Hypothesis plots summary

1666957, Gustavo Espinal Lugo

January 10, 2022

Plots and corresponding metadata

Number of data points used: 99999,
mean expected W mass: 80.36010913 $[GeV/c^2]$,
mean hypothesis masses $[GeV/c^2]$: [¡generator object ¡genexpr¿ at 0x7f533a633510¿],
mass width: 2.07041274 $[GeV/c^2]$,
chi_square value of hypothesis fit: 329.3000645043136
Absolute path to figure: /home/physics/phuxdp/Desktop/PX402 Physics Project/WBosonProject/noQED/plots
Next lines are the data of the shown histograms (if needed):
All quantities: 99999, 80.36010913, [31. 36. 41. 46. 51. 56. 61. 66. 71. 76. 81. 86. 91. 96. 101.
106. 111. 116. 121. 126. 131.], 2.07041274, 329.3000645043136
X_energ_vls = [30.1, 30.299999999999997, 30.5, 30.700000000000003, 30.9, 31.1, 31.299999999999997,
31.5, 31.700000000000003, 31.9, 32.1, 32.3, 32.5, 32.7, 32.9, 33.1, 33.3, 33.5, 33.7, 33.9, 34.1,
34.3, 34.5, 34.7, 34.9, 35.1, 35.3, 35.5, 35.7, 35.9, 36.1, 36.3, 36.5, 36.7, 36.9, 37.1, 37.3, 37.5,
37.7, 37.9, 38.1, 38.3, 38.5, 38.7, 38.9, 39.1, 39.3, 39.5, 39.7, 39.9, 40.1, 40.3, 40.5, 40.7, 40.9,
41.1, 41.3, 41.5, 41.7, 41.9, 42.1, 42.3, 42.5, 42.7, 42.9, 43.1, 43.3, 43.5, 43.7, 43.9, 44.1, 44.3,
44.5, 44.7, 44.9, 45.1, 45.3, 45.5, 45.7, 45.9, 46.1, 46.300000000000004, 46.5, 46.7, 46.9, 47.1,
47.300000000000004, 47.5, 47.7, 47.9, 48.1, 48.300000000000004, 48.5, 48.7, 48.9, 49.1, 49.30000000000
49.5, 49.7, 49.9]
Y_data_bin_cnts = [266.0, 281.0, 301.0, 304.0, 281.0, 321.0, 336.0, 324.0, 300.0, 328.0, 328.0,
325.0, 318.0, 337.0, 328.0, 371.0, 345.0, 331.0, 383.0, 356.0, 327.0, 345.0, 368.0, 354.0, 369.0,
369.0, 367.0, 344.0, 389.0, 342.0, 384.0, 374.0, 371.0, 385.0, 365.0, 370.0, 364.0, 348.0, 351.0,
340.0, 420.0, 408.0, 389.0, 399.0, 403.0, 398.0, 377.0, 376.0, 348.0, 319.0, 320.0, 307.0, 319.0,
305.0, 286.0, 320.0, 272.0, 260.0, 239.0, 235.0, 228.0, 215.0, 216.0, 211.0, 204.0, 180.0, 196.0,
185.0, 158.0, 154.0, 148.0, 127.0, 134.0, 128.0, 120.0, 120.0, 123.0, 101.0, 104.0, 94.0, 110.0,
105.0, 81.0, 79.0, 100.0, 86.0, 75.0, 76.0, 86.0, 83.0, 80.0, 77.0, 65.0, 70.0, 73.0, 61.0, 64.0, 56.0,
57.0, 66.0]
Y_model_bin_cnts = [60.77945327758789, 1.2857933044433594, 6.085181713104248, 3.558061122894287
1.6192806959152222, 1.9629167318344116, 2.64939546585083, 1.2054215669631958, 13.557067871093
2.672044038772583, 4.231561660766602, 114.98712921142578, 1.158971905708313, 3.88835382461547
3.0525996685028076, 3.4878652095794678, 1.9948214292526245, 2.6286845207214355, 8.33633613586
2.6573493480682373, 25.14351463317871, 2.534775733947754, 1.0967795848846436, 2.5384695529937
4.502523899078369, 1.924025297164917, 7.88049840927124, 6.967822551727295, 12.792052268981934
4.174463272094727, 1.4587275981903076, 11.131487846374512, 1.4413037300109863, 4.771837711334
59.43608856201172, 2.9749960899353027, 219.0475616455078, 2.1233692169189453, 7.4026379585266
1908.990478515625, 1.5843236446380615, 1.2341128587722778, 174.01522827148438, 1.812072873115
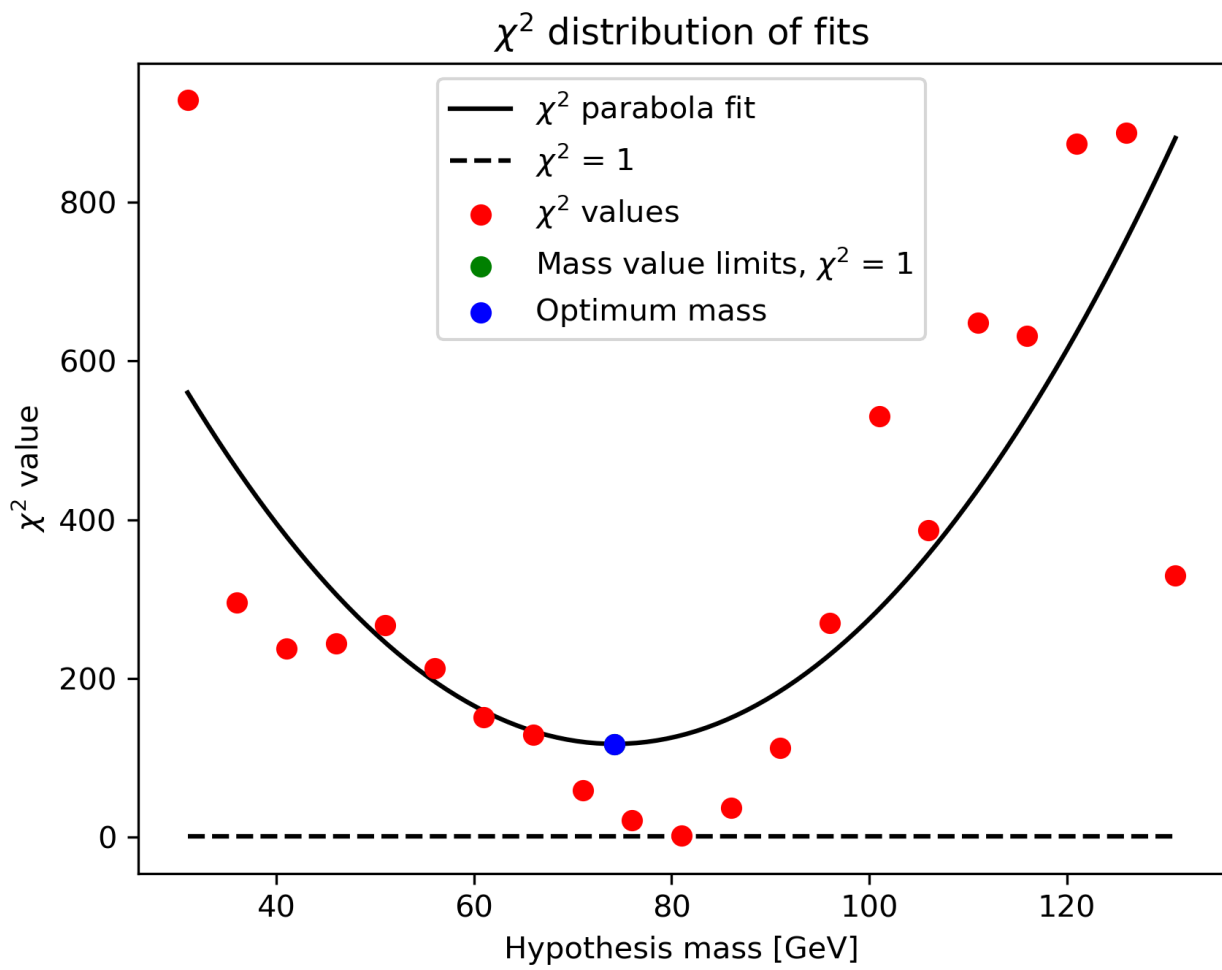151.42913818359375, 8.514216423034668, 4.172840118408203, 2.9140212535858154, 19.68253707885

$P_{T,\mu}$ distribution

data	
Entries	50000
Mean	37.71
Std Dev	4.718

1.6405428647994995, 3.9315357208251953, 309.38140869140625, 7.394631862640381, 5.369898319244
2.2597203254699707, 3.214203357696533, 4.791315078735352, 1190.5732421875, 7.351786136627197,
1.5192288160324097, 6.109335899353027, 4.288990020751953, 18.568132400512695, 1.6339915990829
2.035782814025879, 1.3003445863723755, 18.188058853149414, 1.0673106908798218, 5.098534584045
34.179039001464844, 26.15125846862793, 53.14067077636719, 2.0191004276275635, 4.0891656875610
3.968930721282959, 1.1684402227401733, 20.777502059936523, 6.5763468742370605, 3.453304767608
3.826333999633789, 1.0857011079788208, 4.135969161987305, 1.226033091545105, 4.87878036499023
10.214515686035156, 50.33222579956055, 2.1157166957855225, 21.995885848999023, 15.93395423889
3.9041197299957275, 1.8000022172927856, 101.6497573852539, 21.032649993896484, 7.363205909729
2.46427845954895, 7.526286602020264, 124.72547149658203, 3.7346036434173584, 1.49953627586364
15.372547149658203]

Found optimal massses (χ^2 roots): [74.22745589] $[GeV/c^2]$
Uncertainty [GeV/c^2] : $1.4210854715202004e-14$

Notes:
1) Using mu_born_PT as pseudodata and Mu_Pt as model/hypothesis
2) Using full run mode
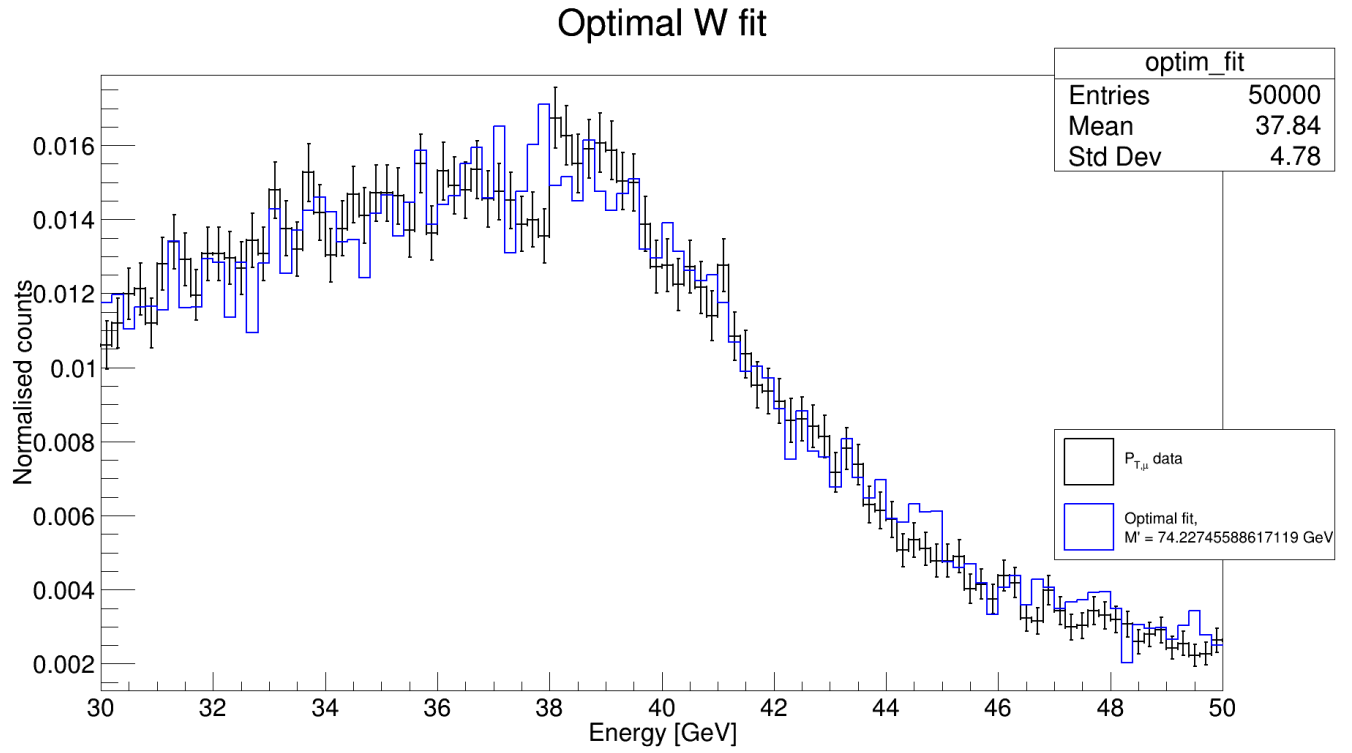
Figure 2: χ^2 of hypothesis masses.

Figure 3: Data and optimum fit with $\chi^2 = 30.652307835646948$. Used the hypothesis mass of 74.22745588617119 $[GeV/c^2]$.