Hypothesis plots summary

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Plots and corresponding metadata

Number of data points used: 4238950,
mean expected W mass: 80.36010913 $[GeV/c^2]$,
mean hypothesis masses: [79. 80. 81. 82. 83.] $[GeV/c^2]$,
mass width: 2.07041274 $[GeV/c^2]$,
chi_square value of hypothesis fit: 69422.85471079372
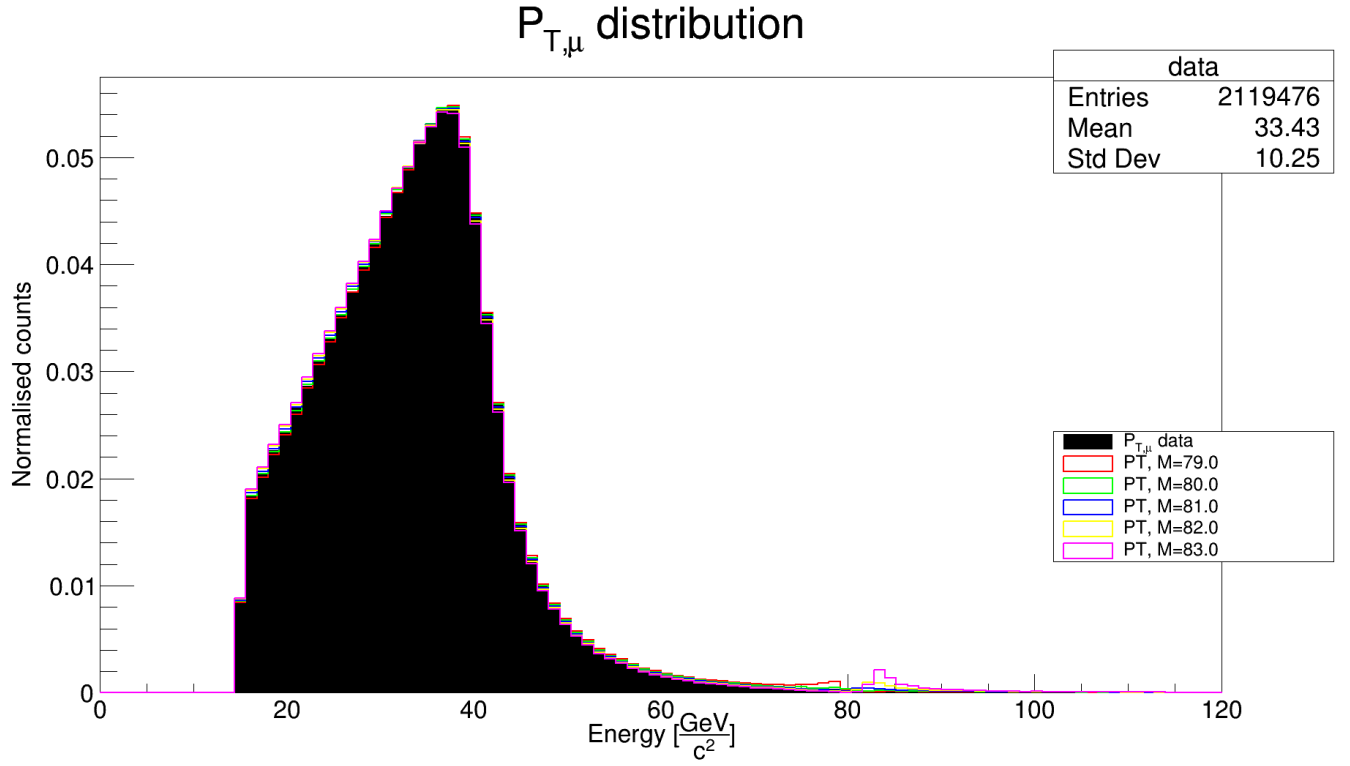Absolute path to figure: /home/physics/phuxdp/Desktop/WBosonProject/templates/plots/muPT_80.36010913
Next lines are the data of the shown histograms (if needed):
All quantities: 4238950, 80.36010913, [79. 80. 81. 82. 83.], 2.07041274, 69422.85471079372
X_energ_vls = [0.6, 1.7999999999999998, 3.0, 4.199999999999999, 5.4, 6.6, 7.8, 9.0, 10.2, 11.39999999999
12.6, 13.799999999999999, 15.0, 16.2, 17.4, 18.6, 19.799999999999997, 21.0, 22.2, 23.4, 24.6,
25.799999999999997, 27.0, 28.199999999999996, 29.4, 30.6, 31.799999999999997, 33.0, 34.2,
35.4, 36.599999999999994, 37.8, 39.0, 40.2, 41.4, 42.599999999999994, 43.8, 45.0, 46.2, 47.4,
48.599999999999994, 49.8, 51.0, 52.2, 53.4, 54.599999999999994, 55.8, 57.0, 58.199999999999996,
59.4, 60.599999999999994, 61.8, 63.0, 64.19999999999999, 65.4, 66.6, 67.8, 69.0, 70.19999999999999,
71.4, 72.6, 73.8, 75.0, 76.19999999999999, 77.4, 78.6, 79.8, 81.0, 82.19999999999999, 83.4,
84.6, 85.8, 87.0, 88.19999999999999, 89.4, 90.6, 91.8, 93.0, 94.19999999999999, 95.4, 96.6, 97.8,
99.0, 100.19999999999999, 101.4, 102.6, 103.8, 105.0, 106.19999999999999, 107.4, 108.6, 109.8,
111.0, 112.19999999999999, 113.4, 114.6, 115.79999999999998, 117.0, 118.19999999999999,
119.4]
Y_data_bin_cnts = [0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 18357.0, 39172.0, 43286.0,
47943.0, 51782.0, 56416.0, 60762.0, 65566.0, 70122.0, 74925.0, 79363.0, 84451.0, 88876.0, 94321.0,
99074.0, 103866.0, 108501.0, 112639.0, 115565.0, 116042.0, 109483.0, 94722.0, 75153.0, 57096.0,
43294.0, 33459.0, 26488.0, 21229.0, 17572.0, 14448.0, 12027.0, 10039.0, 8653.0, 7202.0, 6168.0,
5362.0, 4692.0, 4003.0, 3523.0, 3177.0, 2832.0, 2503.0, 2255.0, 1946.0, 1794.0, 1540.0, 1433.0,
1262.0, 1197.0, 1081.0, 984.0, 891.0, 775.0, 734.0, 683.0, 589.0, 515.0, 520.0, 468.0, 420.0, 428.0,
369.0, 357.0, 334.0, 285.0, 287.0, 228.0, 231.0, 230.0, 203.0, 196.0, 170.0, 144.0, 137.0, 138.0,
125.0, 138.0, 94.0, 98.0, 83.0, 99.0, 104.0, 92.0, 75.0, 76.0, 72.0, 63.0, 60.0]
Y_model_bin_cnts = [0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 16807.806640625,
36165.71484375, 40058.56640625, 44066.640625, 47584.0390625, 51402.4921875, 55971.57421875,
60131.24609375, 64139.3515625, 68294.4140625, 72645.328125, 76513.1796875, 80357.1171875,
85435.1875, 89504.96875, 93271.7265625, 97600.8828125, 100333.0390625, 102963.4765625,
102749.8046875, 96710.0390625, 83083.234375, 65464.71875, 49686.15234375, 37268.81640625,
28717.90234375, 22890.716796875, 18022.09375, 14785.3994140625, 12087.12109375, 9976.6640625,
8453.71484375, 6948.25732421875, 5965.1611328125, 5170.65869140625, 4378.8115234375, 3658.9414
3189.405029296875, 2749.67626953125, 2376.291015625, 2149.39306640625, 1777.75390625,

$P_{T,\mu}$ distribution

1569.8250732421875, 1416.349853515625, 1221.613525390625, 1059.9359130859375, 879.78839111328
781.84619140625, 652.5133666992188, 520.1929321289062, 465.14593505859375, 319.9059143066406,
236.4741973876953, 152.75802612304688, 87.69480895996094, 218.6797332763672, 1519.484375,
4011.9931640625, 2595.84228515625, 1456.21337890625, 1191.173583984375, 761.7518920898438,
659.7547607421875, 576.9785766601562, 516.0912475585938, 479.3993835449219, 396.478271484375,
336.1937561035156, 286.14263916015625, 258.005615234375, 229.2025146484375, 244.6030120849609
228.631591796875, 190.42405700683594, 197.95230102539062, 142.92031860351562, 163.64659118652
132.55836486816406, 119.1921157836914, 112.22322845458984, 114.92454528808594, 125.9804763793
103.91287994384766, 96.26982879638672, 91.05854797363281, 70.83546447753906, 82.0618438720703
75.89705657958984]

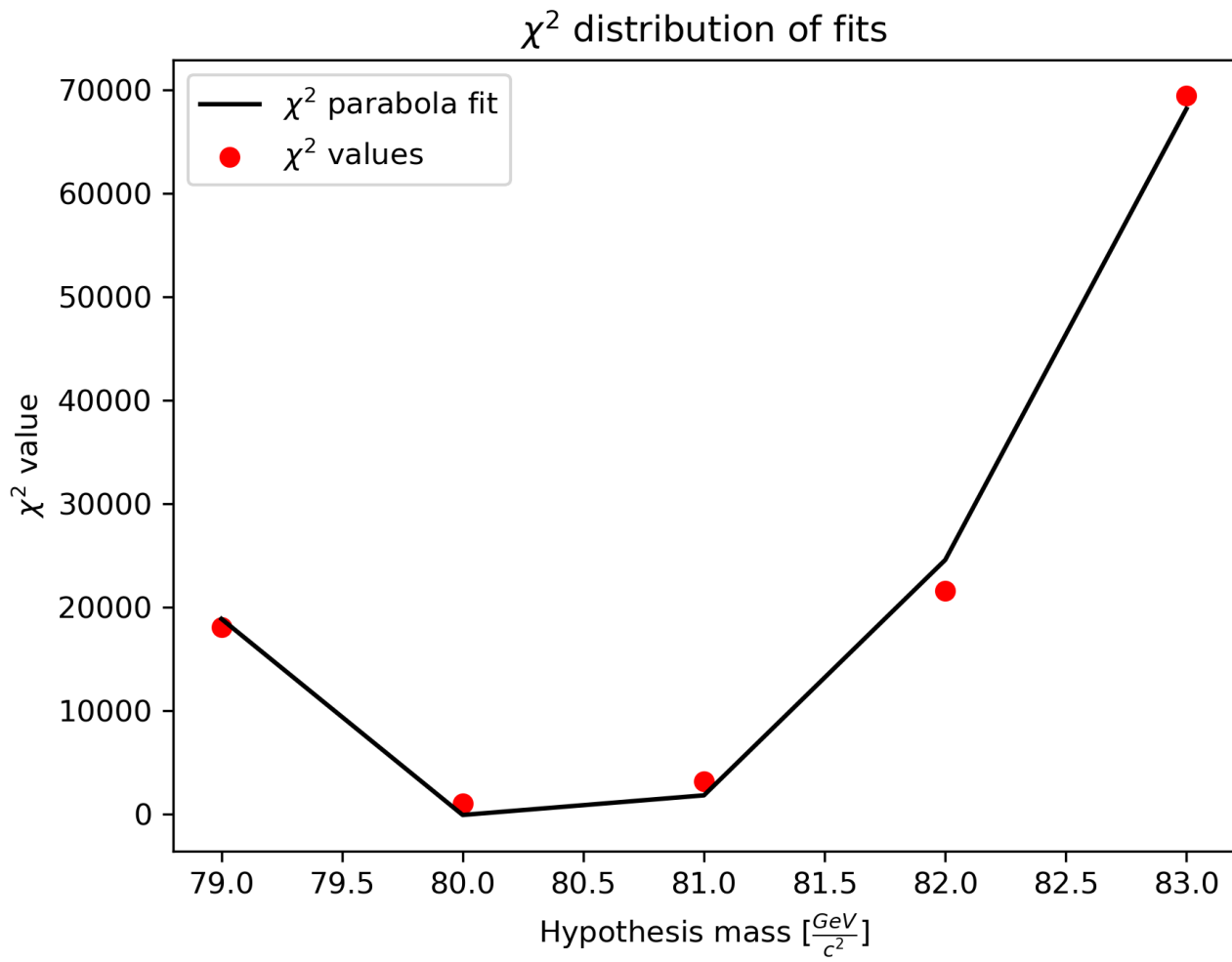Found optimal massses (χ^2 roots): [79.98755699 80.83030675] $[GeV/c^2]$
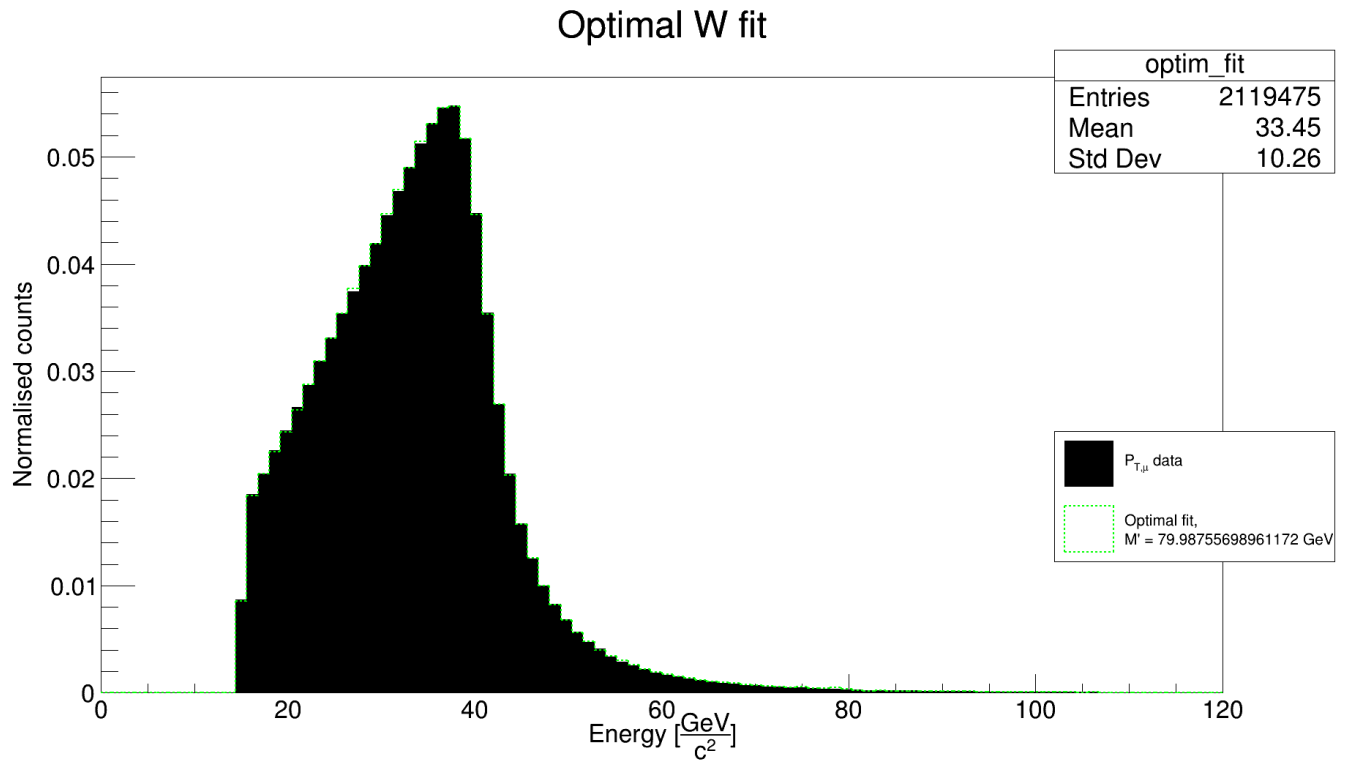
Figure 2: χ^2 of hypothesis masses.

Figure 3: Data and optimum fit with $\chi^2 = 0.000234676197871778 [GeV/c^2]$. Used the hypothesis mass of $79.98755698961172\ [GeV/c^2]$.