# Hypothesis plots summary

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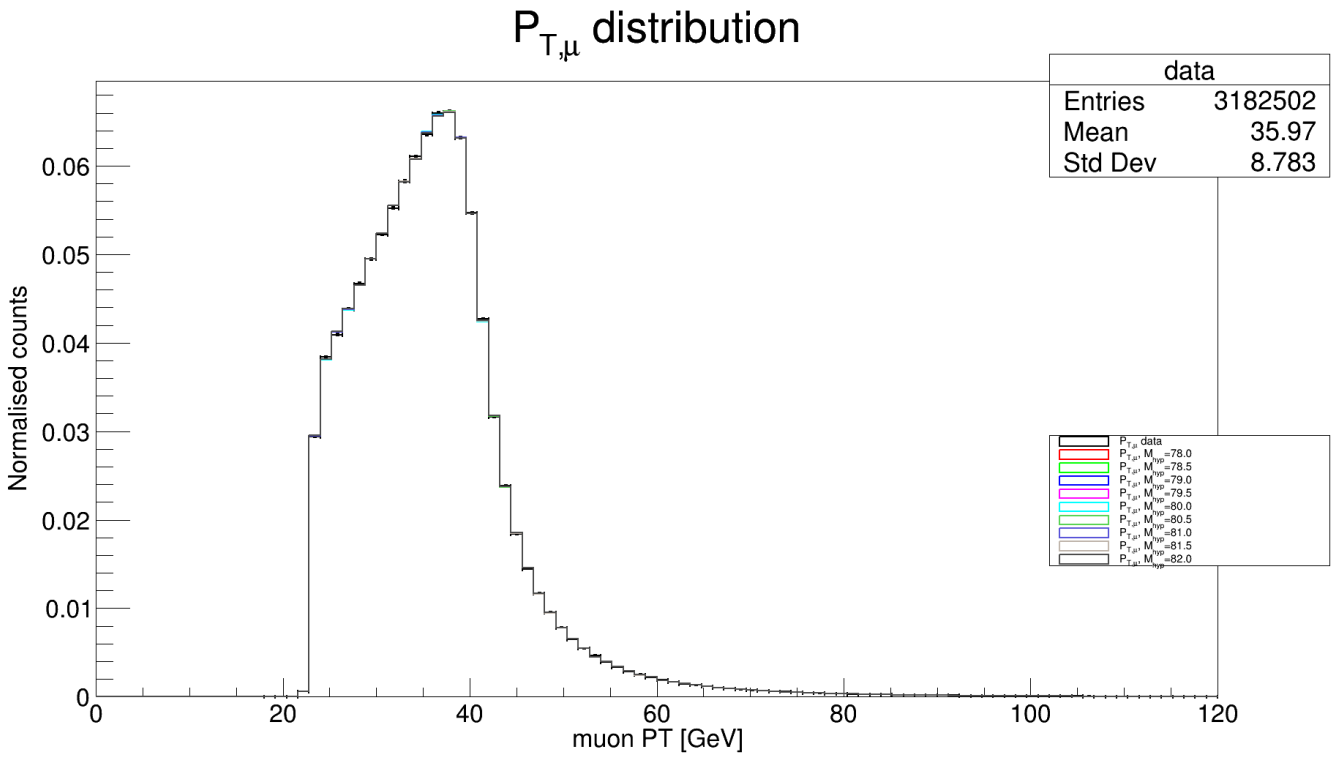
## Plots and corresponding metadata

mean expected W mass: 80.379 $[GeV/c^2]$,
mean hypothesis masses: [78. 78.5 79. 79.5 80. 80.5 81. 81.5 82. ] $[GeV/c^2]$,
mass width: 2.07 $[GeV/c^2]$,
chi_square value of hypothesis fit: 54.43375760081301
Absolute path to figure: /home/physics/phuxdp/Desktop/PX402 Physics Project/WBosonProject/T2W5/plots/r
Next lines are the data of the shown histograms (if needed):
All quantities: 80.379, [78. 78.5 79. 79.5 80. 80.5 81. 81.5 82. ], 2070, 54.43375760081301
X_energ_vls = [0.6, 1.7999999999999998, 3.0, 4.199999999999999, 5.4, 6.6, 7.8, 9.0, 10.2, 11.3999999999
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, 0.0, 0.0, 0.0, 2.0, 2.0,
26.0, 1877.0, 93470.0, 122149.0, 130185.0, 139392.0, 148542.0, 157370.0, 166200.0, 175733.0,
185306.0, 194236.0, 202199.0, 209770.0, 210468.0, 200967.0, 173994.0, 135804.0, 100636.0,
75854.0, 58474.0, 45997.0, 37262.0, 30356.0, 24933.0, 20658.0, 17367.0, 14853.0, 12565.0, 10682.0,
9134.0, 8082.0, 7030.0, 6114.0, 5301.0, 4651.0, 4168.0, 3705.0, 3289.0, 2962.0, 2612.0, 2332.0,
2129.0, 1953.0, 1793.0, 1574.0, 1392.0, 1286.0, 1180.0, 1045.0, 956.0, 890.0, 814.0, 778.0, 693.0,
593.0, 622.0, 528.0, 518.0, 506.0, 451.0, 404.0, 370.0, 326.0, 337.0, 295.0, 261.0, 247.0, 226.0,
232.0, 212.0, 205.0, 173.0, 155.0, 146.0, 134.0, 133.0, 132.0, 104.0, 114.0, 115.0, 100.0, 85.0]
Y_model_bin_cnts = [0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.9608225226402283, 1.921647071838379,
0.0, 0.0, 0.0, 0.0, 0.9608226418495178, 3.843290328979492, 3.8432936668395996, 26.90304183959961,
1791.922607421875, 90206.78125, 116579.7109375, 126073.7734375, 133806.125, 142110.703125,
151180.640625, 159975.125, 169458.71875, 177724.21875, 185457.875, 194505.890625, 200279.921875,
201648.609375, 192689.234375, 166719.4375, 129773.3828125, 97057.296875, 72612.96875, 56565.3085
44595.875, 35620.7109375, 29020.986328125, 23888.619140625, 20124.62109375, 16671.015625,
13836.2490234375, 12109.4482421875, 10349.0107421875, 8852.8359375, 7528.666015625, 6789.70556
5751.892578125, 5217.61767578125, 4541.115234375, 4088.51171875, 3549.4306640625, 3102.5996093
2816.243408203125, 2506.823974609375, 2319.442138671875, 2040.7733154296875, 1829.39379882812




1642.9959716796875, 1553.639892578125, 1351.8687744140625, 1265.3953857421875, 1087.64453125, 1001.1709594726562, 963.69921875, 861.852783203125, 833.989013671875, 724.4562377929688, 619.7273559570312, 575.52978515625, 518.8416137695312, 551.5093383789062, 490.0170593261719, 424.68182373046875, 391.0530700683594, 410.26959228515625, 328.6000061035156, 282.48095703125, 306.50140380859375, 283.4420471191406, 268.06878662109375, 248.8524932861328, 211.38050842285, 214.26296997070312, 196.96827697753906, 182.5560760498047, 162.37884521484375, 160.45727539062, 140.27999877929688, 125.86770629882812, 150.84902954101562, 108.57294464111328, 118.18119049072, 119.14203643798828, 106.65130615234375, 92.23898315429688, 74.94416046142578]

Found optimal massses ($\chi^2$ roots): [80.40684652] $[GeV/c^2]$ Uncertainty [GeV/c$^2$] : $0.1807004941410213$

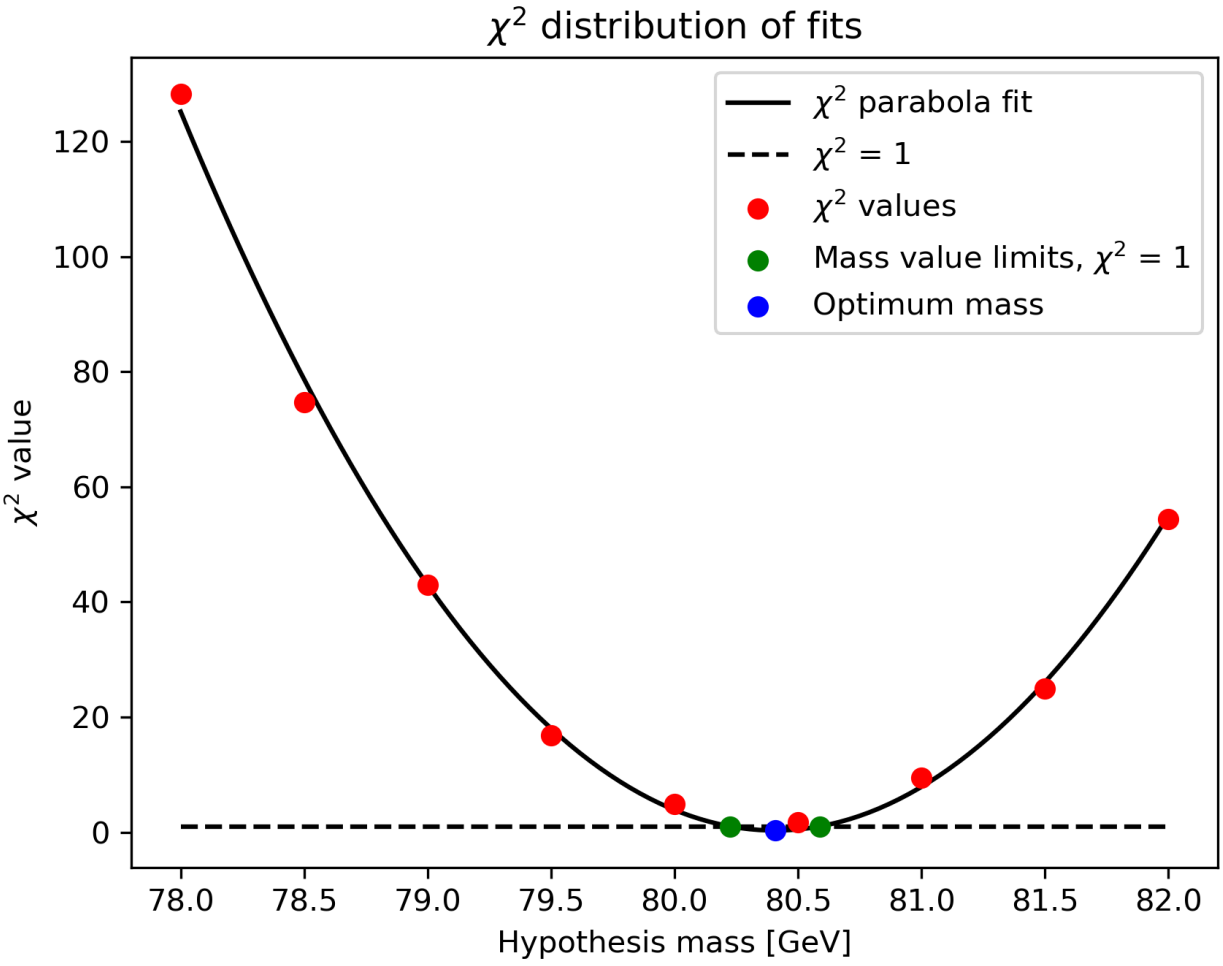



Figure 2: $\chi^2$ of hypothesis masses.

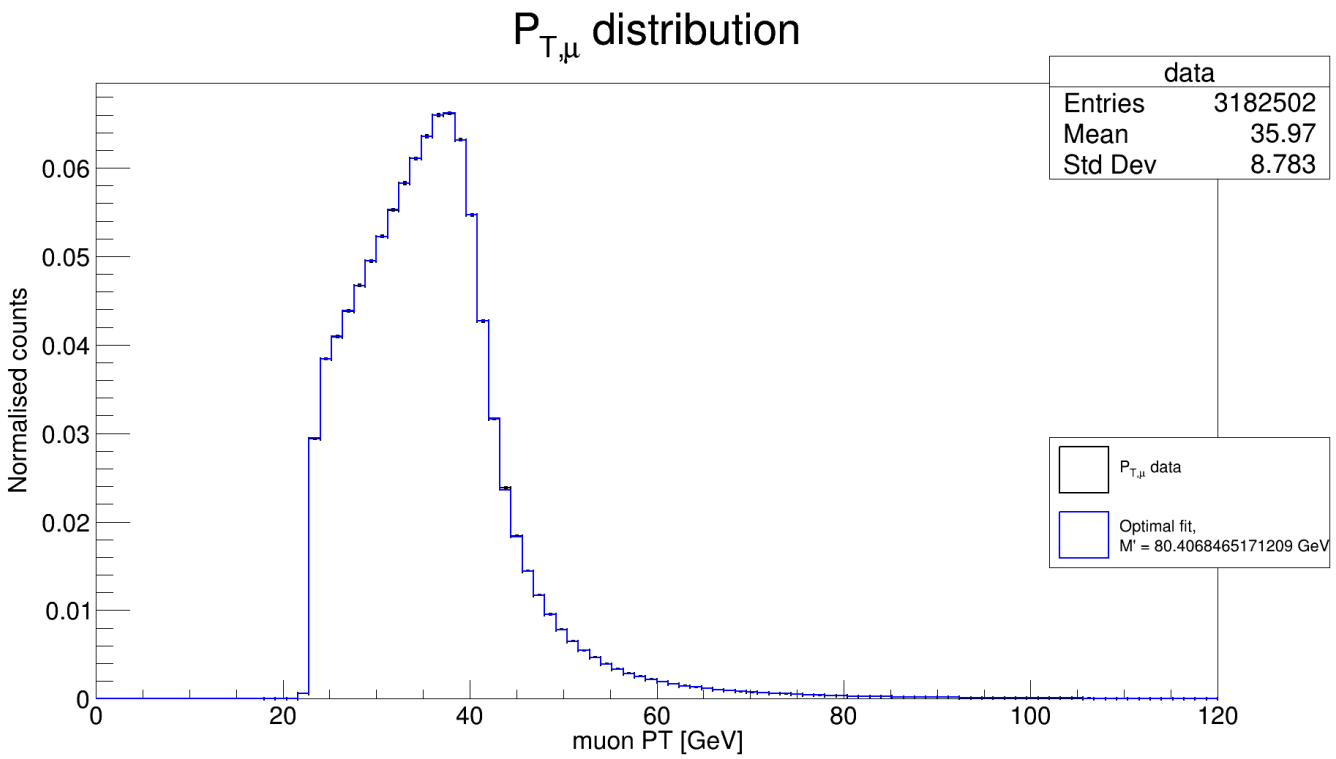



Figure 3: Data and optimum fit with $\chi^2 = 0.14939319155542216$. Used the hypothesis mass of 80.4068465171209±0.1807004941410213 $[GeV/c^2]$.