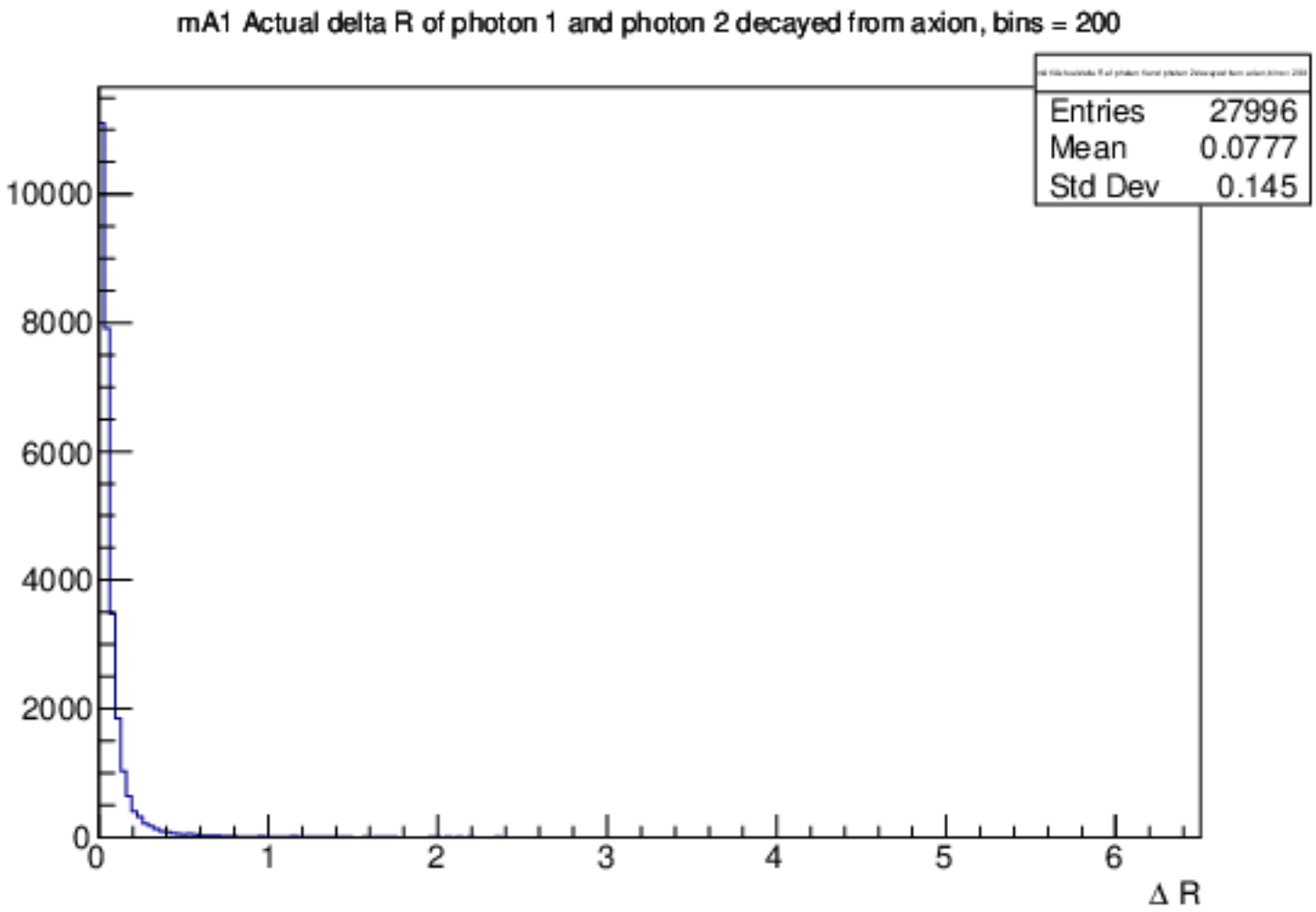
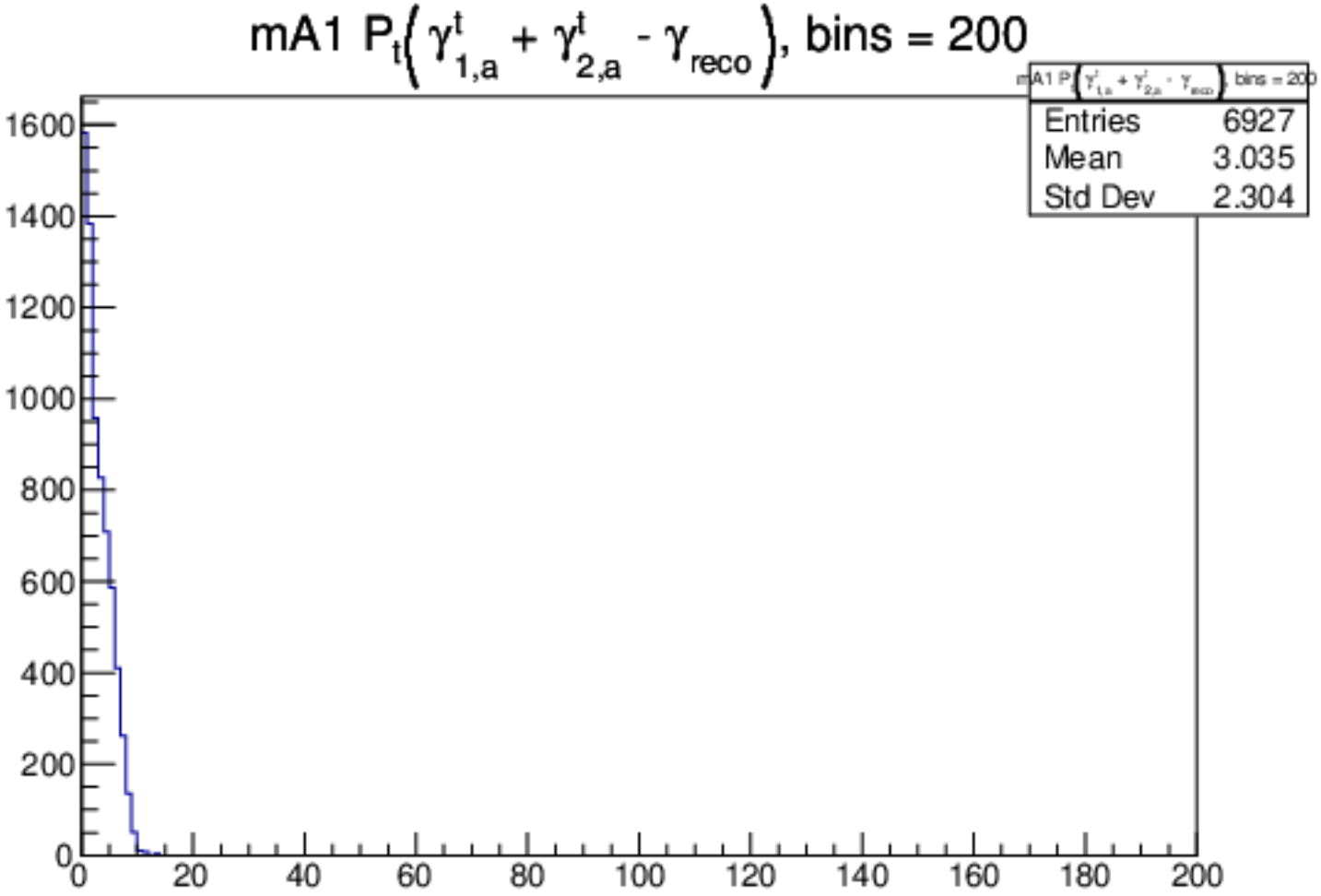
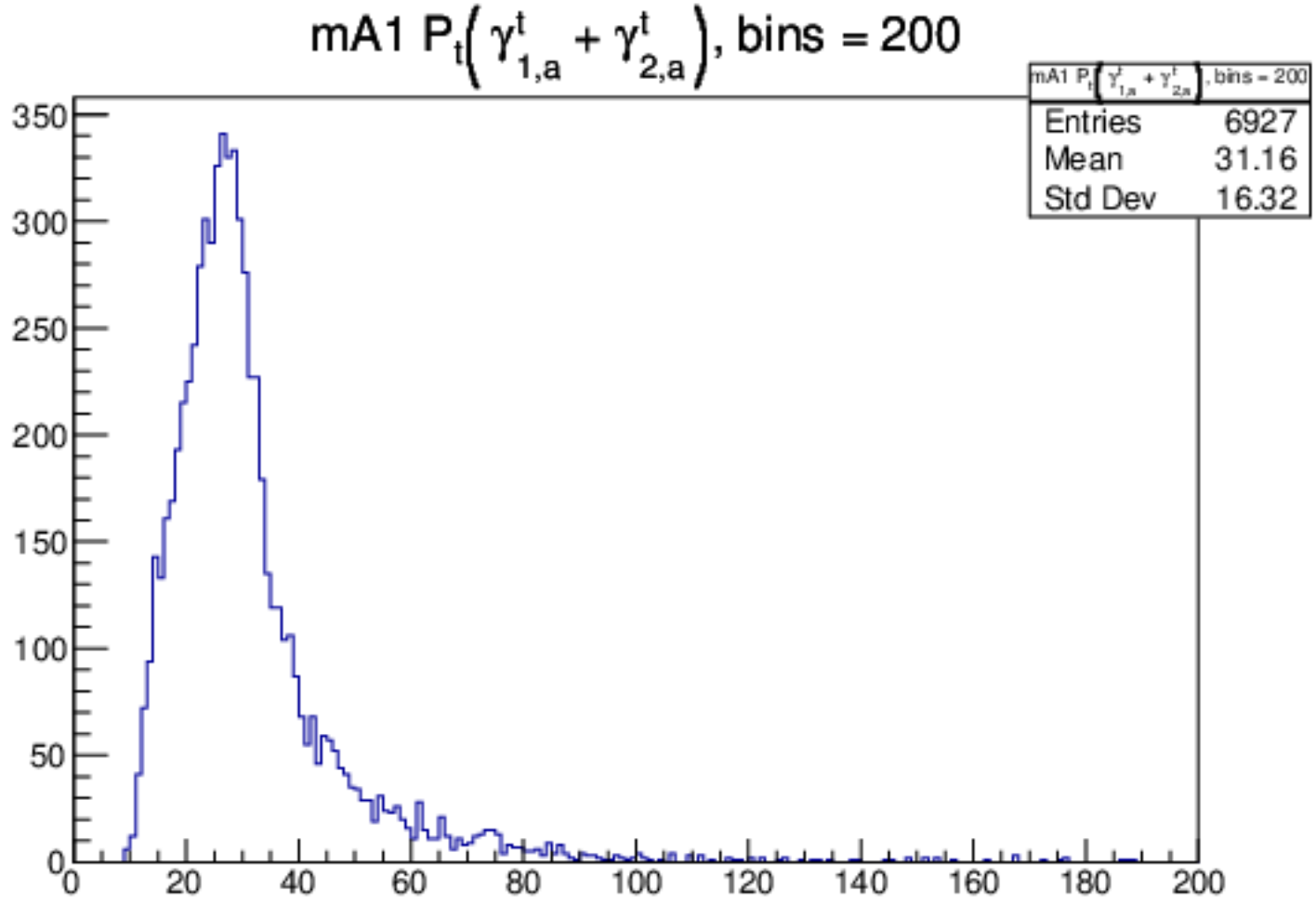
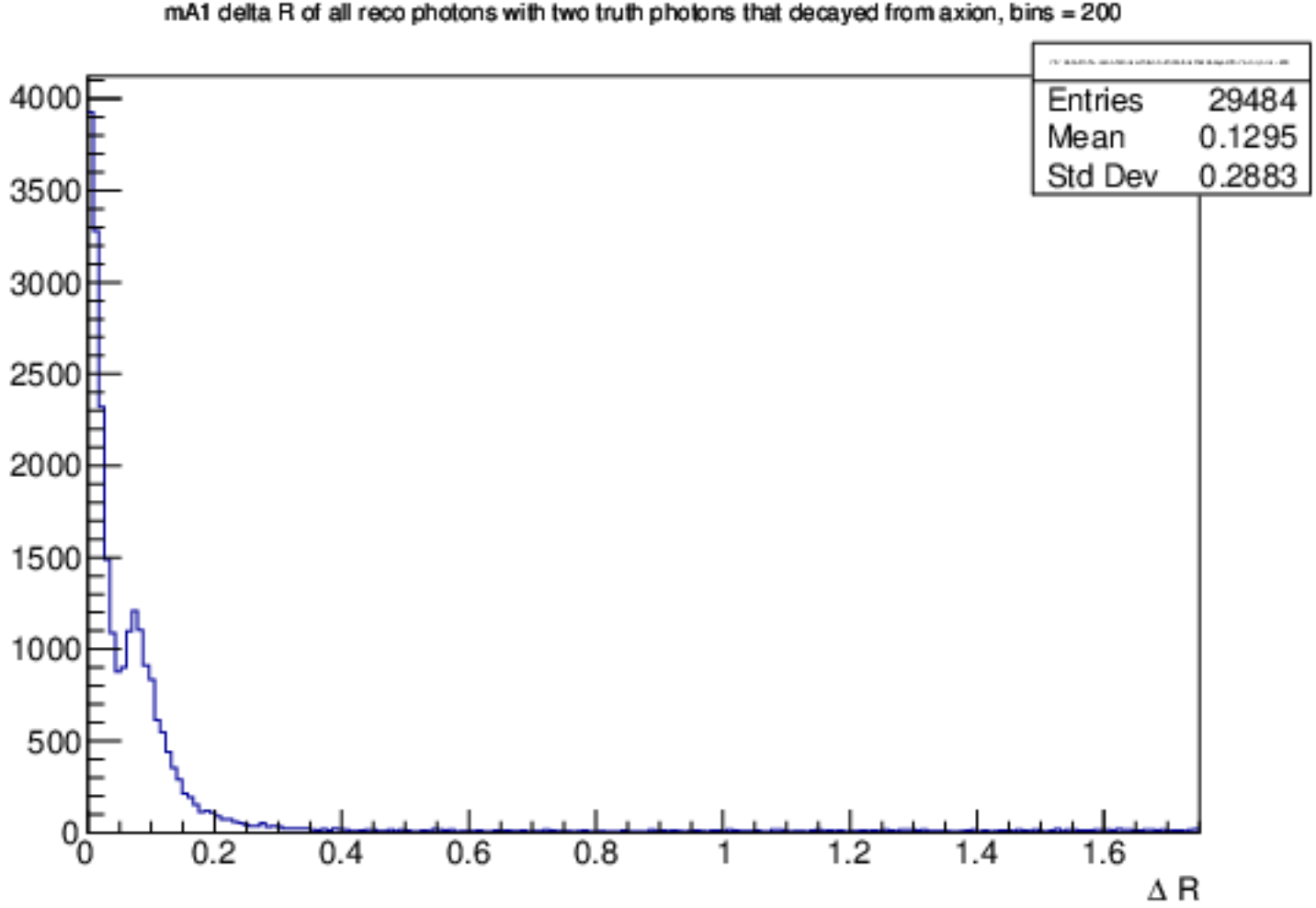
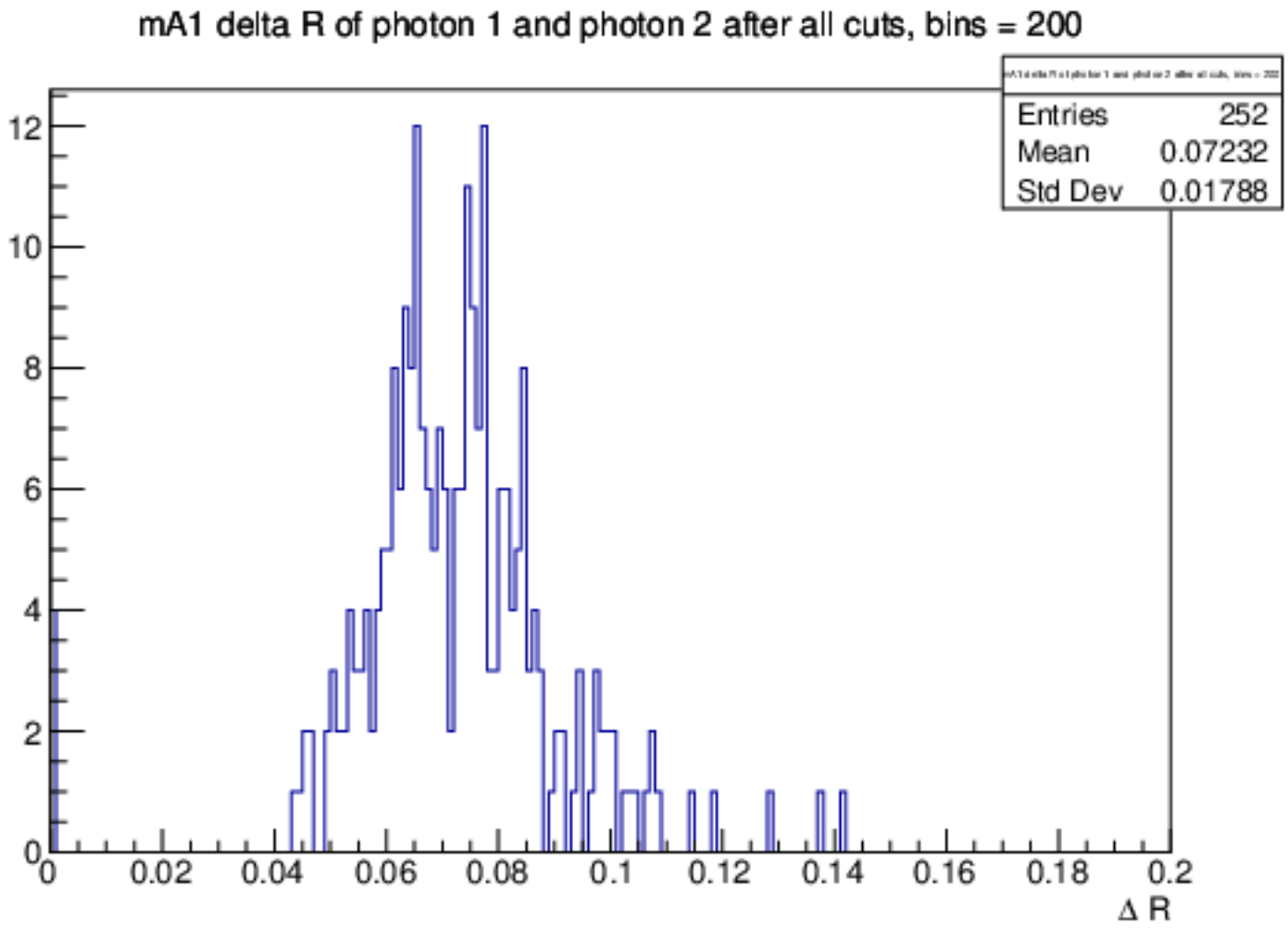
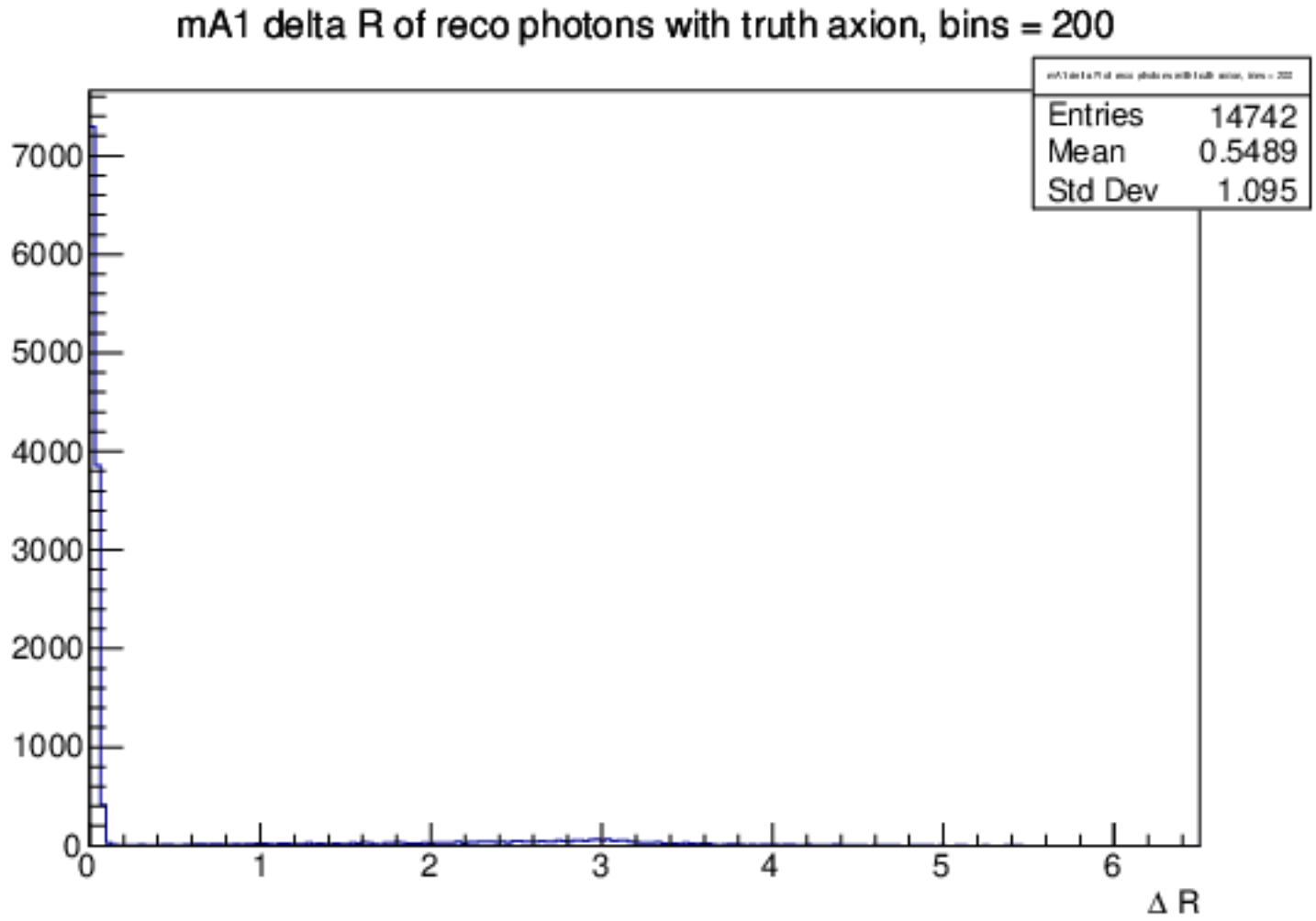

mA1 Actual delta R of photon 1 and photon 2 decayed from axion, bins = 200
Entries 27996
Mean 0.0777
Std Dev 0.145
10000
8000
6000
4000
2000
0
0
1
2
3
4
5
6
Δ R

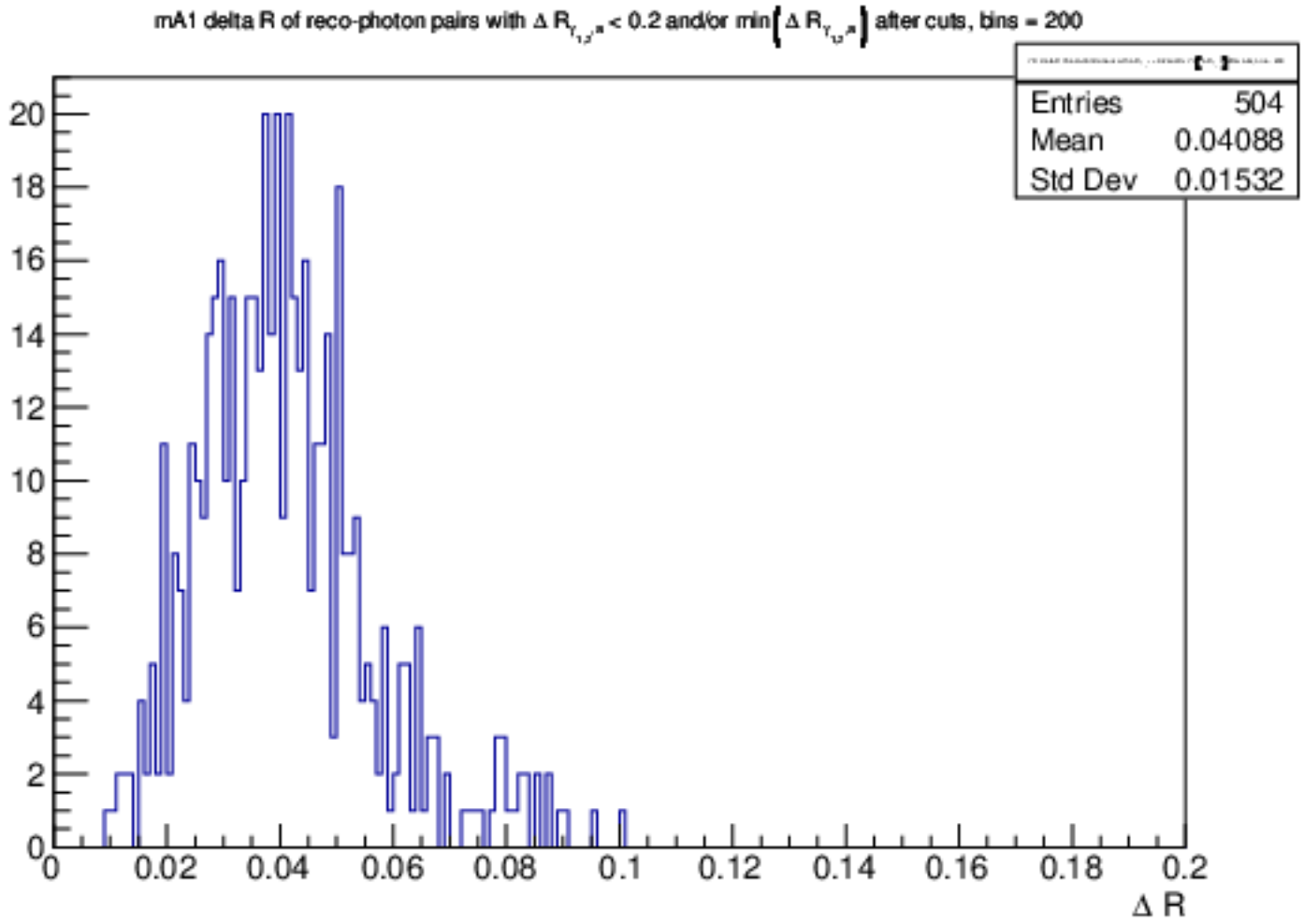

mA1 $P_t\left(\gamma^t_{1,a} + \gamma^t_{2,a} - \gamma_{reco}\right)$, bins = 200
Entries 6927
Mean 3.035
Std Dev 2.304
1600
1400
1200
1000
800
600
400
200
0
0
20
40
60
80
100
120
140
160
180
200

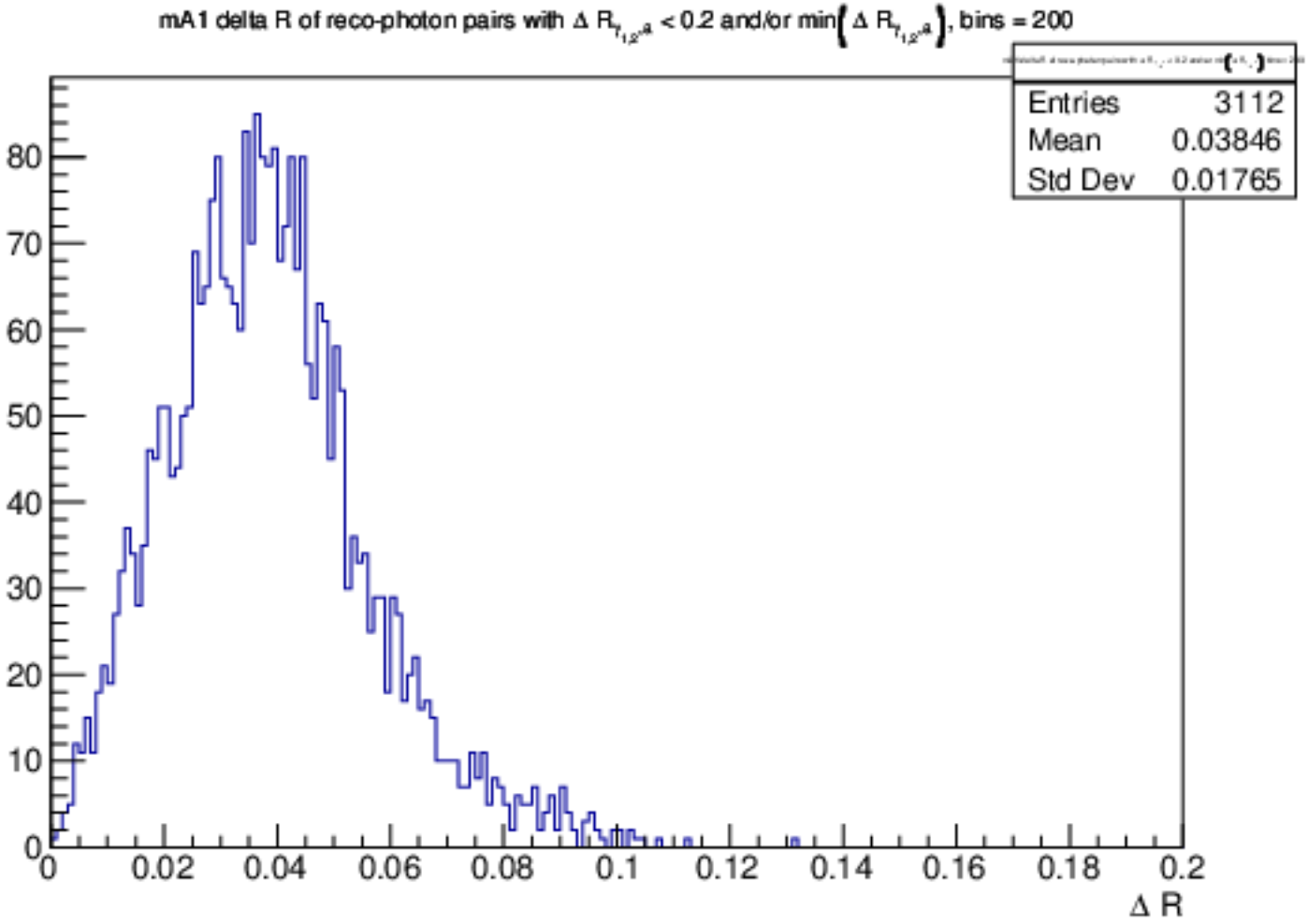

mA1 $P_t\left(\gamma^t_{1,a} + \gamma^t_{2,a}\right)$, bins = 200
mA1 $P_t\left(\gamma^t_{1,a} + \gamma^t_{2,a}\right)$, bins = 200
Entries 6927
Mean 31.16
Std Dev 16.32
350
300
250
200
150
100
50
0
0
20
40
60
80
100
120
140
160
180
200

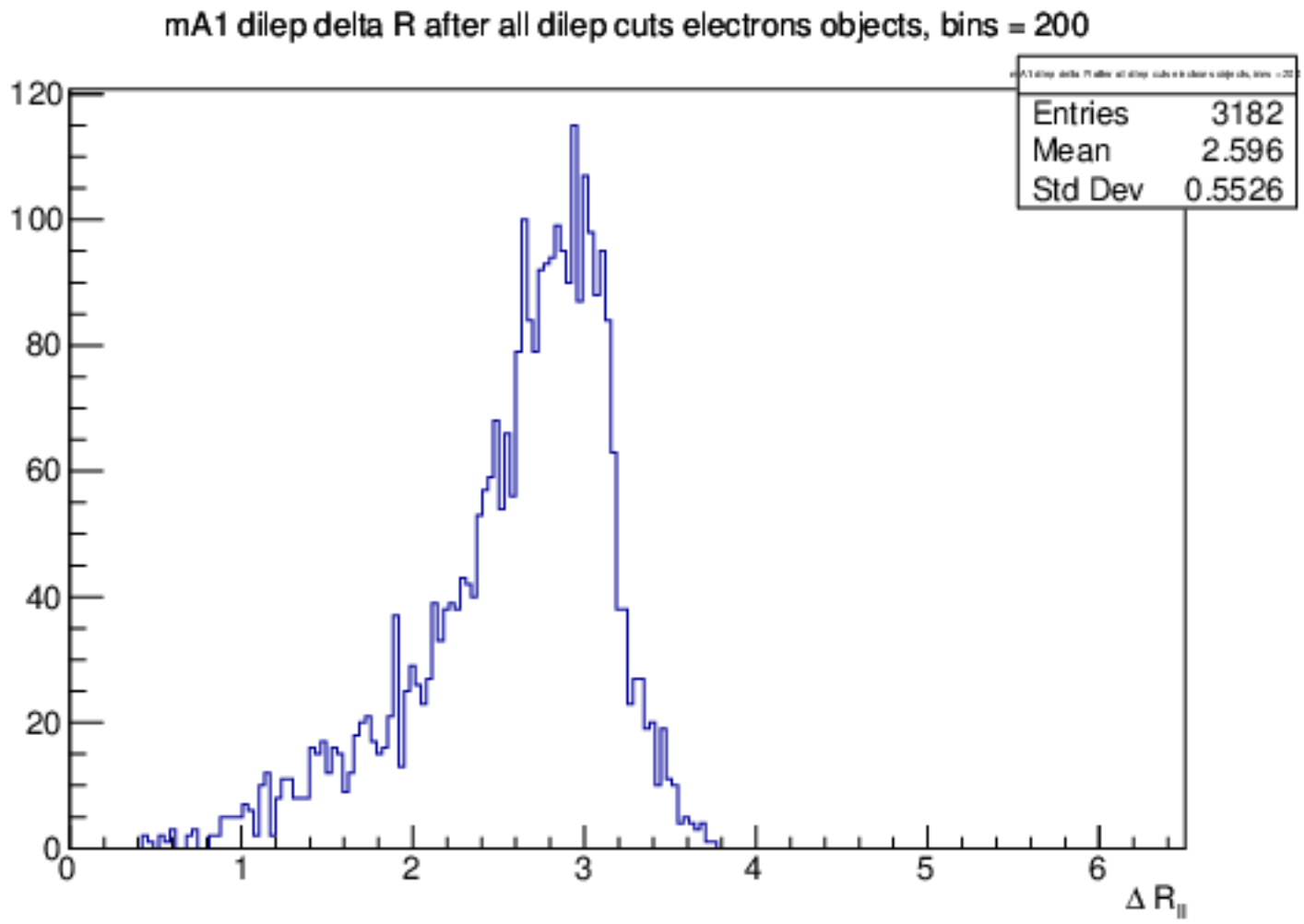

mA1 delta R of all reco photons with two truth photons that decayed from axion, bins = 200
Entries 29484
Mean 0.1295
Std Dev 0.2883
4000
3500
3000
2500
2000
1500
1000
500
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
Δ R

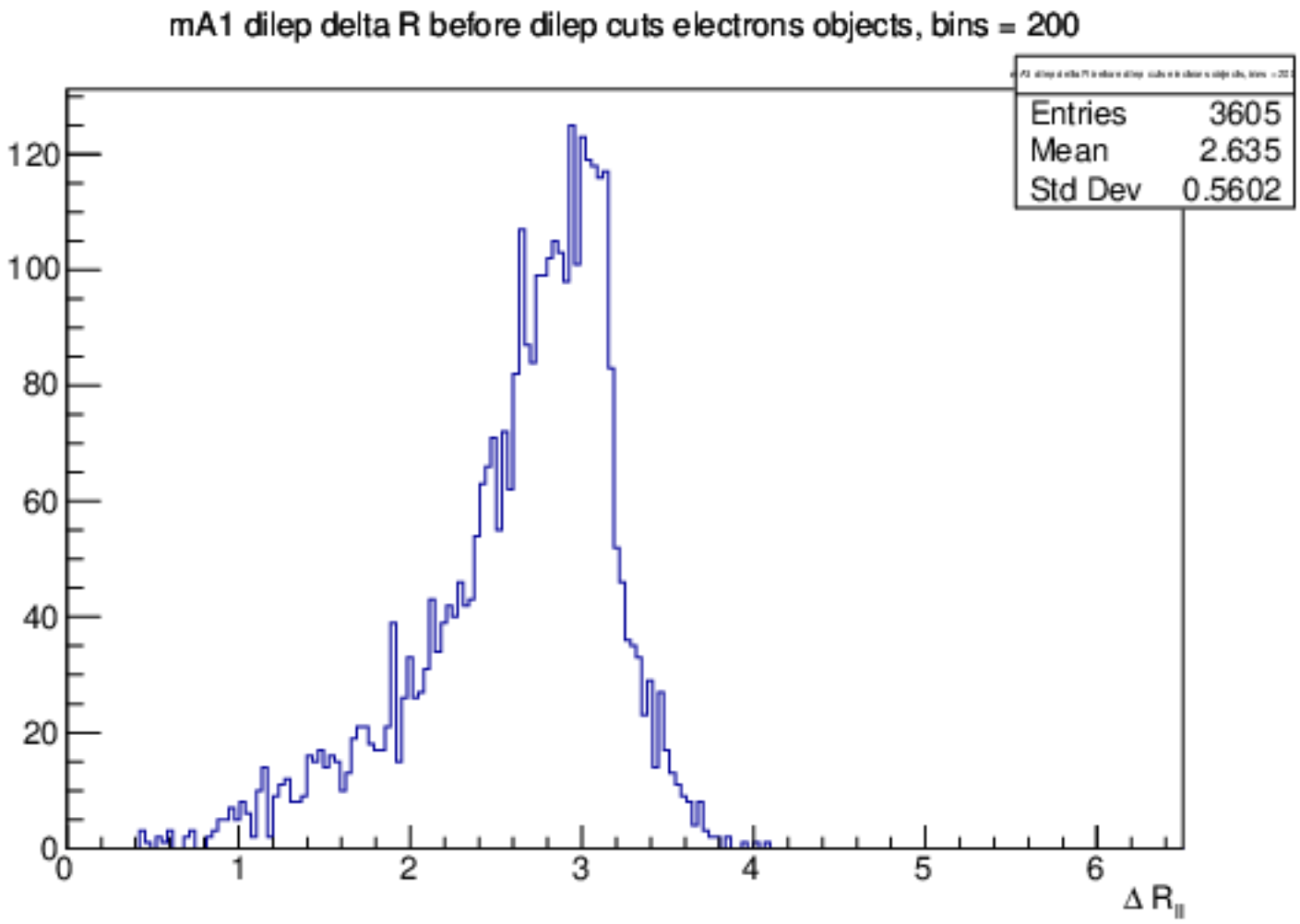

mA1 delta R of photon 1 and photon 2 after all cuts, bins = 200
Entries 252
Mean 0.07232
Std Dev 0.01788
0
2
4
6
8
10
12
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Δ R

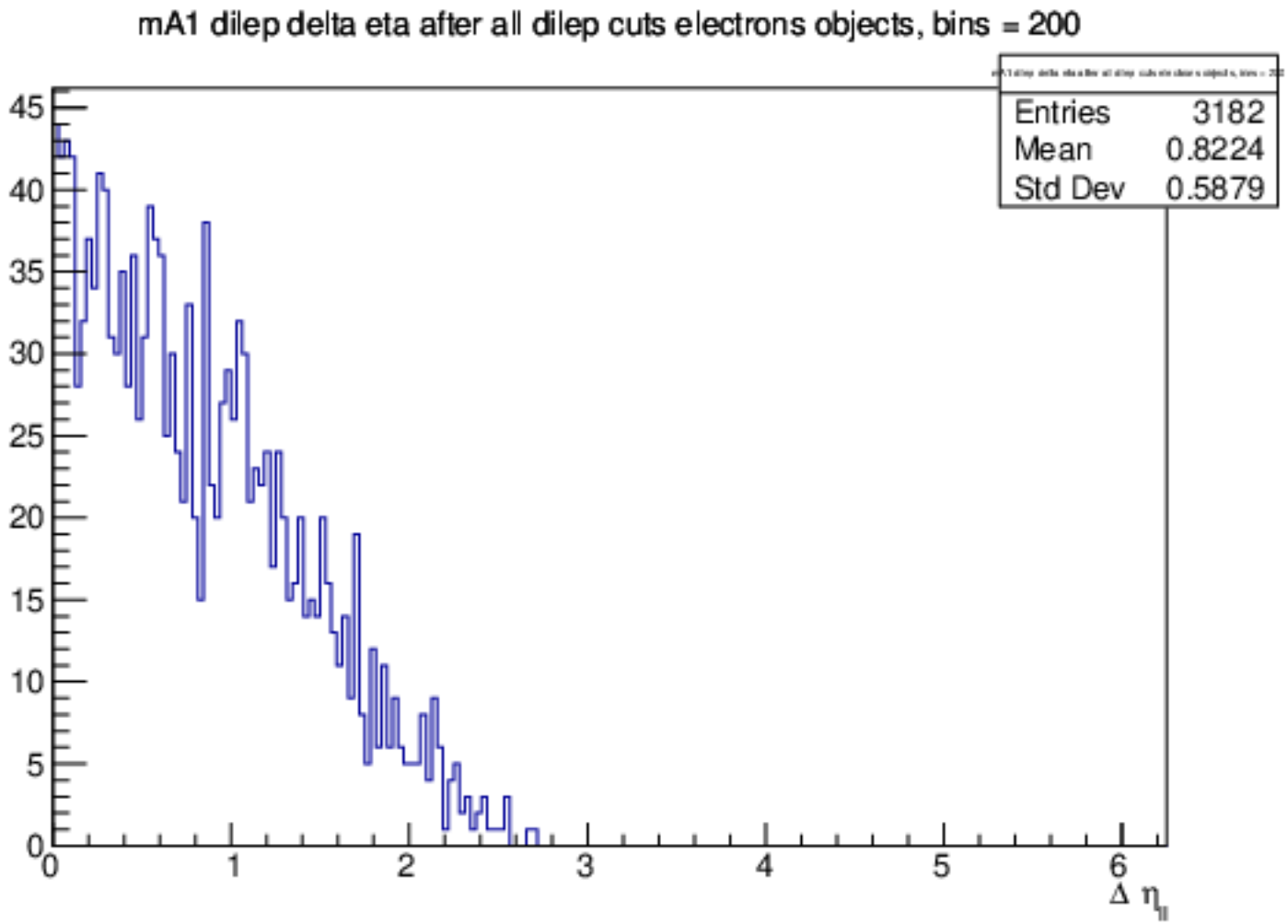

mA1 delta R of reco photons with truth axion, bins = 200
Entries 14742
Mean 0.5489
Std Dev 1.095
7000
6000
5000
4000
3000
2000
1000
0
0
1
2
3
4
5
6
Δ R

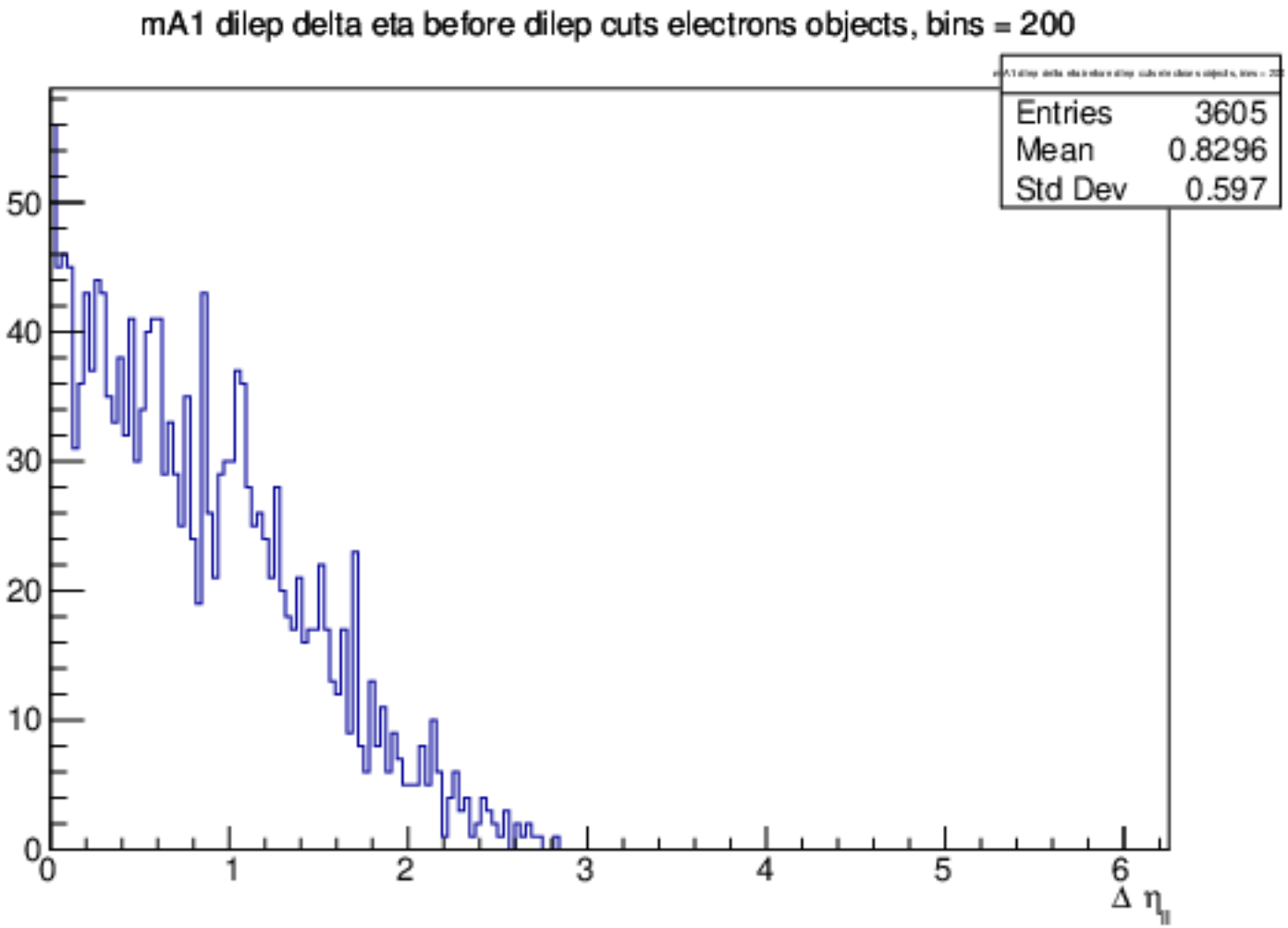

mA1 delta R of reco-photon pairs with Δ R < 0.2 and/or min(Δ R) after cuts, bins = 200
Entries 504
Mean 0.04088
Std Dev 0.01532
0
2
4
6
8
10
12
14
16
18
20
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Δ R

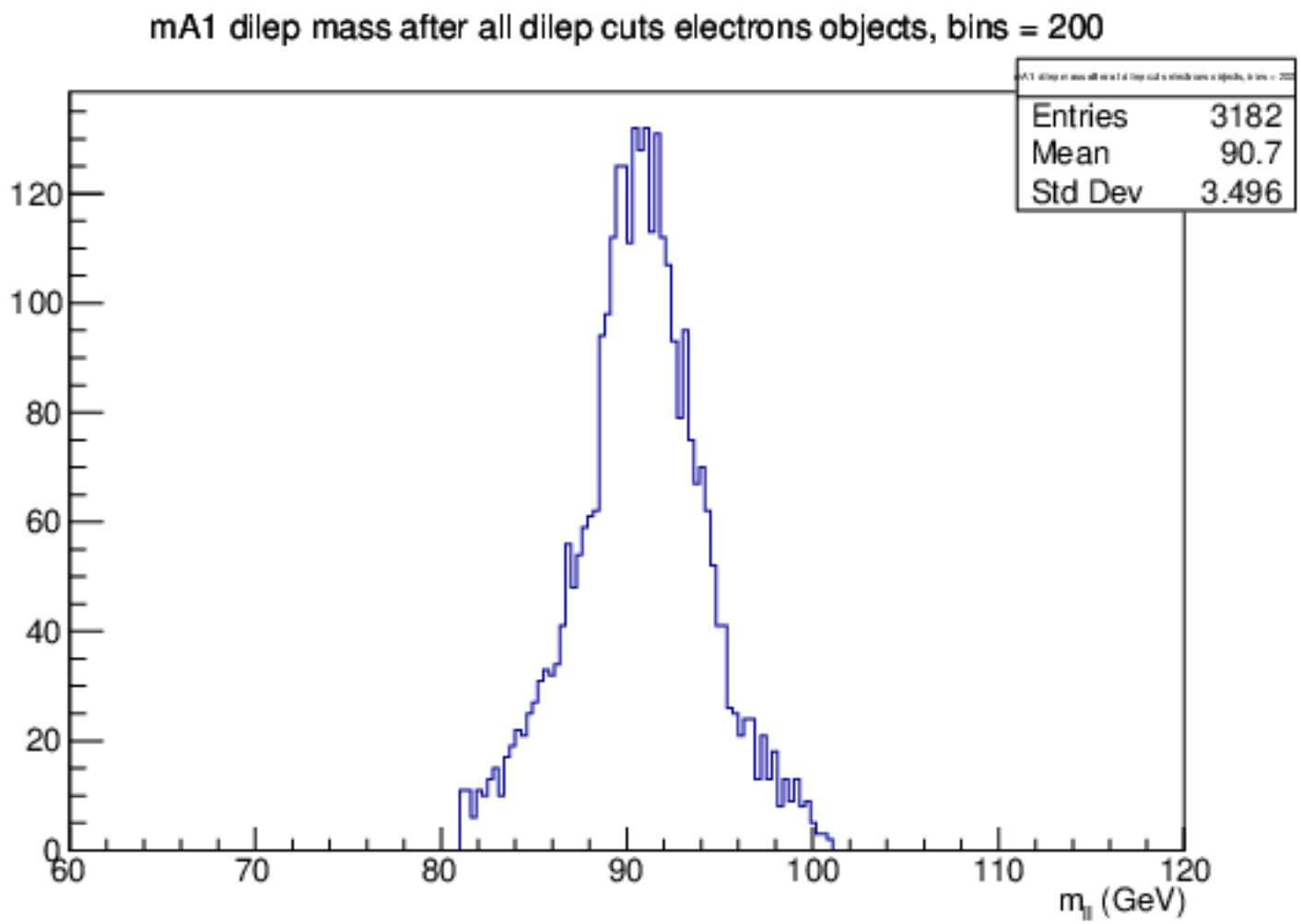

mA1 delta R of reco-photon pairs with Δ R_{γ1,2;a} < 0.2 and/or min(Δ R_{γ1,2;a}), bins = 200
Entries 3112
Mean 0.03846
Std Dev 0.01765
0
10
20
30
40
50
60
70
80
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Δ R

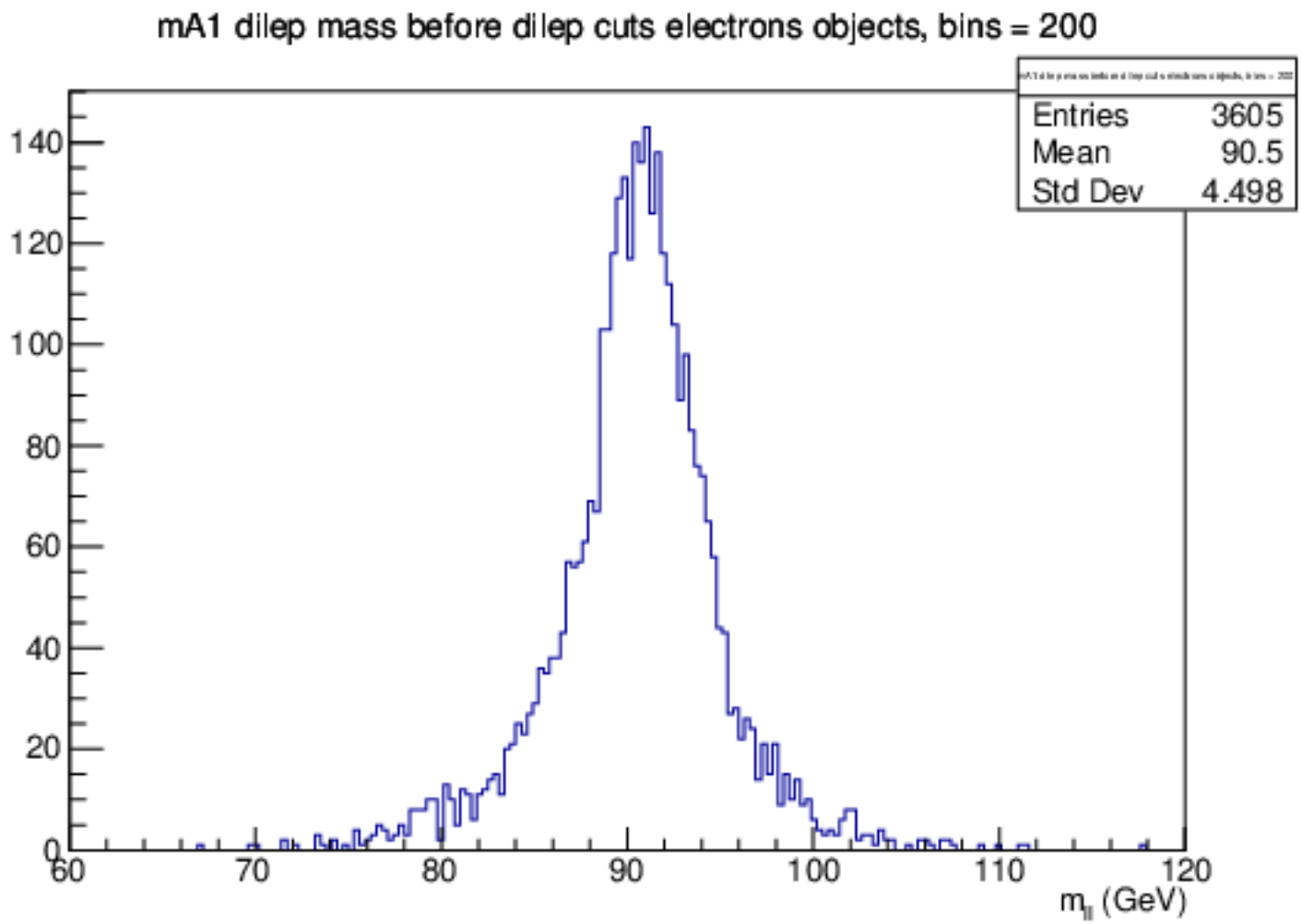

mA1 dilep delta R after all dilep cuts electrons objects, bins = 200
Entries 3182
Mean 2.596
Std Dev 0.5526
120
100
80
60
40
20
0
0
1
2
3
4
5
6
Δ R_ll

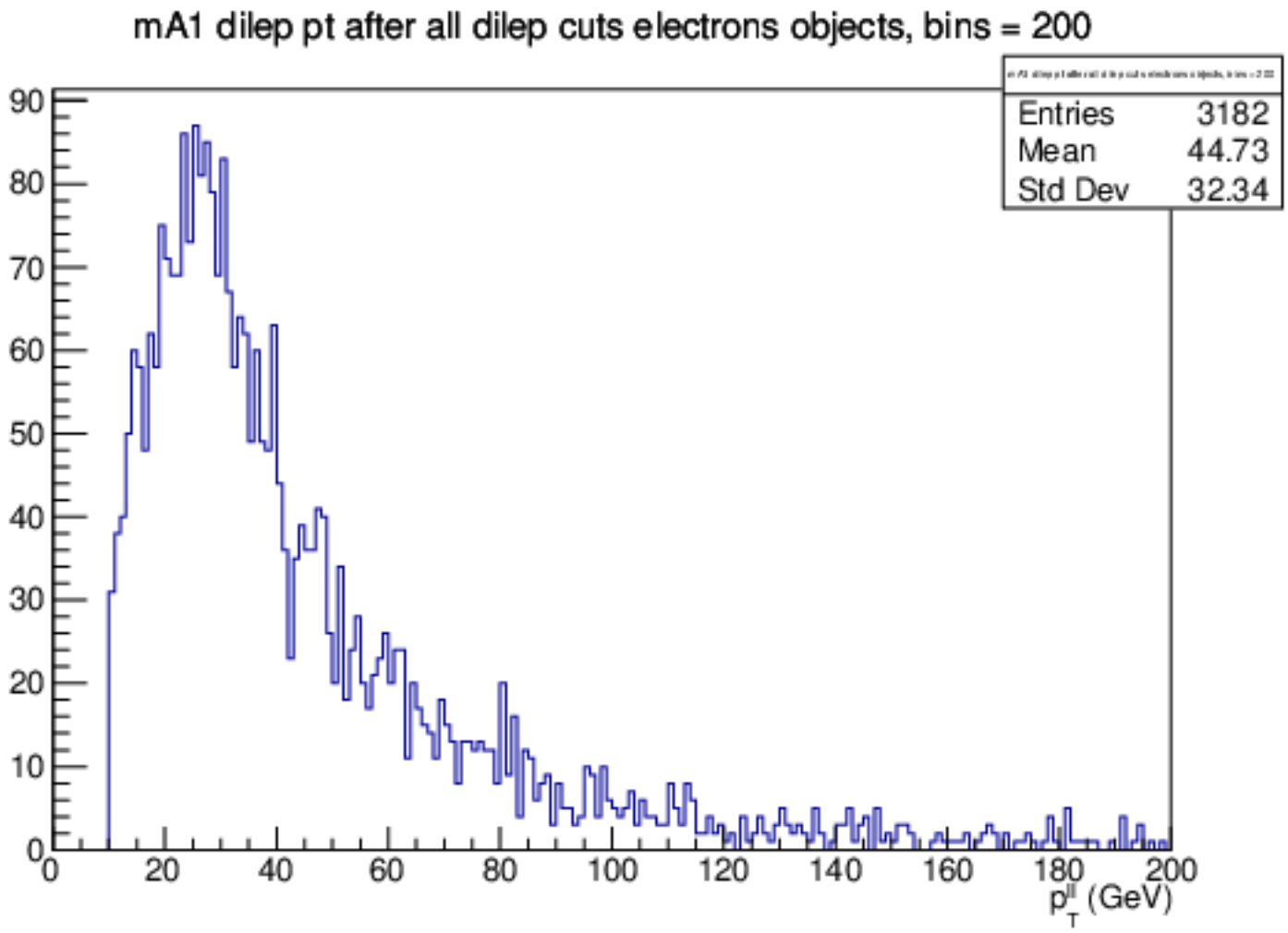

mA1 dilep delta R before dilep cuts electrons objects, bins = 200
Entries 3605
Mean 2.635
Std Dev 0.5602
120
100
80
60
40
20
0
0
1
2
3
4
5
6
Δ R_ll

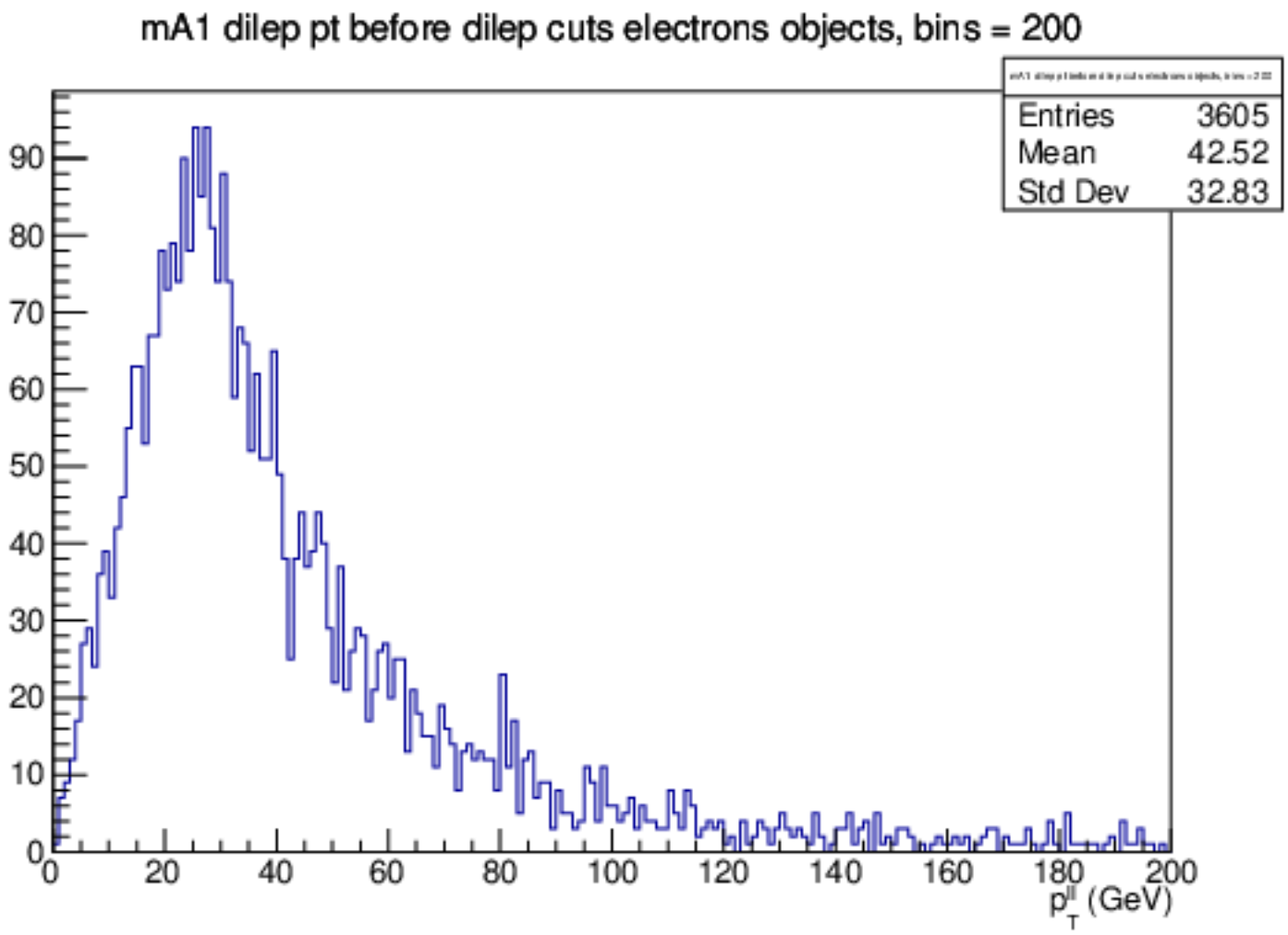

mA1 dilep delta eta after all dilep cuts electrons objects, bins = 200
Entries 3182
Mean 0.8224
Std Dev 0.5879
45
40
35
30
25
20
15
10
5
0
0
1
2
3
4
5
6
Δ η_ll

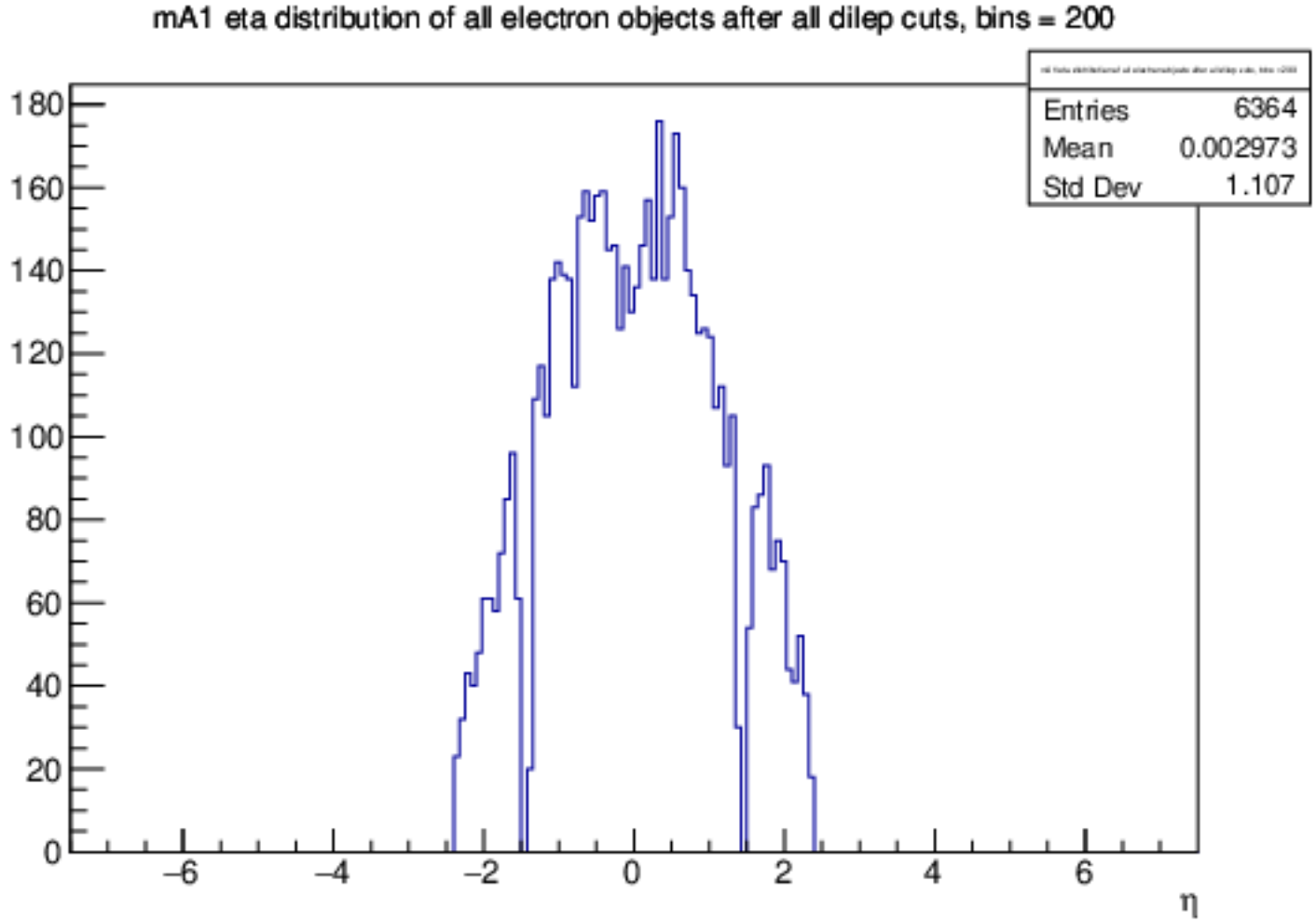

mA1 dilep delta eta before dilep cuts electrons objects, bins = 200
Entries 3605
Mean 0.8296
Std Dev 0.597
50
40
30
20
10
0
0
1
2
3
4
5
6
Δ η_ll

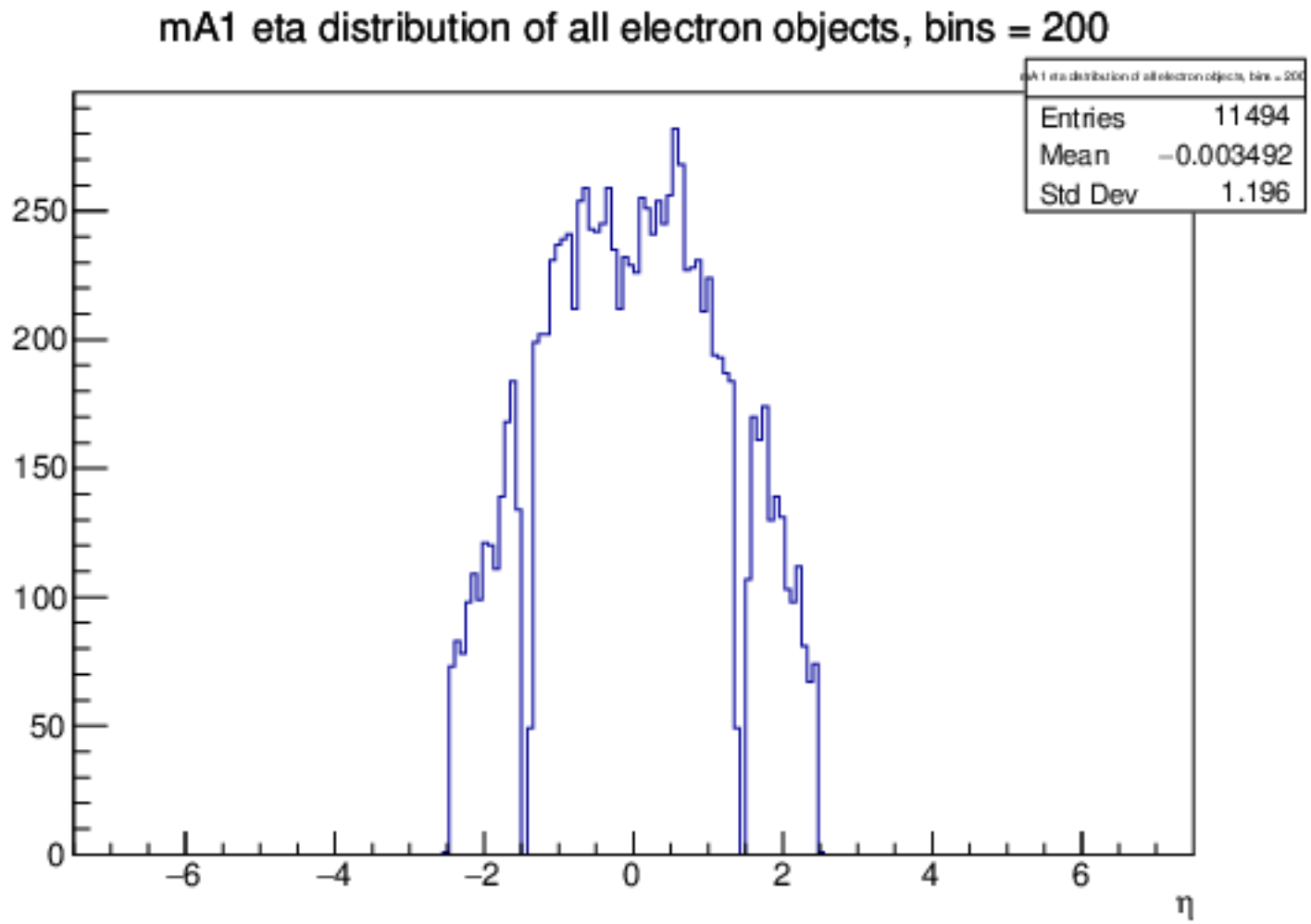

mA1 dilep mass after all dilep cuts electrons objects, bins = 200
Entries 3182
Mean 90.7
Std Dev 3.496
120
100
80
60
40
20
0
60
70
80
90
100
110
120
m_ll (GeV)

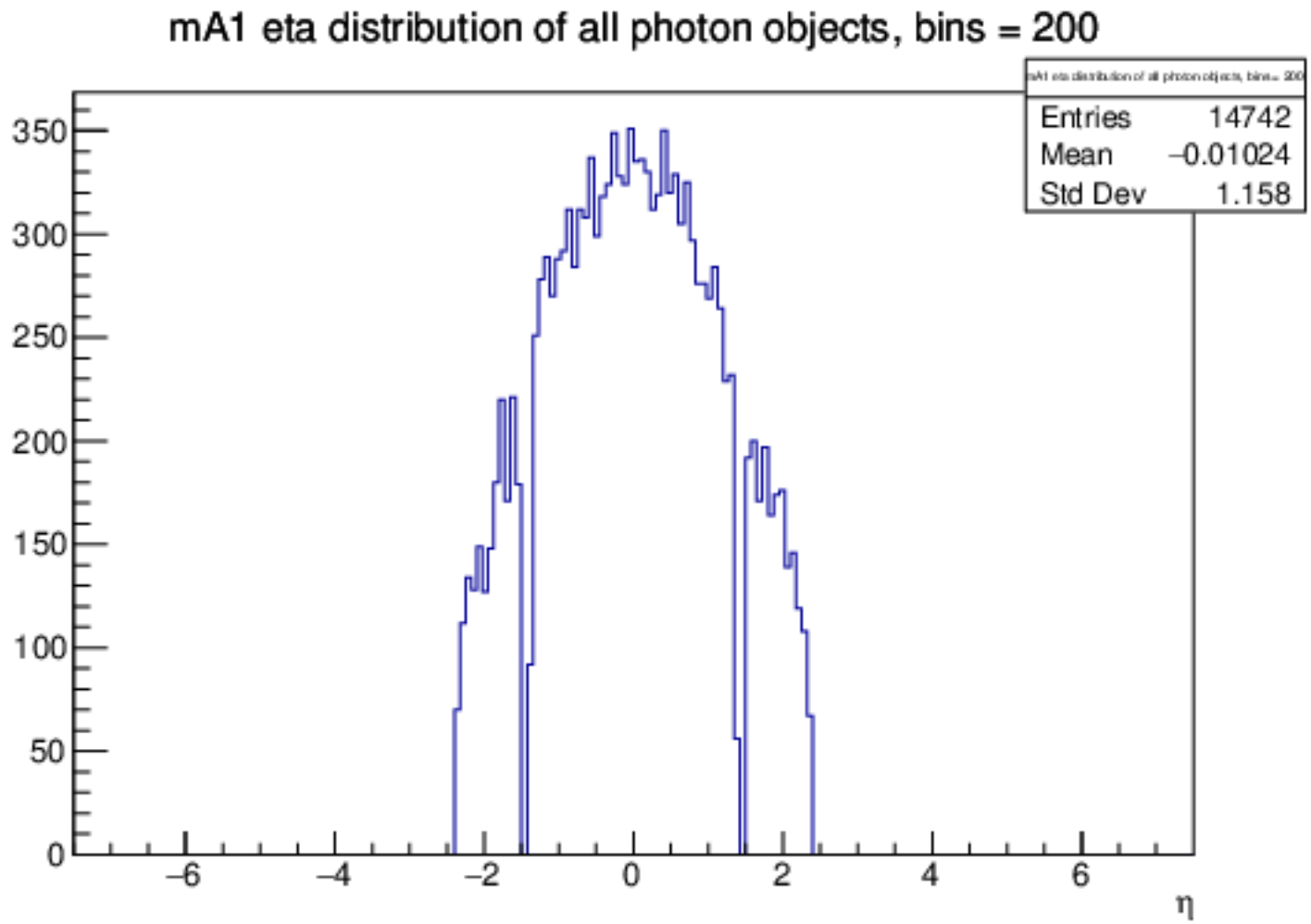

mA1 dilep mass before dilep cuts electrons objects, bins = 200
Entries 3605
Mean 90.5
Std Dev 4.498
140
120
100
80
60
40
20
0
60
70
80
90
100
110
120
m_ll (GeV)

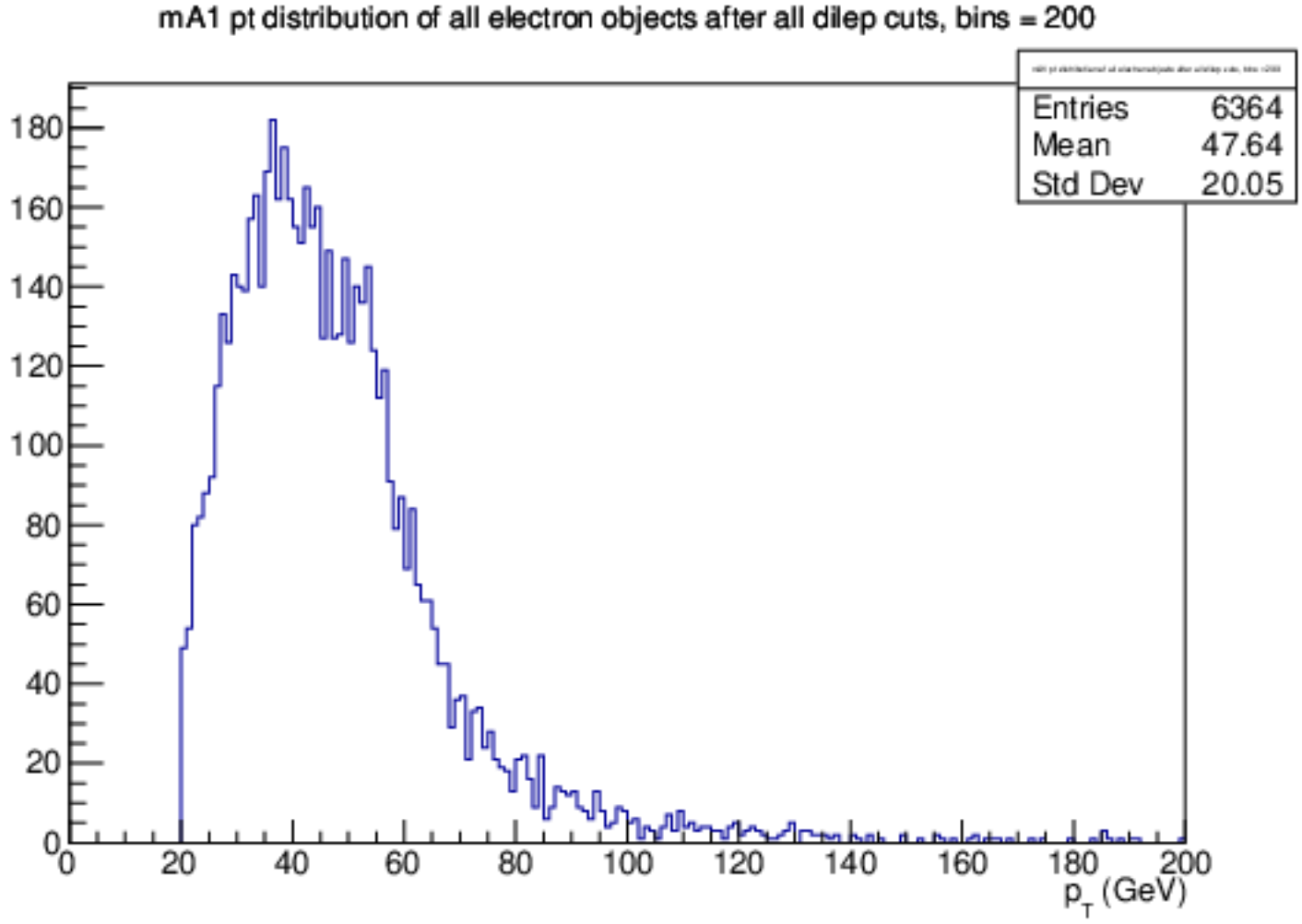

mA1 dilep pt after all dilep cuts electrons objects, bins = 200
Entries 3182
Mean 44.73
Std Dev 32.34
0
10
20
30
40
50
60
70
80
90
0
20
40
60
80
100
120
140
160
180
200
p_T^{ll} (GeV)

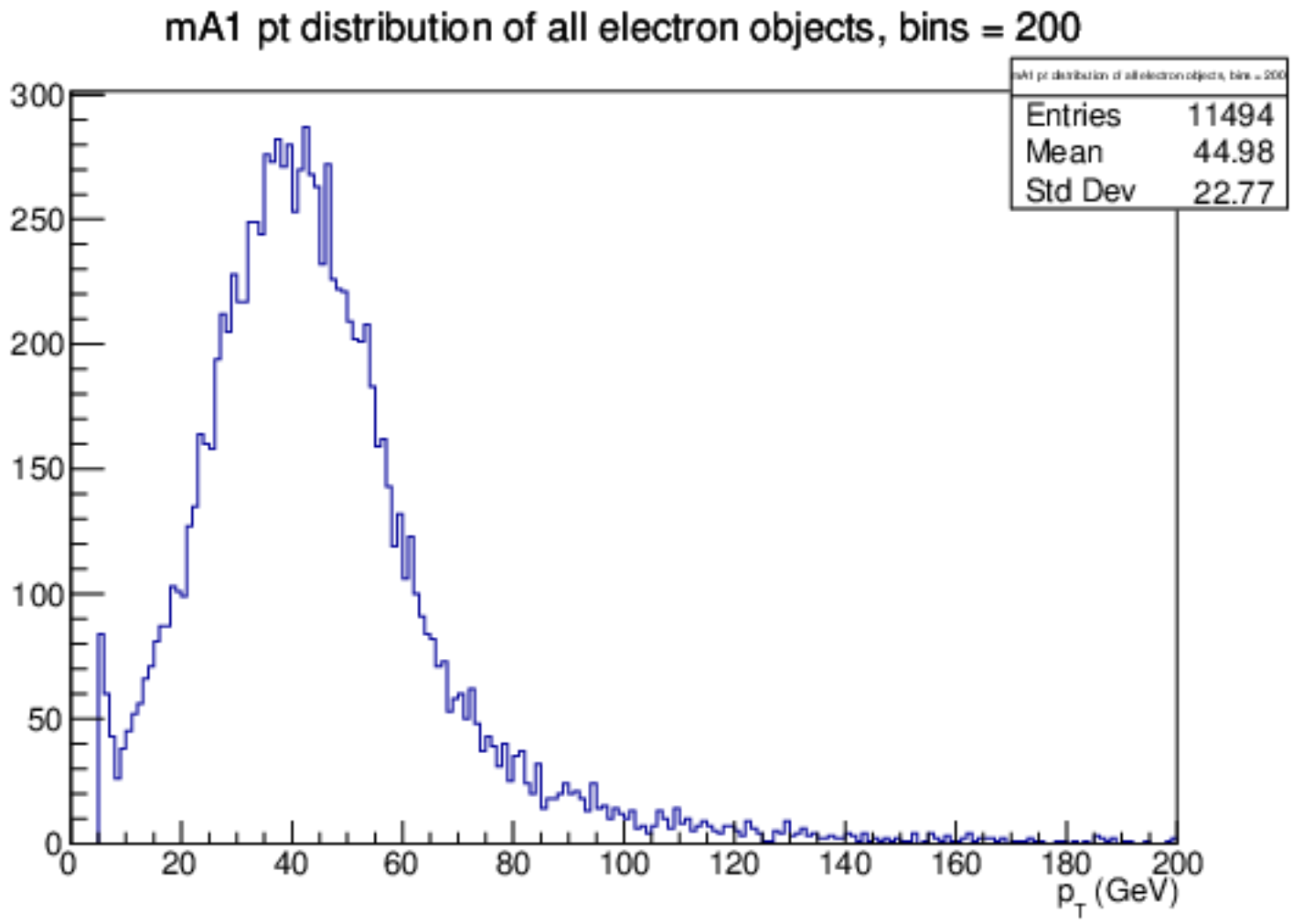

mA1 dilep pt before dilep cuts electrons objects, bins = 200
Entries 3605
Mean 42.52
Std Dev 32.83
0
10
20
30
40
50
60
70
80
90
0
20
40
60
80
100
120
140
160
180
200
p_T^{ll} (GeV)

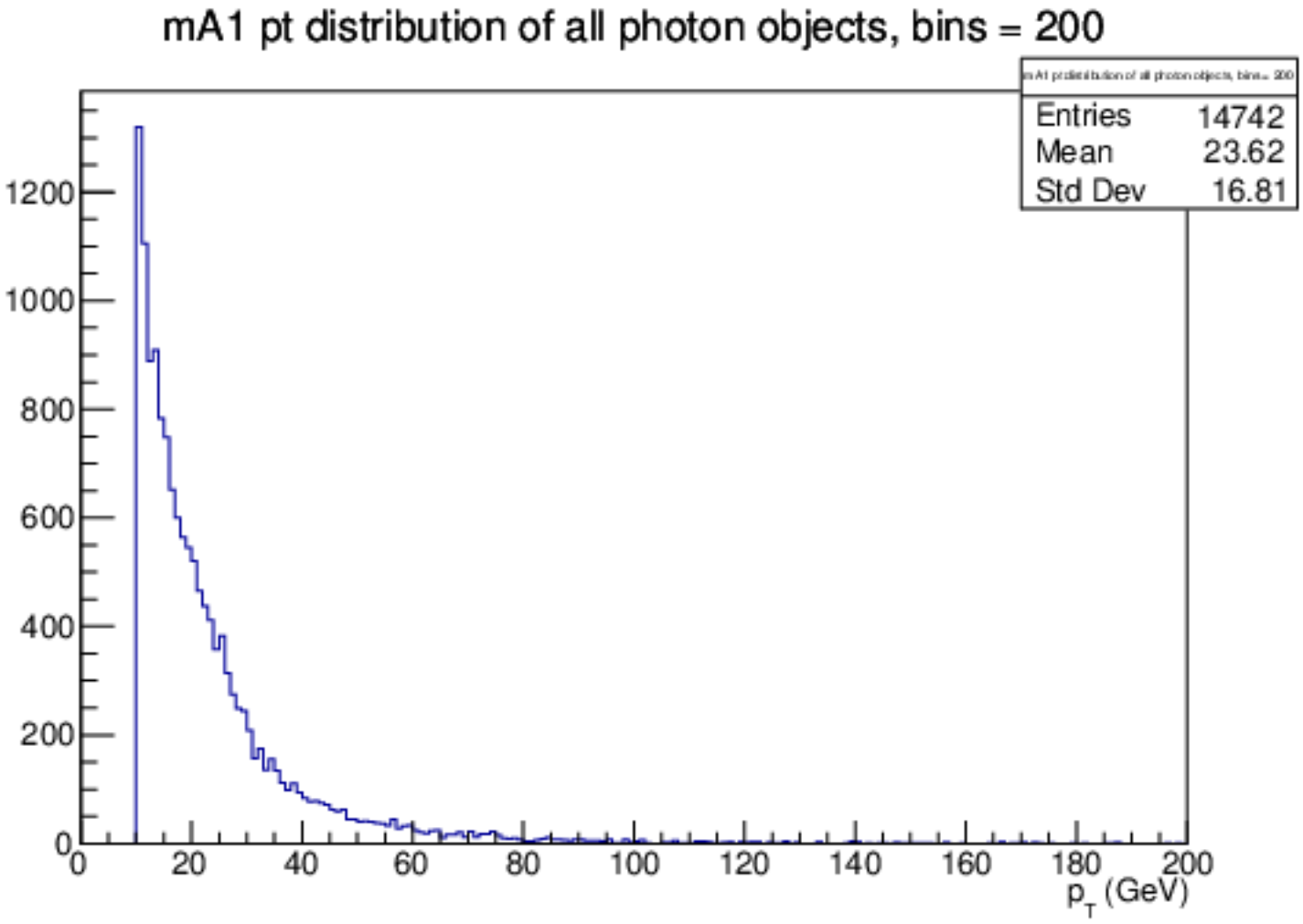

mA1 eta distribution of all electron objects after all dilep cuts, bins = 200
Entries 6364
Mean 0.002973
Std Dev 1.107
180
160
140
120
100
80
60
40
20
0
−6
−4
−2
0
2
4
6
η

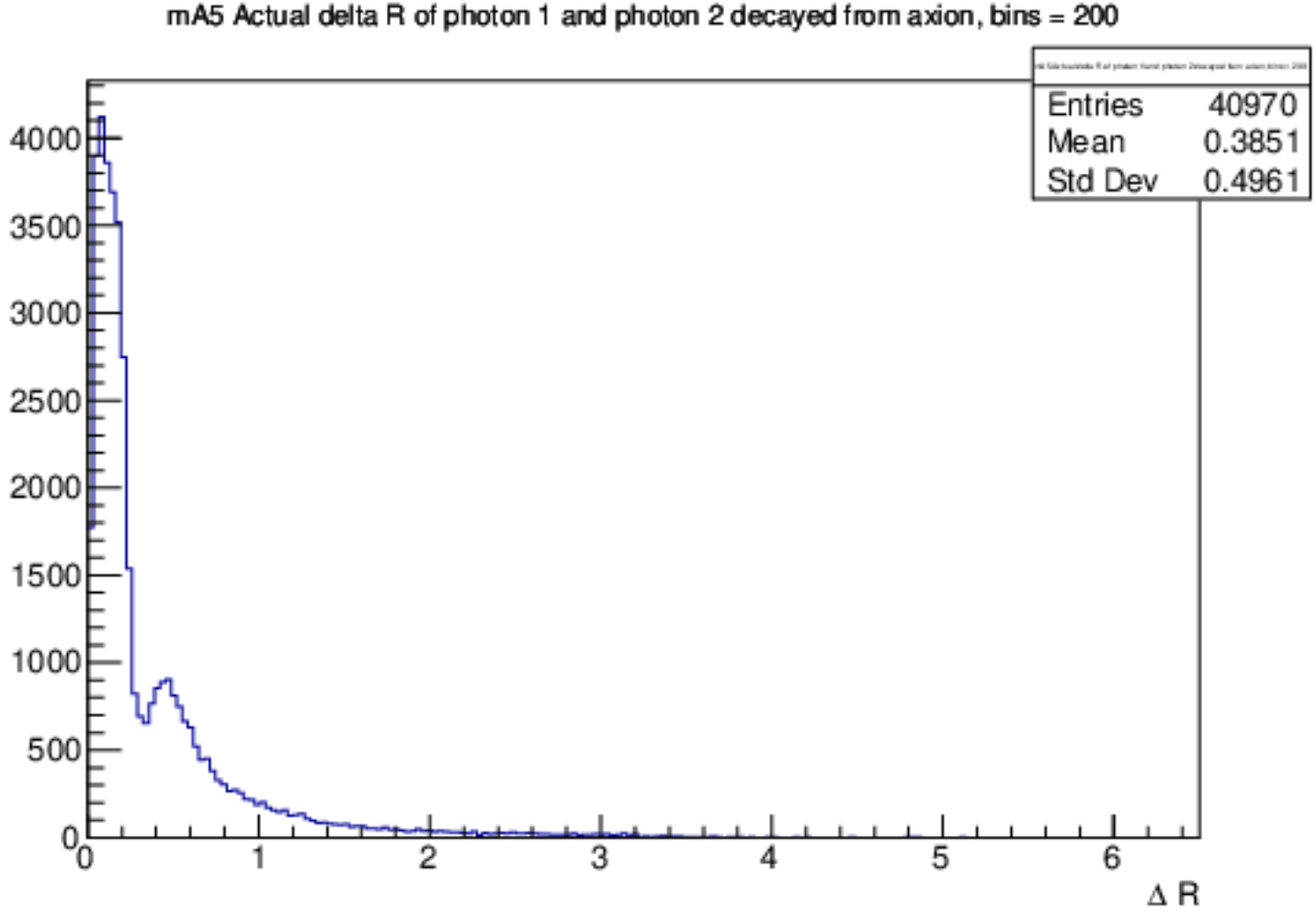

mA1 eta distribution of all electron objects, bins = 200
Entries 11494
Mean −0.003492
Std Dev 1.196
250
200
150
100
50
0
−6
−4
−2
0
2
4
6
η

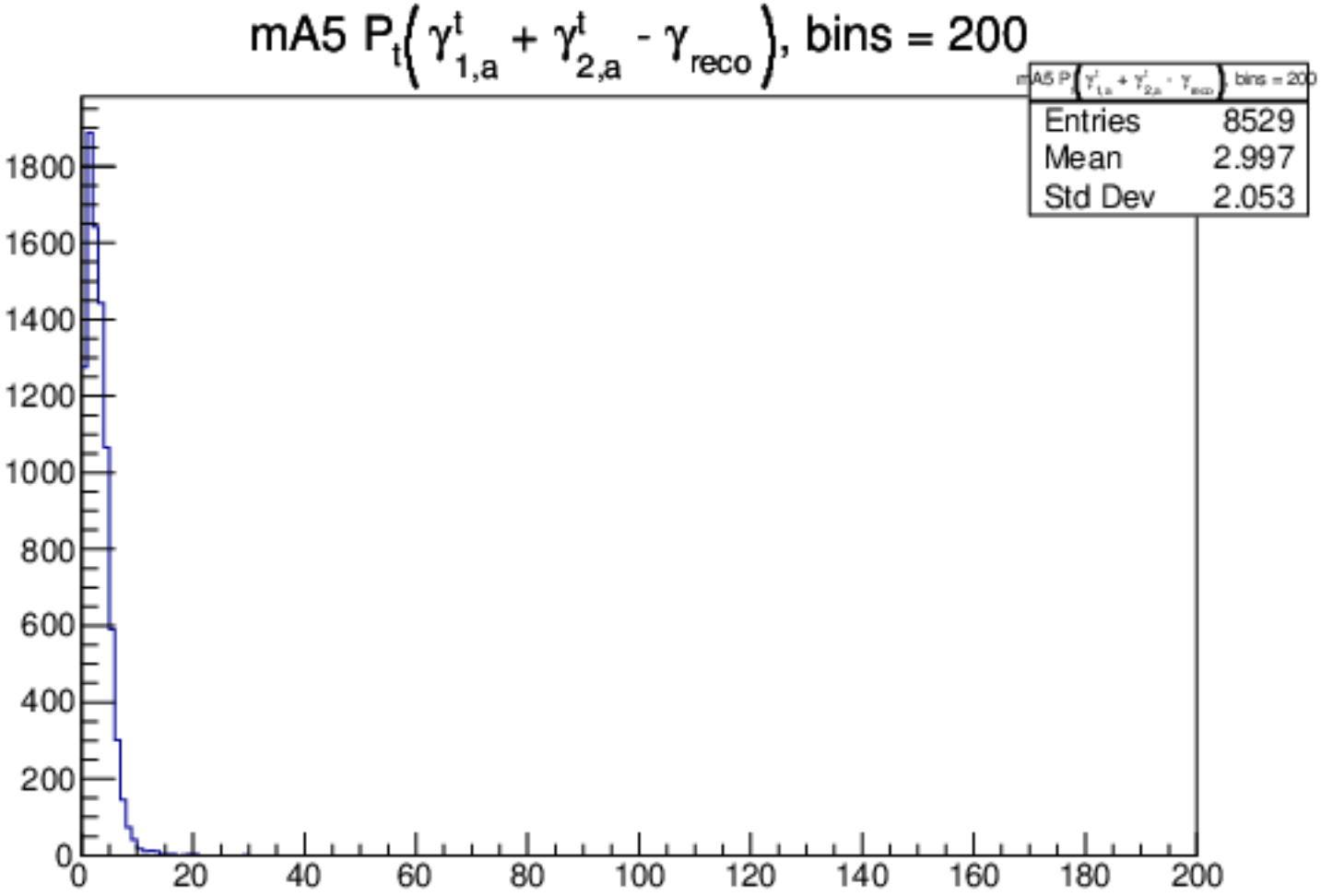

mA1 eta distribution of all photon objects, bins = 200
Entries 14742
Mean −0.01024
Std Dev 1.158
350
300
250
200
150
100
50
0
−6
−4
−2
0
2
4
6
η

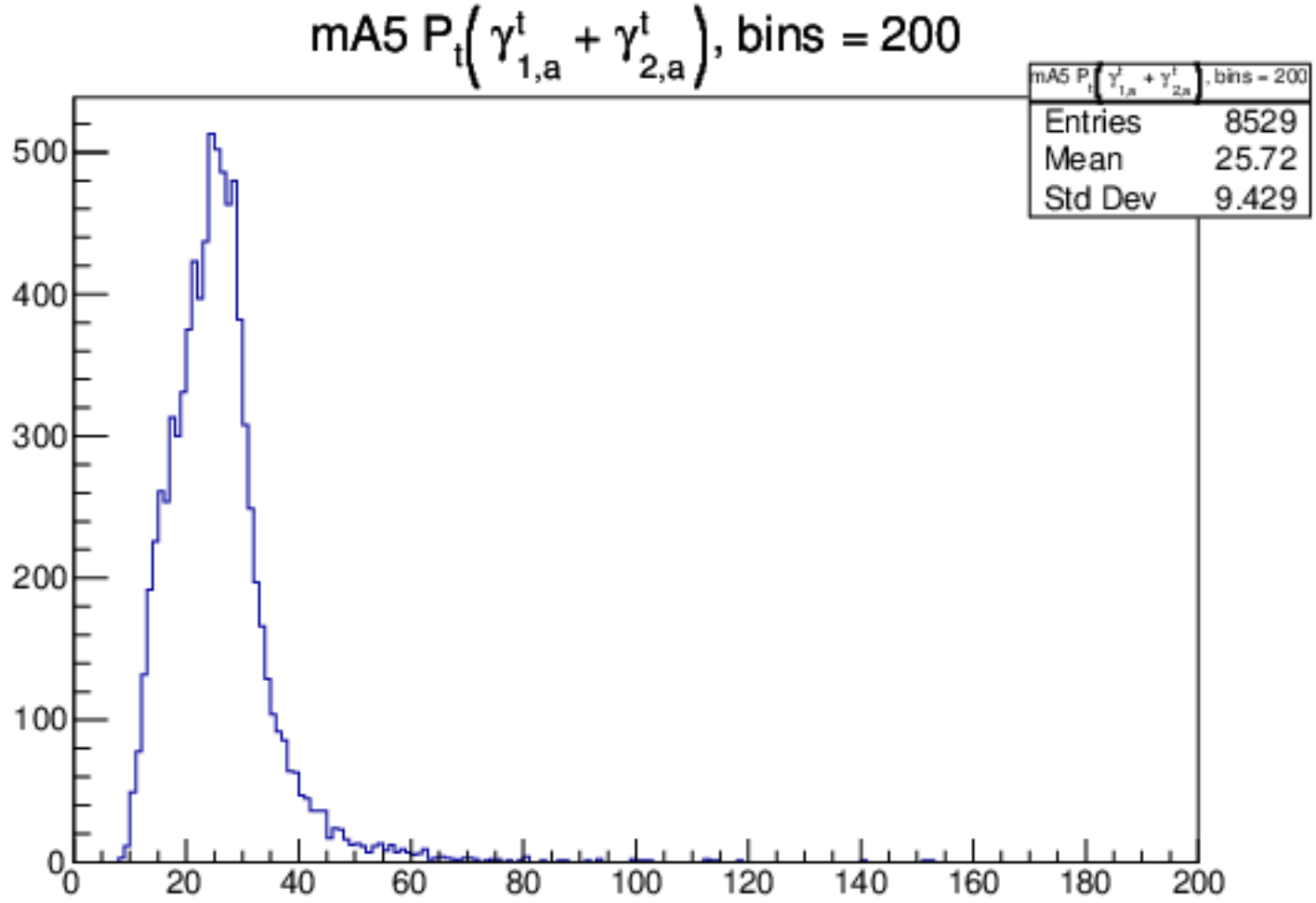

mA1 pt distribution of all electron objects after all dilep cuts, bins = 200
Entries 6364
Mean 47.64
Std Dev 20.05
0
20
40
60
80
100
120
140
160
180
200
p_T (GeV)

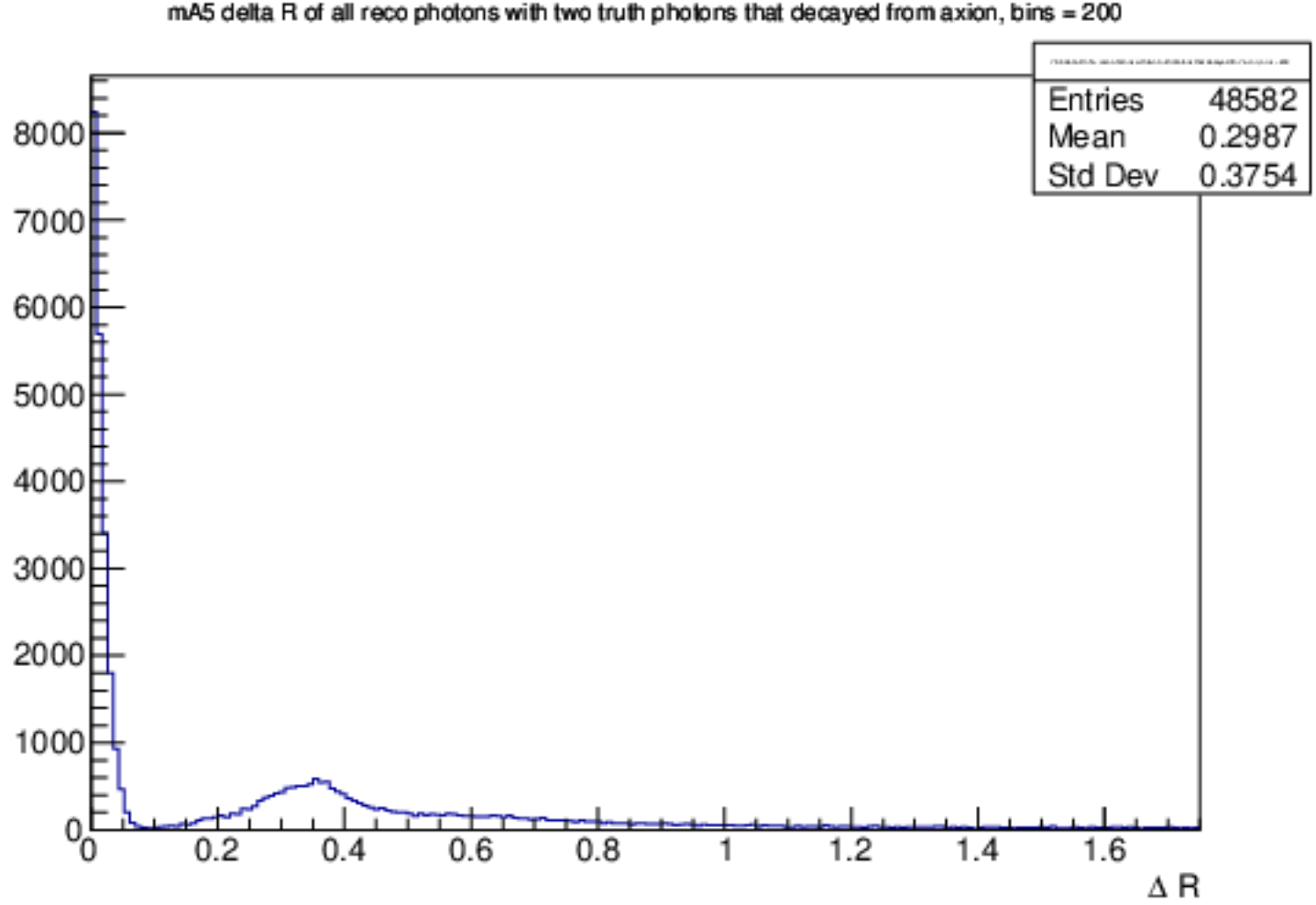

mA1 pt distribution of all electron objects, bins = 200
Entries 11494
Mean 44.98
Std Dev 22.77
300
250
200
150
100
50
0
0
20
40
60
80
100
120
140
160
180
200
p_T (GeV)

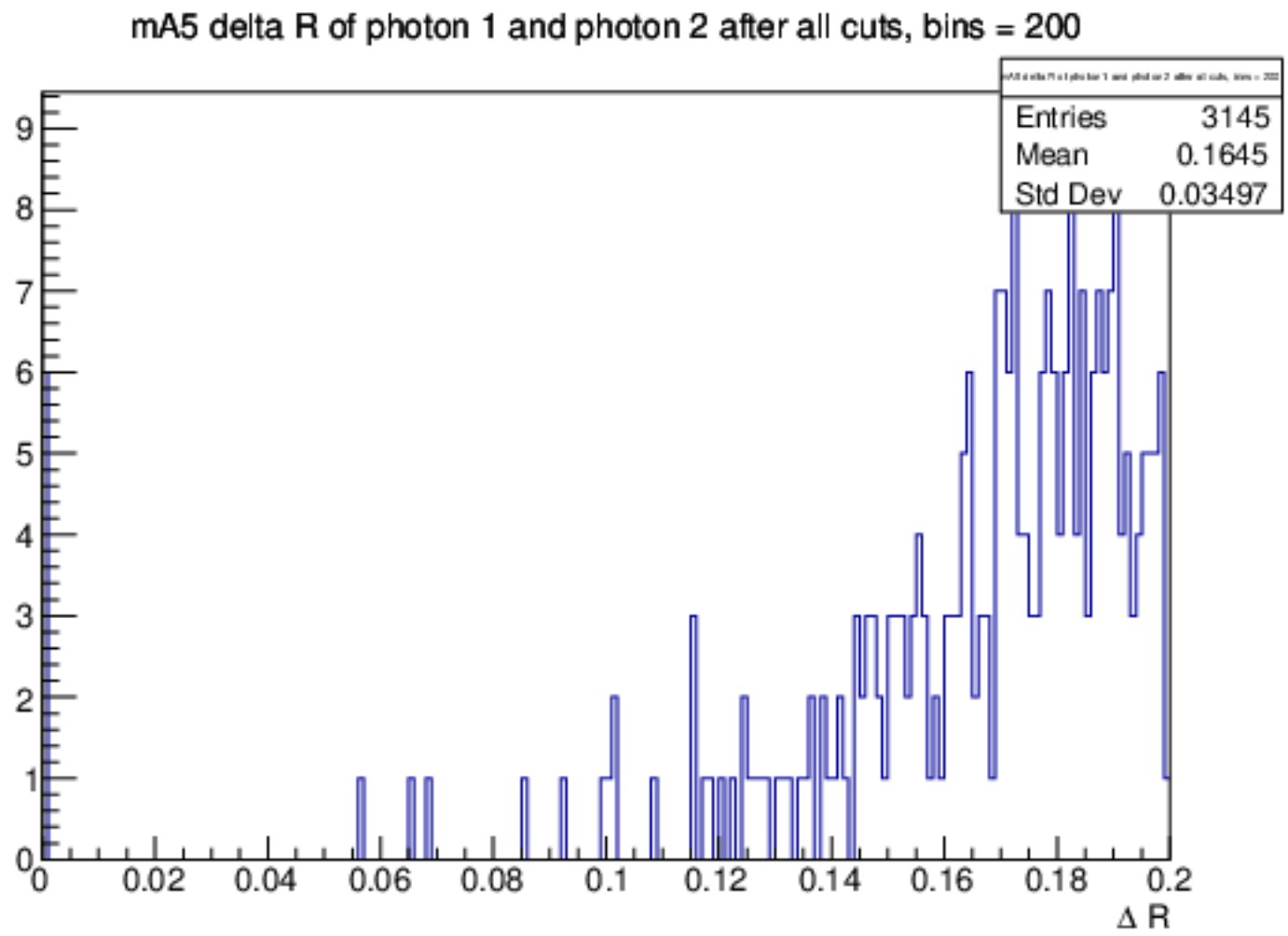

mA1 pt distribution of all photon objects, bins = 200
Entries 14742
Mean 23.62
Std Dev 16.81
1200
1000
800
600
400
200
0
0
20
40
60
80
100
120
140
160
180
200
p_T (GeV)

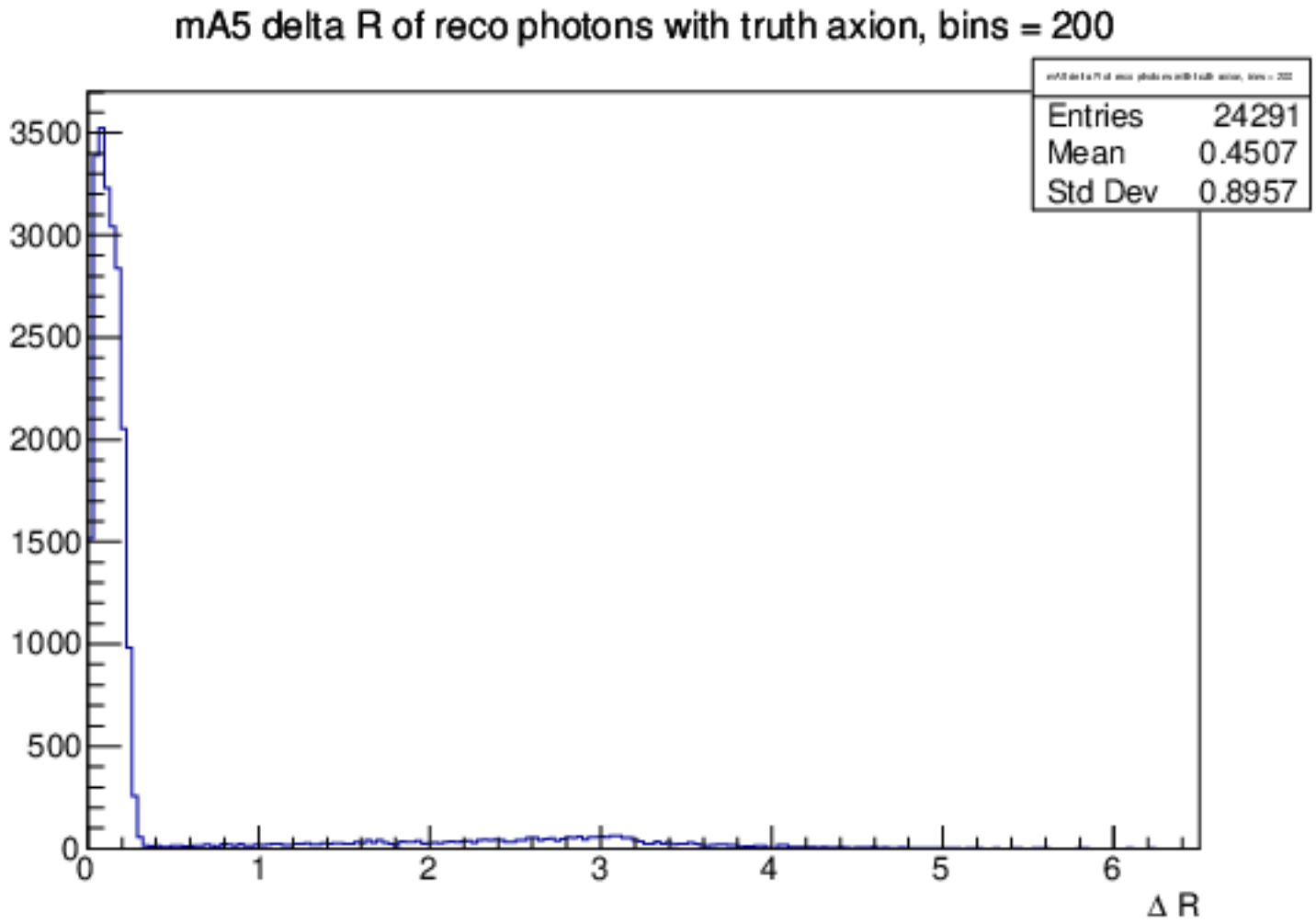

mA5 Actual delta R of photon 1 and photon 2 decayed from axion, bins = 200
Entries 40970
Mean 0.3851
Std Dev 0.4961
4000
3500
3000
2500
2000
1500
1000
500
0
0
1
2
3
4
5
6
Δ R

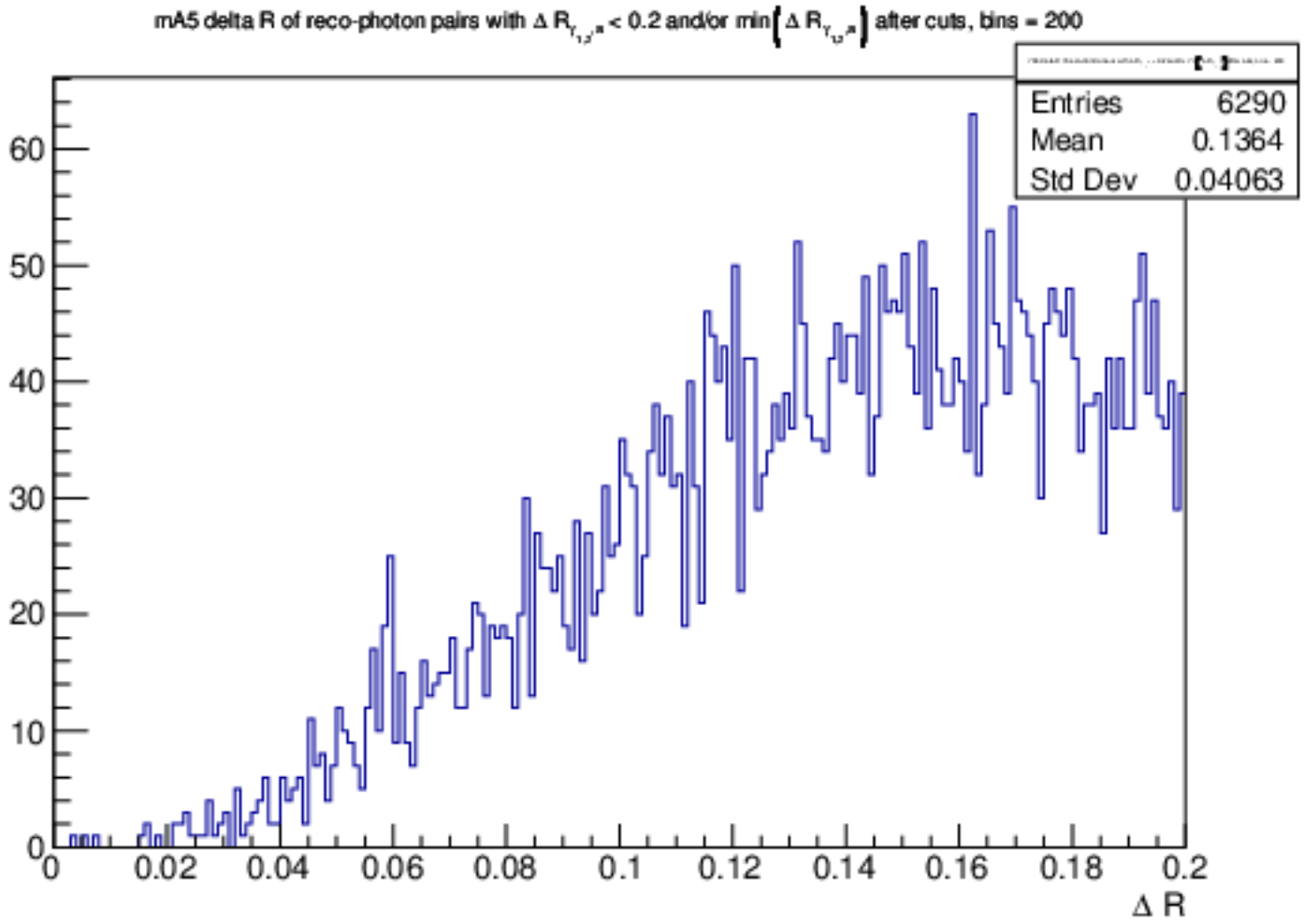

mA5 P_t(γ^t_{1,a} + γ^t_{2,a} - γ_reco), bins = 200
Entries 8529
Mean 2.997
Std Dev 2.053
1800
1600
1400
1200
1000
800
600
400
200
0
0
20
40
60
80
100
120
140
160
180
200

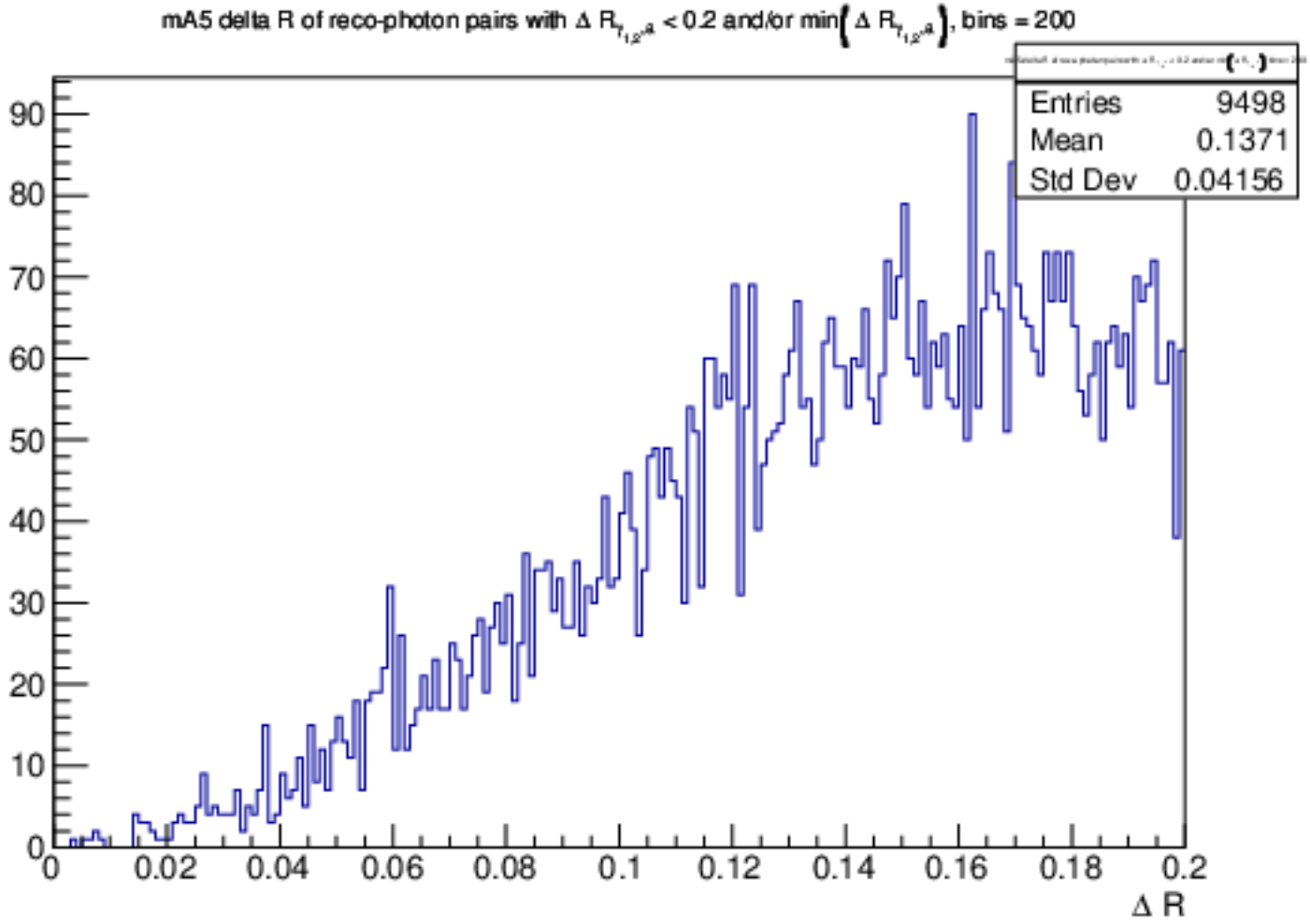

mA5 $P_t\left(\gamma^t_{1,a} + \gamma^t_{2,a}\right)$, bins = 200
Entries 8529
Mean 25.72
Std Dev 9.429
0
100
200
300
400
500
0
20
40
60
80
100
120
140
160
180
200

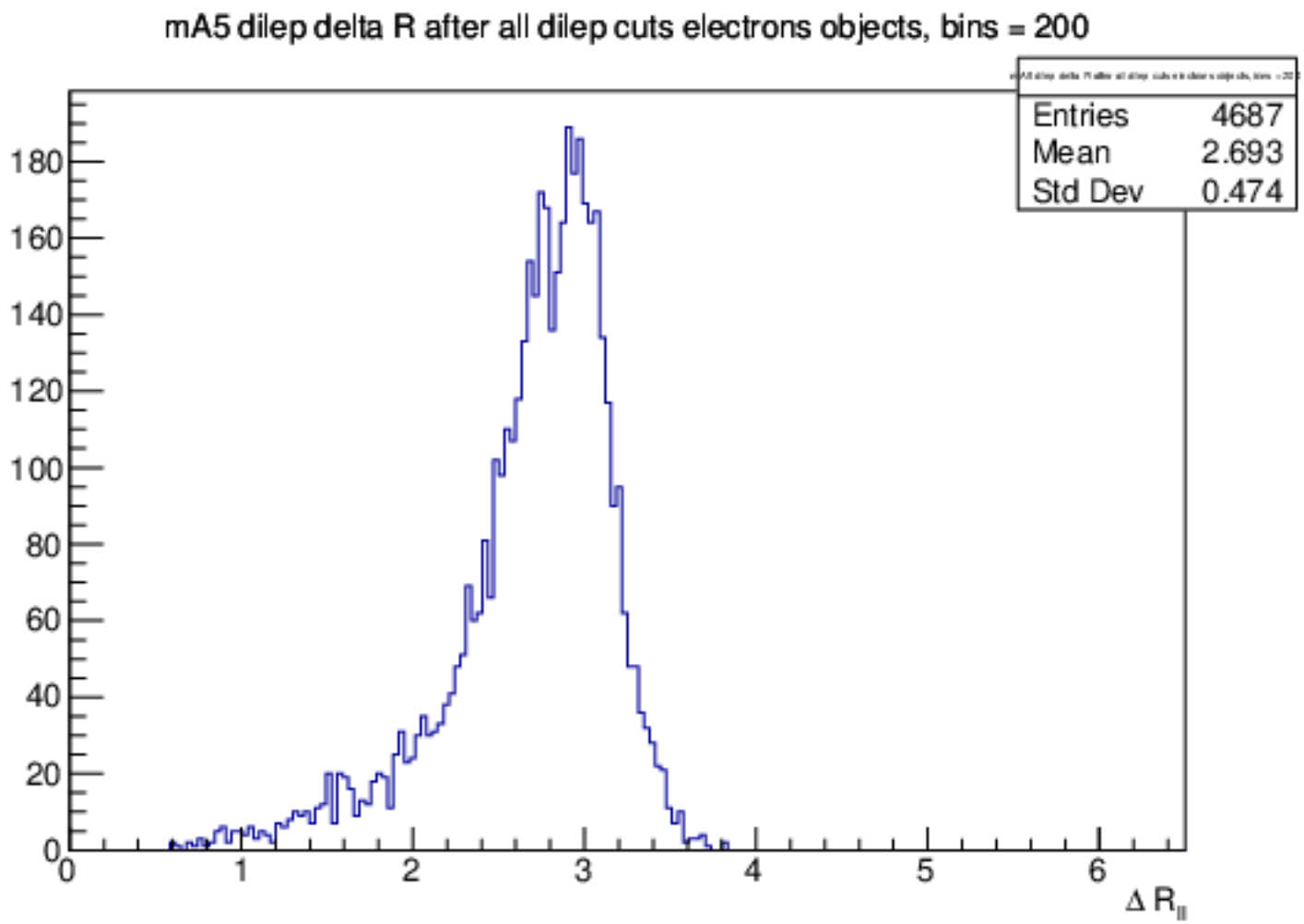

mA5 delta R of all reco photons with two truth photons that decayed from axion, bins = 200
Entries 48582
Mean 0.2987
Std Dev 0.3754
8000
7000
6000
5000
4000
3000
2000
1000
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
Δ R

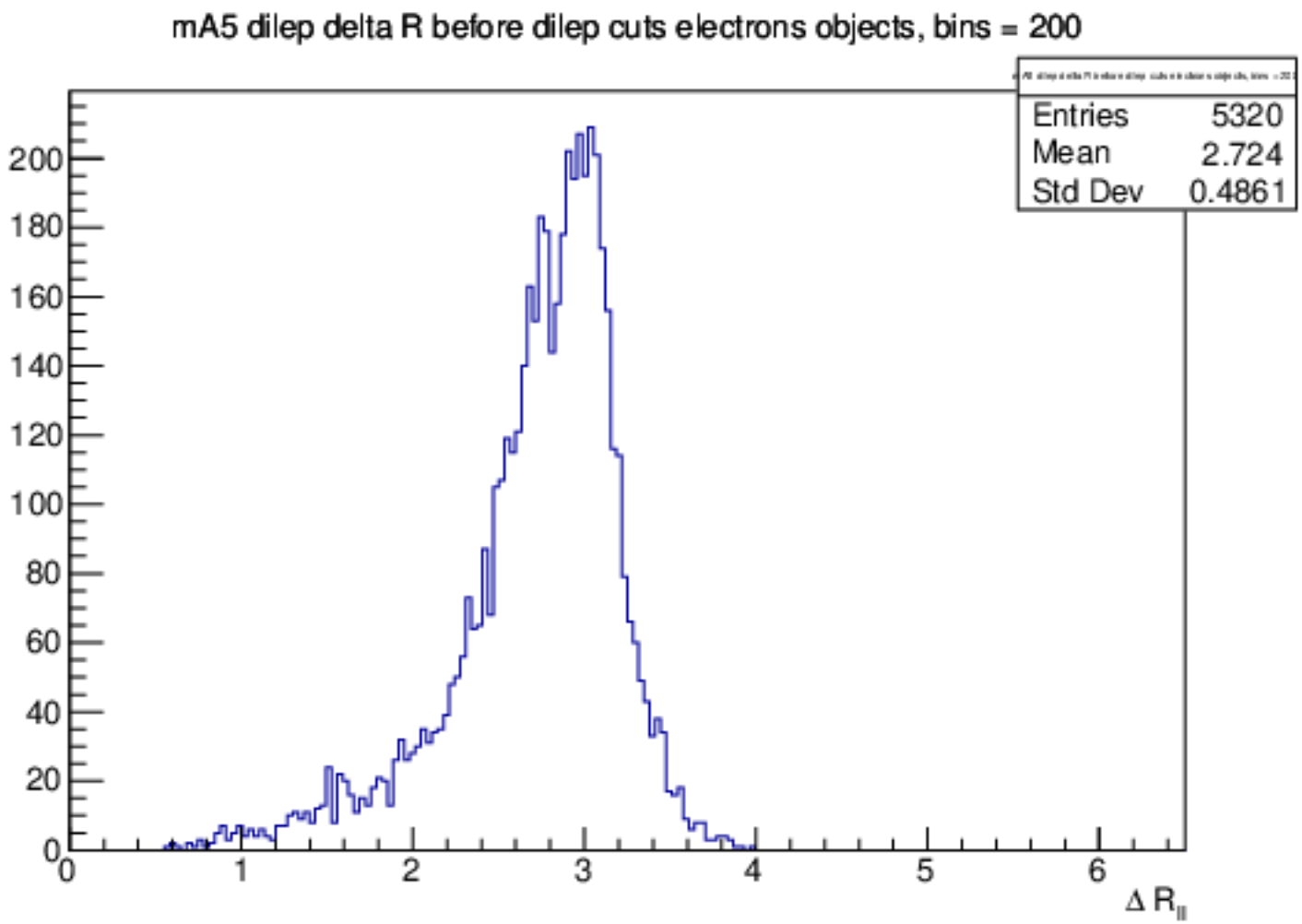

mA5 delta R of photon 1 and photon 2 after all cuts, bins = 200
Entries 3145
Mean 0.1645
Std Dev 0.03497
0
1
2
3
4
5
6
7
8
9
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Δ R

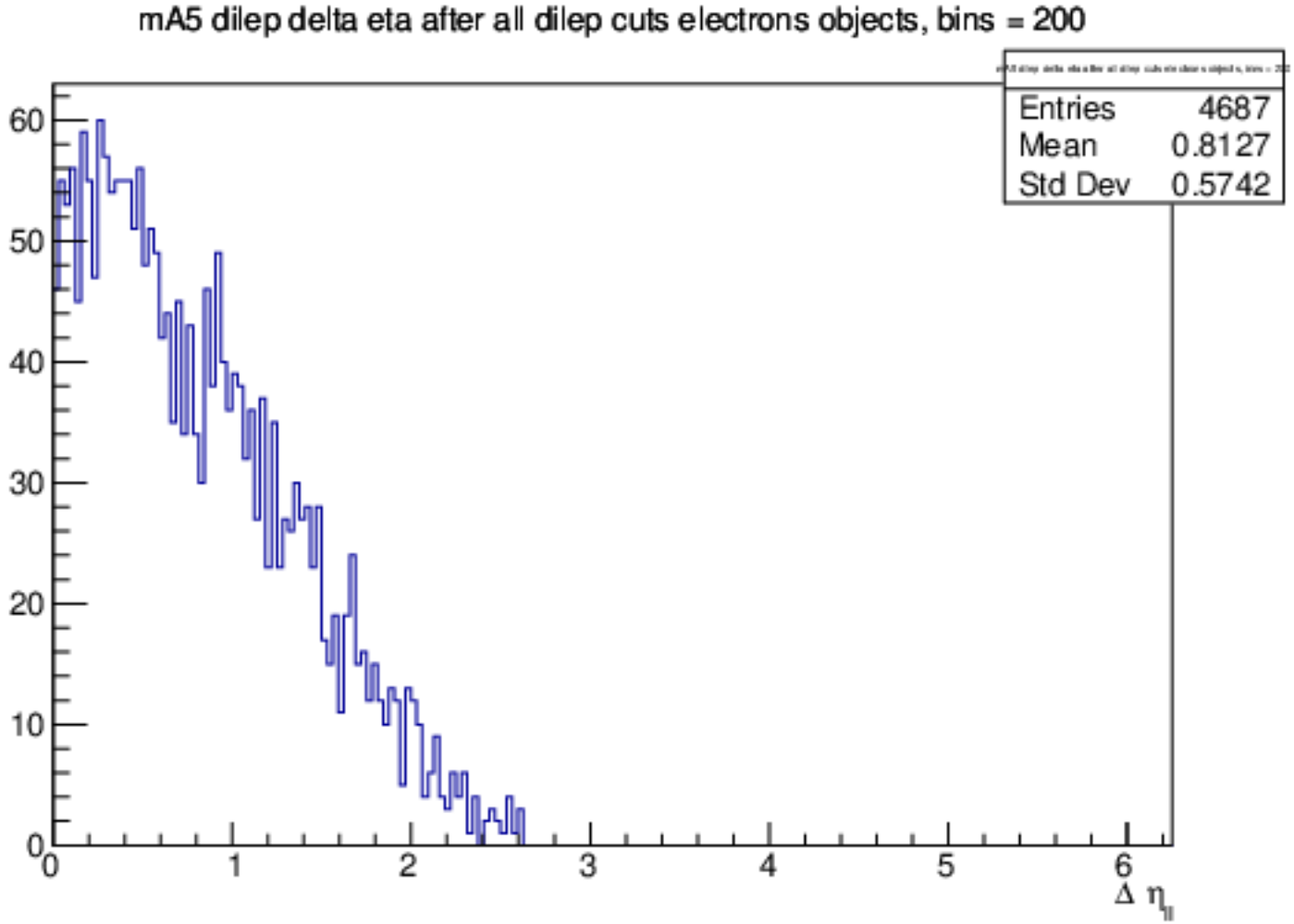

mA5 delta R of reco photons with truth axion, bins = 200
Entries 24291
Mean 0.4507
Std Dev 0.8957
3500
3000
2500
2000
1500
1000
500
0
0
1
2
3
4
5
6
Δ R

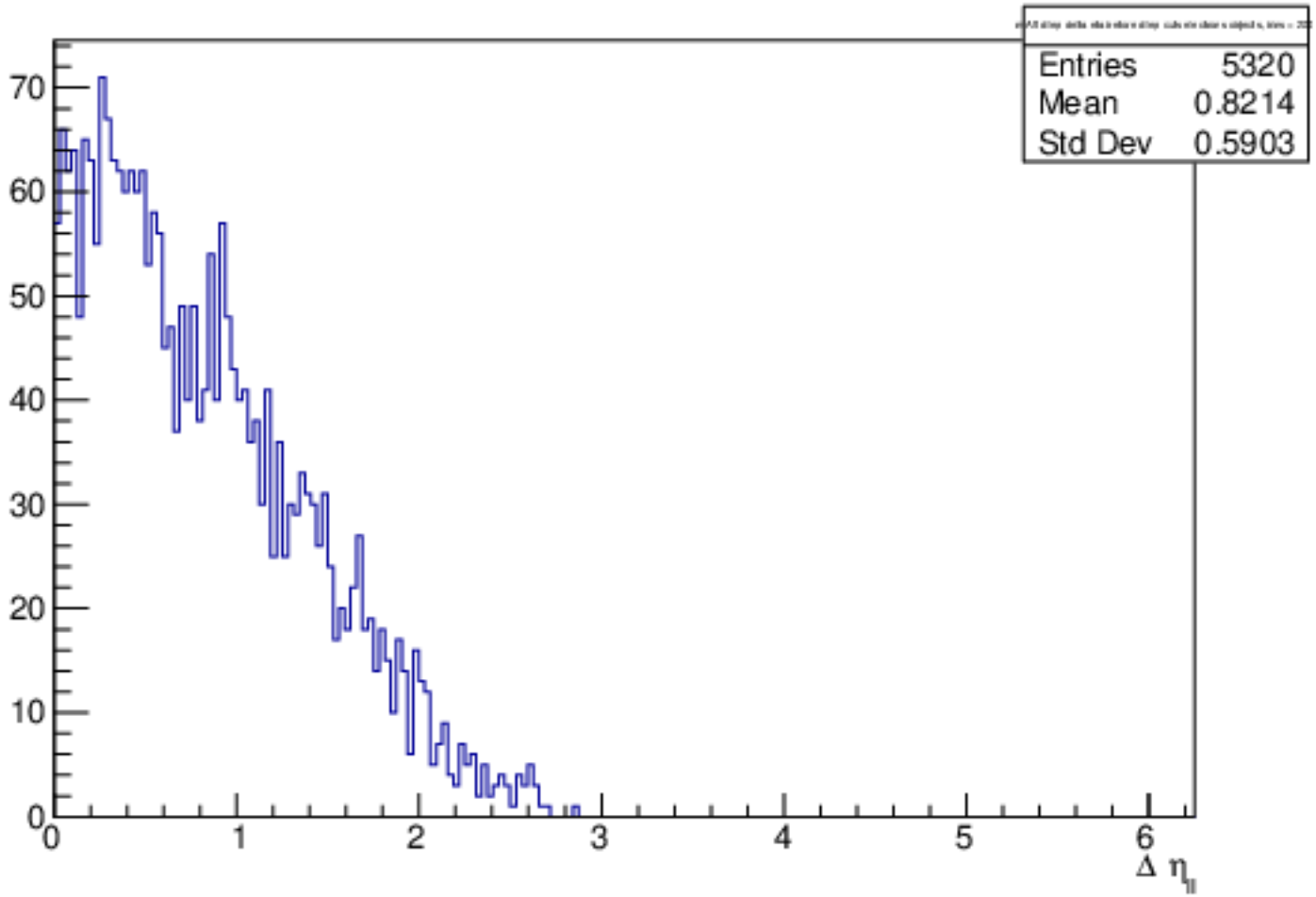

mA5 delta R of reco-photon pairs with Δ R < 0.2 and/or min(Δ R) after cuts, bins = 200
Entries 6290
Mean 0.1364
Std Dev 0.04063
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Δ R

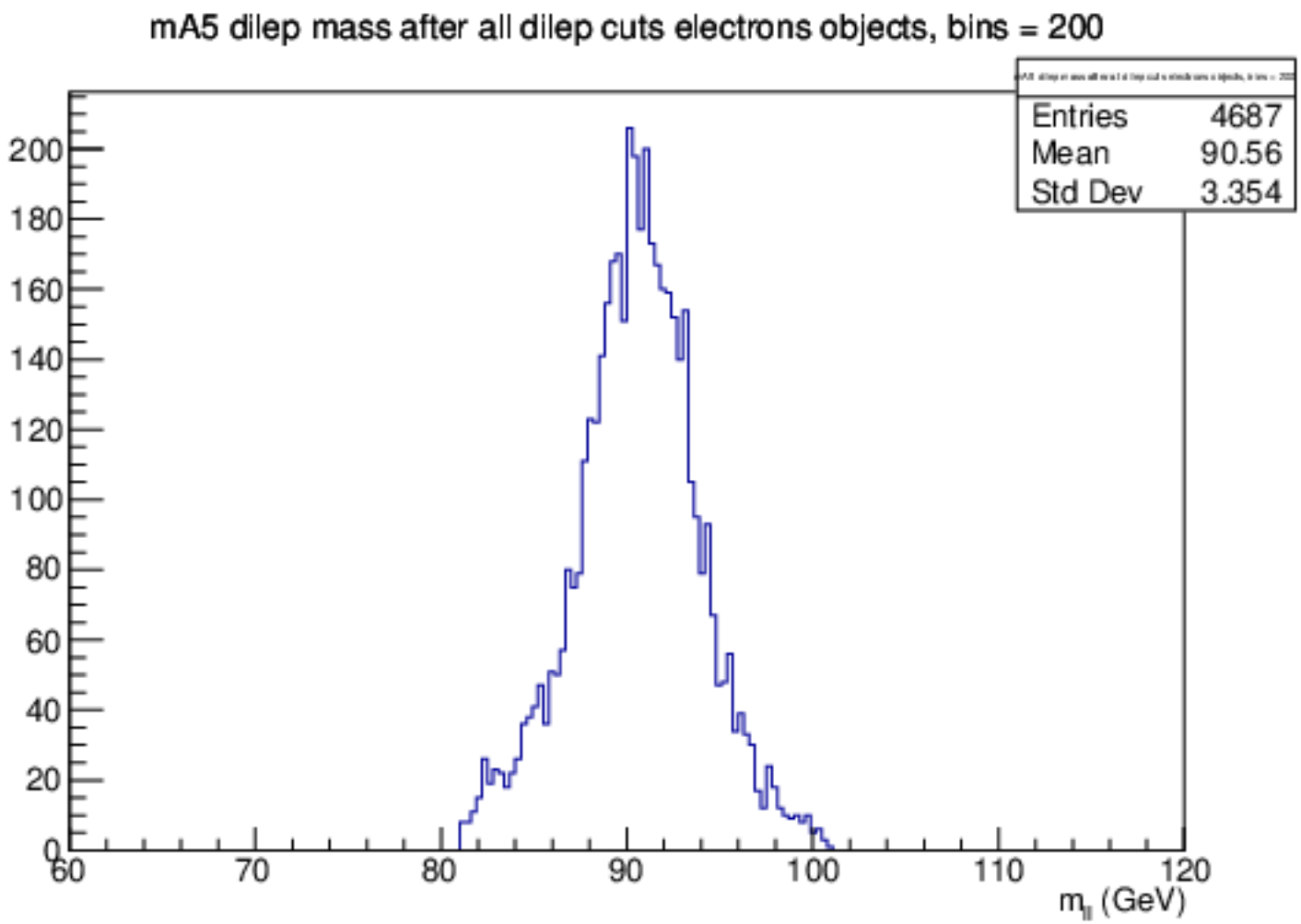

mA5 delta R of reco-photon pairs with Δ R_{γ1,2;a} < 0.2 and/or min(Δ R_{γ1,2;a}), bins = 200
Entries 9498
Mean 0.1371
Std Dev 0.04156
0
10
20
30
40
50
60
70
80
90
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Δ R

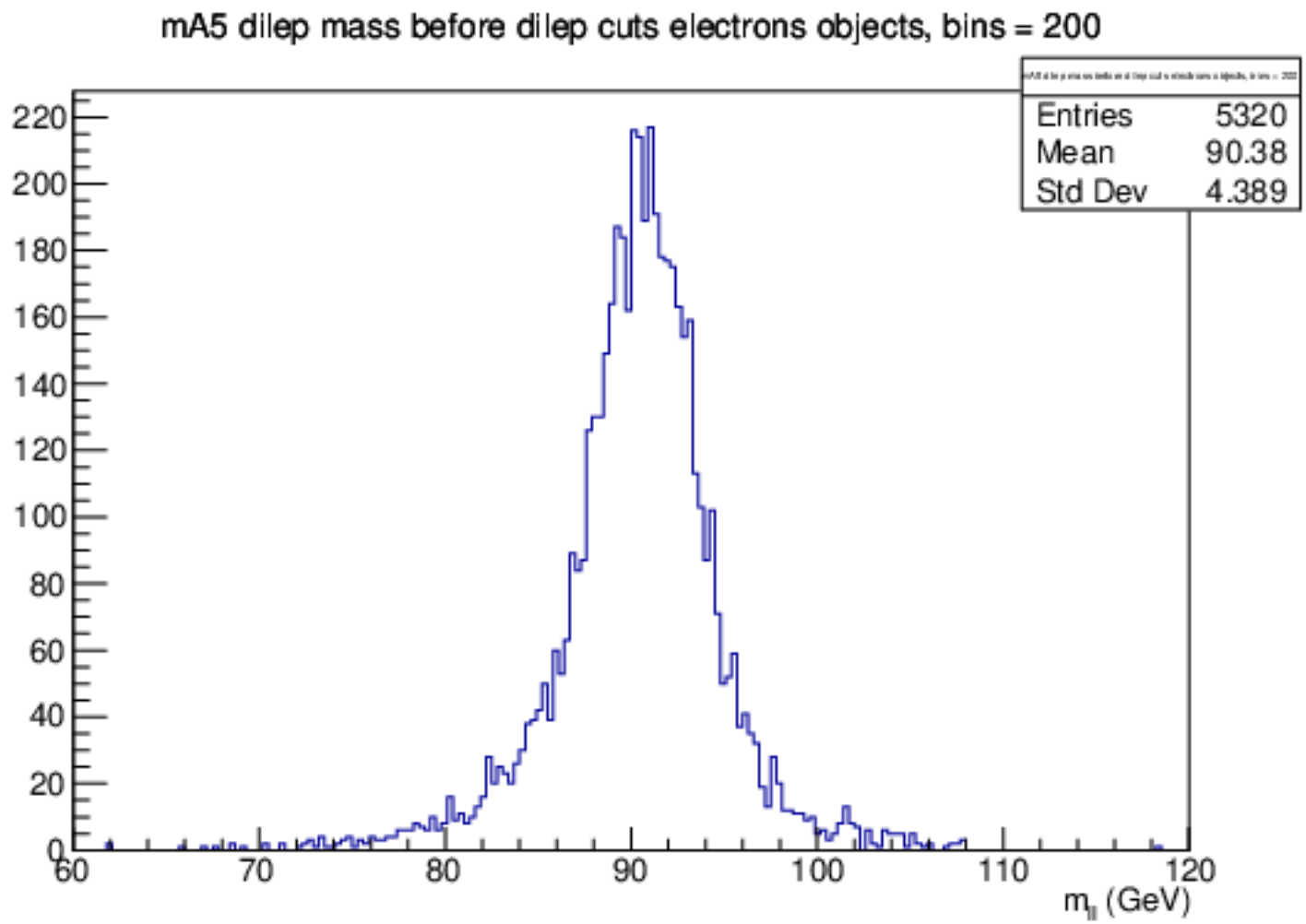

mA5 dilep delta R after all dilep cuts electrons objects, bins = 200
Entries 4687
Mean 2.693
Std Dev 0.474
180
160
140
120
100
80
60
40
20
0
0
1
2
3
4
5
6
Δ R_ll

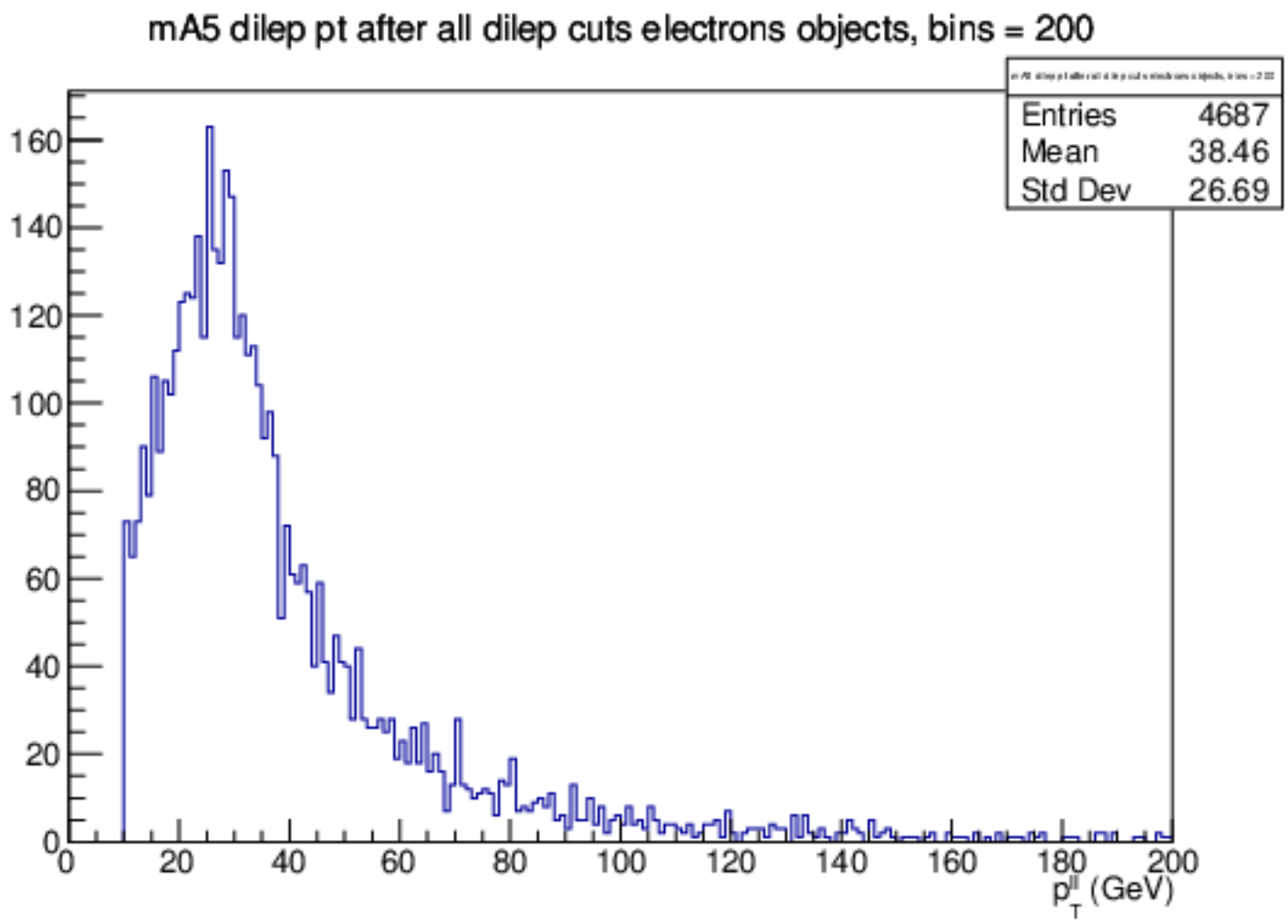

mA5 dilep delta R before dilep cuts electrons objects, bins = 200
Entries 5320
Mean 2.724
Std Dev 0.4861
200
180
160
140
120
100
80
60
40
20
0
0
1
2
3
4
5
6
Δ R_ll

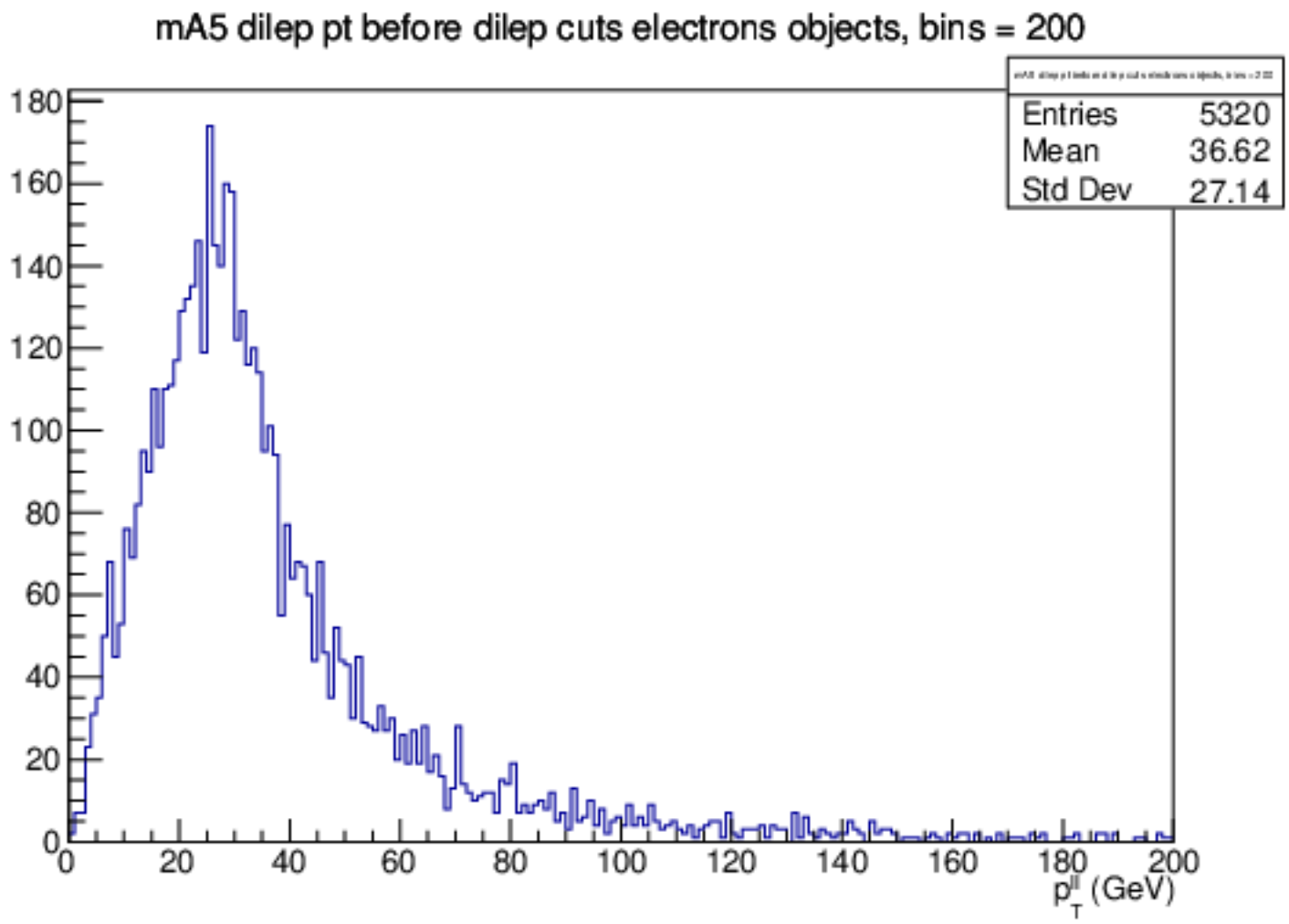

mA5 dilep delta eta after all dilep cuts electrons objects, bins = 200
Entries 4687
Mean 0.8127
Std Dev 0.5742
60
50
40
30
20
10
0
0
1
2
3
4
5
6
Δ η_ll

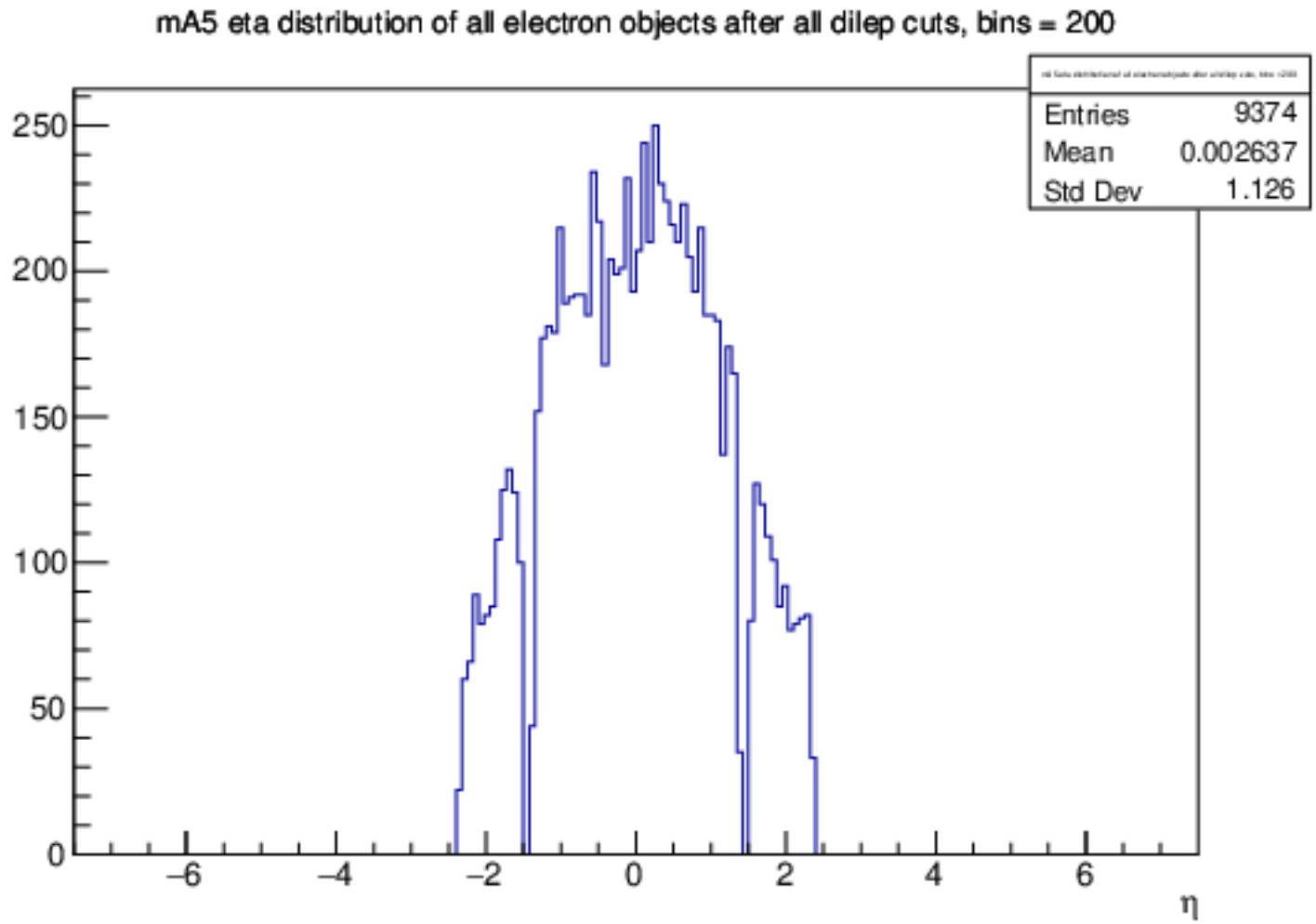

mA5 dilep delta eta before dilep cuts electrons objects, bins = 200
Entries 5320
Mean 0.8214
Std Dev 0.5903
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
Δ η_ll

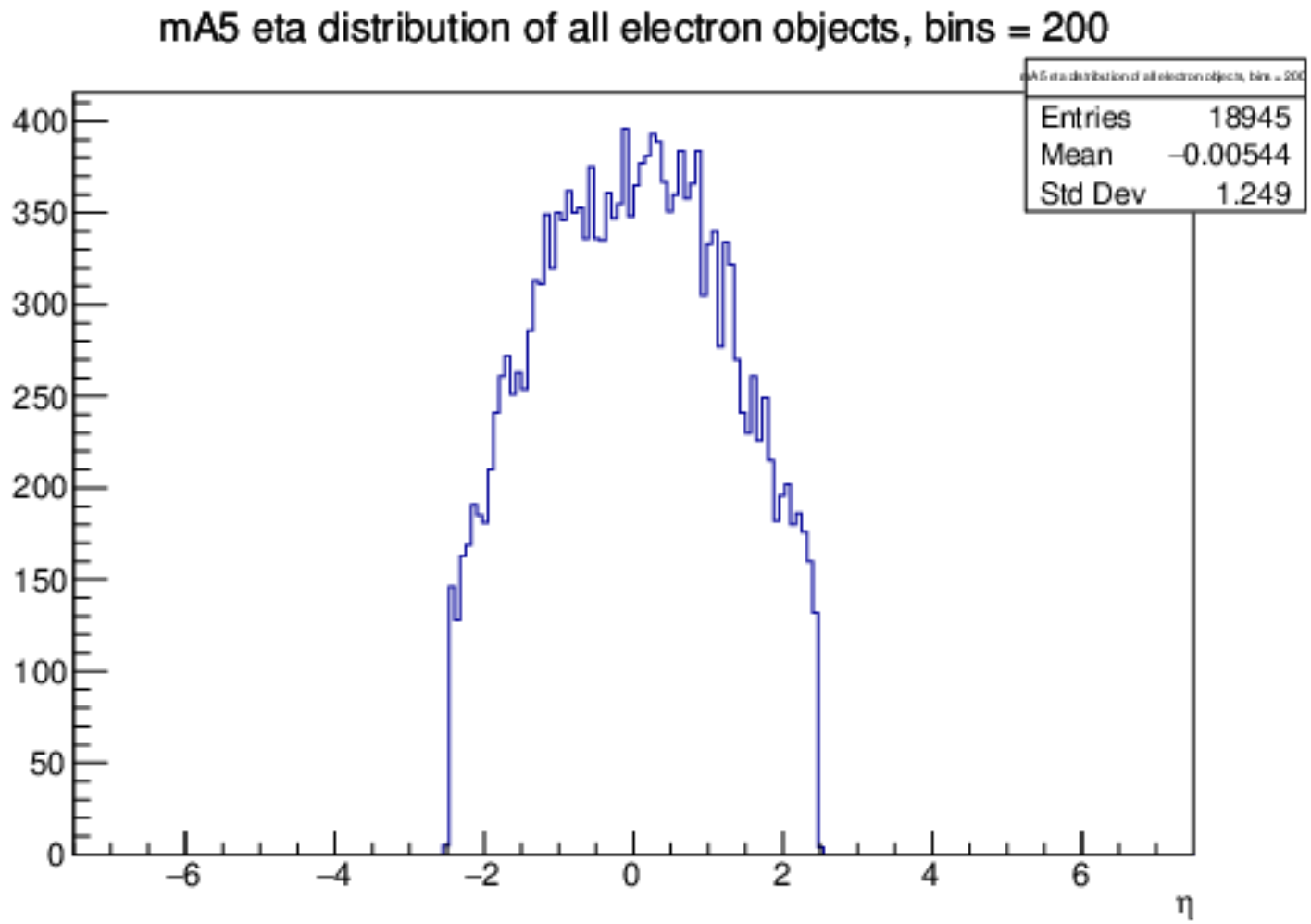

mA5 dilep mass after all dilep cuts electrons objects, bins = 200
Entries 4687
Mean 90.56
Std Dev 3.354
200
180
160
140
120
100
80
60
40
20
0
60
70
80
90
100
110
120
m_ll (GeV)

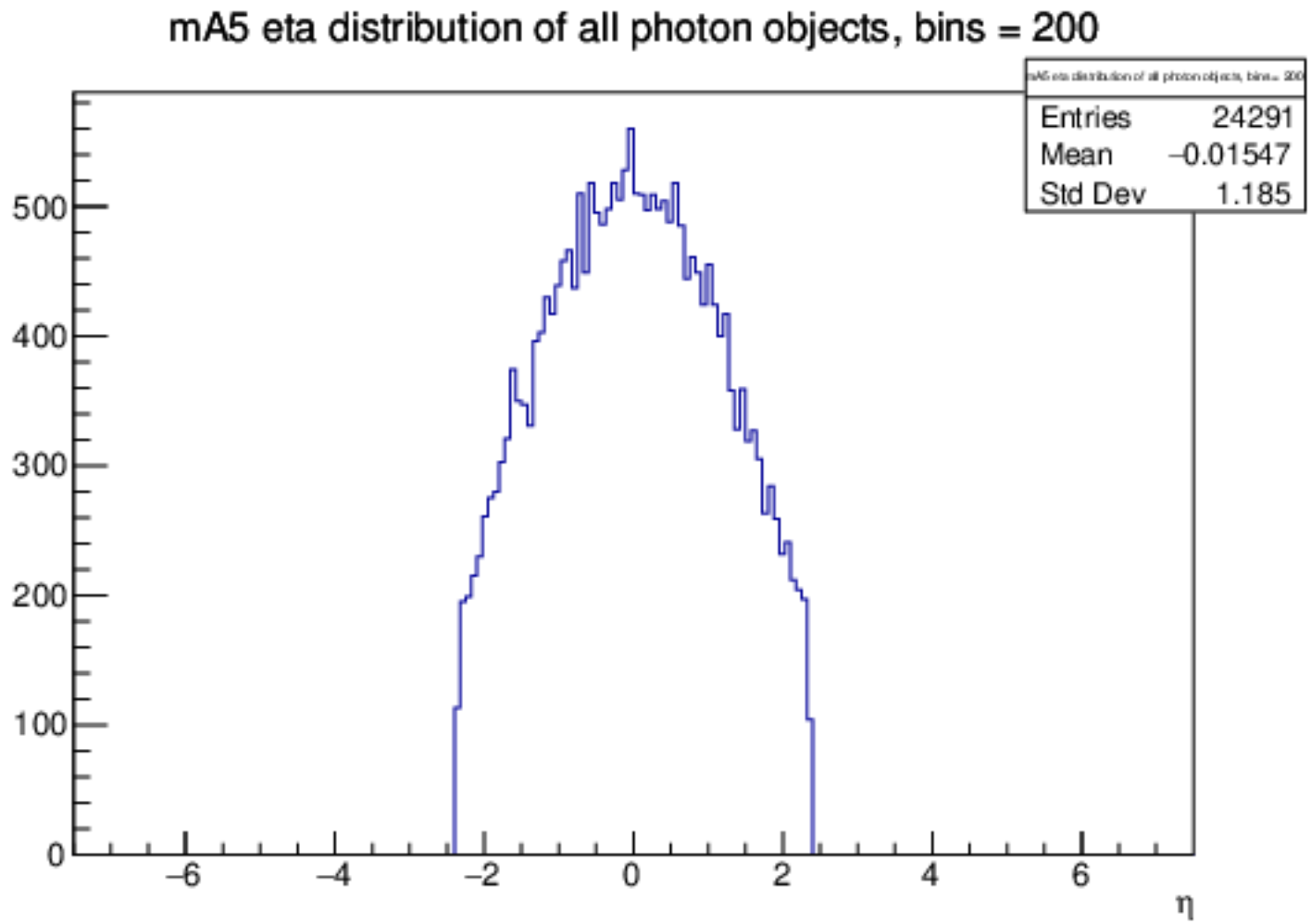

mA5 dilep mass before dilep cuts electrons objects, bins = 200
Entries 5320
Mean 90.38
Std Dev 4.389
220
200
180
160
140
120
100
80
60
40
20
0
60
70
80
90
100
110
120
m_ll (GeV)

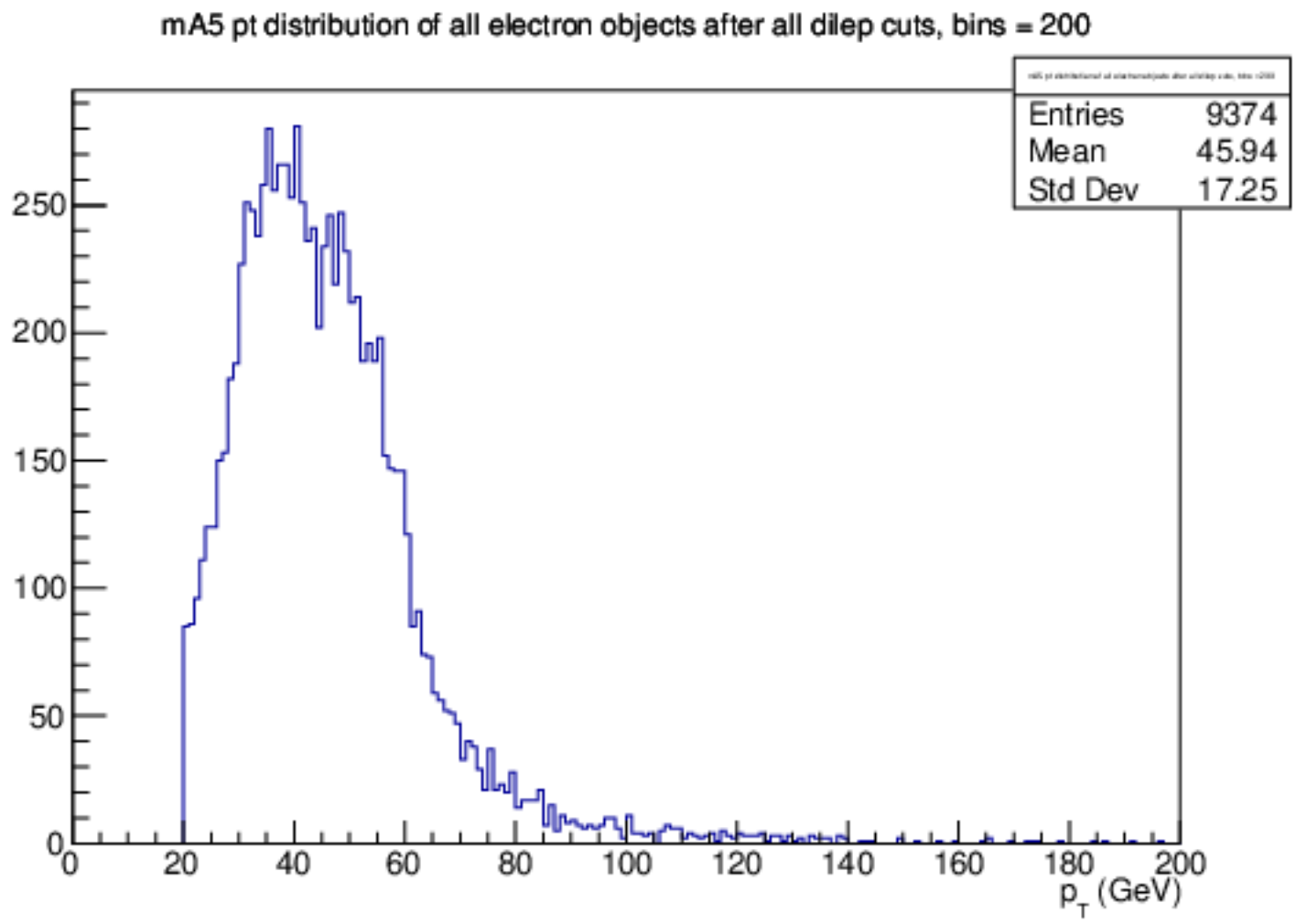

mA5 dilep pt after all dilep cuts electrons objects, bins = 200
Entries 4687
Mean 38.46
Std Dev 26.69
0
20
40
60
80
100
120
140
160
180
200
p_T^{ll} (GeV)

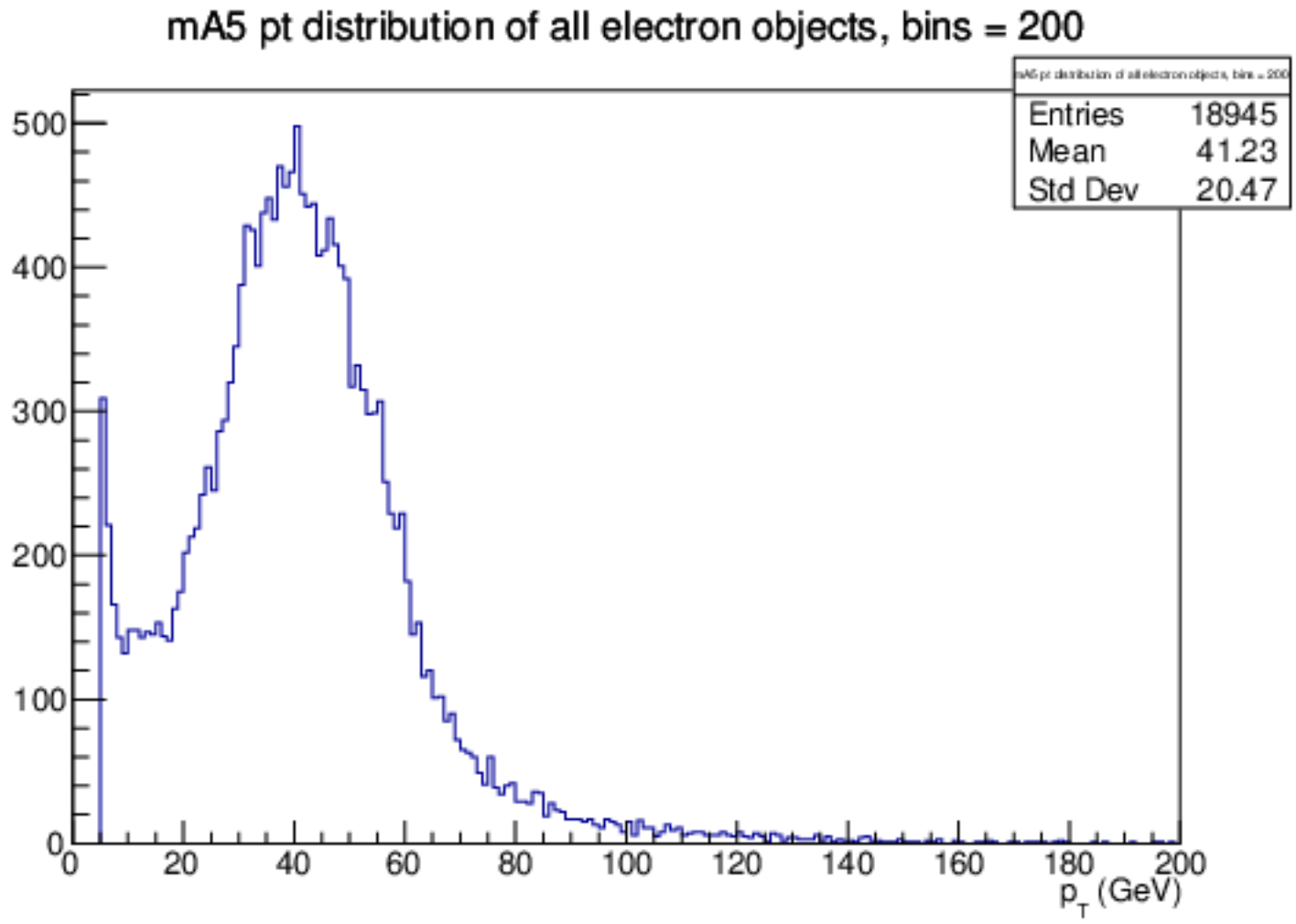

mA5 dilep pt before dilep cuts electrons objects, bins = 200
Entries 5320
Mean 36.62
Std Dev 27.14
0
20
40
60
80
100
120
140
160
180
200
p_T^{ll} (GeV)

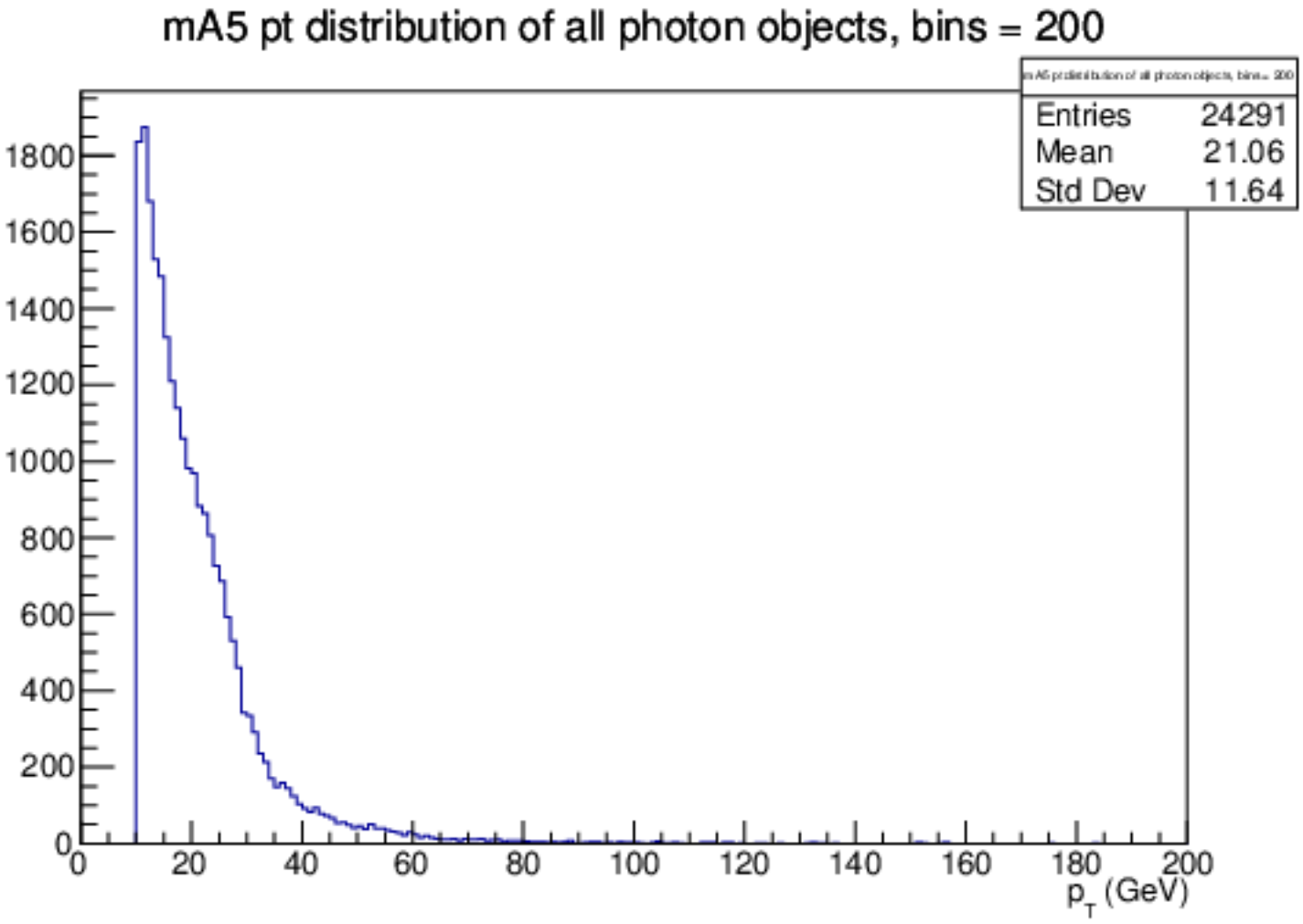

mA5 eta distribution of all electron objects after all dilep cuts, bins = 200
Entries 9374
Mean 0.002637
Std Dev 1.126
250
200
150
100
50
0
−6
−4
−2
0
2
4
6
η


mA5 eta distribution of all electron objects, bins = 200
Entries 18945
Mean −0.00544
Std Dev 1.249
400
350
300
250
200
150
100
50
0
−6
−4
−2
0
2
4
6
η


mA5 eta distribution of all photon objects, bins = 200
Entries 24291
Mean −0.01547
Std Dev 1.185
500
400
300
200
100
0
−6
−4
−2
0
2
4
6
η


mA5 pt distribution of all electron objects after all dilep cuts, bins = 200
Entries 9374
Mean 45.94
Std Dev 17.25
250
200
150
100
50
0
0
20
40
60
80
100
120
140
160
180
200
p_T (GeV)


mA5 pt distribution of all electron objects, bins = 200
Entries 18945
Mean 41.23
Std Dev 20.47
500
400
300
200
100
0
0
20
40
60
80
100
120
140
160
180
200
p_T (GeV)


mA5 pt distribution of all photon objects, bins = 200
Entries 24291
Mean 21.06
Std Dev 11.64
1800
1600
1400
1200
1000
800
600
400
200
0
0
20
40
60
80
100
120
140
160
180
200
p_T (GeV)