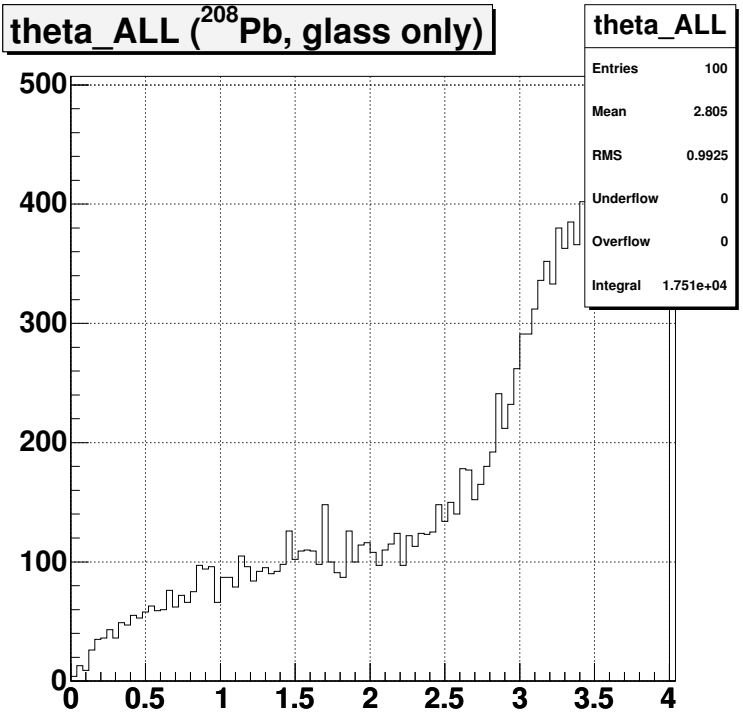
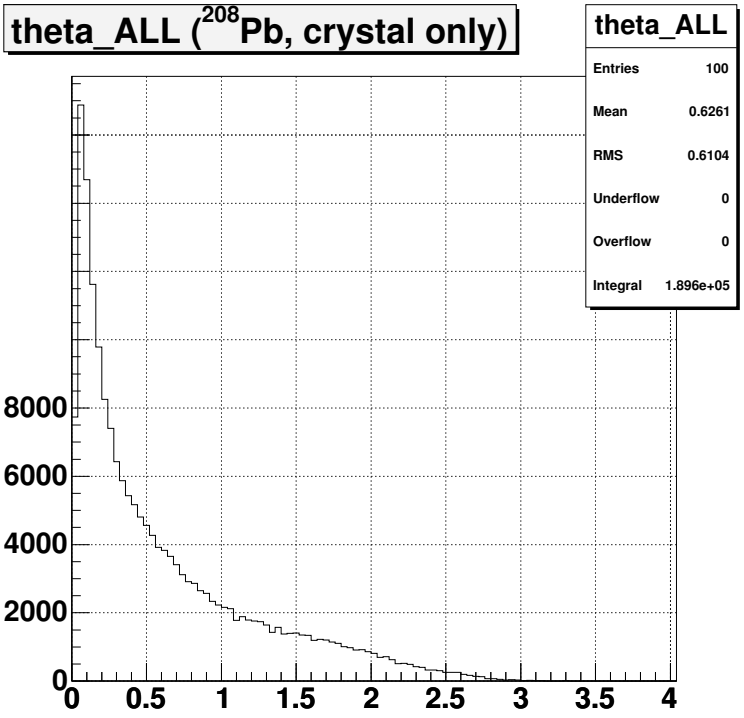
π^0 yield from ^{208}Pb
ALL Events from 86 **runs** ϵ**[04882,05330]**

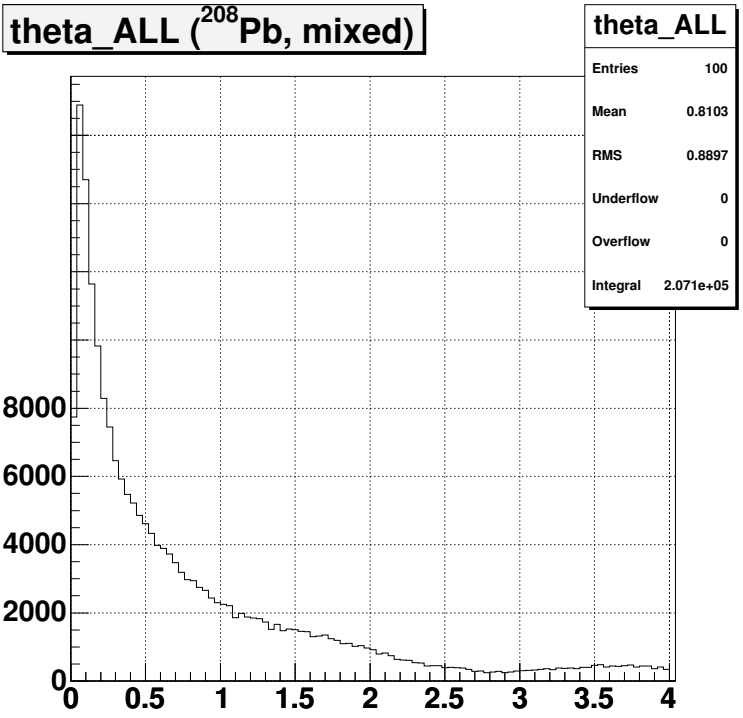
Cuts/Algorithm used:

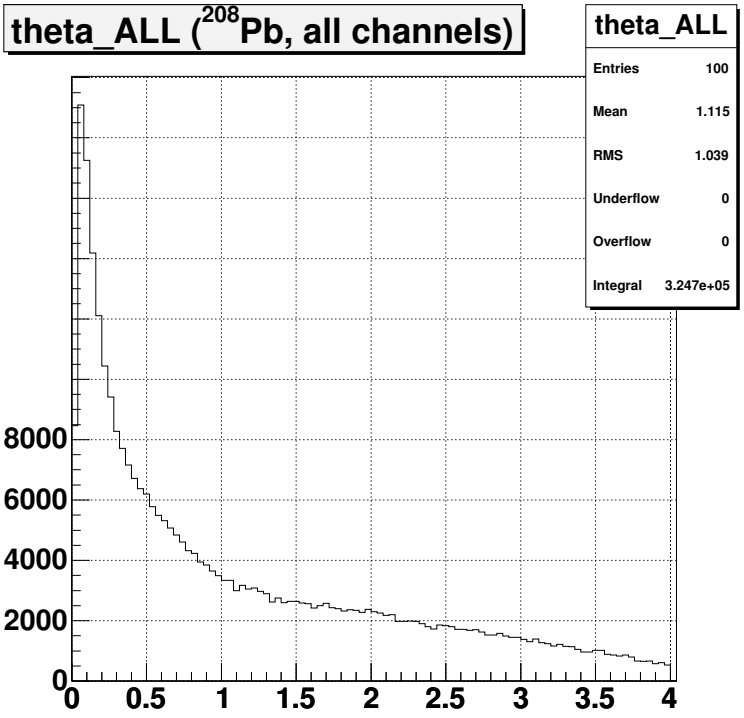
−Loop over clusts in evnt i_cl=0 to # clusts
− −nested Loop over j_cl=i_cl+1 to n_clusters
− − −Calculate cluster pair observables
− − −Apply fiducial cuts (if any)
− − −if pair energy > 6.5GeV, skip
− − −if pair energy < 3.5GeV, skip
− − −if one clust. energy < 500MeV, skip
− − −cut out beamline box ($7.6cm \times 7.6cm$)
− − −check clusters internal time matching
− − −check for matching tagger hits
− − −if (pair mass > 0.085 GeV)
− − − −Loop over tagger hits (ass.w/ i_cl & can be 0)
− − − − −Fill nTuple

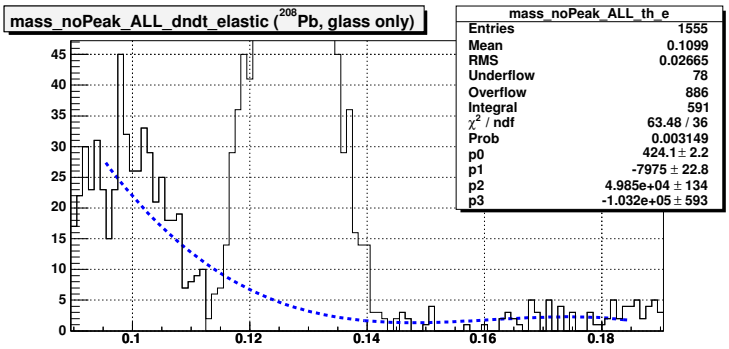
page 1: π^0 **prod angle** (θ_{π^0}) **dist.**
page 2: 2γ **Inv. Mass for elastic** π^0
page 3: 2γ **Inv. Mass for inelastic** π^0
page 4: π^0 **yield vs. elasticity ratio**
page 5: π^0 **yield vs. elasticity fits**
page 6: FINAL π^0 **yield vs.** θ_{π^0}

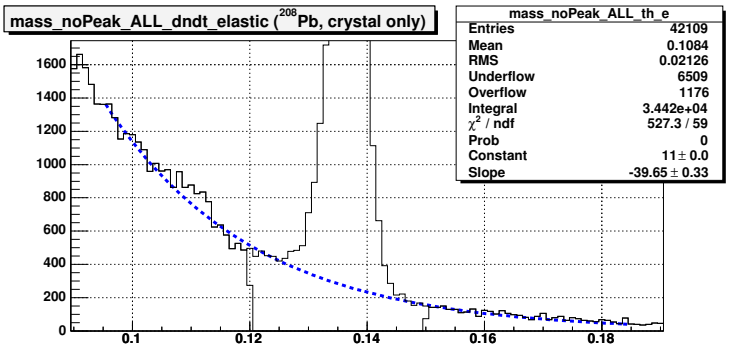

theta_ALL (^{208}Pb, glass only)
theta_ALL
Entries 100
Mean 2.805
RMS 0.9925
Underflow 0
Overflow 0
Integral 1.751e+04
500
400
300
200
100
0
0 0.5 1 1.5 2 2.5 3 3.5 4

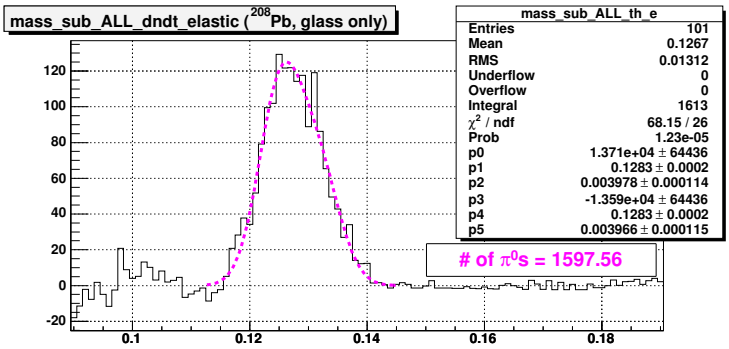

theta_ALL (^{208}Pb, crystal only)
theta_ALL
Entries 100
Mean 0.6261
RMS 0.6104
Underflow 0
Overflow 0
Integral 1.896e+05
8000
6000
4000
2000
0
0 0.5 1 1.5 2 2.5 3 3.5 4

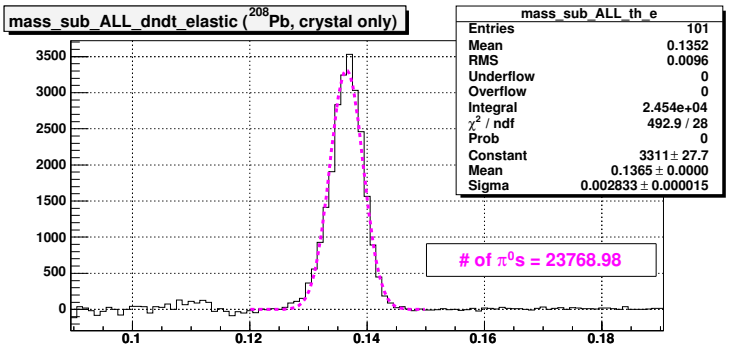

theta_ALL (^{208}Pb, mixed)
theta_ALL
Entries 100
Mean 0.8103
RMS 0.8897
Underflow 0
Overflow 0
Integral 2.071e+05
8000
6000
4000
2000
0
0 0.5 1 1.5 2 2.5 3 3.5 4

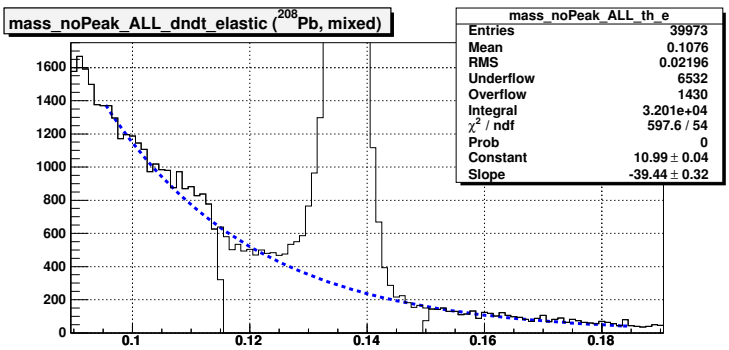

theta_ALL (^{208}Pb, all channels)
theta_ALL
Entries 100
Mean 1.115
RMS 1.039
Underflow 0
Overflow 0
Integral 3.247e+05
8000
6000
4000
2000
0
0 0.5 1 1.5 2 2.5 3 3.5 4

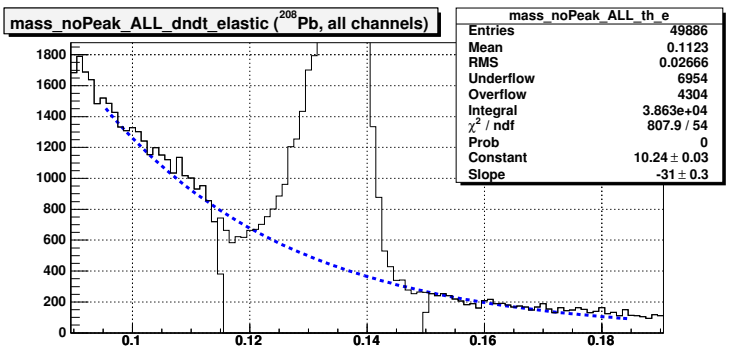

mass_noPeak_ALL_dndt_elastic (^{208}Pb, glass only)
mass_noPeak_ALL_th_e
Entries 1555
Mean 0.1099
RMS 0.02665
Underflow 78
Overflow 886
Integral 591
χ^2 / ndf 63.48 / 36
Prob 0.003149
p0 424.1 ± 2.2
p1 -7975 ± 22.8
p2 4.985e+04 ± 134
p3 -1.032e+05 ± 593

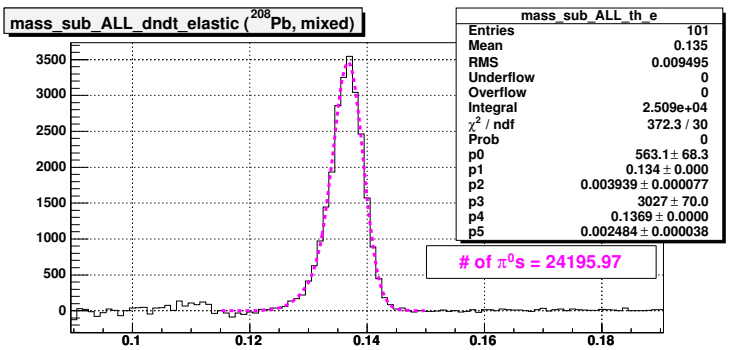

mass_noPeak_ALL_dndt_elastic (^{208}Pb, crystal only)
mass_noPeak_ALL_th_e
Entries 42109
Mean 0.1084
RMS 0.02126
Underflow 6509
Overflow 1176
Integral 3.442e+04
χ^2 / ndf 527.3 / 59
Prob 0
Constant 11 ± 0.0
Slope -39.65 ± 0.33

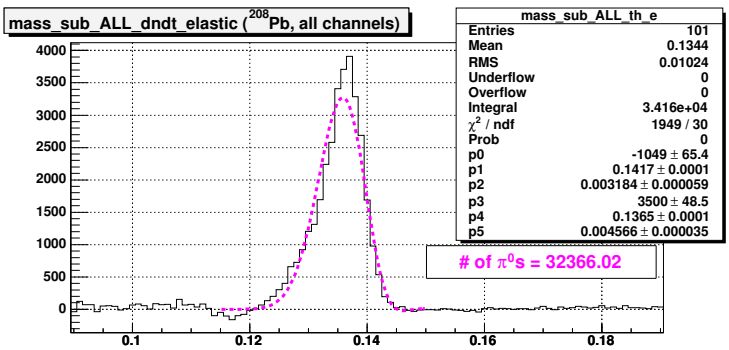

mass_sub_ALL_dndt_elastic (^{208}Pb, glass only)
mass_sub_ALL_th_e
Entries 101
Mean 0.1267
RMS 0.01312
Underflow 0
Overflow 0
Integral 1613
χ^2 / ndf 68.15 / 26
Prob 1.23e-05
p0 1.371e+04 ± 64436
p1 0.1283 ± 0.0002
p2 0.003978 ± 0.000114
p3 -1.359e+04 ± 64436
p4 0.1283 ± 0.0002
p5 0.003966 ± 0.000115
of π^0s = 1597.56

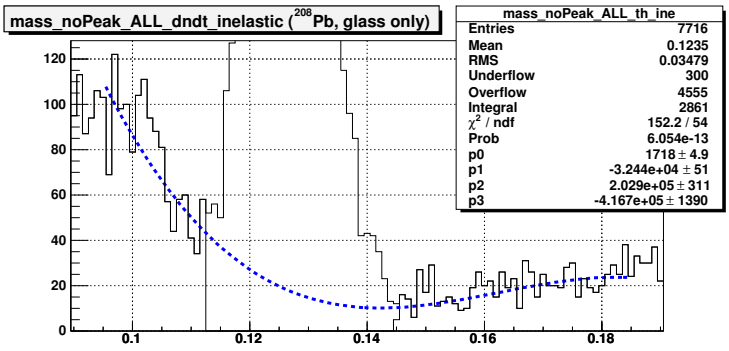

mass_sub_ALL_dndt_elastic (^{208}Pb, crystal only)
mass_sub_ALL_th_e
Entries 101
Mean 0.1352
RMS 0.0096
Underflow 0
Overflow 0
Integral 2.454e+04
χ^2 / ndf 492.9 / 28
Prob 0
Constant 3311 ± 27.7
Mean 0.1365 ± 0.0000
Sigma 0.002833 ± 0.000015
of π^0s = 23768.98

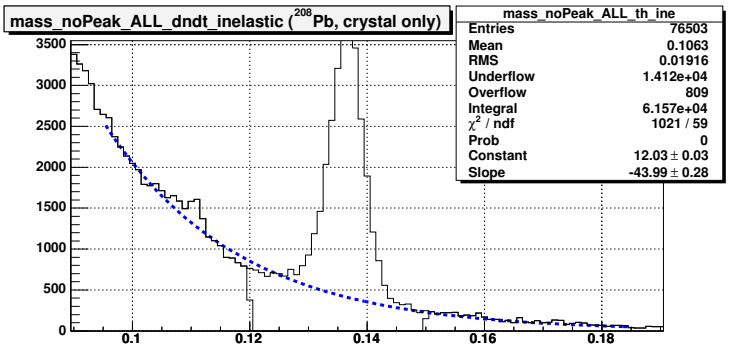

mass_noPeak_ALL_dndt_elastic (^{208}Pb, mixed)
mass_noPeak_ALL_th_e
Entries 39973
Mean 0.1076
RMS 0.02196
Underflow 6532
Overflow 1430
Integral 3.201e+04
χ^2 / ndf 597.6 / 54
Prob 0
Constant 10.99 ± 0.04
Slope -39.44 ± 0.32

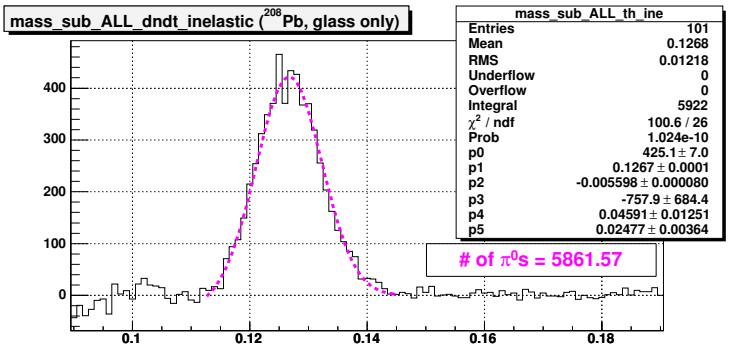

mass_noPeak_ALL_dndt_elastic (^{208}Pb, all channels)
mass_noPeak_ALL_th_e
Entries 49886
Mean 0.1123
RMS 0.02666
Underflow 6954
Overflow 4304
Integral 3.863e+04
χ^2 / ndf 807.9 / 54
Prob 0
Constant 10.24 ± 0.03
Slope -31 ± 0.3

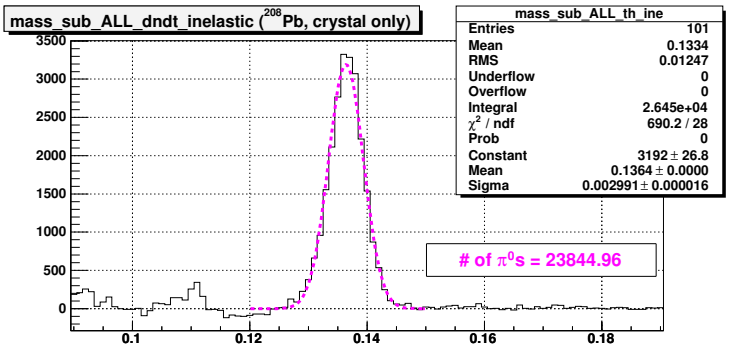

mass_sub_ALL_dndt_elastic (^{208}Pb, mixed)
mass_sub_ALL_th_e
Entries 101
Mean 0.135
RMS 0.009495
Underflow 0
Overflow 0
Integral 2.509e+04
χ^2 / ndf 372.3 / 30
Prob 0
p0 563.1 ± 68.3
p1 0.134 ± 0.000
p2 0.003939 ± 0.000077
p3 3027 ± 70.0
p4 0.1369 ± 0.0000
p5 0.002484 ± 0.000038
of π^0s = 24195.97

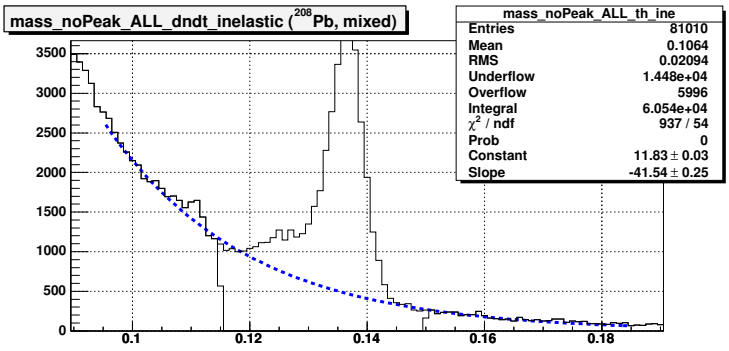

mass_sub_ALL_dndt_elastic (^{208}Pb, all channels)
mass_sub_ALL_th_e
Entries 101
Mean 0.1344
RMS 0.01024
Underflow 0
Overflow 0
Integral 3.416e+04
χ^2 / ndf 1949 / 30
Prob 0
p0 -1049 ± 65.4
p1 0.1417 ± 0.0001
p2 0.003184 ± 0.000059
p3 3500 ± 48.5
p4 0.1365 ± 0.0001
p5 0.004566 ± 0.000035
of π^0s = 32366.02

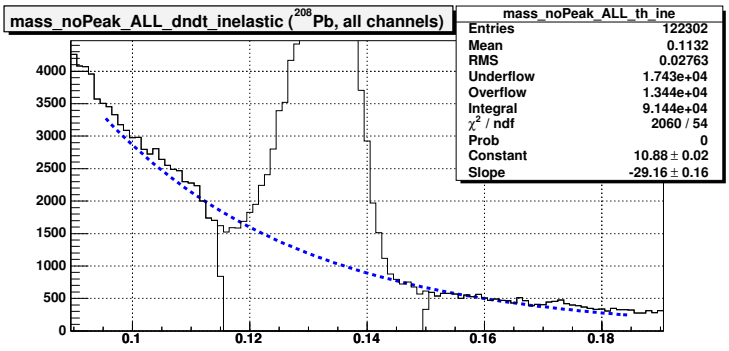

mass_noPeak_ALL_dndt_inelastic (^{208}Pb, glass only)
mass_noPeak_ALL_th_ine
Entries 7716
Mean 0.1235
RMS 0.03479
Underflow 300
Overflow 4555
Integral 2861
χ^2 / ndf 152.2 / 54
Prob 6.054e-13
p0 1718 ± 4.9
p1 -3.244e+04 ± 51
p2 2.029e+05 ± 311
p3 -4.167e+05 ± 1390

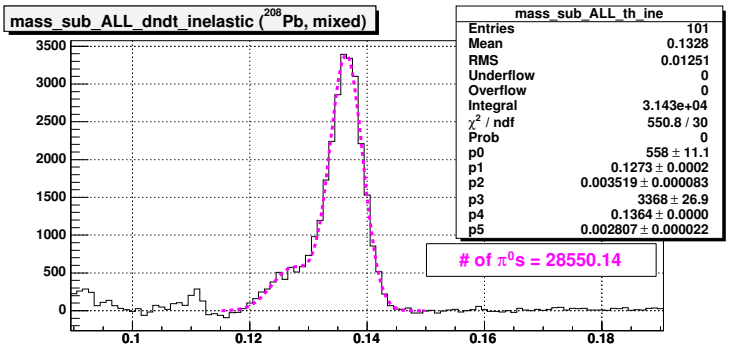

mass_noPeak_ALL_dndt_inelastic (^{208}Pb, crystal only)
mass_noPeak_ALL_th_ine
Entries 76503
Mean 0.1063
RMS 0.01916
Underflow 1.412e+04
Overflow 809
Integral 6.157e+04
χ^2 / ndf 1021 / 59
Prob 0
Constant 12.03 ± 0.03
Slope -43.99 ± 0.28

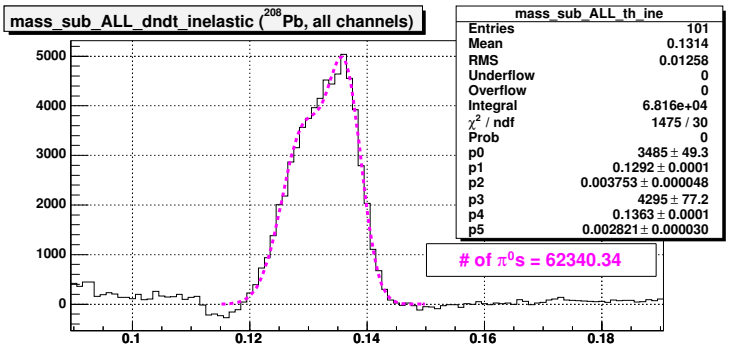

mass_sub_ALL_dndt_inelastic (^{208}Pb, glass only)
mass_sub_ALL_th_ine
Entries 101
Mean 0.1268
RMS 0.01218
Underflow 0
Overflow 0
Integral 5922
χ^2 / ndf 100.6 / 26
Prob 1.024e-10
p0 425.1 ± 7.0
p1 0.1267 ± 0.0001
p2 -0.005598 ± 0.000080
p3 -757.9 ± 684.4
p4 0.04591 ± 0.01251
p5 0.02477 ± 0.00364
of π^0s = 5861.57

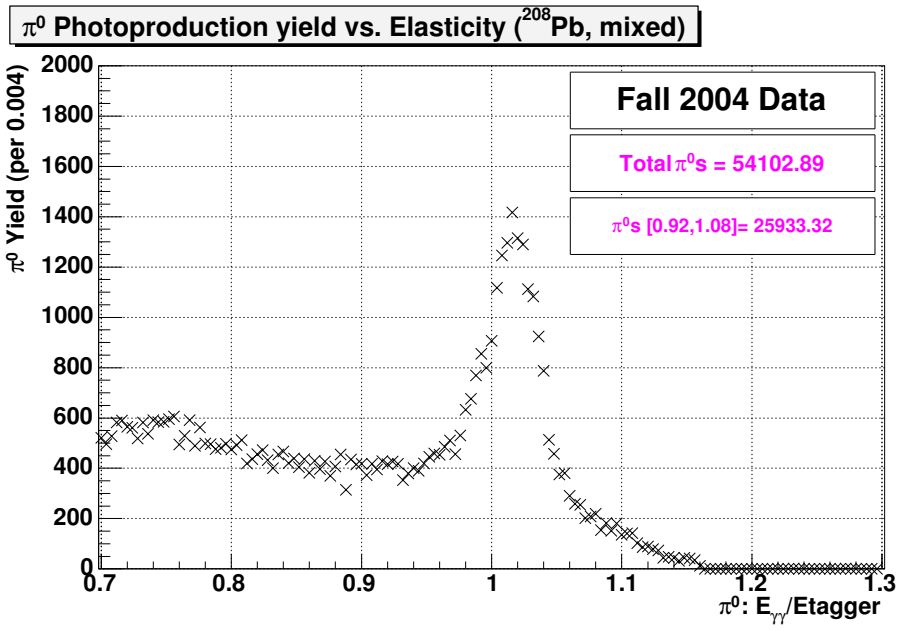

mass_sub_ALL_dndt_inelastic (^{208}Pb, crystal only)
mass_sub_ALL_th_ine
Entries 101
Mean 0.1334
RMS 0.01247
Underflow 0
Overflow 0
Integral 2.645e+04
χ^2 / ndf 690.2 / 28
Prob 0
Constant 3192 ± 26.8
Mean 0.1364 ± 0.0000
Sigma 0.002991 ± 0.000016
of π^0s = 23844.96

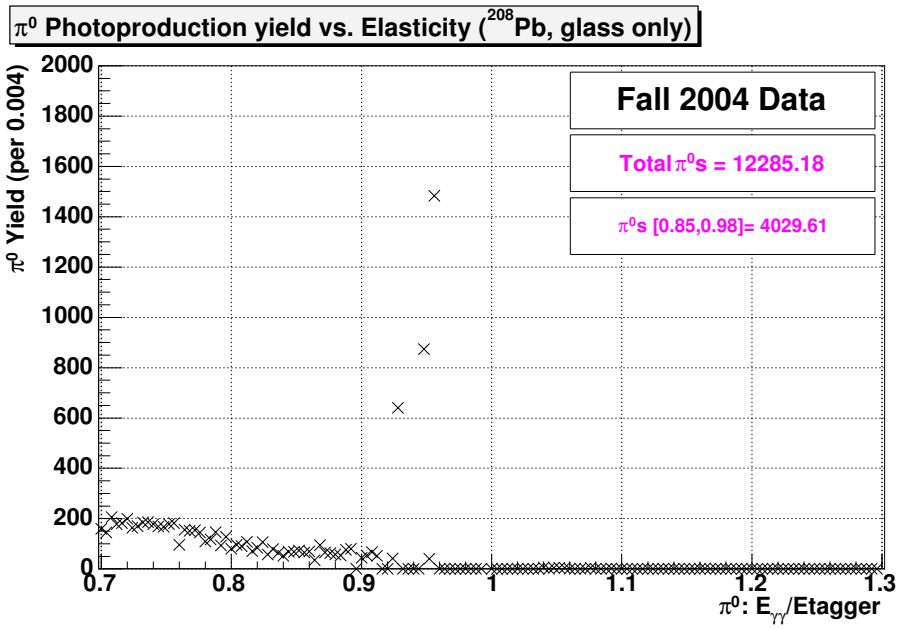

mass_noPeak_ALL_dndt_inelastic (^{208}Pb, mixed)
mass_noPeak_ALL_th_ine
Entries 81010
Mean 0.1064
RMS 0.02094
Underflow 1.448e+04
Overflow 5996
Integral 6.054e+04
χ^2 / ndf 937 / 54
Prob 0
Constant 11.83 ± 0.03
Slope -41.54 ± 0.25

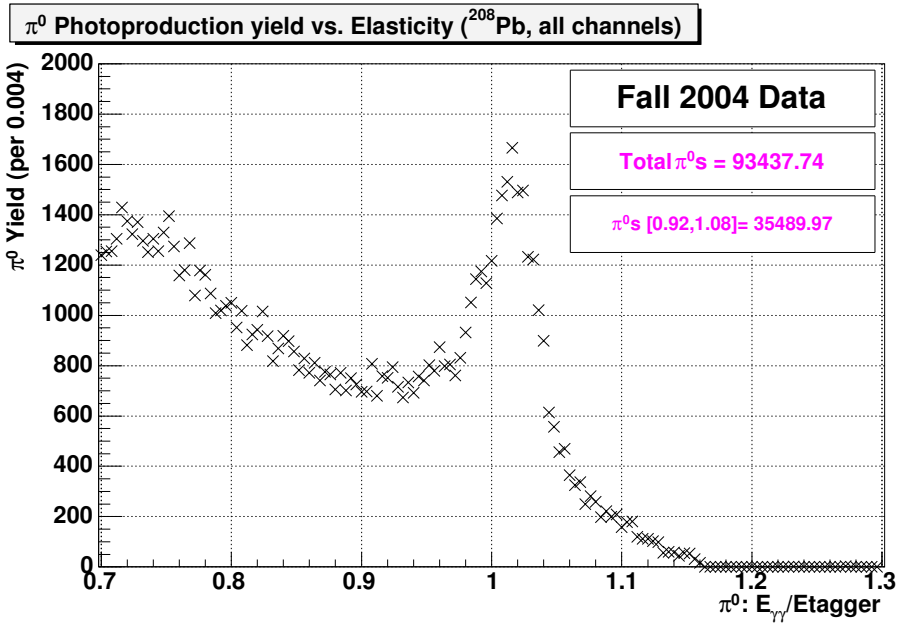

mass_noPeak_ALL_dndt_inelastic (^{208}Pb, all channels)
mass_noPeak_ALL_th_ine
Entries 122302
Mean 0.1132
RMS 0.02763
Underflow 1.743e+04
Overflow 1.344e+04
Integral 9.144e+04
χ^2 / ndf 2060 / 54
Prob 0
Constant 10.88 ± 0.02
Slope -29.16 ± 0.16

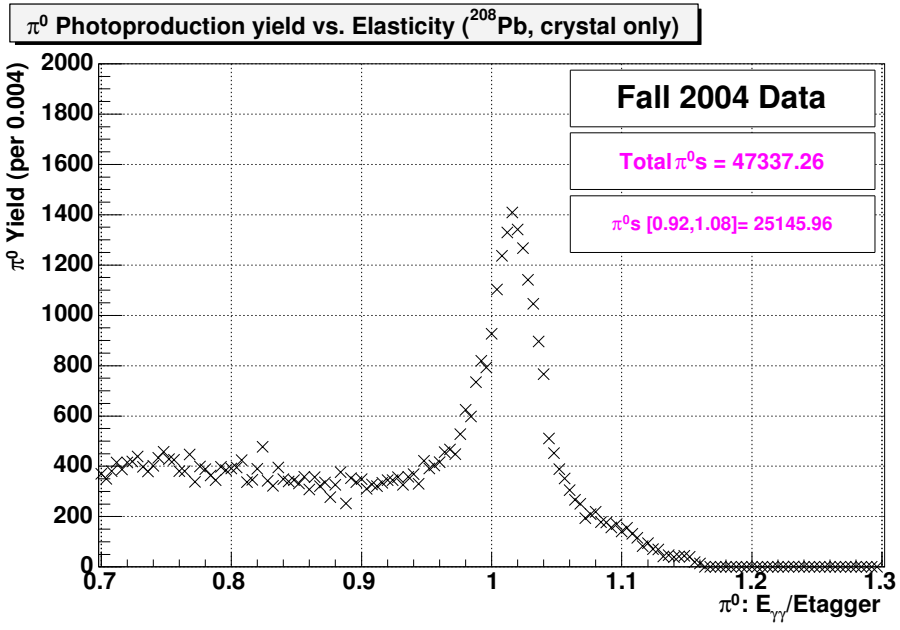

mass_sub_ALL_dndt_inelastic (^{208}Pb, mixed)
mass_sub_ALL_th_ine
Entries 101
Mean 0.1328
RMS 0.01251
Underflow 0
Overflow 0
Integral 3.143e+04
χ^2 / ndf 550.8 / 30
Prob 0
p0 558 ± 11.1
p1 0.1273 ± 0.0002
p2 0.003519 ± 0.000083
p3 3368 ± 26.9
p4 0.1364 ± 0.0000
p5 0.002807 ± 0.000022
of π^0s = 28550.14

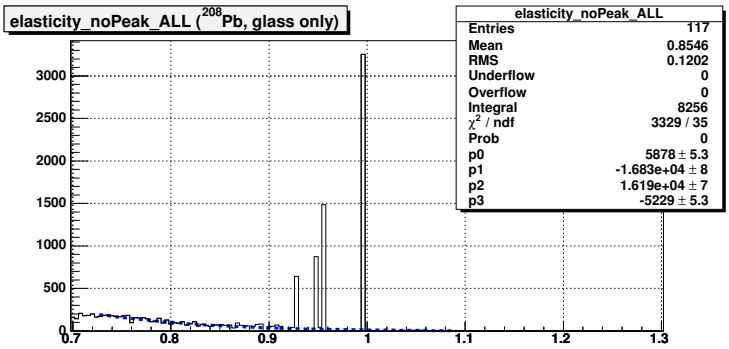

mass_sub_ALL_dndt_inelastic (^{208}Pb, all channels)
mass_sub_ALL_th_ine
Entries 101
Mean 0.1314
RMS 0.01258
Underflow 0
Overflow 0
Integral 6.816e+04
χ^2 / ndf 1475 / 30
Prob 0
p0 3485 ± 49.3
p1 0.1292 ± 0.0001
p2 0.003753 ± 0.000048
p3 4295 ± 77.2
p4 0.1363 ± 0.0001
p5 0.002821 ± 0.000030
of π^0s = 62340.34

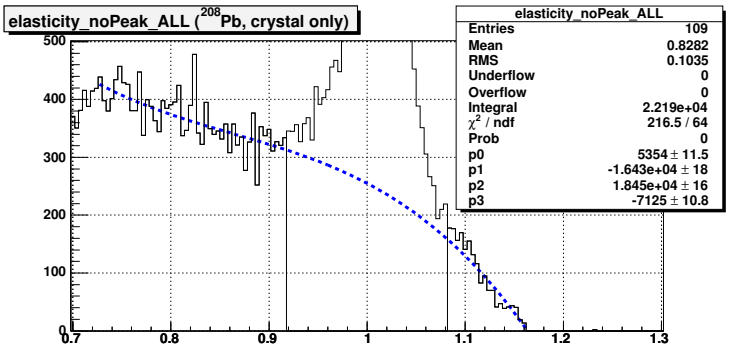

π^0 Photoproduction yield vs. Elasticity (^{208}Pb, mixed)
Fall 2004 Data
Total π^0s = 54102.89
π^0s [0.92,1.08]= 25933.32
π^0 Yield (per 0.004)
π^0: $E_{\gamma\gamma}$/Etagger

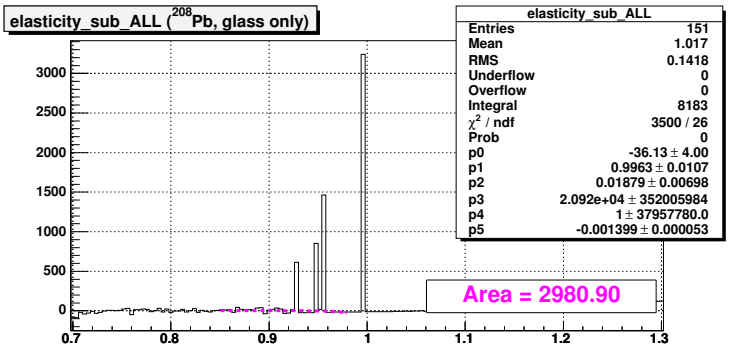

π^0 Photoproduction yield vs. Elasticity (^{208}Pb, glass only)
Fall 2004 Data
Total π^0s = 12285.18
π^0s [0.85,0.98]= 4029.61
π^0 Yield (per 0.004)
π^0: $E_{\gamma\gamma}$/Etagger

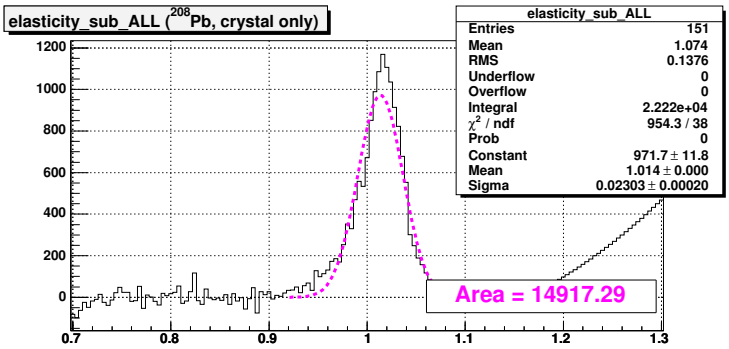

π^0 Photoproduction yield vs. Elasticity (^{208}Pb, all channels)
Fall 2004 Data
Total π^0s = 93437.74
π^0s [0.92,1.08]= 35489.97
π^0 Yield (per 0.004)
π^0: $E_{\gamma\gamma}$/Etagger

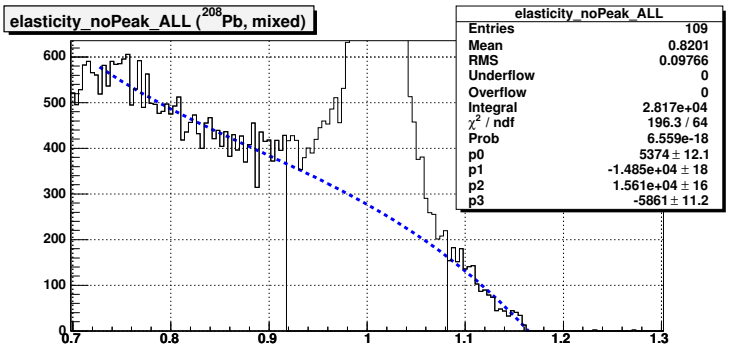

π^0 Photoproduction yield vs. Elasticity (^{208}Pb, crystal only)
Fall 2004 Data
Total π^0s = 47337.26
π^0s [0.92,1.08]= 25145.96
π^0 Yield (per 0.004)
π^0: $E_{\gamma\gamma}$/Etagger

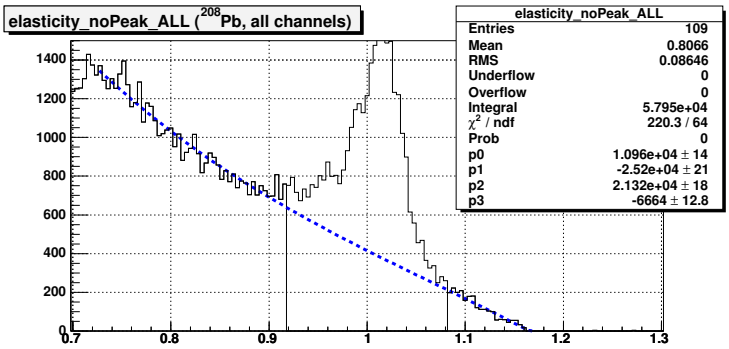

elasticity_noPeak_ALL (^{208}Pb, glass only)
elasticity_noPeak_ALL
Entries 117
Mean 0.8546
RMS 0.1202
Underflow 0
Overflow 0
Integral 8256
χ^2 / ndf 3329 / 35
Prob 0
p0 5878 ± 5.3
p1 -1.683e+04 ± 8
p2 1.619e+04 ± 7
p3 -5229 ± 5.3

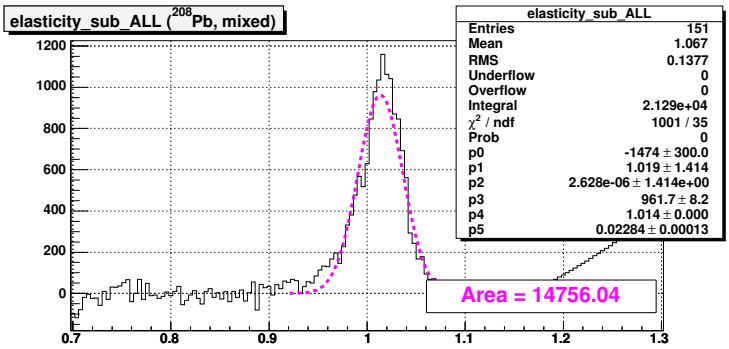

elasticity_noPeak_ALL (^{208}Pb, crystal only)
elasticity_noPeak_ALL
Entries 109
Mean 0.8282
RMS 0.1035
Underflow 0
Overflow 0
Integral 2.219e+04
χ^2 / ndf 216.5 / 64
Prob 0
p0 5354 ± 11.5
p1 -1.643e+04 ± 18
p2 1.845e+04 ± 16
p3 -7125 ± 10.8

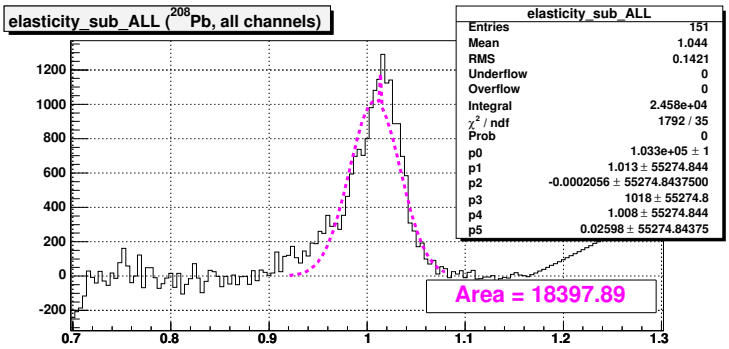

elasticity_sub_ALL (^{208}Pb, glass only)
elasticity_sub_ALL
Entries 151
Mean 1.017
RMS 0.1418
Underflow 0
Overflow 0
Integral 8183
χ^2 / ndf 3500 / 26
Prob 0
p0 -36.13 ± 4.00
p1 0.9963 ± 0.0107
p2 0.01879 ± 0.00698
p3 2.092e+04 ± 352005984
p4 1 ± 37957780.0
p5 -0.001399 ± 0.000053
Area = 2980.90

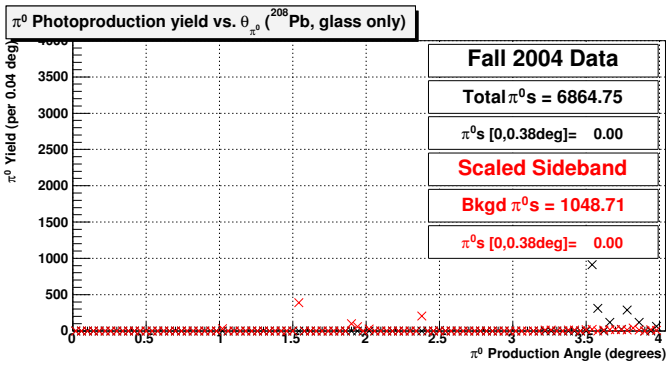

elasticity_sub_ALL (^{208}Pb, crystal only)
elasticity_sub_ALL
Entries 151
Mean 1.074
RMS 0.1376
Underflow 0
Overflow 0
Integral 2.222e+04
χ^2 / ndf 954.3 / 38
Prob 0
Constant 971.7 ± 11.8
Mean 1.014 ± 0.000
Sigma 0.02303 ± 0.00020
Area = 14917.29

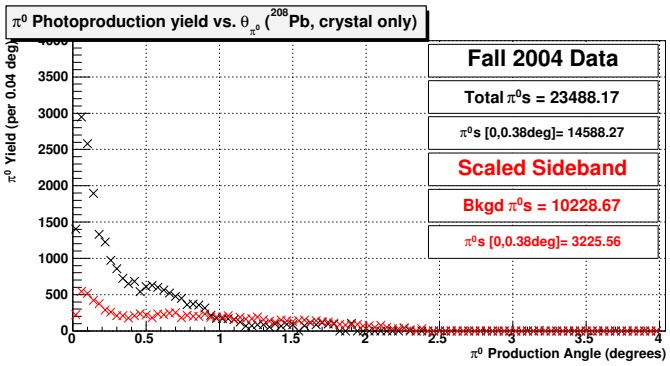

elasticity_noPeak_ALL (^{208}Pb, mixed)
elasticity_noPeak_ALL
Entries 109
Mean 0.8201
RMS 0.09766
Underflow 0
Overflow 0
Integral 2.817e+04
χ^2 / ndf 196.3 / 64
Prob 6.559e-18
p0 5374 ± 12.1
p1 -1.485e+04 ± 18
p2 1.561e+04 ± 16
p3 -5861 ± 11.2

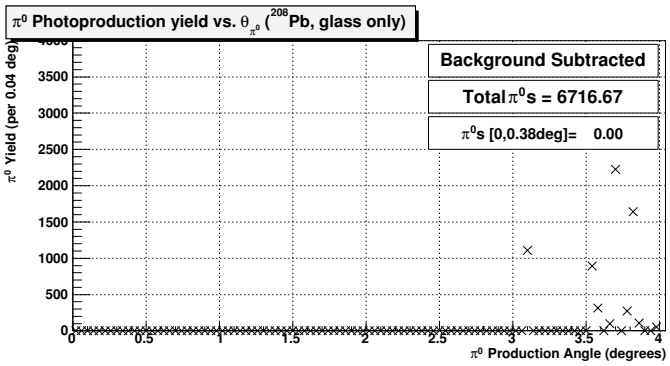

elasticity_noPeak_ALL (^{208}Pb, all channels)
elasticity_noPeak_ALL
Entries 109
Mean 0.8066
RMS 0.08646
Underflow 0
Overflow 0
Integral 5.795e+04
χ^2 / ndf 220.3 / 64
Prob 0
p0 1.096e+04 ± 14
p1 -2.52e+04 ± 21
p2 2.132e+04 ± 18
p3 -6664 ± 12.8

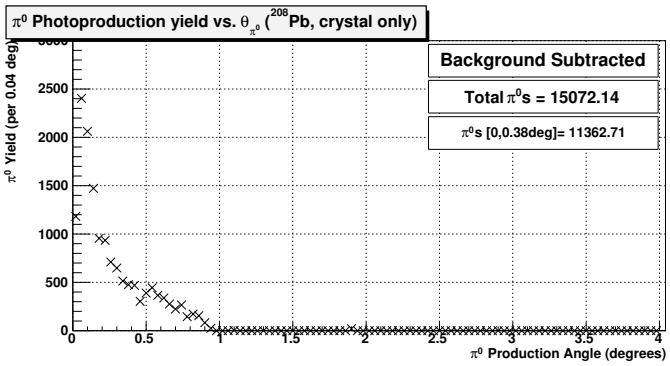

elasticity_sub_ALL (^{208}Pb, mixed)
elasticity_sub_ALL
Entries 151
Mean 1.067
RMS 0.1377
Underflow 0
Overflow 0
Integral 2.129e+04
χ^2 / ndf 1001 / 35
Prob 0
p0 -1474 ± 300.0
p1 1.019 ± 1.414
p2 2.628e-06 ± 1.414e+00
p3 961.7 ± 8.2
p4 1.014 ± 0.000
p5 0.02284 ± 0.00013
Area = 14756.04

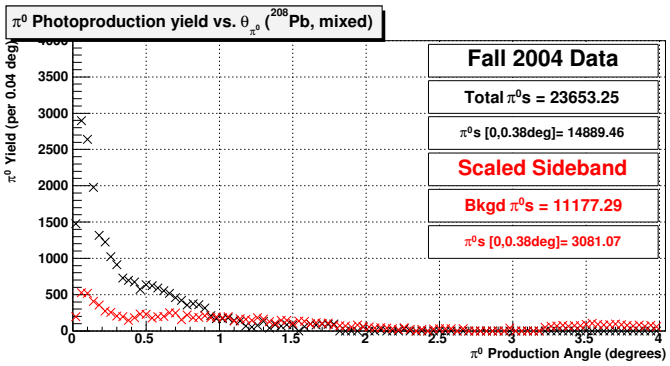

elasticity_sub_ALL (^{208}Pb, all channels)
elasticity_sub_ALL
Entries 151
Mean 1.044
RMS 0.1421
Underflow 0
Overflow 0
Integral 2.458e+04
χ^2 / ndf 1792 / 35
Prob 0
p0 1.033e+05 ± 1
p1 1.013 ± 55274.844
p2 -0.0002056 ± 55274.8437500
p3 1018 ± 55274.8
p4 1.008 ± 55274.844
p5 0.02598 ± 55274.84375
Area = 18397.89

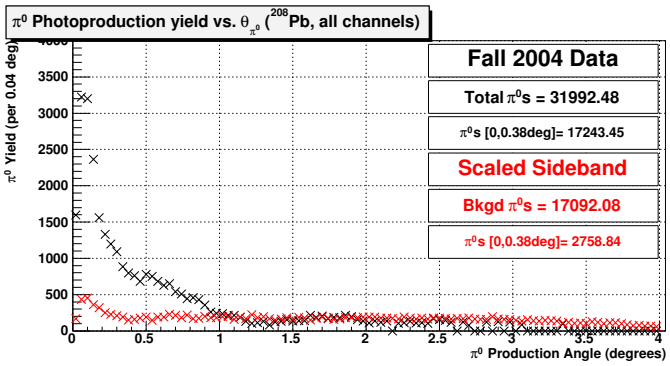

π^0 Photoproduction yield vs. θ_{π^0} (^{208}Pb, glass only)
Fall 2004 Data
Total π^0s = 6864.75
π^0s [0,0.38deg]= 0.00
Scaled Sideband
Bkgd π^0s = 1048.71
π^0s [0,0.38deg]= 0.00
π^0 Yield (per 0.04 deg)
π^0 Production Angle (degrees)

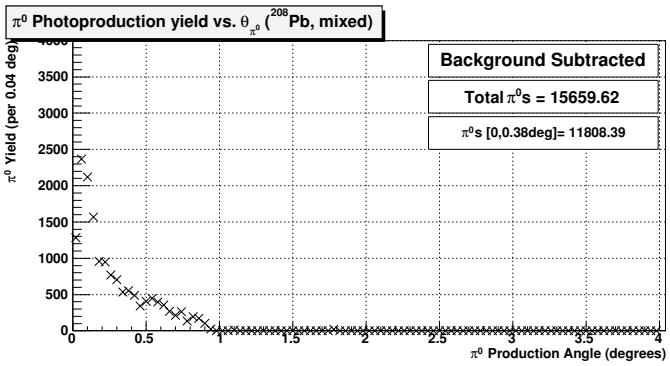

π^0 Photoproduction yield vs. θ_{π^0} (^{208}Pb, crystal only)
Fall 2004 Data
Total π^0s = 23488.17
π^0s [0,0.38deg]= 14588.27
Scaled Sideband
Bkgd π^0s = 10228.67
π^0s [0,0.38deg]= 3225.56
π^0 Yield (per 0.04 deg)
π^0 Production Angle (degrees)

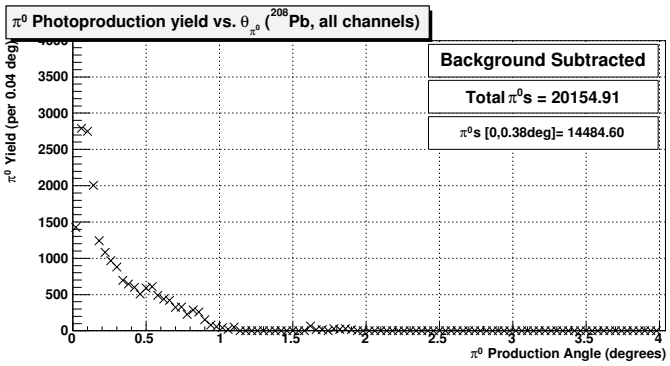

π^0 Photoproduction yield vs. θ_{π^0} (^{208}Pb, glass only)
Background Subtracted
Total π^0s = 6716.67
π^0s [0,0.38deg]= 0.00
π^0 Yield (per 0.04 deg)
π^0 Production Angle (degrees)


π^0 Photoproduction yield vs. θ_{π^0} (^{208}Pb, crystal only)
Background Subtracted
Total π^0s = 15072.14
π^0s [0,0.38deg]= 11362.71
π^0 Yield (per 0.04 deg)
π^0 Production Angle (degrees)


π^0 Photoproduction yield vs. θ_{π^0} (^{208}Pb, mixed)
Fall 2004 Data
Total π^0s = 23653.25
π^0s [0,0.38deg]= 14889.46
Scaled Sideband
Bkgd π^0s = 11177.29
π^0s [0,0.38deg]= 3081.07
π^0 Yield (per 0.04 deg)
π^0 Production Angle (degrees)


π^0 Photoproduction yield vs. θ_{π^0} (^{208}Pb, all channels)
Fall 2004 Data
Total π^0s = 31992.48
π^0s [0,0.38deg]= 17243.45
Scaled Sideband
Bkgd π^0s = 17092.08
π^0s [0,0.38deg]= 2758.84
π^0 Yield (per 0.04 deg)
π^0 Production Angle (degrees)


π^0 Photoproduction yield vs. θ_{π^0} (^{208}Pb, mixed)
Background Subtracted
Total π^0s = 15659.62
π^0s [0,0.38deg]= 11808.39
π^0 Yield (per 0.04 deg)
π^0 Production Angle (degrees)


π^0 Photoproduction yield vs. θ_{π^0} (^{208}Pb, all channels)
Background Subtracted
Total π^0s = 20154.91
π^0s [0,0.38deg]= 14484.60
π^0 Yield (per 0.04 deg)
π^0 Production Angle (degrees)