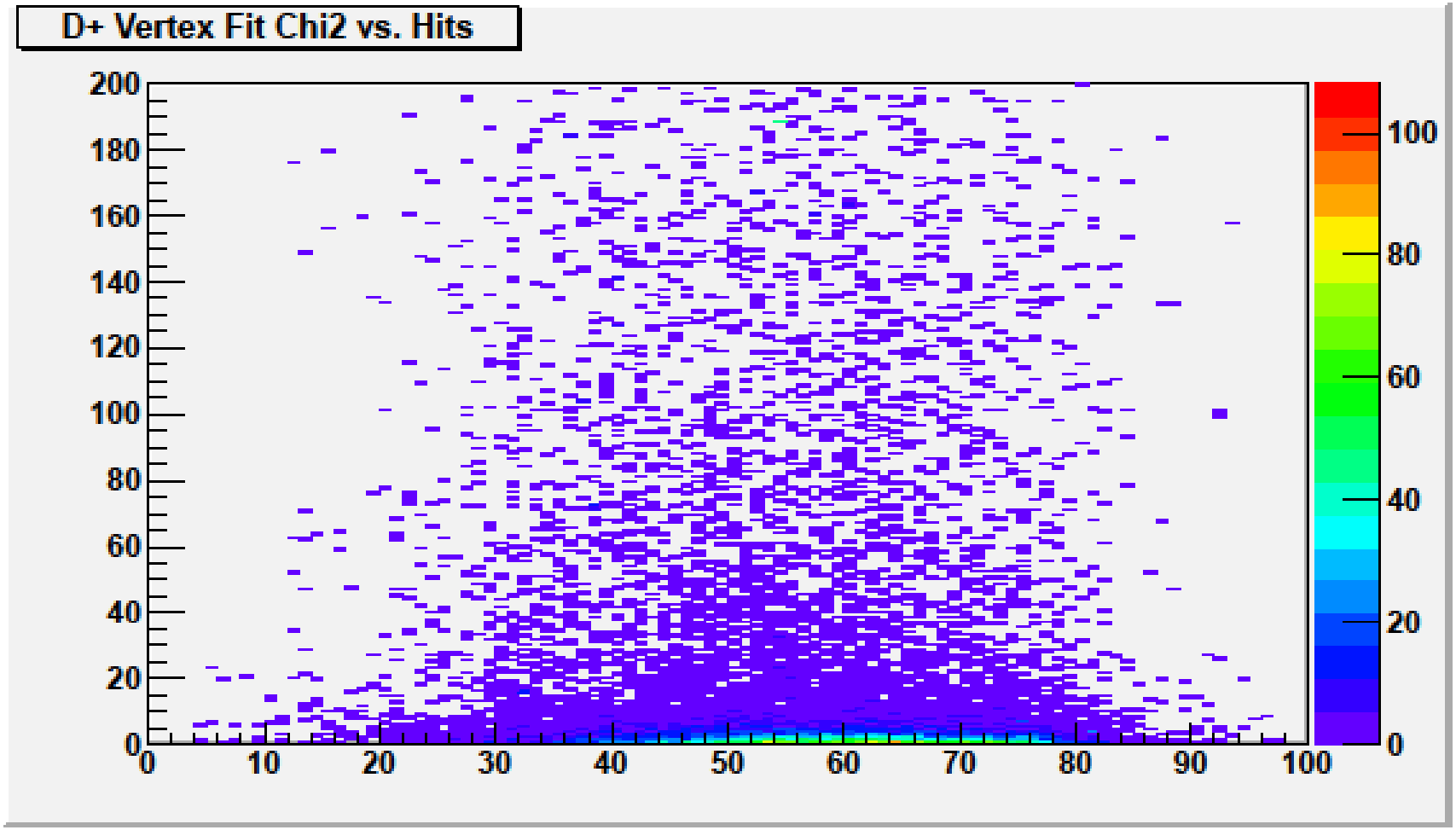
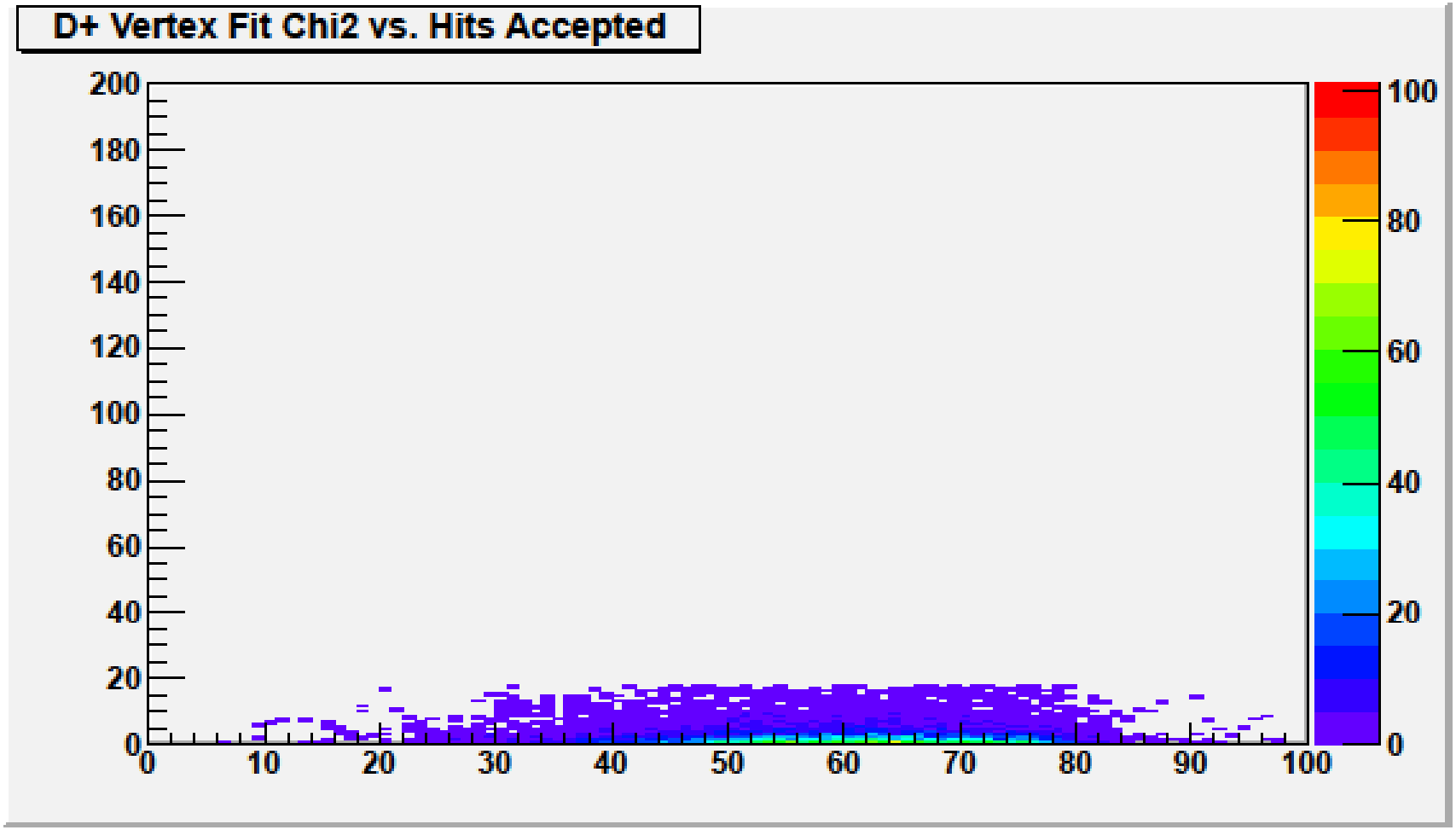
Alternative Track Selection in the STT Analysis

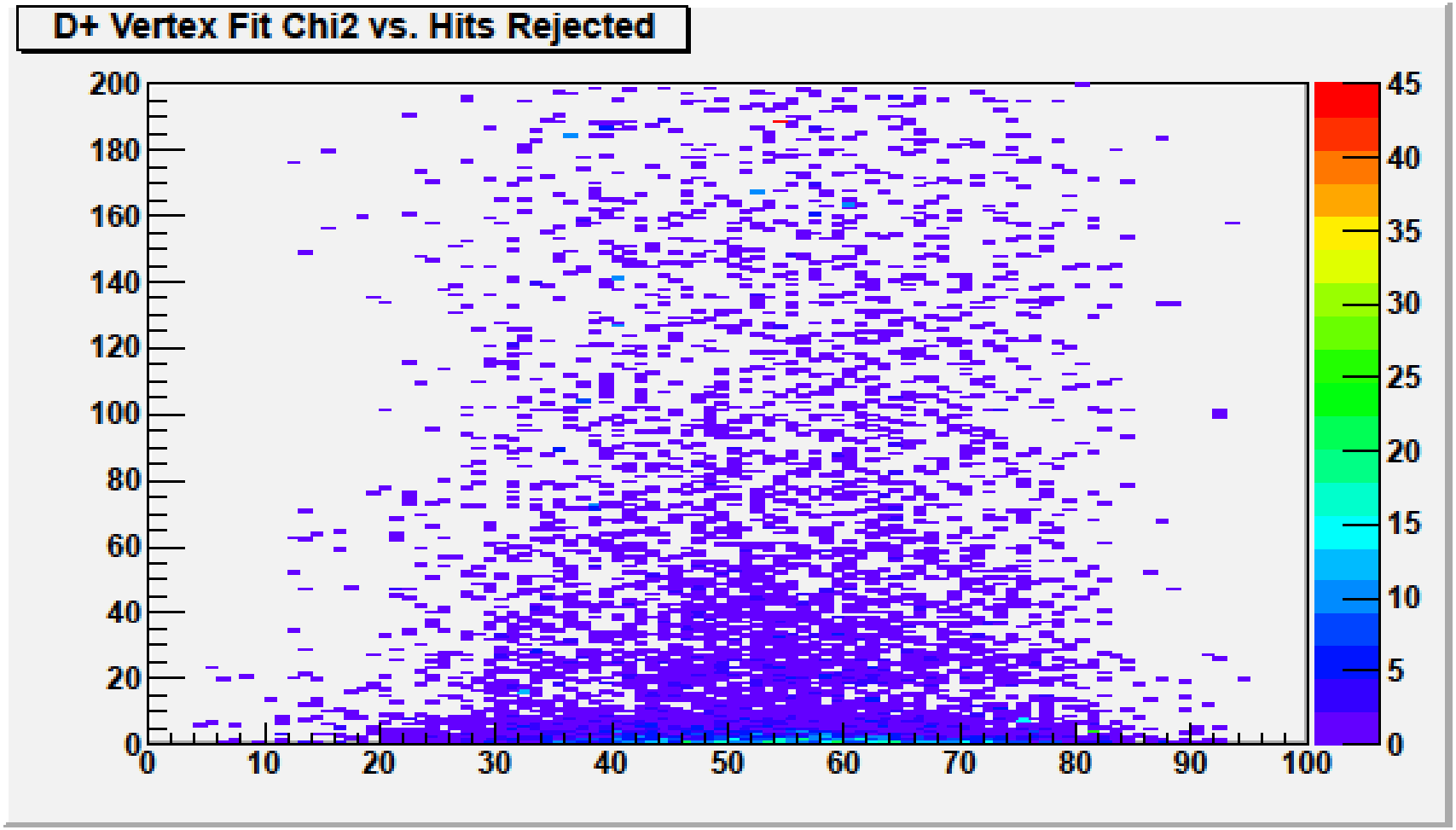
c) For the analysis, as pointed by Lars, the selection of the "best candidate" **using the combination with the best chi2 value after some 4c/vertex fit should be avoided**, in order to not be biased by parameter error values (a worse error value means a lower chi2 -> a selection of the lowest chi2 could take the "worse" tracks in case of clones). I would suggest to define a proper chi2 of the reaction before fitters, correlated to the channel. I.e.

n(pipi) -> (reco_mass-mc_mass)^2
eta_c -> (totalreco_mass-eta_mass)^2/sigma(eta)^2 +
(phi1reco_mass-phi_mass)^2/sigma(phi)^2 +
(phi2reco_mass-phi_mass)^2/sigma(phi)^2
psi37770 -> (totalreco_mass-psi_mass)^2/sigma(psi)^2 +
(D1reco_mass-D_mass)^2/sigma(D)^2 + (D2reco_mass-D_mass)^2/sigma(D)^2

where sigma(eta/phi/psi/S) are the measured resolutions by fitting the invariant mass distribution peaks.
In such a way, if there are more than 1 candidate per event only the best one should be chosen and sent to the fitters.


D+ Vertex Fit Chi2 vs. Hits
200
180
160
140
120
100
80
60
40
20
0
0
10
20
30
40
50
60
70
80
90
100
100
80
60
40
20
0


D+ Vertex Fit Chi2 vs. Hits Accepted
200
180
160
140
120
100
80
60
40
20
0
0
10
20
30
40
50
60
70
80
90
100
100
80
60
40
20
0


D+ Vertex Fit Chi2 vs. Hits Rejected
200
180
160
140
120
100
80
60
40
20
0
0
10
20
30
40
50
60
70
80
90
100
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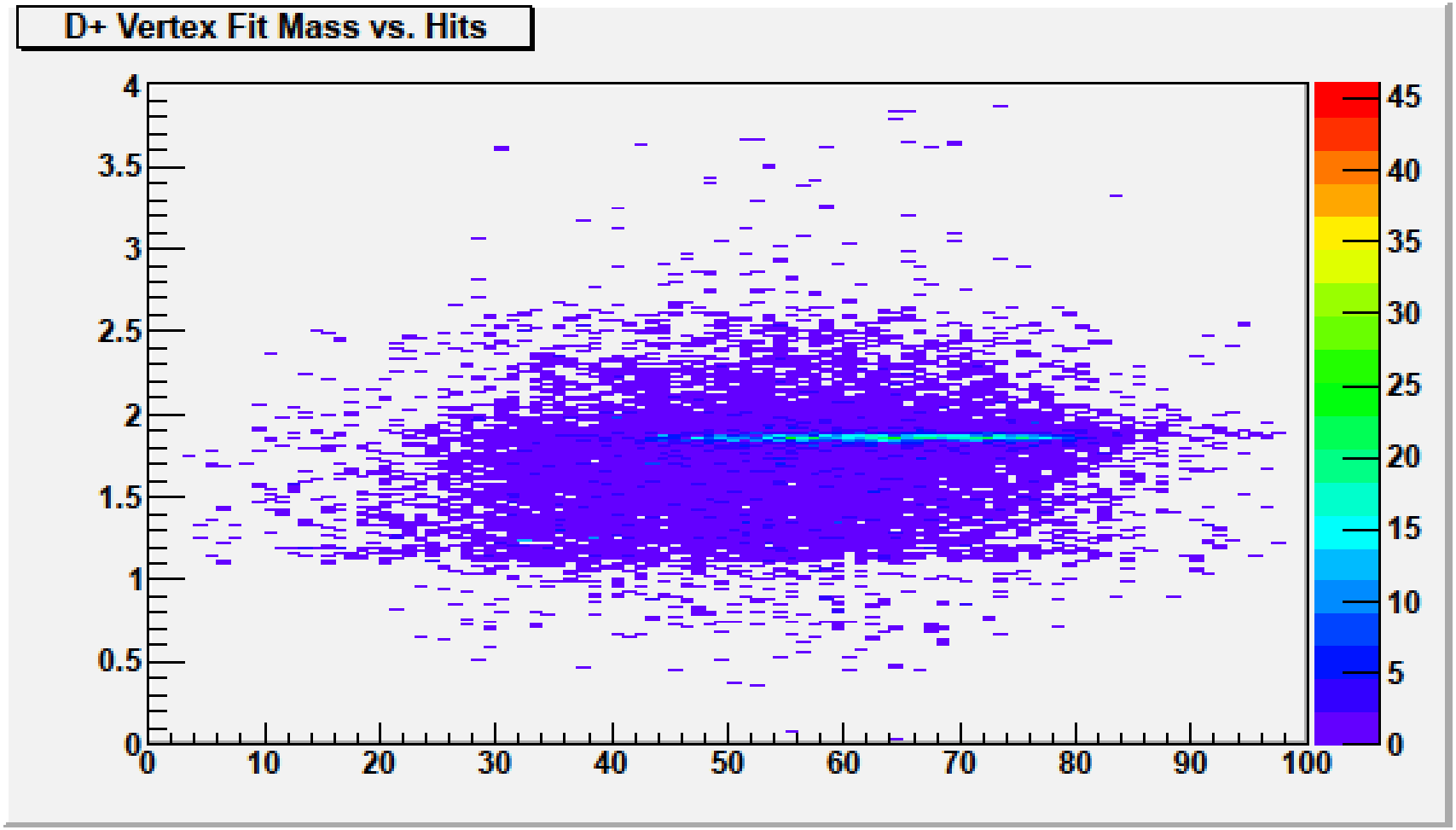
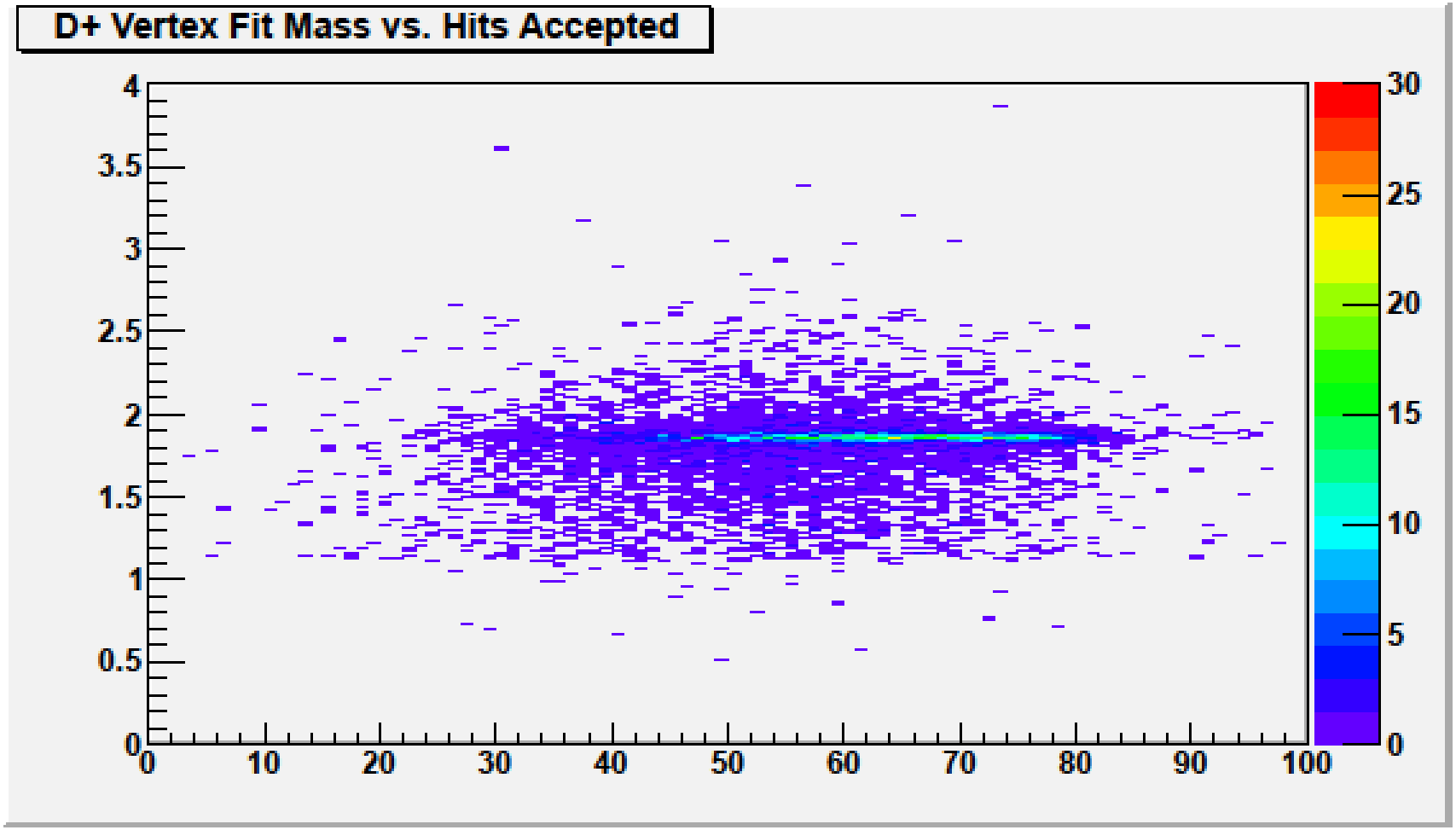
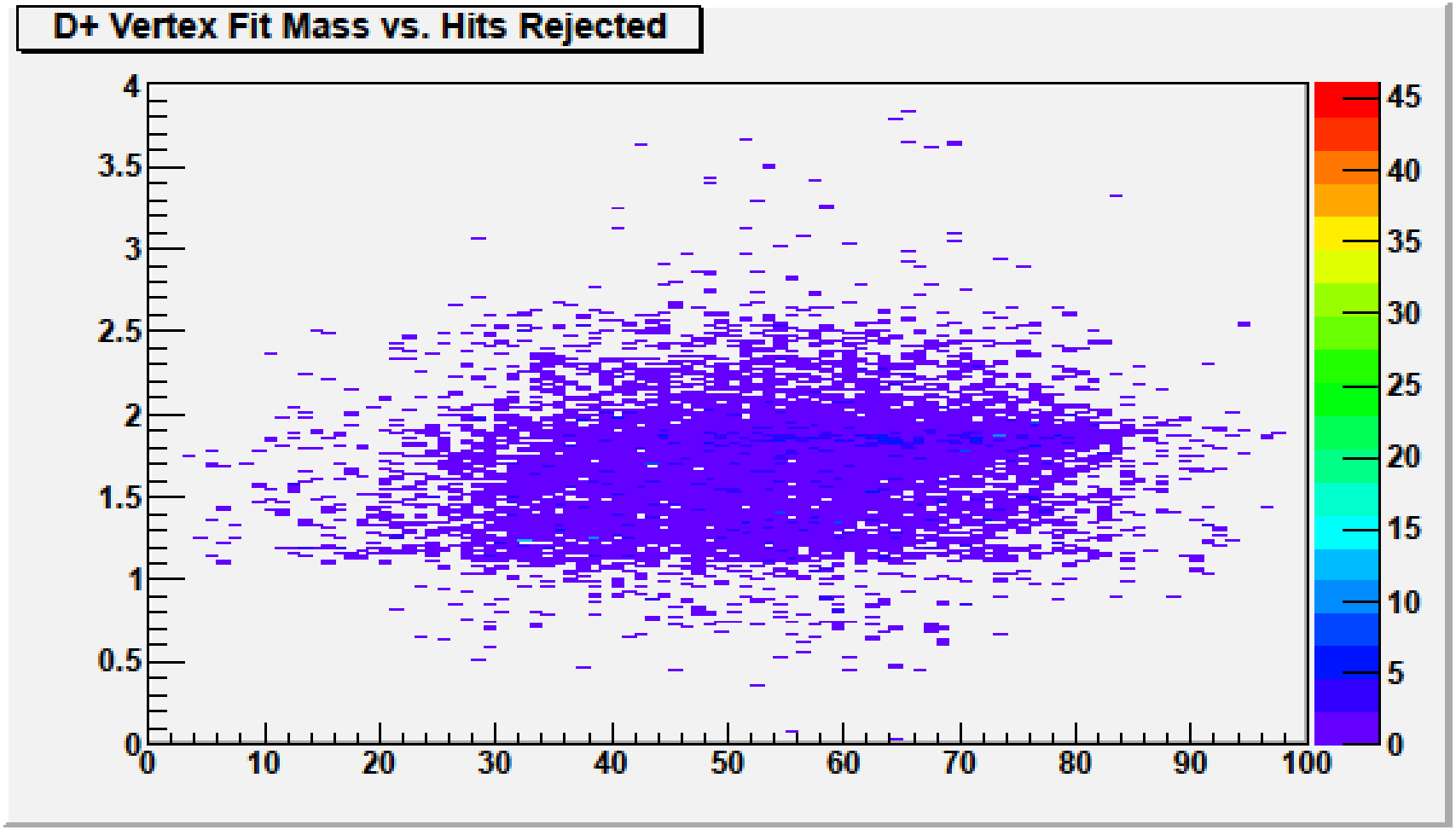
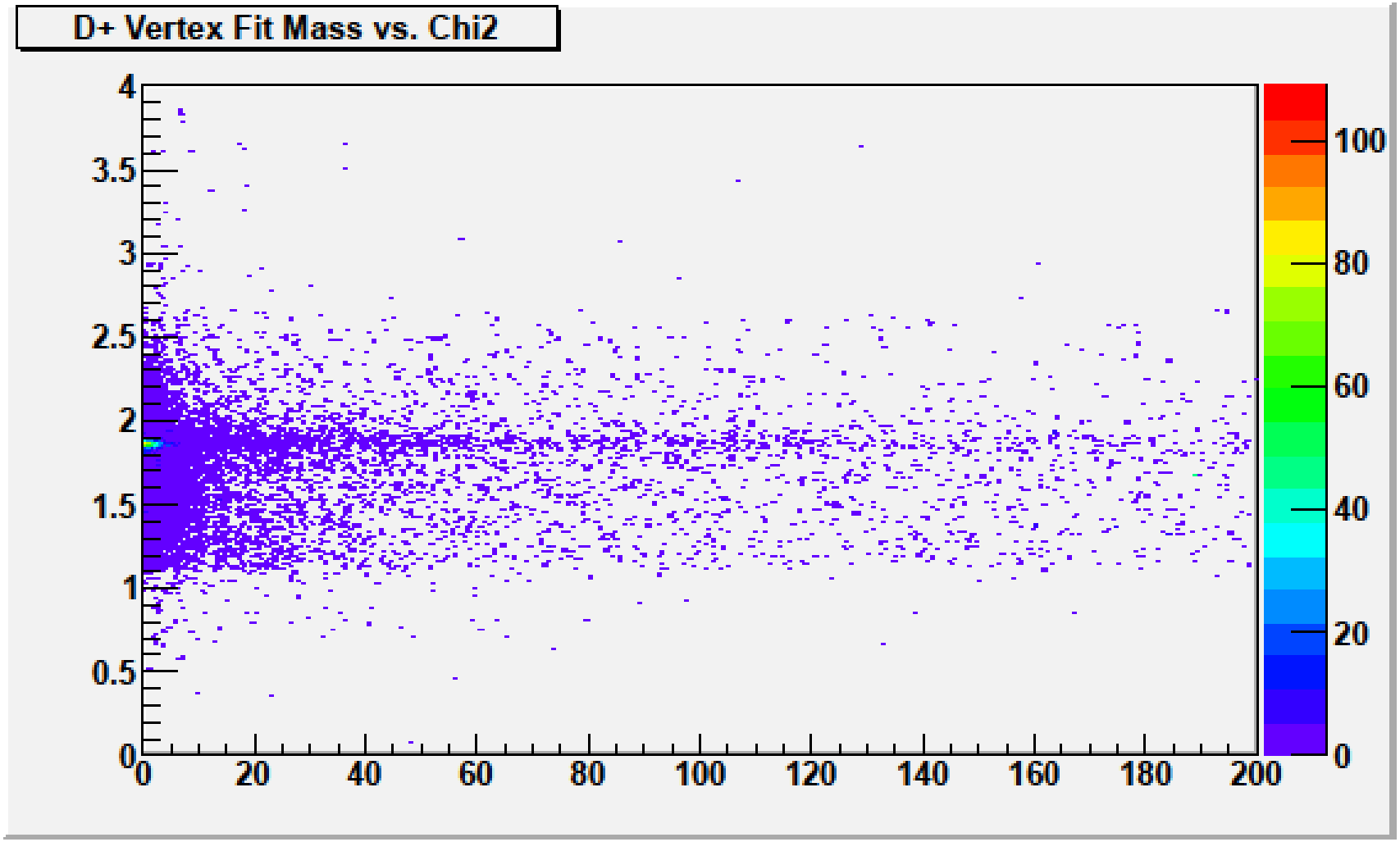
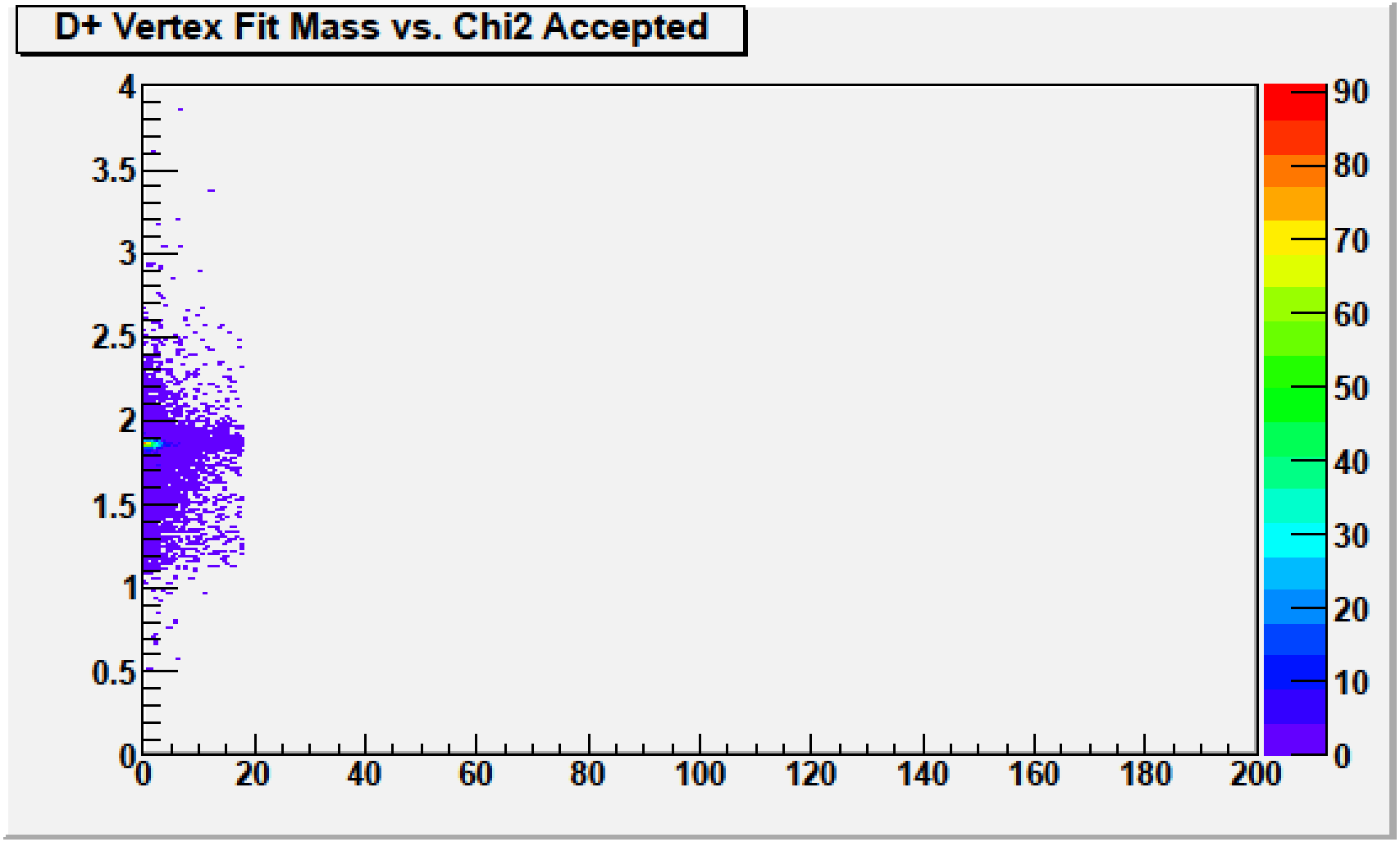
25
20
15
10
5
0

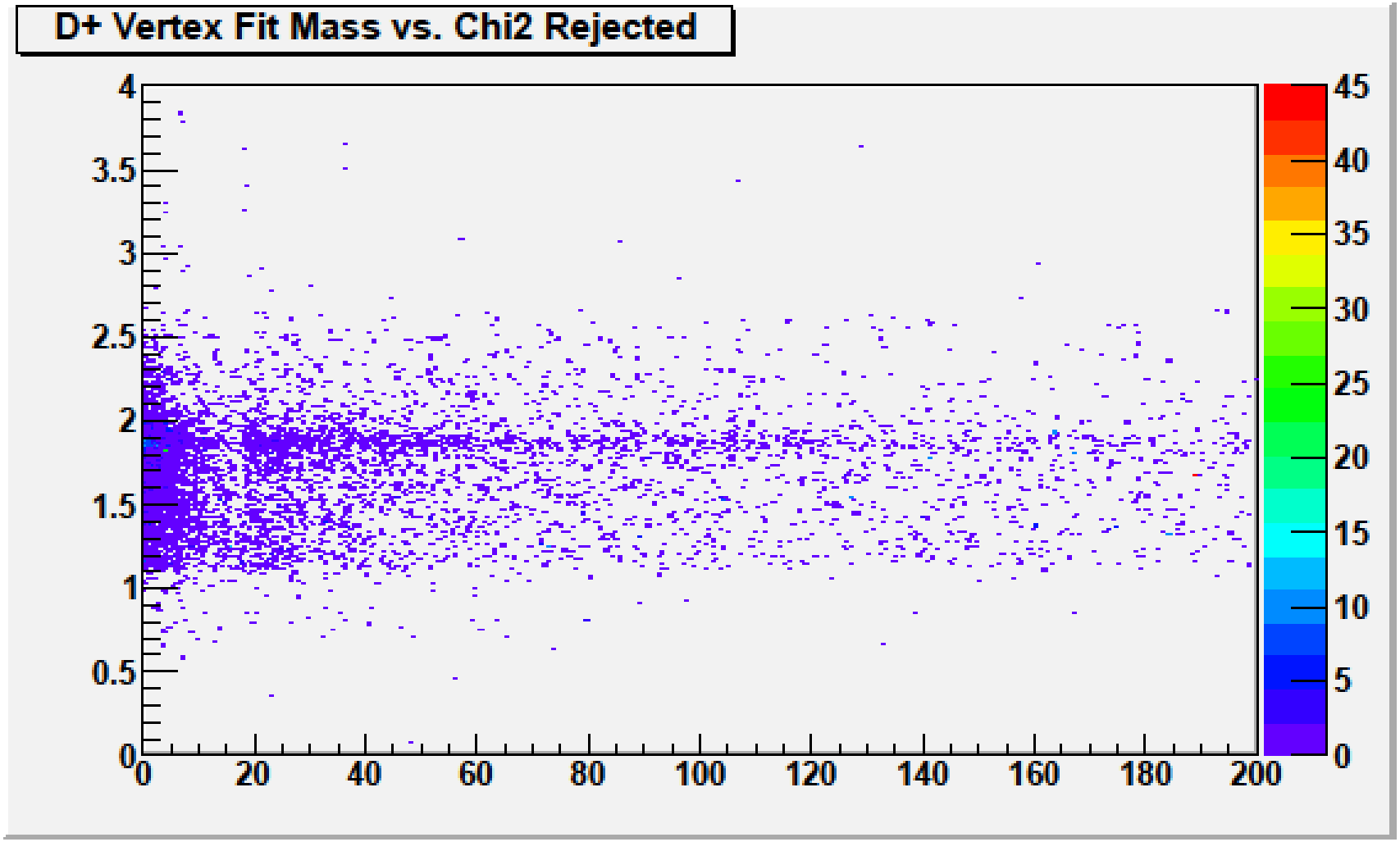

D+ Vertex Fit Mass vs. Hits
4
3.5
3
2.5
2
1.5
1
0.5
0
0
10
20
30
40
50
60
70
80
90
100
45
40
35
30
25
20
15
10
5
0


D+ Vertex Fit Mass vs. Hits Accepted
4
3.5
3
2.5
2
1.5
1
0.5
0
0
10
20
30
40
50
60
70
80
90
100
30
25
20
15
10
5
0


D+ Vertex Fit Mass vs. Hits Rejected
4
3.5
3
2.5
2
1.5
1
0.5
0
0
10
20
30
40
50
60
70
80
90
100
45
40
35
30
25
20
15
10
5
0


D+ Vertex Fit Mass vs. Chi2
4
3.5
3
2.5
2
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
180
200
100
80
60
40
20
0


D+ Vertex Fit Mass vs. Chi2 Accepted
4
3.5
3
2.5
2
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
180
200
90
80
70
60
50
40
30
20
10
0


D+ Vertex Fit Mass vs. Chi2 Rejected
4
3.5
3
2.5
2
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
180
200
45
40
35
30
25
20
15
10
5
0