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: 12.277004393963184
Absolute path to figure: /home/physics/phuxdp/Desktop/PX402 Physics Project/WBosonProject/T2W5/plots/r
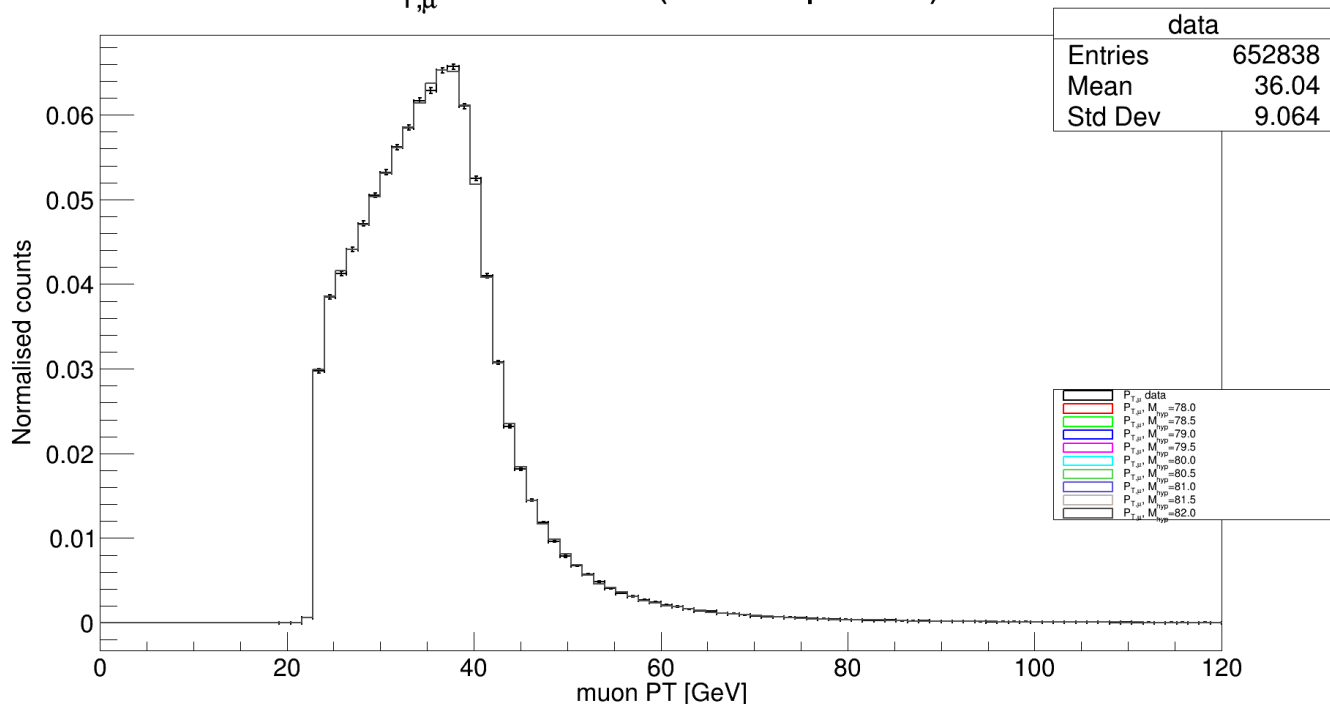Next lines are the data of the shown histograms (if needed):
All quantities: 80.379, [78. 78.5 79. 79.5 80. 80.5 81. 81.5 82.], 2070, 12.277004393963184
X_energ_vls = [0.6, 1.7999999999999998, 3.0, 4.199999999999999, 5.4, 6.6, 7.8, 9.0, 10.2, 11.39999999999
12.6, 13.799999999999999, 15.0, 16.2, 17.4, 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, 0.0, 0.0, 0.0, 0.0, 2.627226591110229
4.258678436279297, 411.0599060058594, 19834.36328125, 25654.76953125, 27492.1484375, 29399.117
31445.021484375, 33674.59375, 35479.23046875, 37453.0390625, 38995.7890625, 41129.69140625,
41910.35546875, 43507.53125, 43788.16015625, 40698.3125, 34981.6171875, 27335.462890625,
20507.5390625, 15436.955078125, 12118.1220703125, 9656.71875, 7876.9765625, 6411.98046875,
5231.4833984375, 4520.0859375, 3801.73583984375, 3213.220458984375, 2732.826416015625,
2341.7314453125, 2076.64306640625, 1818.6474609375, 1628.831787109375, 1405.4285888671875,
1271.6634521484375, 1088.3131103515625, 942.9937744140625, 903.0429077148438, 757.87243652343
706.1197509765625, 623.2659301757812, 536.2207641601562, 473.77142333984375, 468.772705078125
429.5991516113281, 385.8650207519531, 332.1512756347656, 317.75103759765625, 287.962432861328
266.9156494140625, 239.6173858642578, 207.060302734375, 182.9595184326172, 215.72808837890625
158.14715576171875, 150.80113220214844, 160.19888305664062, 133.1354522705078, 118.3522796630
123.95072174072266, 109.80606842041016, 94.69293212890625, 76.50025177001953, 92.154457092285
91.18305206298828, 86.8621597290039, 58.849674224853516, 62.39198684692383, 66.516845703125,
51.518882751464844, 46.24637222290039, 49.22967529296875, 47.363338470458984, 35.417716979980
42.362308502197266, 34.773494720458984, 35.56611251831055, 28.009634017944336, 32.3659706115
31.151290893554688, 30.208356857299805, 33.36943817138672, 16.019208908081055]

$P_{T,\mu}$ distribution (bare+1 photon)

data	
Entries	652838
Mean	36.04
Std Dev	9.064

Legend:
- $P_{T,\mu}$ data
- $P_{T,\mu}$, M_{hyp}=78.0
- $P_{T,\mu}$, M_{hyp}=78.5
- $P_{T,\mu}$, M_{hyp}=79.0
- $P_{T,\mu}$, M_{hyp}=79.5
- $P_{T,\mu}$, M_{hyp}=80.0
- $P_{T,\mu}$, M_{hyp}=80.5
- $P_{T,\mu}$, M_{hyp}=81.0
- $P_{T,\mu}$, M_{hyp}=81.5
- $P_{T,\mu}$, M_{hyp}=82.0

Y_model_bin_cnts = [0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 4.101123332977295, 7.663997173309326, 0.0, 0.0, 0.0, 0.0, 0.0, 1.9238522052764893, 0.0, 8.782835960388184, 374.4552307128906, 19139.6660156 24711.69921875, 26640.58203125, 28266.40234375, 30119.58203125, 32216.7265625, 34020.58984375, 35966.08203125, 37468.67578125, 39297.79296875, 40811.6484375, 41788.1484375, 41685.3125, 39148.96875, 33170.08984375, 26115.07421875, 19678.041015625, 15072.0615234375, 11797.70214843 9252.412109375, 7498.21240234375, 6328.04931640625, 5189.8125, 4367.48388671875, 3598.03417968 2962.368408203125, 2669.89111328125, 2334.505615234375, 1975.554443359375, 1694.23193359375, 1519.984619140625, 1283.98291015625, 1220.0179443359375, 1047.61669921875, 962.0630493164062, 797.534423828125, 710.9413452148438, 656.0203247070312, 642.6231079101562, 584.046875, 481.2906494140625, 425.02020263671875, 383.2881774902344, 341.0120544433594, 307.256896972656 310.9994812011719, 243.84129333496094, 232.2761688232422, 242.4253692626953, 224.121246337890 220.83544921875, 178.28875732421875, 161.1588134765625, 136.97256469726562, 119.9537124633789 129.80130004882812, 126.69454956054688, 105.55067443847656, 103.23039245605469, 99.6817398071 95.34903717041016, 76.10367584228516, 85.2097396850586, 68.81581115722656, 84.99134063720703, 61.82329559326172, 56.138118743896484, 56.03828048706055, 43.4036979675293, 54.45879364013672 41.66075897216797, 44.19742202758789, 30.37186622619629, 37.68223190307617, 33.90385818481445 24.18895149230957, 30.970230102539062, 30.146305084228516, 31.00786781311035, 24.082813262939 23.796789169311523]

Found optimal massses (χ^2 roots): [80.42277708] $[GeV/c^2]$ Uncertainty [GeV/c^2] : $4.263256414560601e-14$
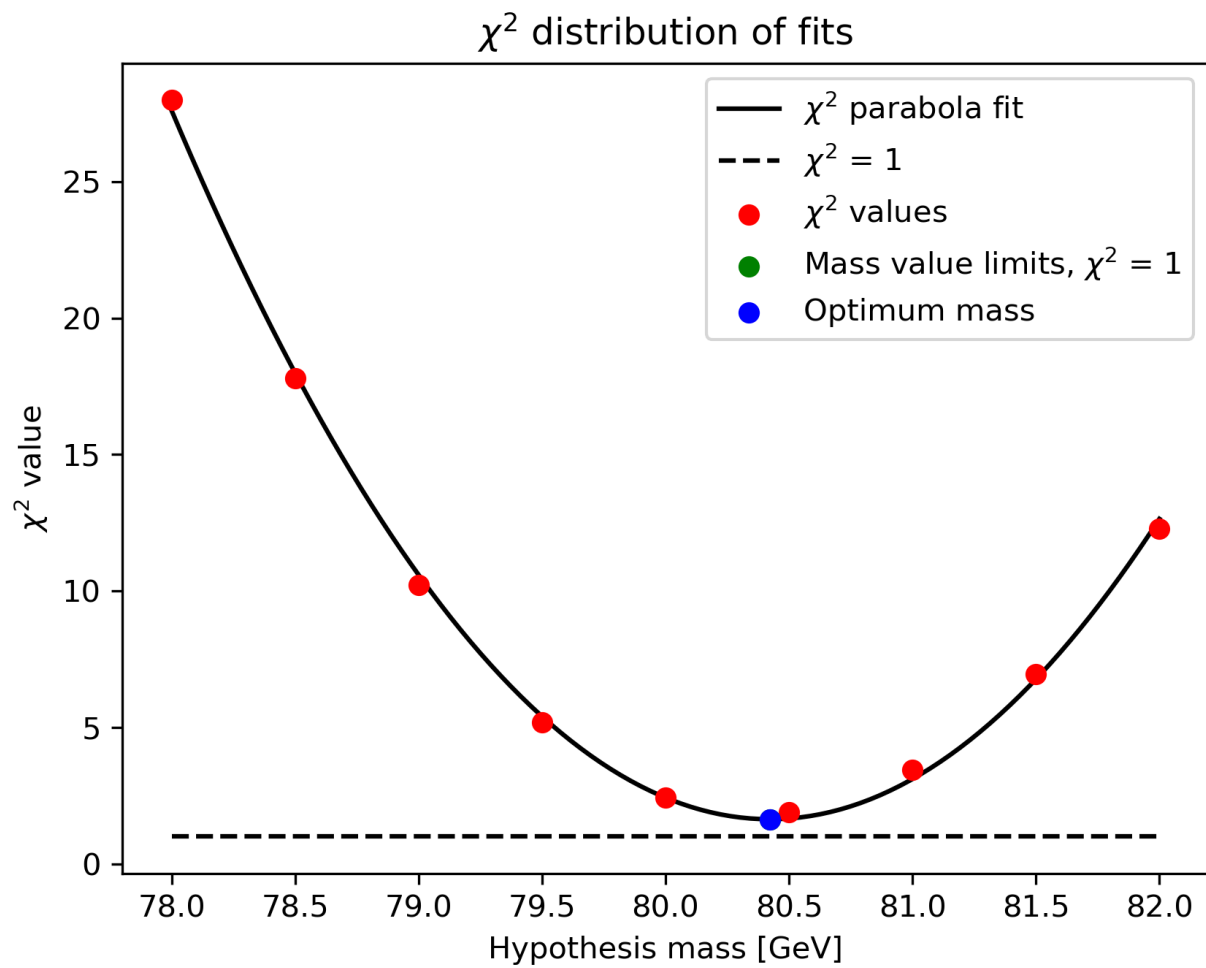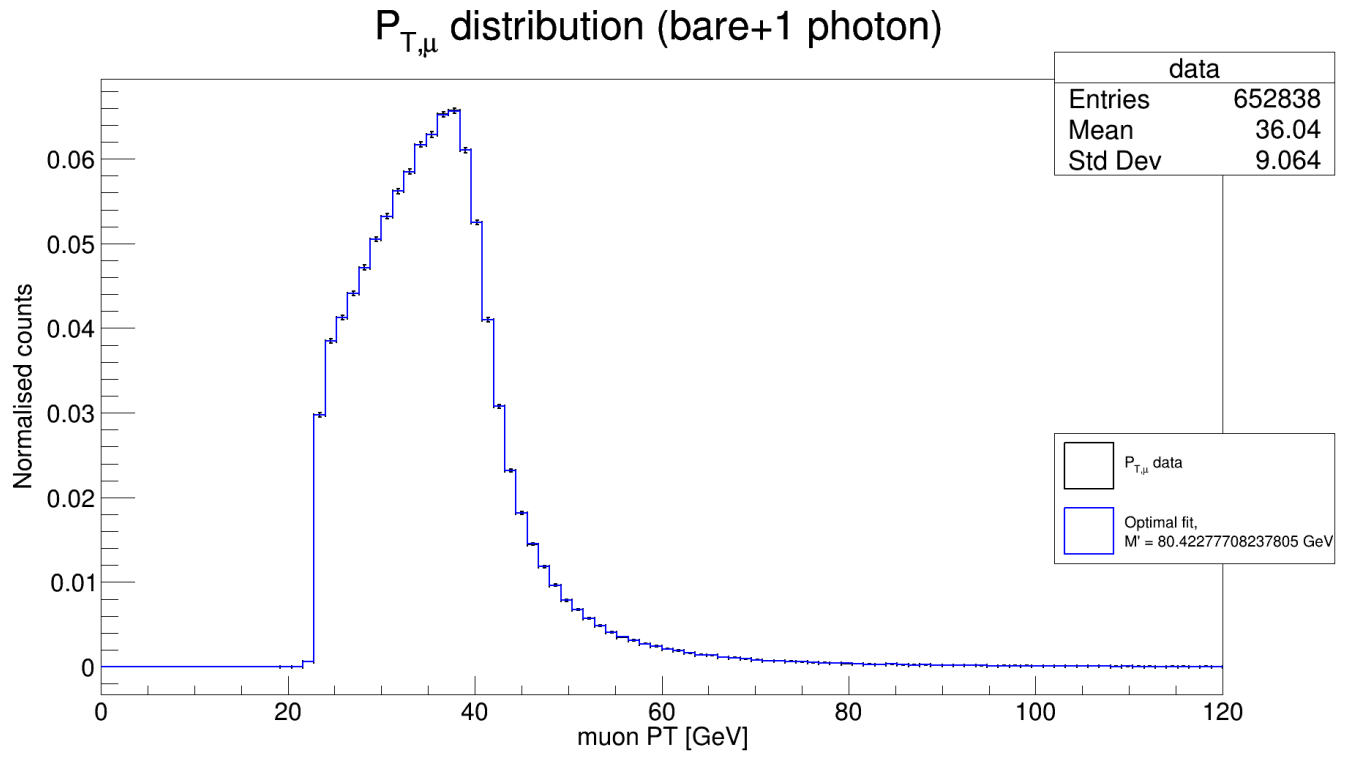
Figure 2: χ^2 of hypothesis masses.

Figure 3: Data and optimum fit with $\chi^2 = 0.024937773839225155$. Used the hypothesis mass of 80.42277708237805±4.263256414560601e-14 $[GeV/c^2]$.