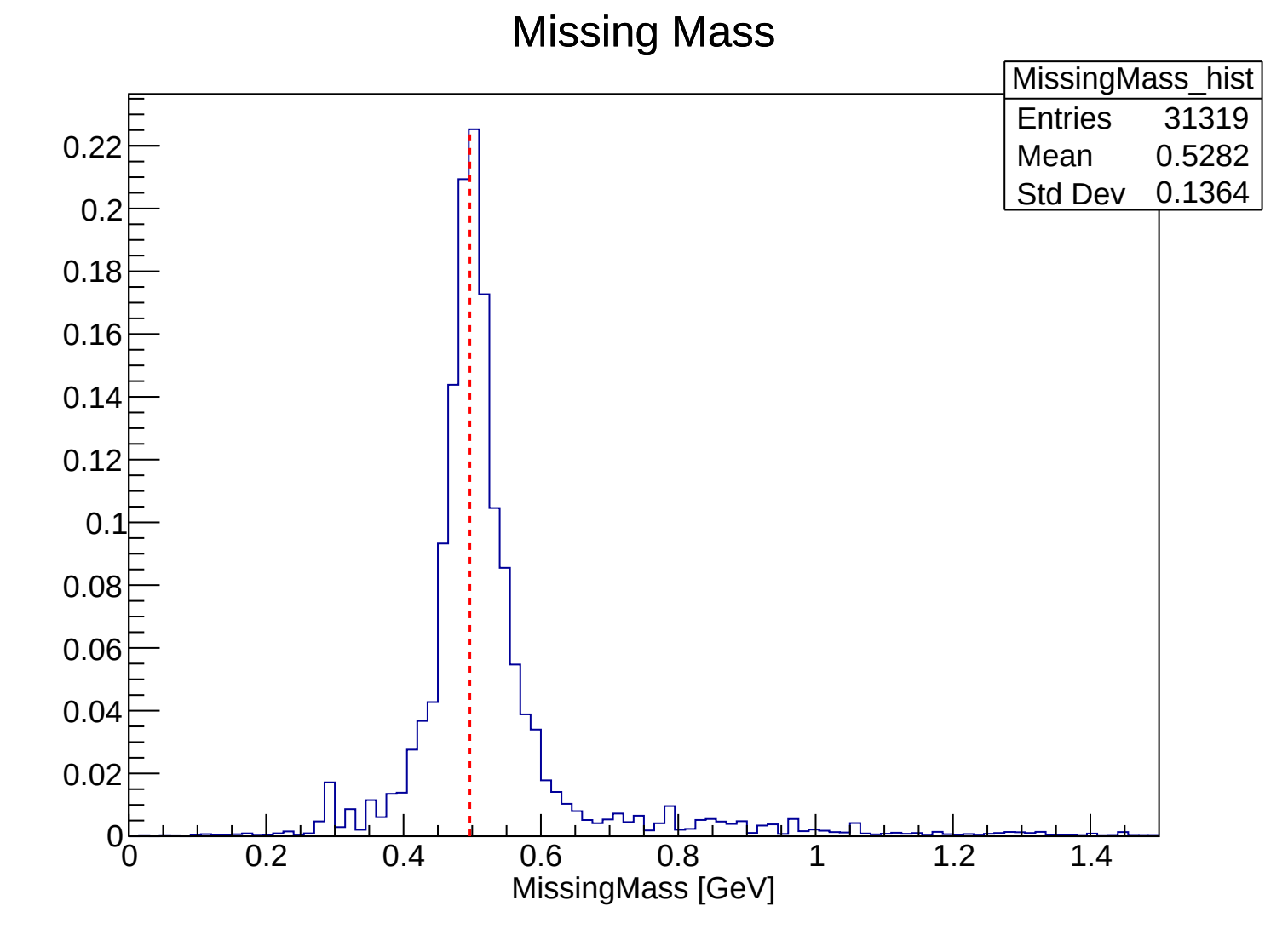

Distance vertex e- and Ks
Dist1
Entries 31319
Mean 3.681
Std Dev 1.902
1000
800
600
400
200
0
0
5
10
15
20
$\sqrt{(v_{Ksx} - v_{ex})^2 + (v_{Ksy} - v_{ey})^2 + (v_{Ksz} - v_{ez})^2}$ [cm]

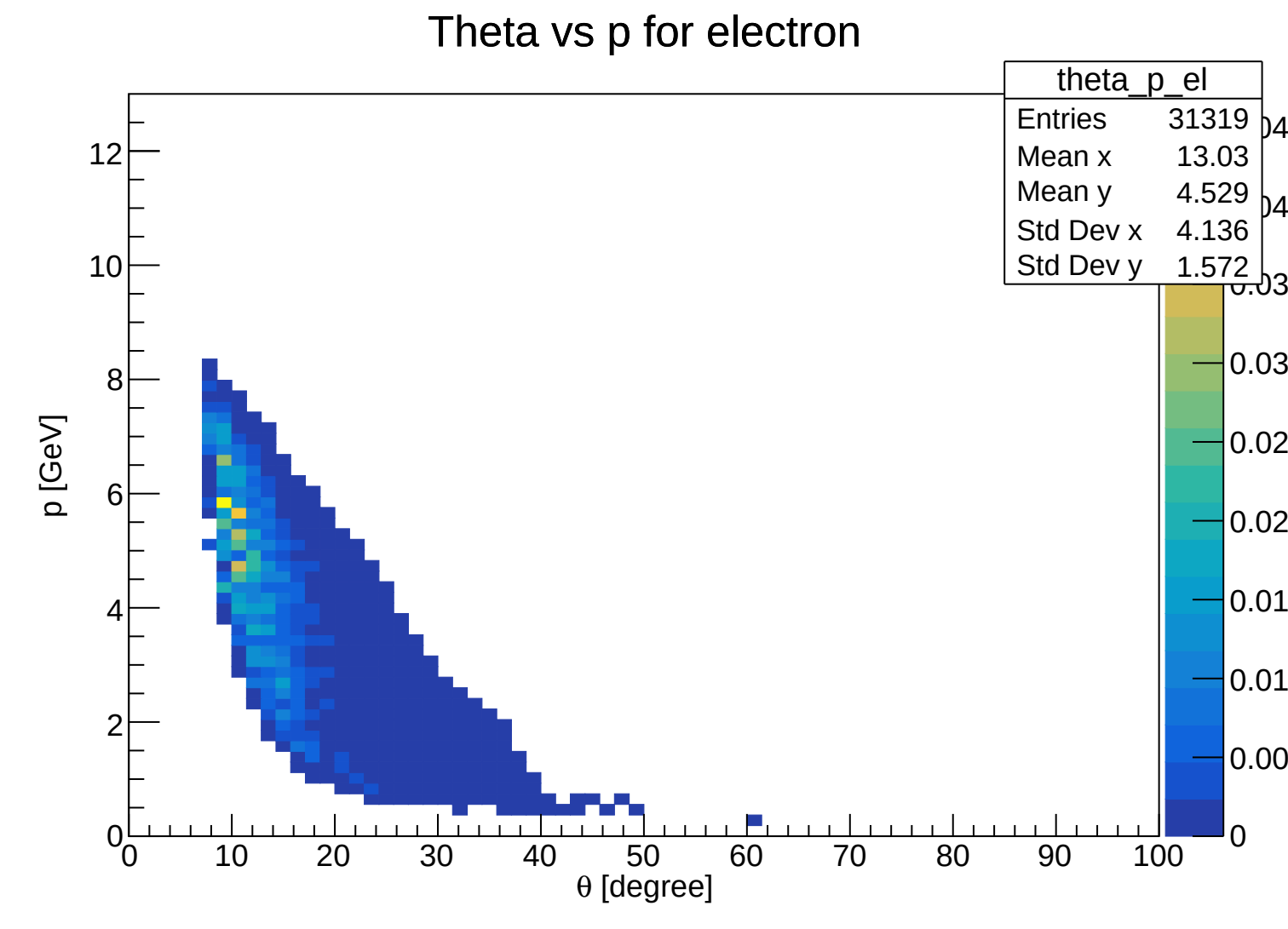

Vz_{π^-} - Vz_{π^+}
vz_diff2
Entries 31319
Mean −0.004365
Std Dev 0.8536
6000
5000
4000
3000
2000
1000
0
−15
−10
−5
0
5
10
15
Δ v_z (π^- - π^+) [cm]

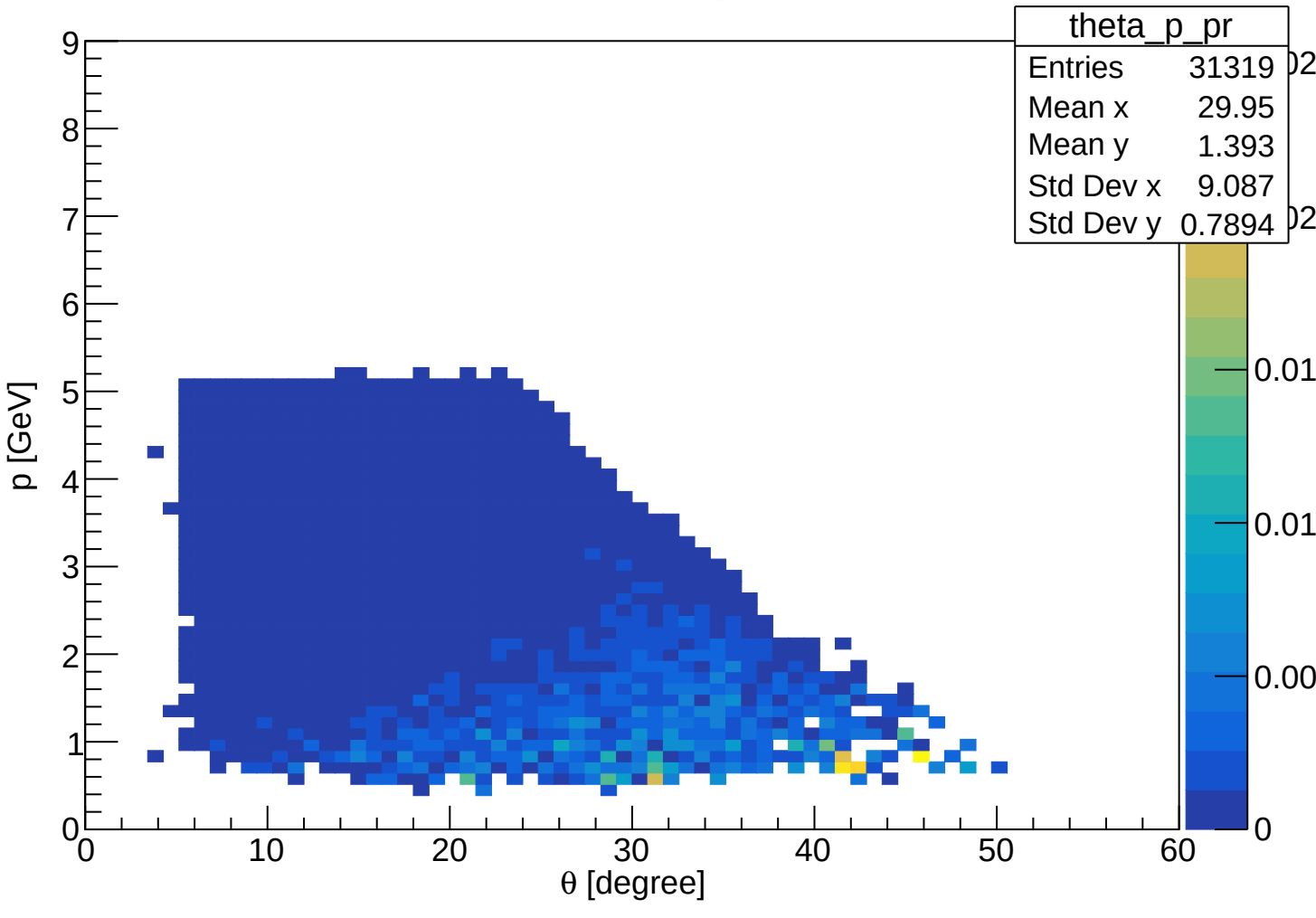

Distance vertex π+ and π-
Dist2
Entries 31319
Mean 1.026
Std Dev 1.061
3500
3000
2500
2000
1500
1000
500
0
0
5
10
15
20
$\sqrt{(v_{\pi_x^+} - v_{\pi_x^-})^2 + (v_{\pi_y^+} - v_{\pi_y^-})^2 + (v_{\pi_z^+} - v_{\pi_z^-})^2}$ [cm]

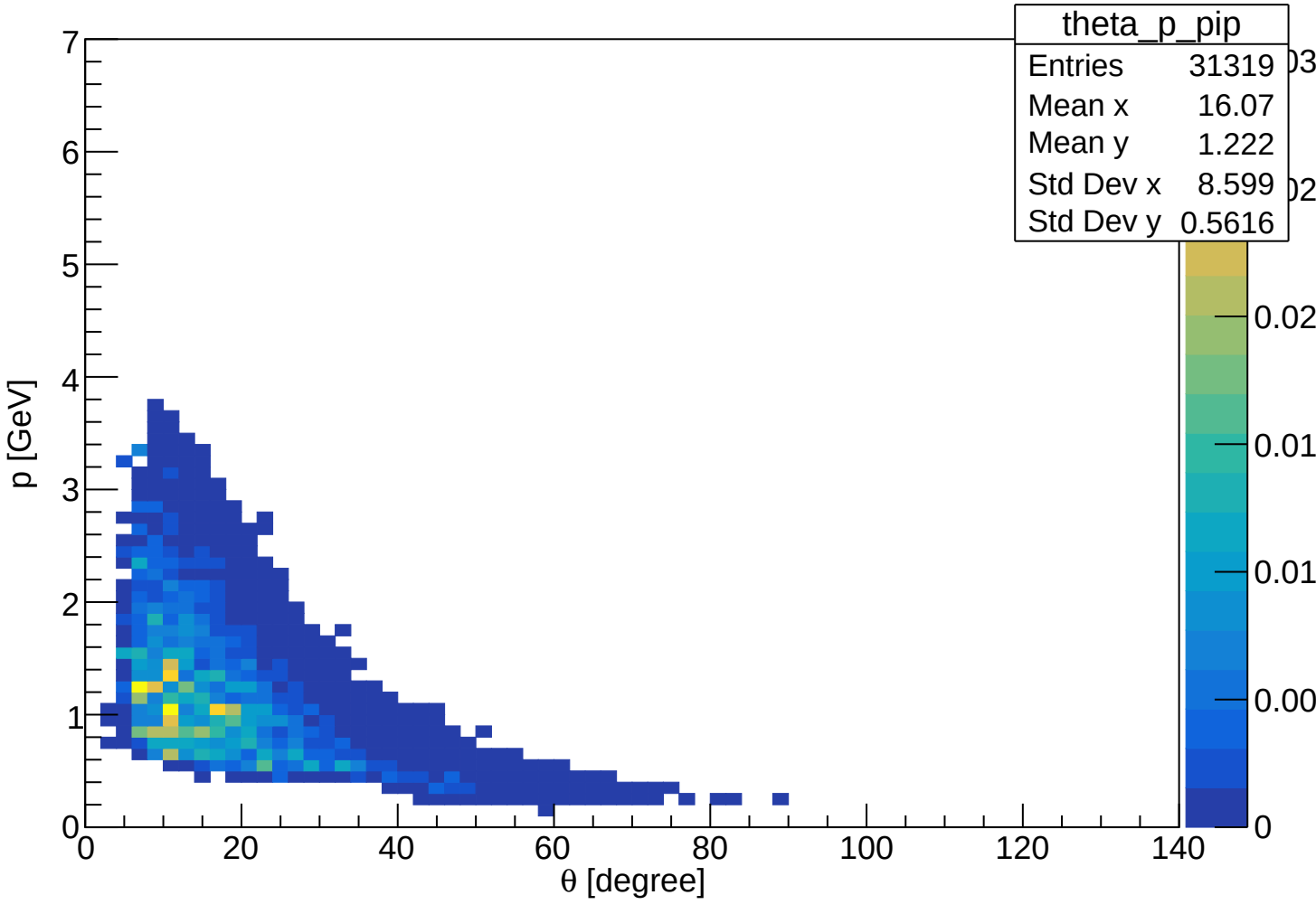

weight
weight_hist
Entries 31319
Mean 2.802e−05
Std Dev 8.761e−05
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
0 0.0001 0.0002 0.0003 0.0004 0.0005 0.0006 0.0007 0.0008 0.0009 0.001
weight of events

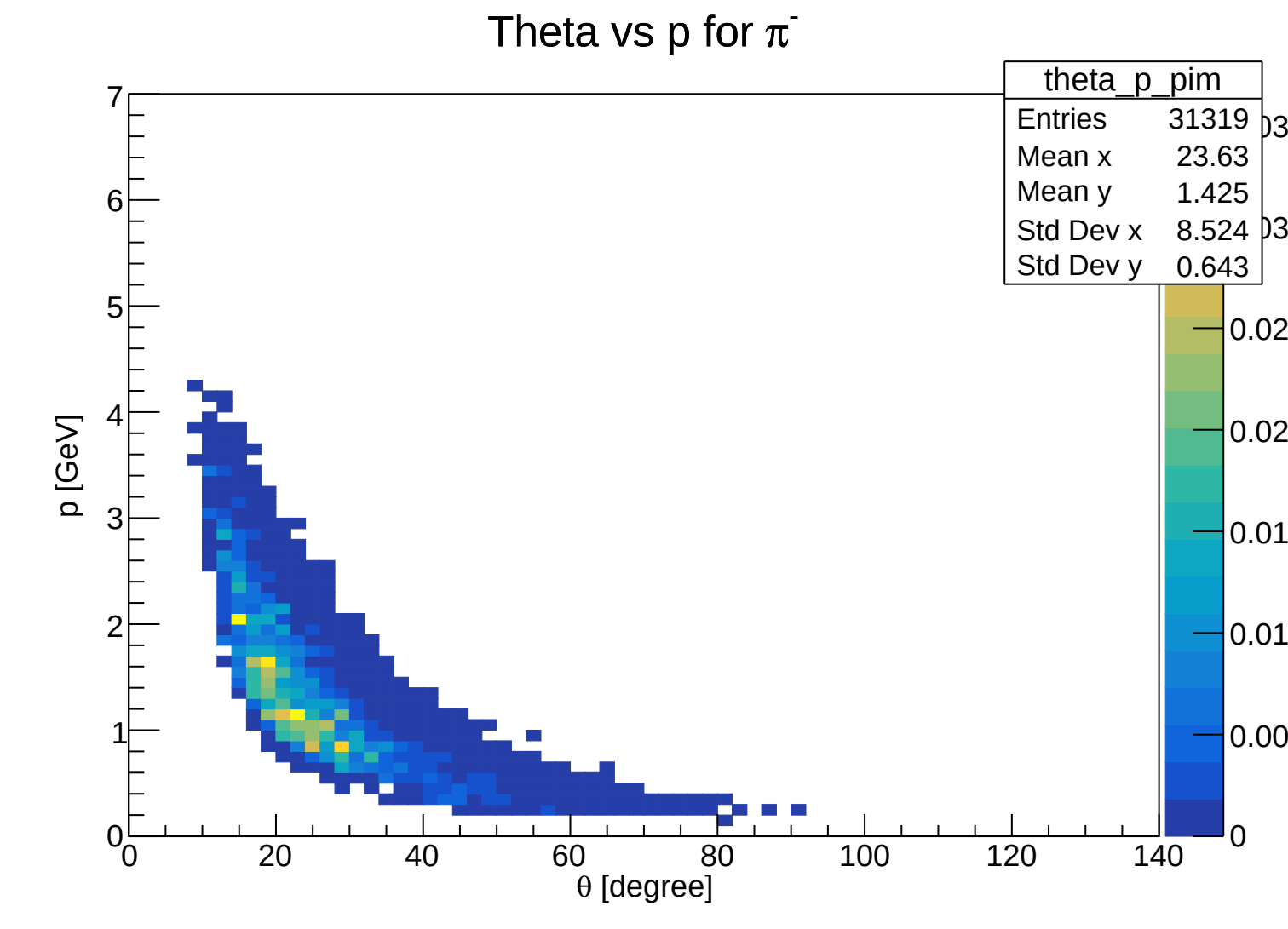

Invariant Mass π⁻ π⁺
MinvPiPlusMoins_hist
Entries 31319
Mean 0.4933
Std Dev 0.03006
0.5
0.4
0.3
0.2
0.1
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
M_inv(π⁻ π⁺)

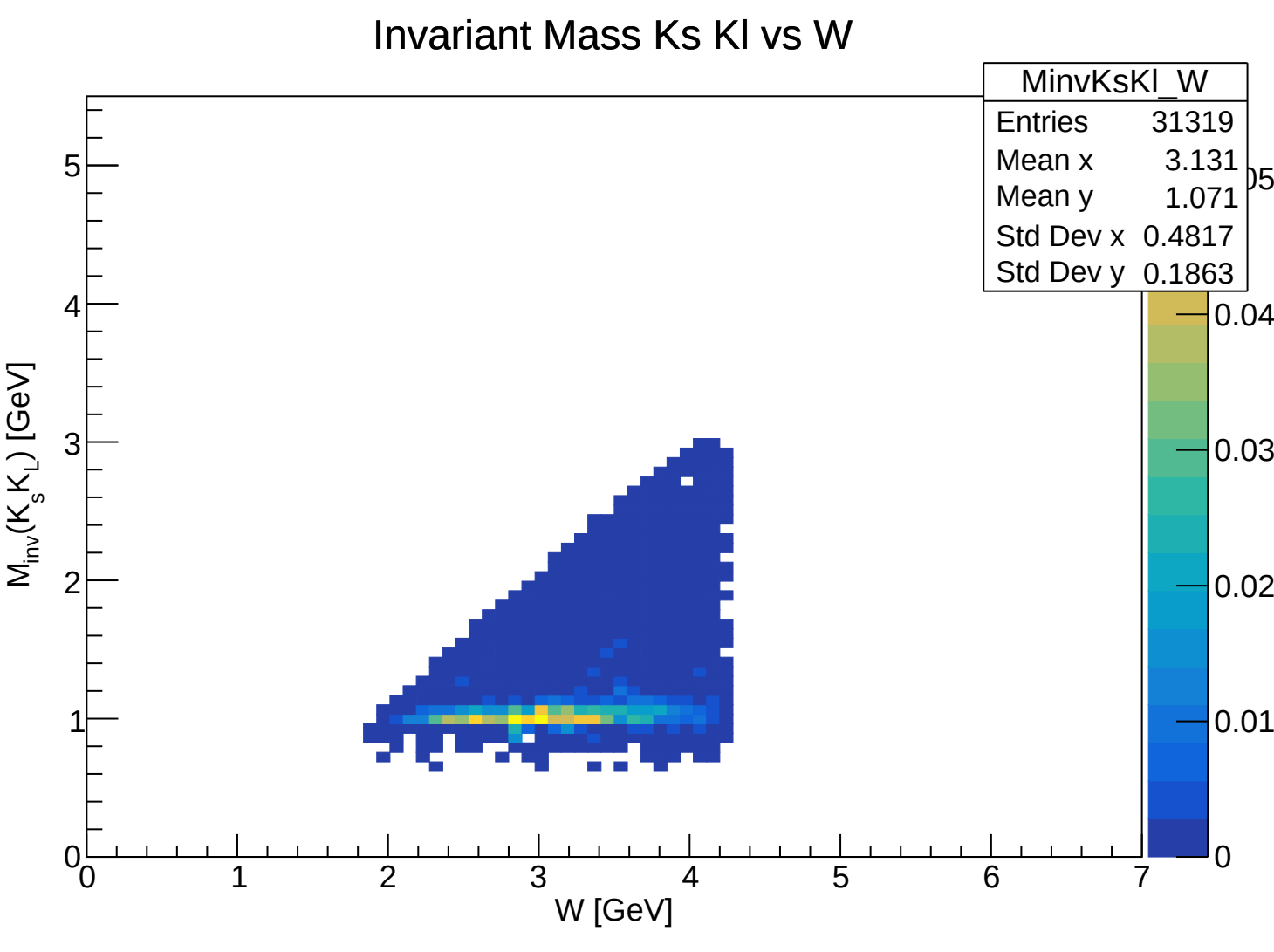

Missing Mass
MissingMass_hist
Entries 31319
Mean 0.5282
Std Dev 0.1364
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
MissingMass [GeV]

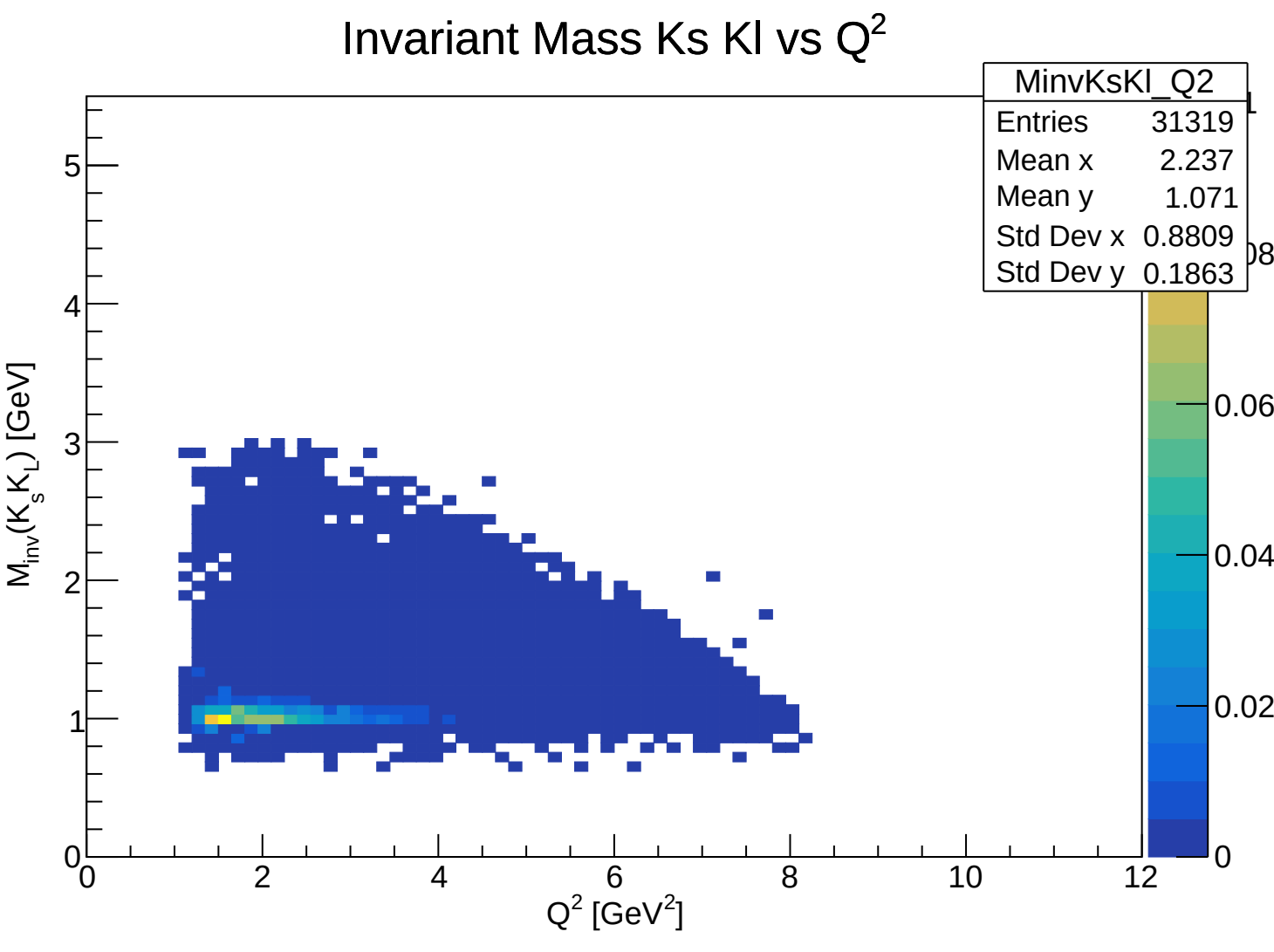

Theta vs p for electron
theta_p_el
Entries 31319
Mean x 13.03
Mean y 4.529
Std Dev x 4.136
Std Dev y 1.572
p [GeV]
θ [degree]
0
2
4
6
8
10
12
0
10
20
30
40
50
60
70
80
90
100
0.03
0.02
0.02
0.01
0.01
0.00
0

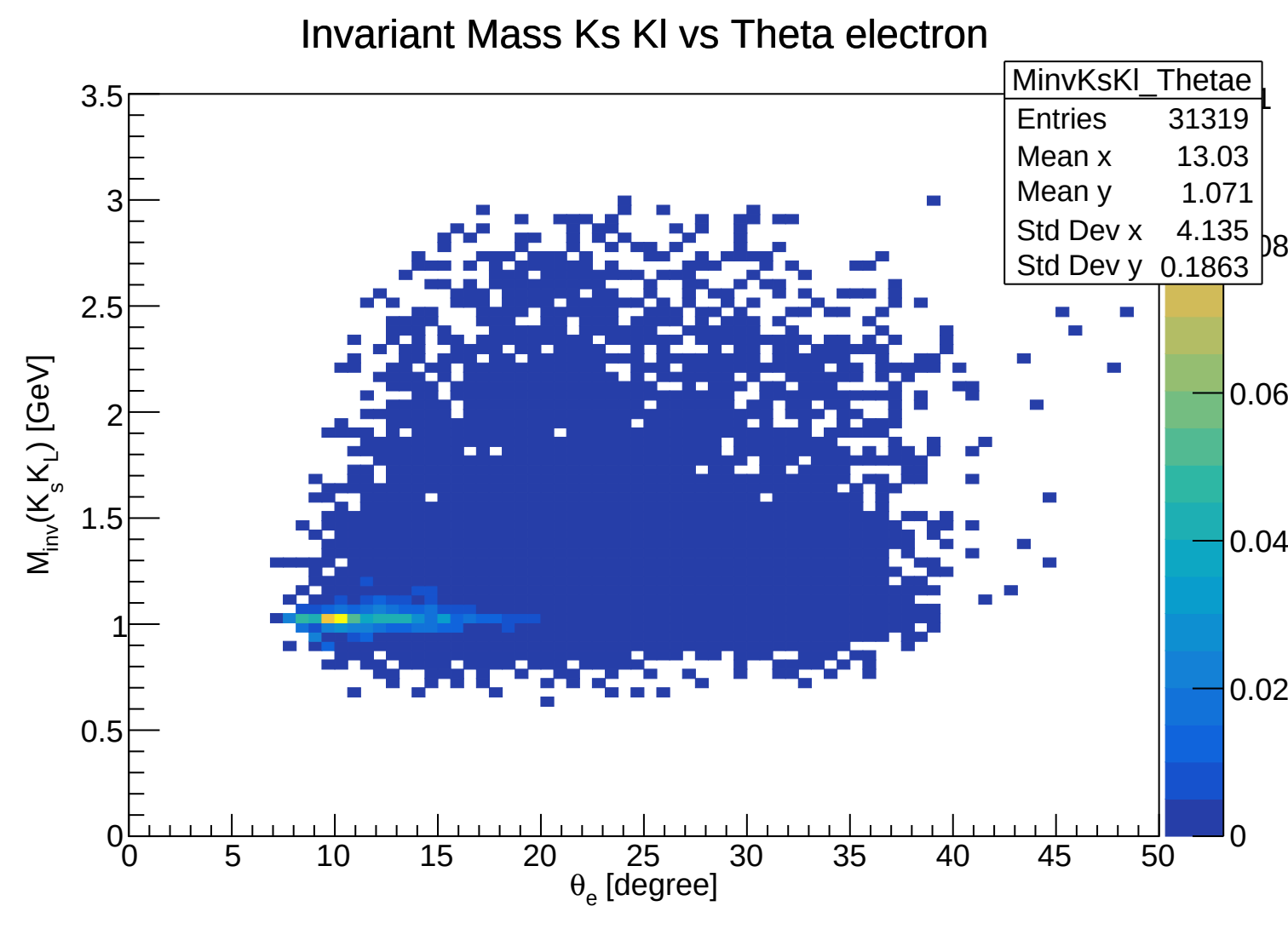

Theta vs p for proton
theta_p_pr
Entries 31319
Mean x 29.95
Mean y 1.393
Std Dev x 9.087
Std Dev y 0.7894
p [GeV]
θ [degree]
0
10
20
30
40
50
60
1
2
3
4
5
6
7
8
9
0.01
0.01
0.00
0


Theta vs p for π^+
theta_p_pip
Entries 31319
Mean x 16.07
Mean y 1.222
Std Dev x 8.599
Std Dev y 0.5616
p [GeV]
θ [degree]
0
1
2
3
4
5
6
7
0
20
40
60
80
100
120
140
0.02
0.01
0.01
0.00
0


Theta vs p for π-
theta_p_pim
Entries 31319
Mean x 23.63
Mean y 1.425
Std Dev x 8.524
Std Dev y 0.643
p [GeV]
θ [degree]
0
1
2
3
4
5
6
7
0
20
40
60
80
100
120
140
0.02
0.02
0.01
0.01
0.00
0

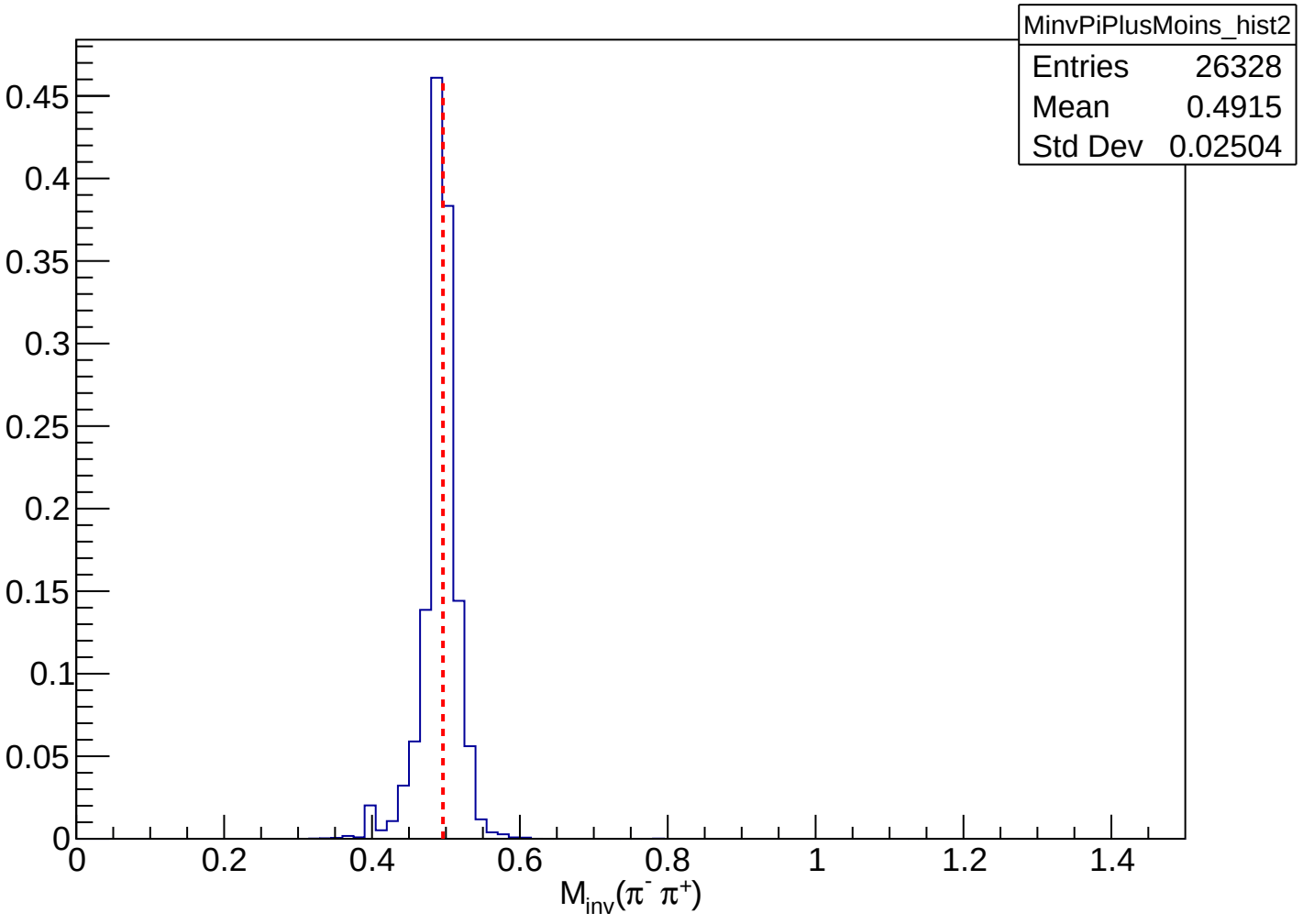

Invariant Mass Ks Kl vs W
MinvKsKl_W
Entries 31319
Mean x 3.131
Mean y 1.071
Std Dev x 0.4817
Std Dev y 0.1863
$M_{inv}(K_s K_L)$ [GeV]
W [GeV]
0
1
2
3
4
5
6
7
0.04
0.03
0.02
0.01


Invariant Mass Ks Kl vs Q2
MinvKsKl_Q2
Entries 31319
Mean x 2.237
Mean y 1.071
Std Dev x 0.8809
Std Dev y 0.1863
M_inv(K_S K_L) [GeV]
Q2 [GeV2]
0
1
2
3
4
5
0
2
4
6
8
10
12
0.06
0.04
0.02
0


Invariant Mass Ks Kl vs Theta electron
MinvKsKl_Thetae
Entries 31319
Mean x 13.03
Mean y 1.071
Std Dev x 4.135
Std Dev y 0.1863
$M_{inv}(K_S K_L)$ [GeV]
θ_e [degree]
0
0.5
1
1.5
2
2.5
3
3.5
0
5
10
15
20
25
30
35
40
45
50
0.06
0.04
0.02
0

Summary of cuts for the next plots:

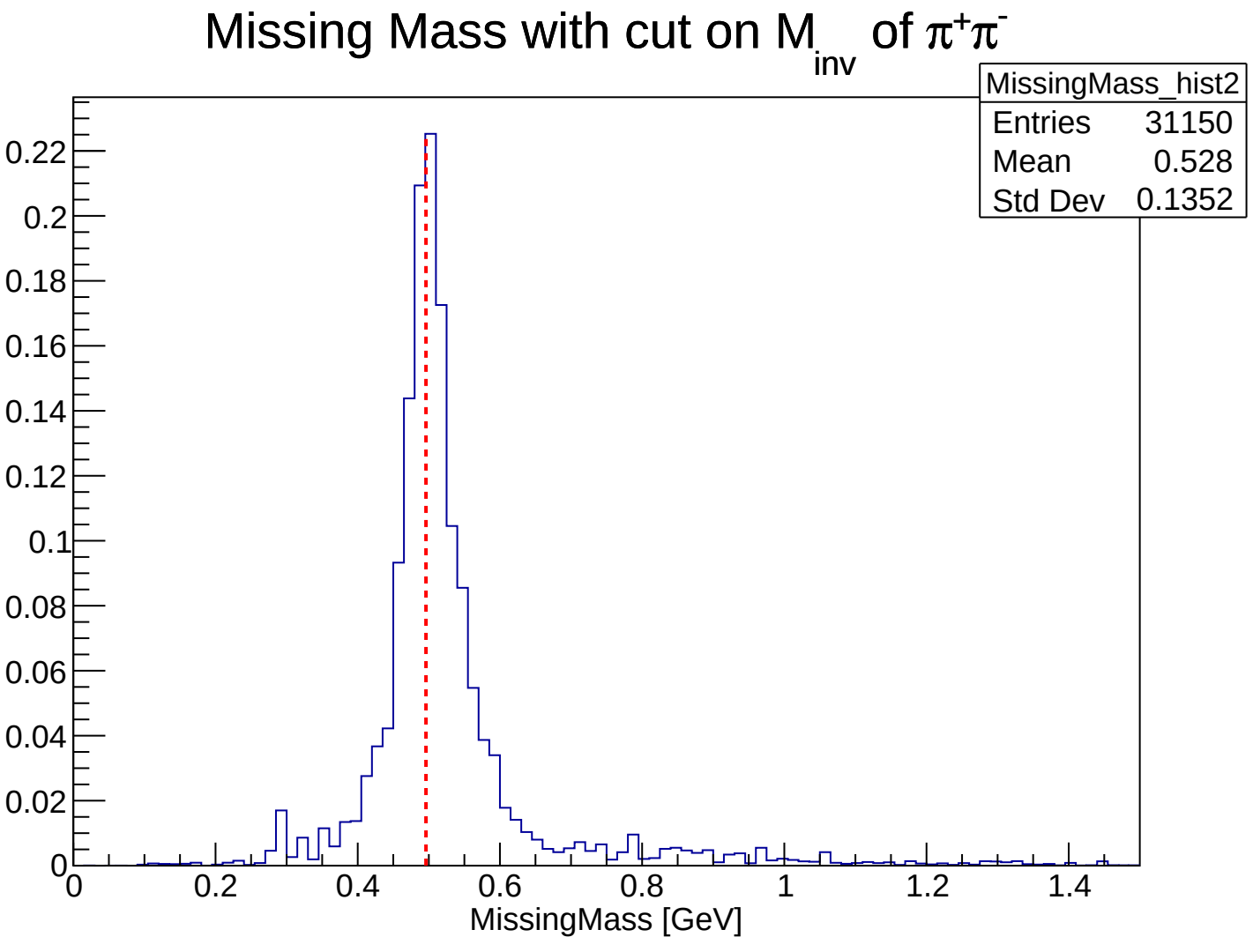
- Add a cut on missing mass : 0.4 < MM < 0.7 GeV


Invariant Mass π⁻ π⁺ with cut on MM
MinvPiPlusMoins_hist2
Entries 26328
Mean 0.4915
Std Dev 0.02504
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
M_inv(π⁻ π⁺)

Summary of cuts for the next plots:

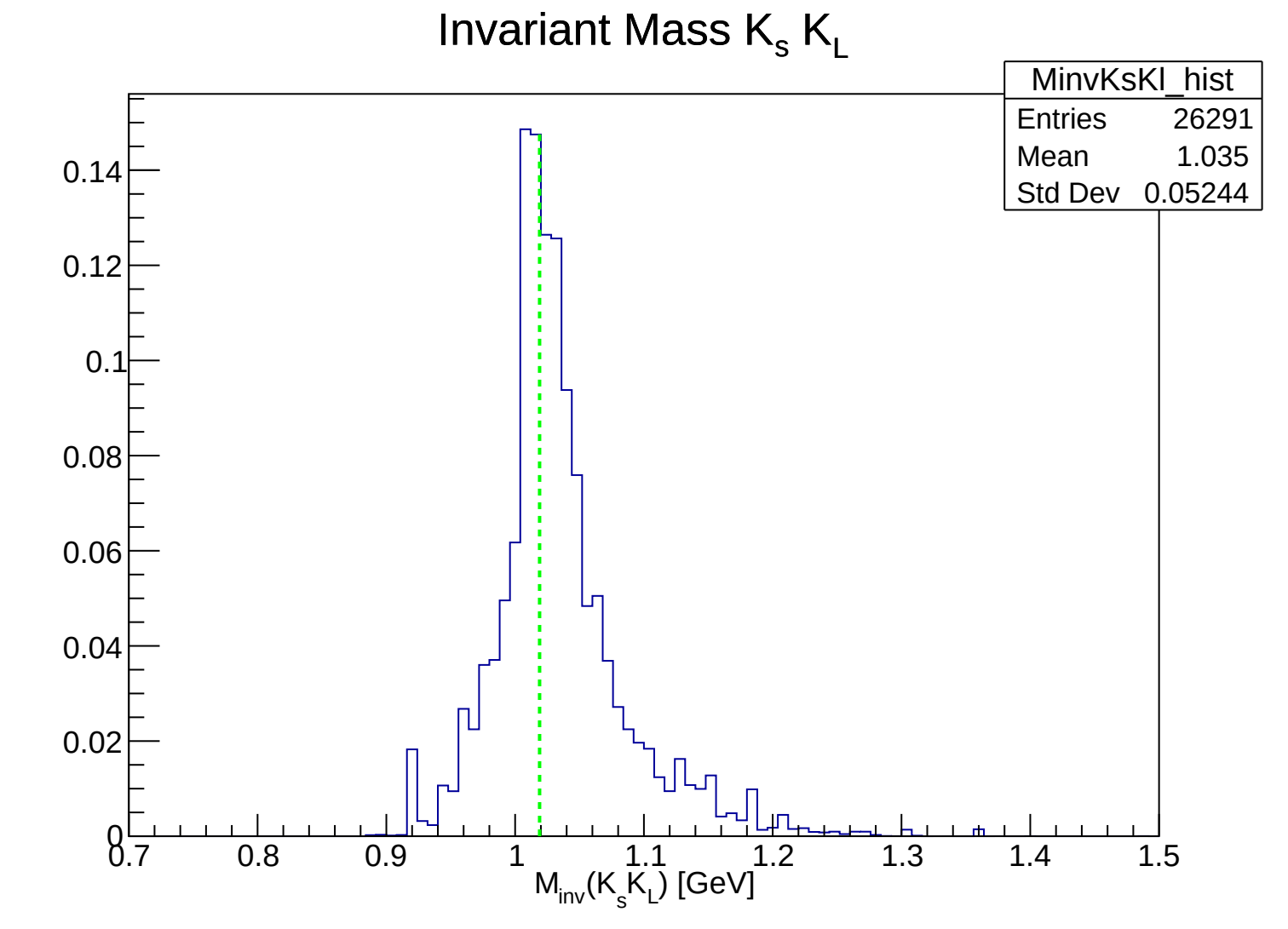
- Replace the cut on missing mass by the cut on invariant mass pi+ pi- :

$0.3 < M_{inv} < 0.6$ GeV


Missing Mass with cut on M inv of π+π-
MissingMass_hist2
Entries 31150
Mean 0.528
Std Dev 0.1352
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
MissingMass [GeV]

Summary of cuts for the next plots:

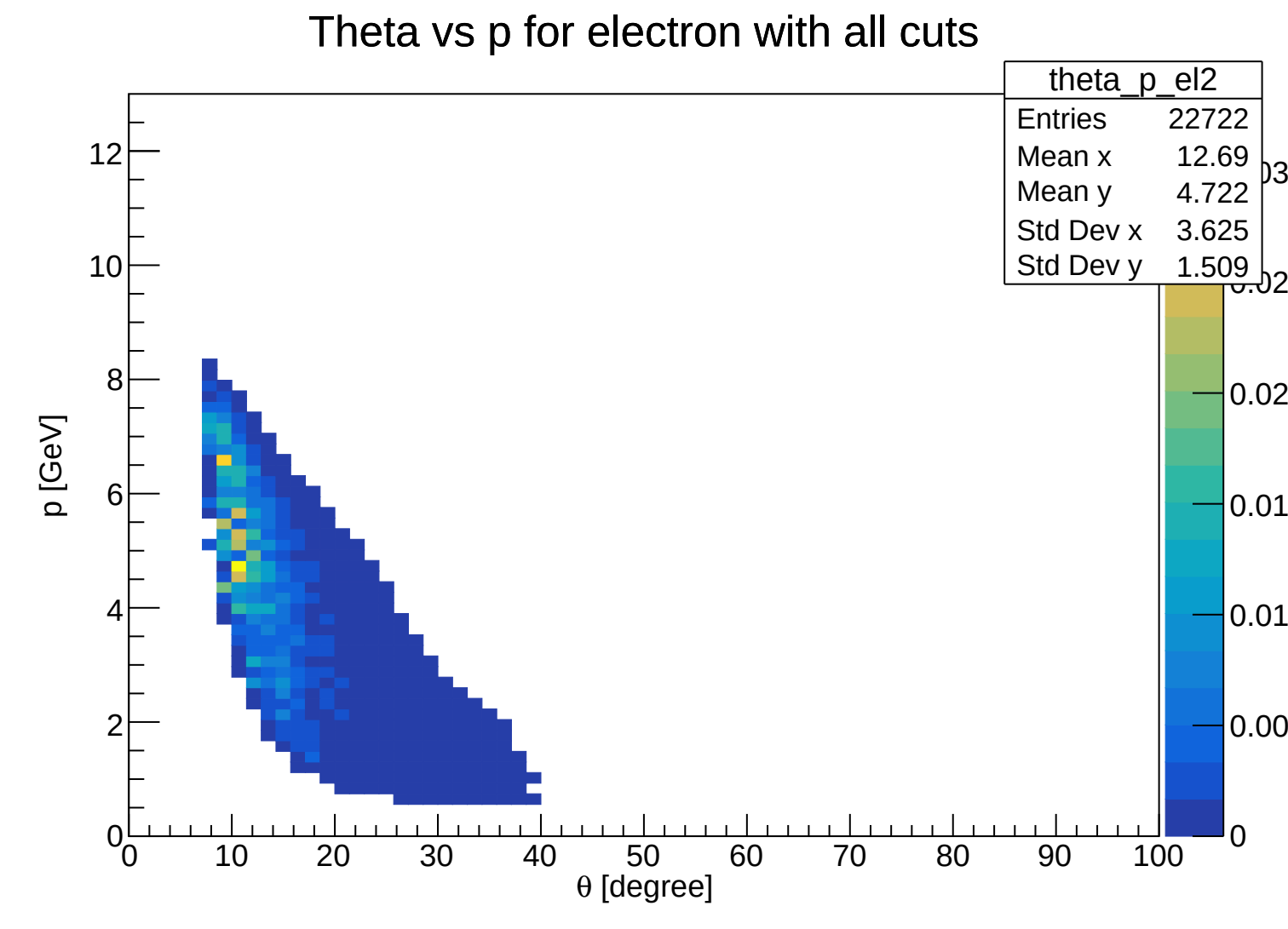
- both cut are present (in invariant mass pi+ pi- and missing mass)

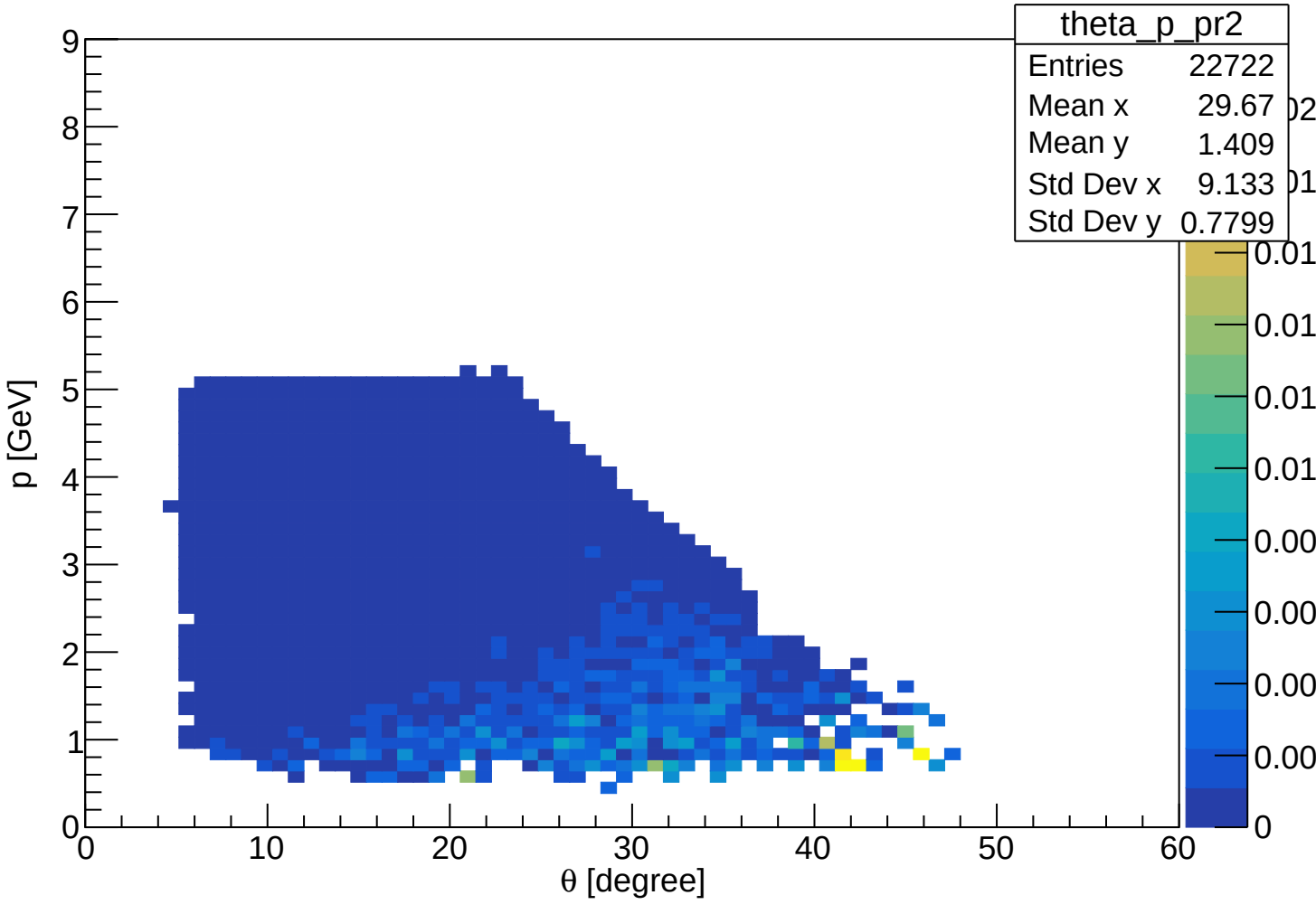

Invariant Mass K_s K_L
MinvKsKl_hist
Entries 26291
Mean 1.035
Std Dev 0.05244
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5
$M_{inv}(K_s K_L)$ [GeV]

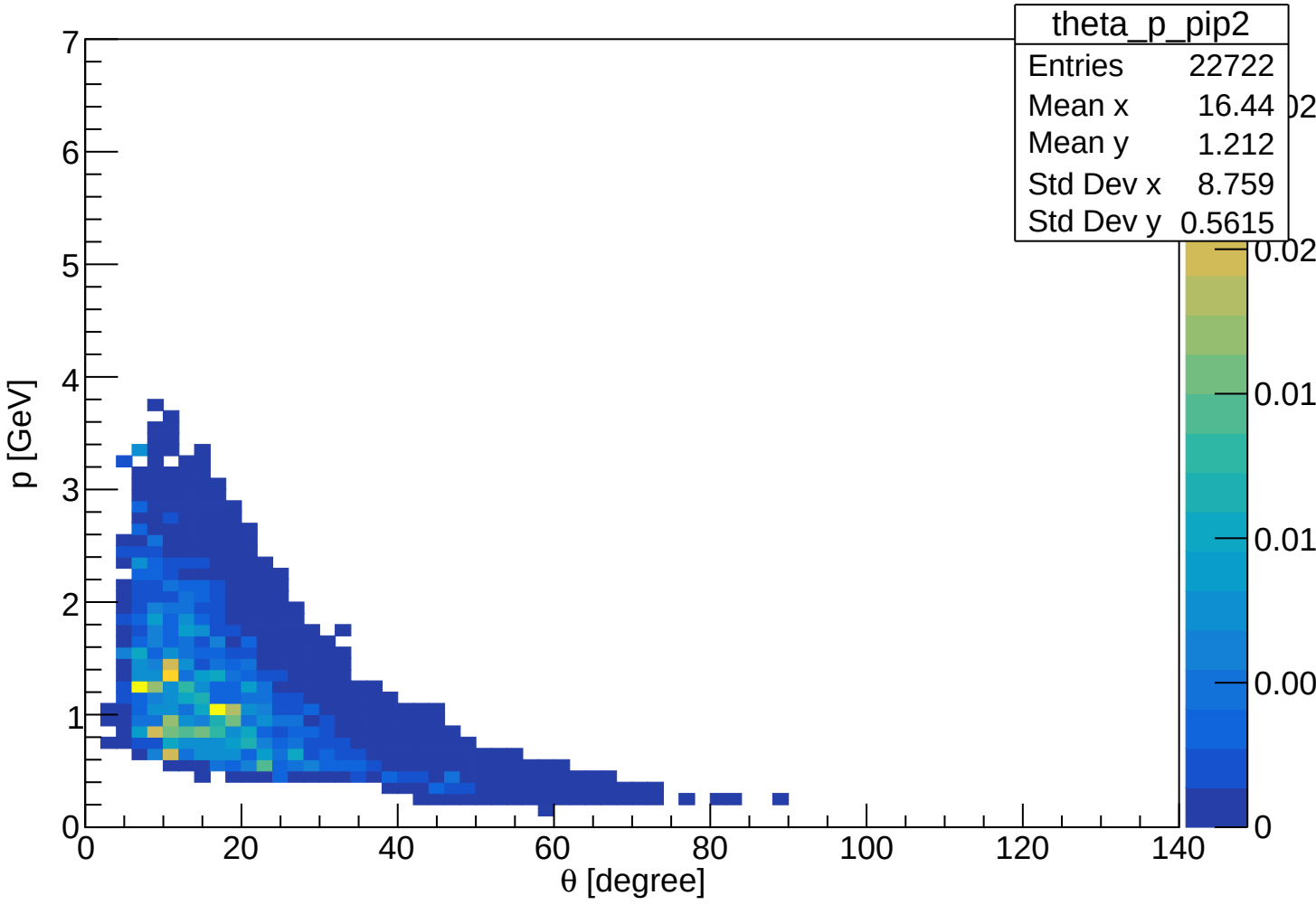
Summary of cuts for the next plots:

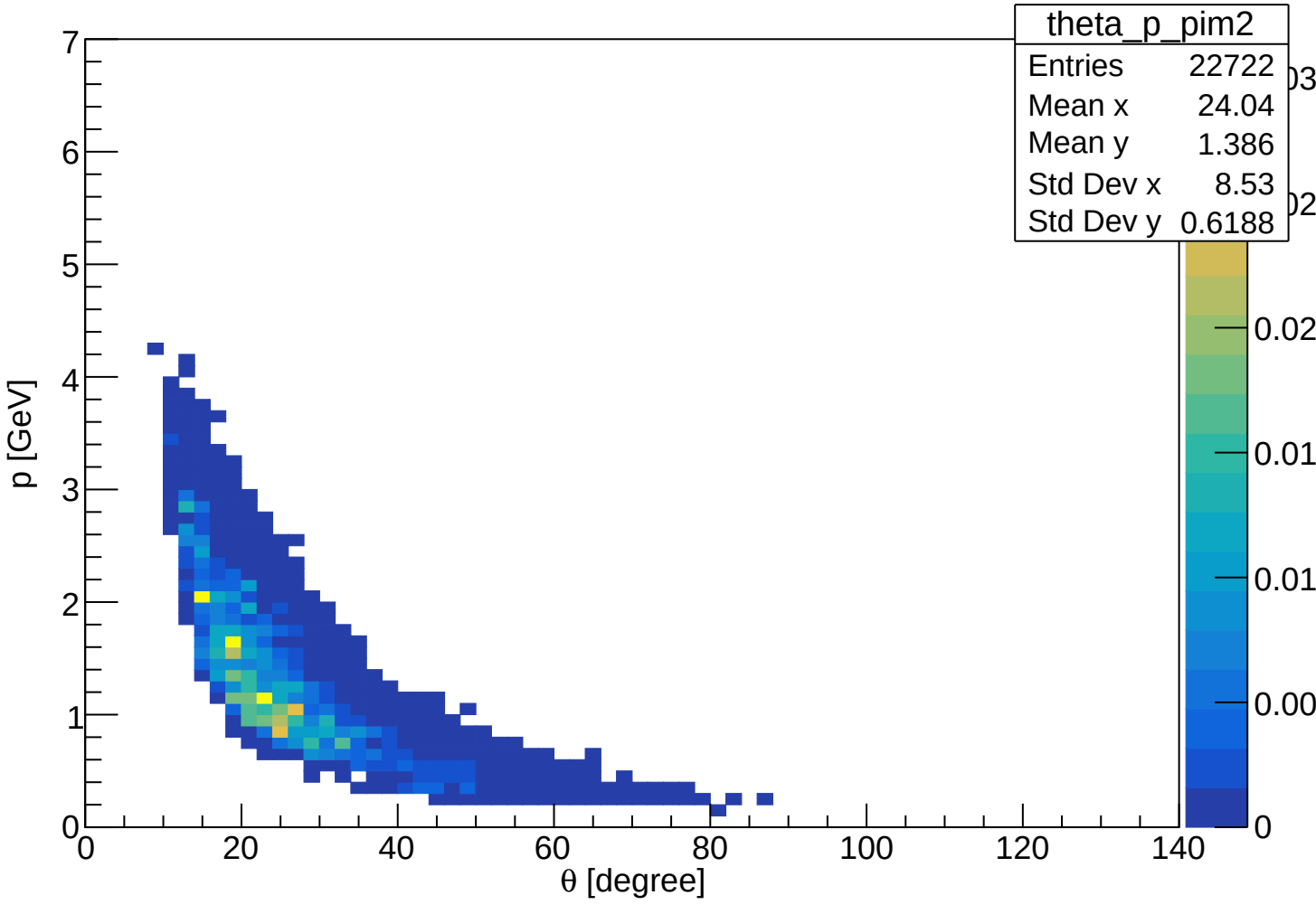
- All cuts (like invariant mass pi+ pi- and missing mass) + 0.8 < M_{ϕ} < 1.2 G

objective : see where the particles reconstructed as a phi went


Theta vs p for electron with all cuts
theta_p_el2
Entries 22722
Mean x 12.69
Mean y 4.722
Std Dev x 3.625
Std Dev y 1.509
p [GeV]
θ [degree]
0
2
4
6
8
10
12
0
10
20
30
40
50
60
70
80
90
100
0.02
0.02
0.01
0.01
0.00
0


Theta vs p for proton with all cuts
theta_p_pr2
Entries 22722
Mean x 29.67
Mean y 1.409
Std Dev x 9.133
Std Dev y 0.7799
p [GeV]
θ [degree]
0
10
20
30
40
50
60
1
2
3
4
5
6
7
8
9
0.01
0.01
0.01
0.01
0.00
0.00
0.00
0.00
0


Theta vs p for π+ with all cuts
theta_p_pip2
Entries 22722
Mean x 16.44
Mean y 1.212
Std Dev x 8.759
Std Dev y 0.5615
p [GeV]
θ [degree]
0
20
40
60
80
100
120
140
1
2
3
4
5
6
7
0.02
0.01
0.01
0.00
0


Theta vs p for π⁻ with all cuts
theta_p_pim2
Entries 22722
Mean x 24.04
Mean y 1.386
Std Dev x 8.53
Std Dev y 0.6188
p [GeV]
θ [degree]
0
1
2
3
4
5
6
7
0
20
40
60
80
100
120
140
0.02
0.01
0.01
0.00
0