EmCal PbGl π^0 search

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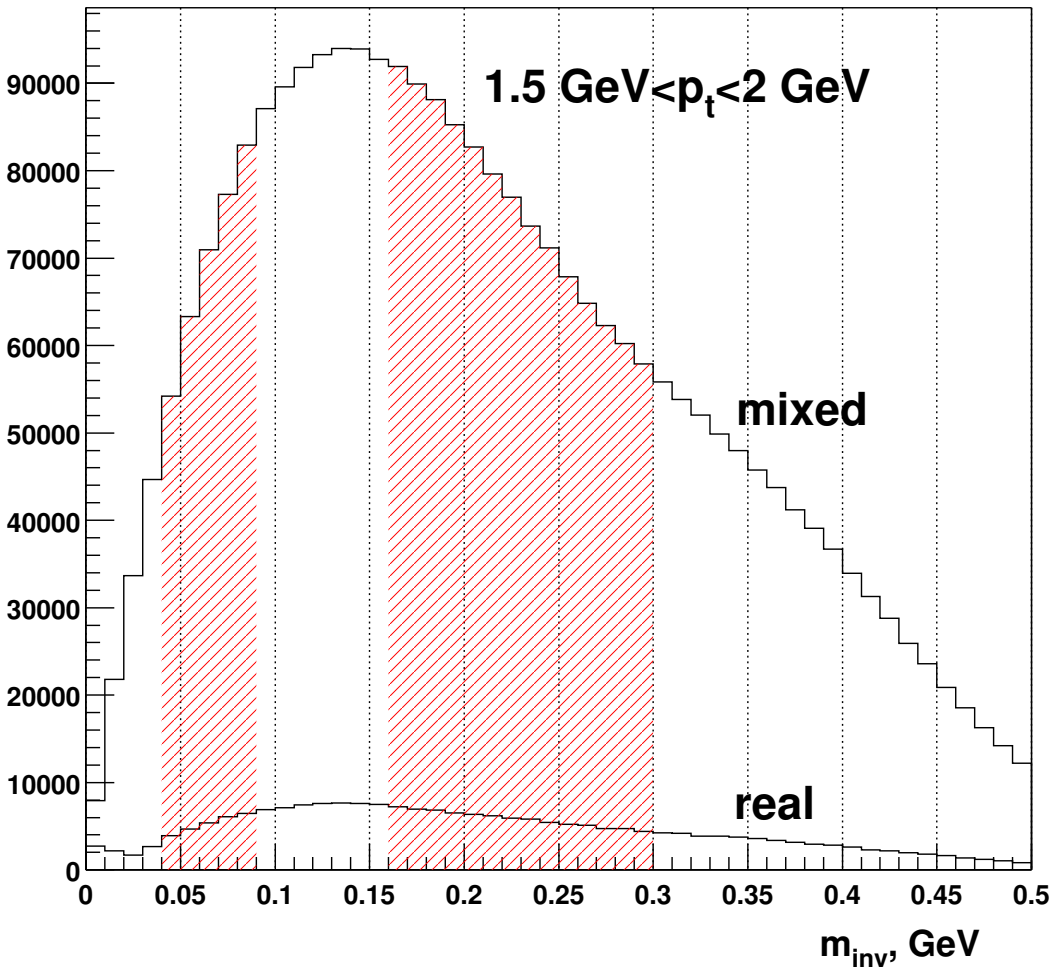
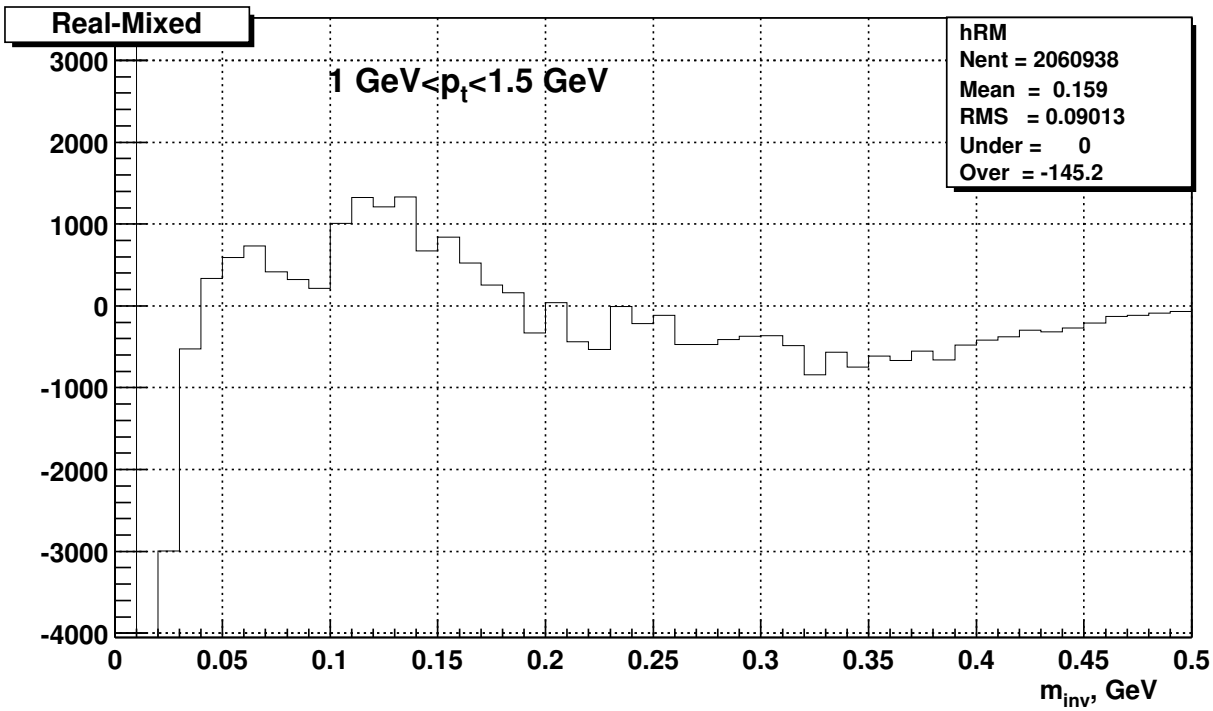
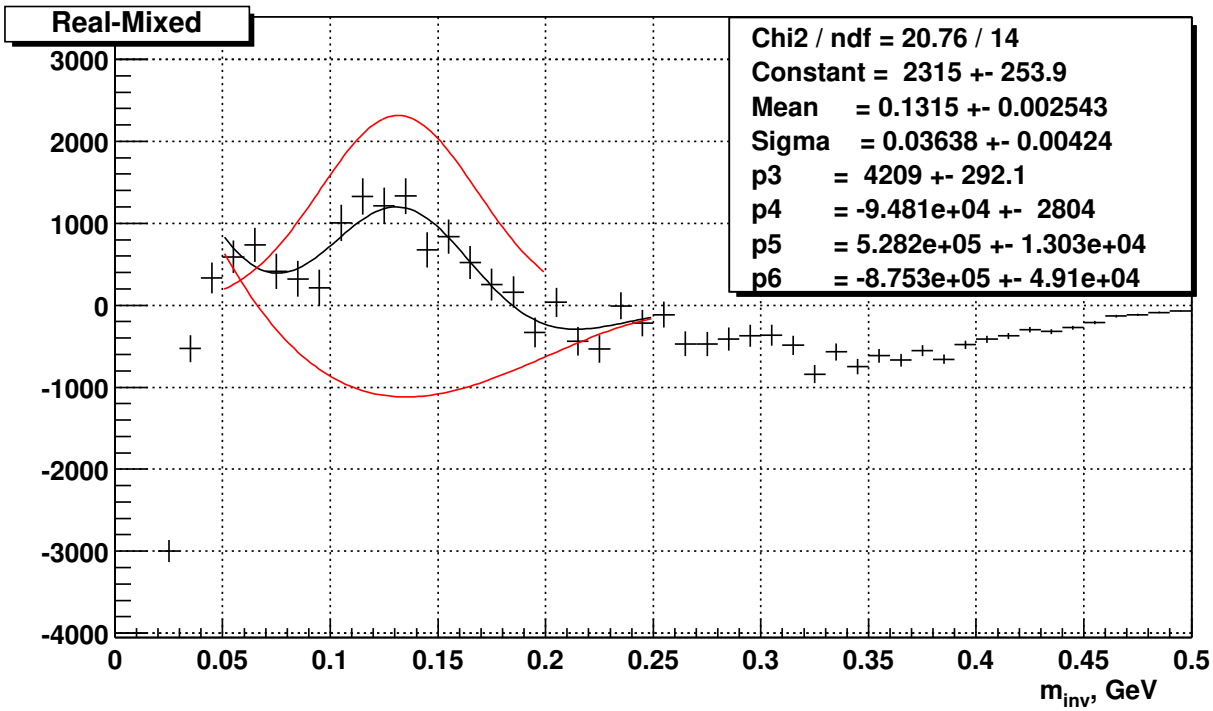
Some Statistics

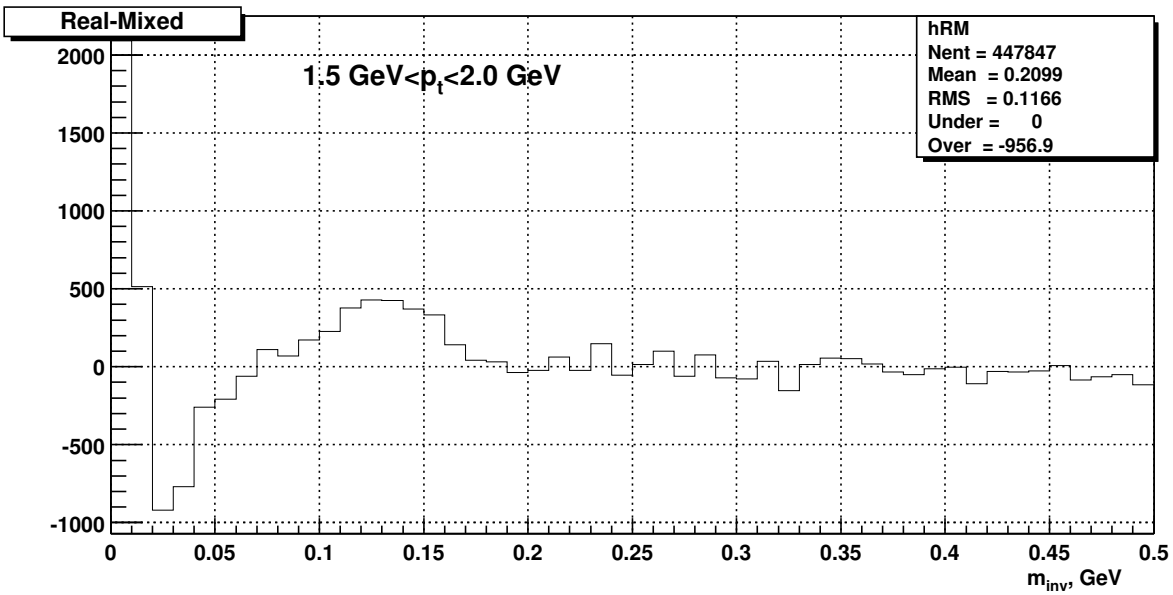
- Total number of events analyzed: $660,383$
- $-40cm < Z_{bbc} < 40cm$: $395,118$
- Total amount of PbGl clusters: $97,917,175$
- PbGl clusters $E > 100$ MeV: $2,720,880$
- PbGl clusters $0.01 < CL < 0.9999$: $1,064,090$

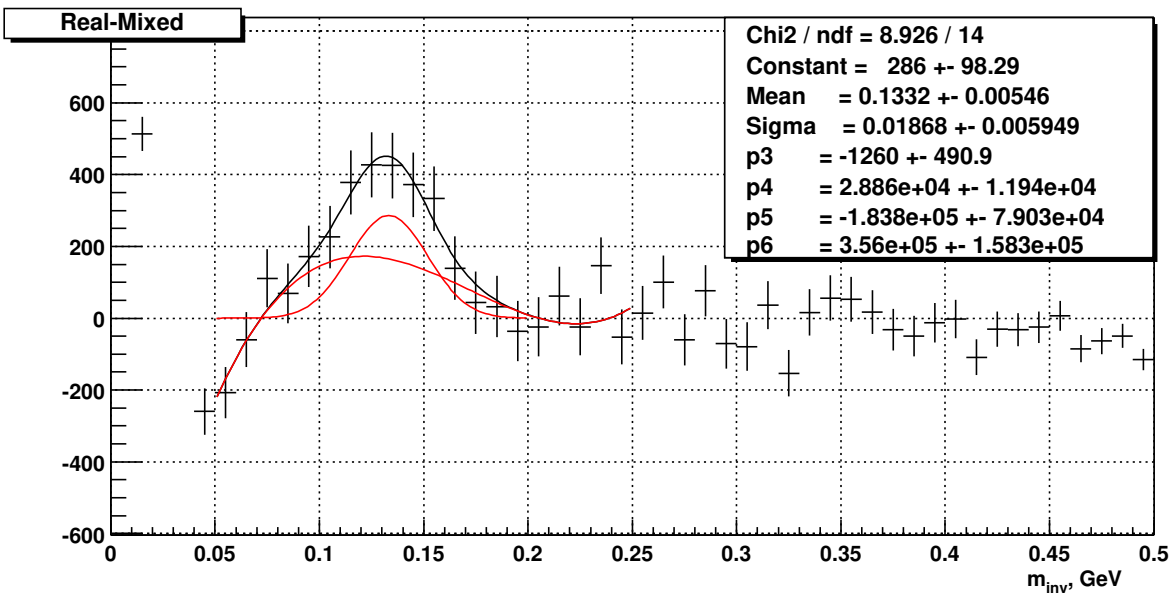


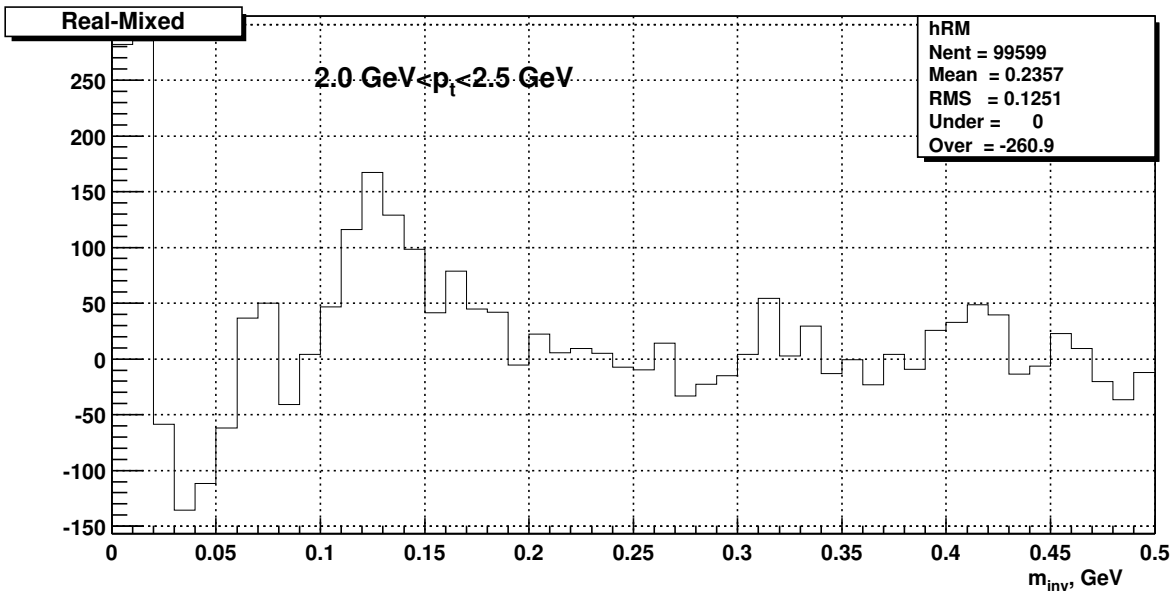
Normalization coefficient k: $\int(real - k \cdot mixed) = 0$ over $0.4 < m_{inv} < 0.9$ and $0.16 < m_{inv} < 0.3$ (hatched areas)

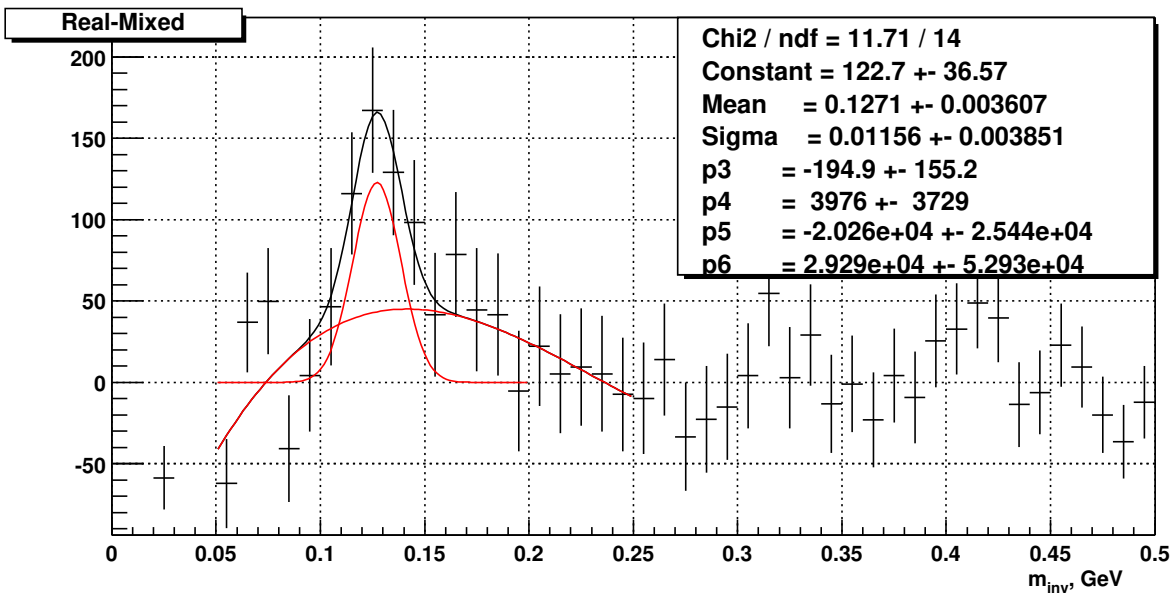

Real-Mixed
1 GeV<p_t<1.5 GeV
hRM
Nent = 2060938
Mean = 0.159
RMS = 0.09013
Under = 0
Over = -145.2
3000
2000
1000
0
-1000
-2000
-3000
-4000
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
m_inv, GeV

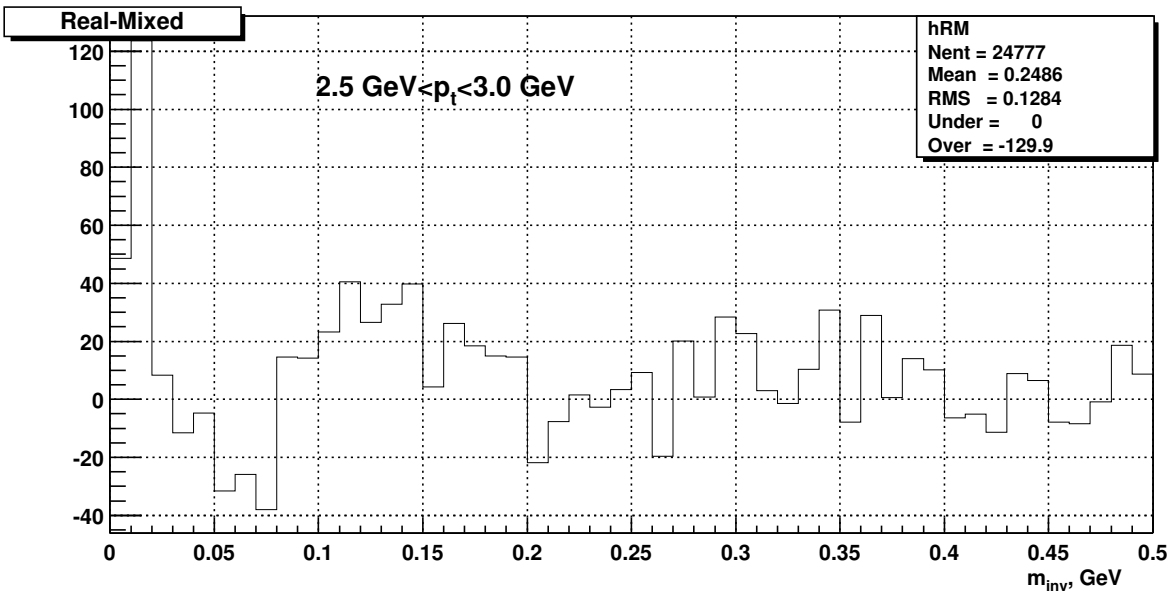

Real-Mixed
Chi2 / ndf = 20.76 / 14
Constant = 2315 +- 253.9
Mean = 0.1315 +- 0.002543
Sigma = 0.03638 +- 0.00424
p3 = 4209 +- 292.1
p4 = -9.481e+04 +- 2804
p5 = 5.282e+05 +- 1.303e+04
p6 = -8.753e+05 +- 4.91e+04
3000
2000
1000
0
-1000
-2000
-3000
-4000
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
m_inv, GeV

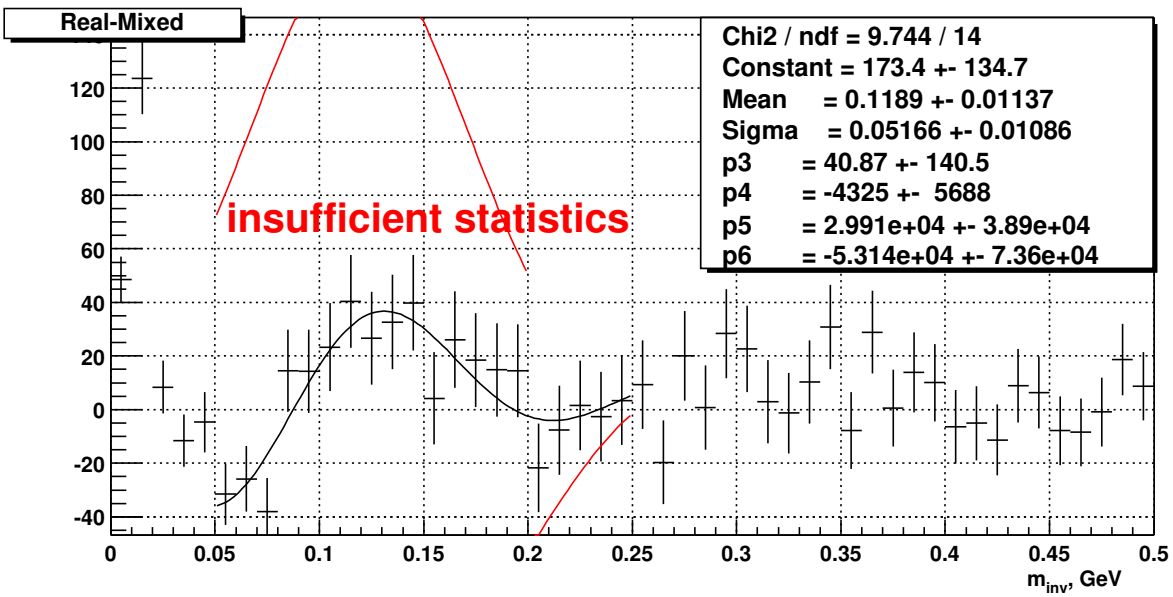

Real-Mixed
1.5 GeV<p_t<2.0 GeV
hRM
Nent = 447847
Mean = 0.2099
RMS = 0.1166
Under = 0
Over = -956.9
2000
1500
1000
500
0
-500
-1000
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
m_inv, GeV

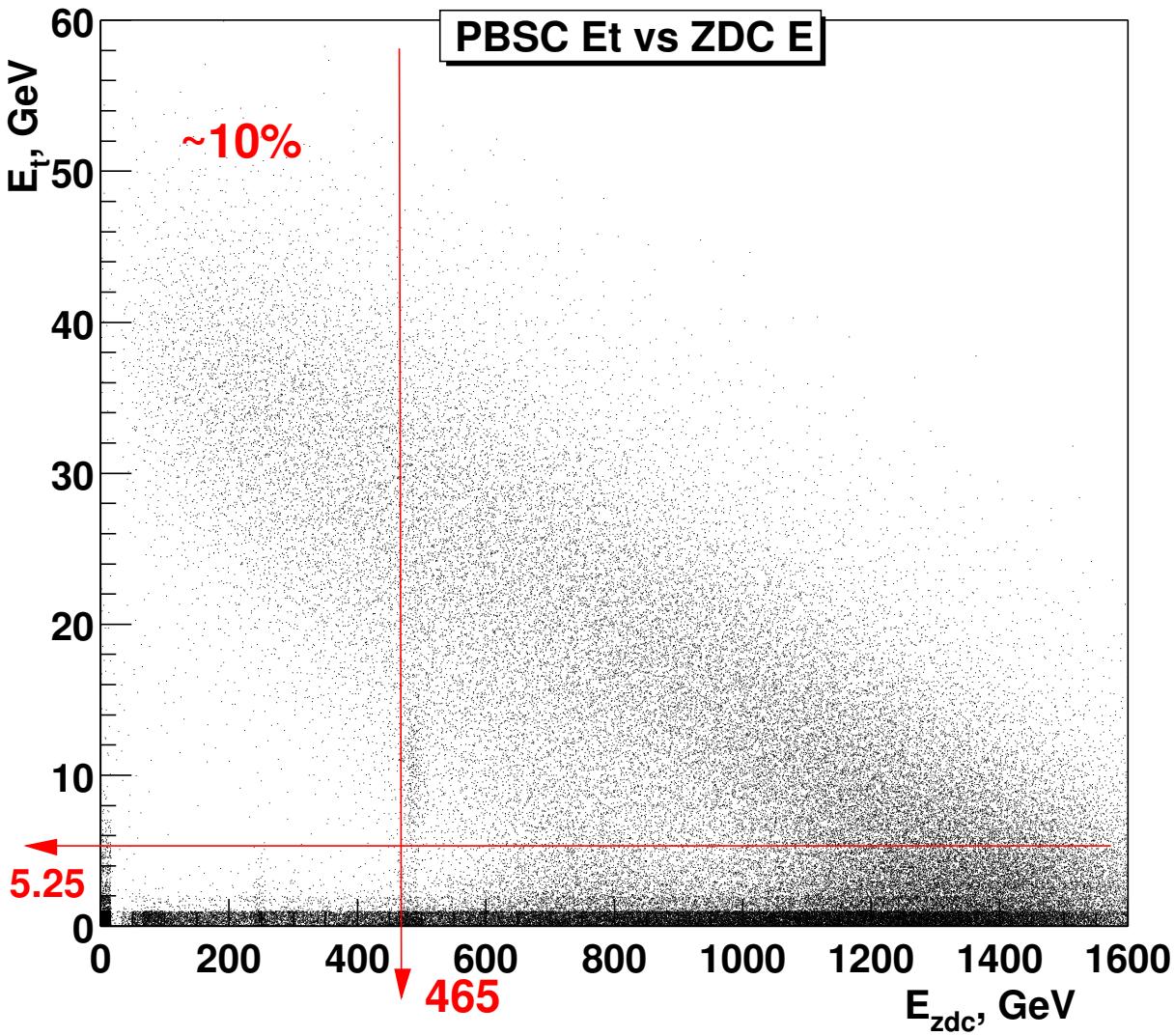

Real-Mixed
Chi2 / ndf = 8.926 / 14
Constant = 286 +- 98.29
Mean = 0.1332 +- 0.00546
Sigma = 0.01868 +- 0.005949
p3 = -1260 +- 490.9
p4 = 2.886e+04 +- 1.194e+04
p5 = -1.838e+05 +- 7.903e+04
p6 = 3.56e+05 +- 1.583e+05
600
400
200
0
-200
-400
-600
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
m_inv, GeV

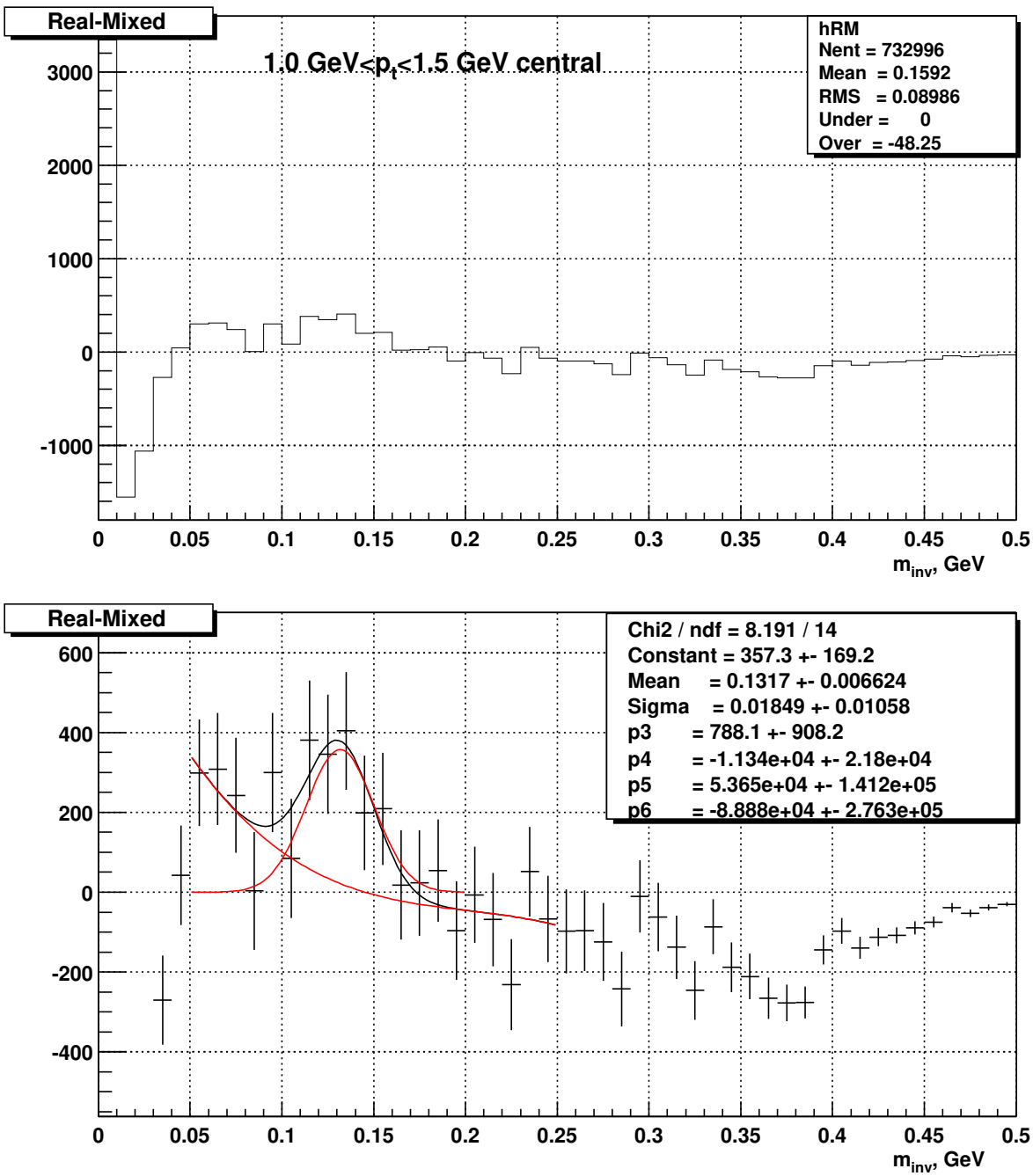

Real-Mixed
2.0 GeV<p_t<2.5 GeV
hRM
Nent = 99599
Mean = 0.2357
RMS = 0.1251
Under = 0
Over = -260.9
m_inv, GeV

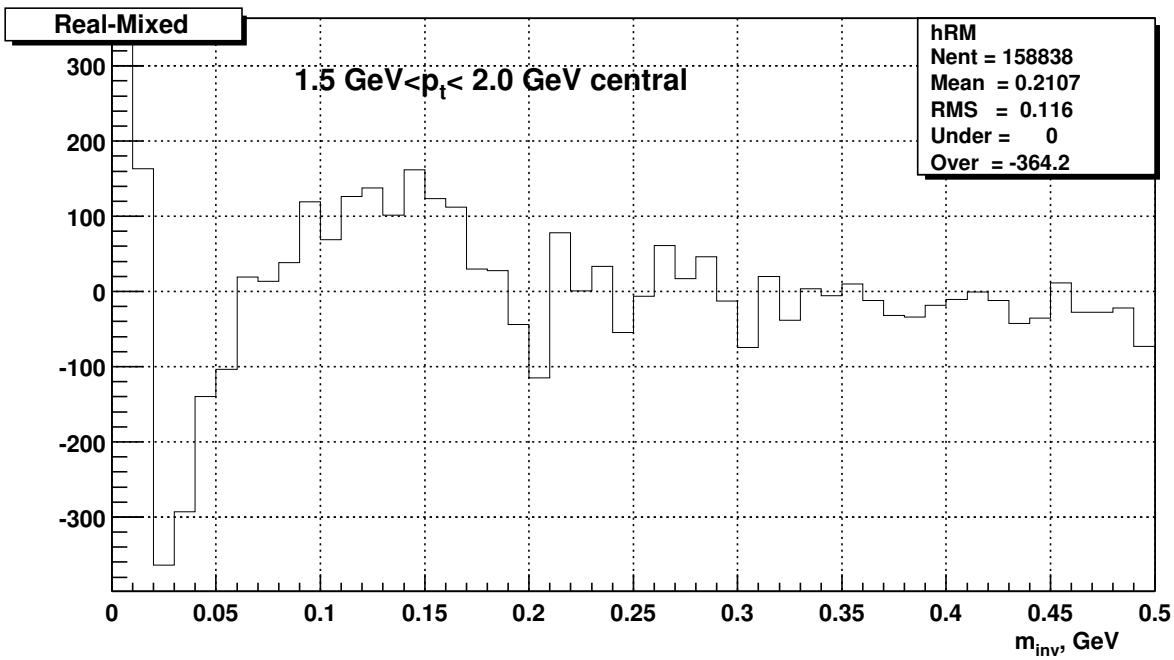

Real-Mixed
Chi2 / ndf = 11.71 / 14
Constant = 122.7 +- 36.57
Mean = 0.1271 +- 0.003607
Sigma = 0.01156 +- 0.003851
p3 = -194.9 +- 155.2
p4 = 3976 +- 3729
p5 = -2.026e+04 +- 2.544e+04
p6 = 2.929e+04 +- 5.293e+04
m_inv, GeV

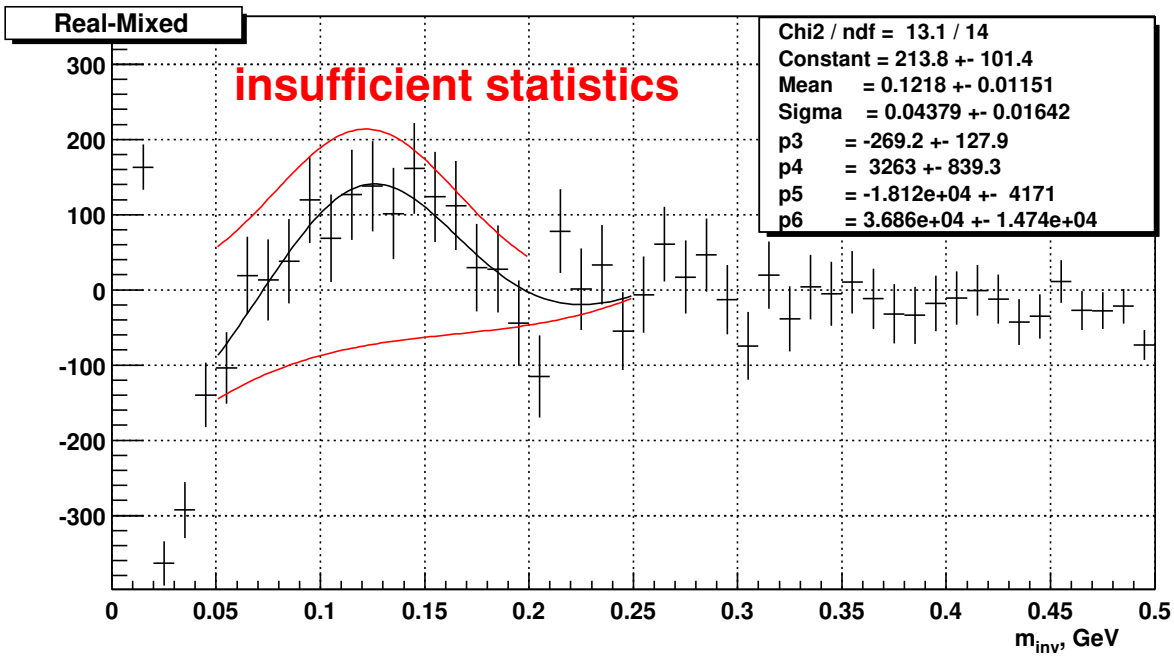

Real-Mixed
2.5 GeV<p_t<3.0 GeV
hRM
Nent = 24777
Mean = 0.2486
RMS = 0.1284
Under = 0
Over = -129.9
m_inv, GeV


Real-Mixed
insufficient statistics
Chi2 / ndf = 9.744 / 14
Constant = 173.4 +- 134.7
Mean = 0.1189 +- 0.01137
Sigma = 0.05166 +- 0.01086
p3 = 40.87 +- 140.5
p4 = -4325 +- 5688
p5 = 2.991e+04 +- 3.89e+04
p6 = -5.314e+04 +- 7.36e+04
m_inv, GeV


PBSC Et vs ZDC E
~10%
5.25
465
E_t, GeV
E_{zdc}, GeV
0
10
20
30
40
50
60
0
200
400
600
800
1000
1200
1400
1600


Real-Mixed
1.0 GeV<p_t<1.5 GeV central
hRM
Nent = 732996
Mean = 0.1592
RMS = 0.08986
Under = 0
Over = -48.25
3000
2000
1000
0
-1000
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
m_inv, GeV
Real-Mixed
Chi2 / ndf = 8.191 / 14
Constant = 357.3 +- 169.2
Mean = 0.1317 +- 0.006624
Sigma = 0.01849 +- 0.01058
p3 = 788.1 +- 908.2
p4 = -1.134e+04 +- 2.18e+04
p5 = 5.365e+04 +- 1.412e+05
p6 = -8.888e+04 +- 2.763e+05
600
400
200
0
-200
-400
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
m_inv, GeV


Real-Mixed
1.5 GeV<p_t< 2.0 GeV central
hRM
Nent = 158838
Mean = 0.2107
RMS = 0.116
Under = 0
Over = -364.2
300
200
100
0
-100
-200
-300
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
m_inv, GeV


Real-Mixed
insufficient statistics
Chi2 / ndf = 13.1 / 14
Constant = 213.8 +- 101.4
Mean = 0.1218 +- 0.01151
Sigma = 0.04379 +- 0.01642
p3 = -269.2 +- 127.9
p4 = 3263 +- 839.3
p5 = -1.812e+04 +- 4171
p6 = 3.686e+04 +- 1.474e+04
300
200
100
0
-100
-200
-300
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
m_inv, GeV