



Mumu 3.5T & 3T

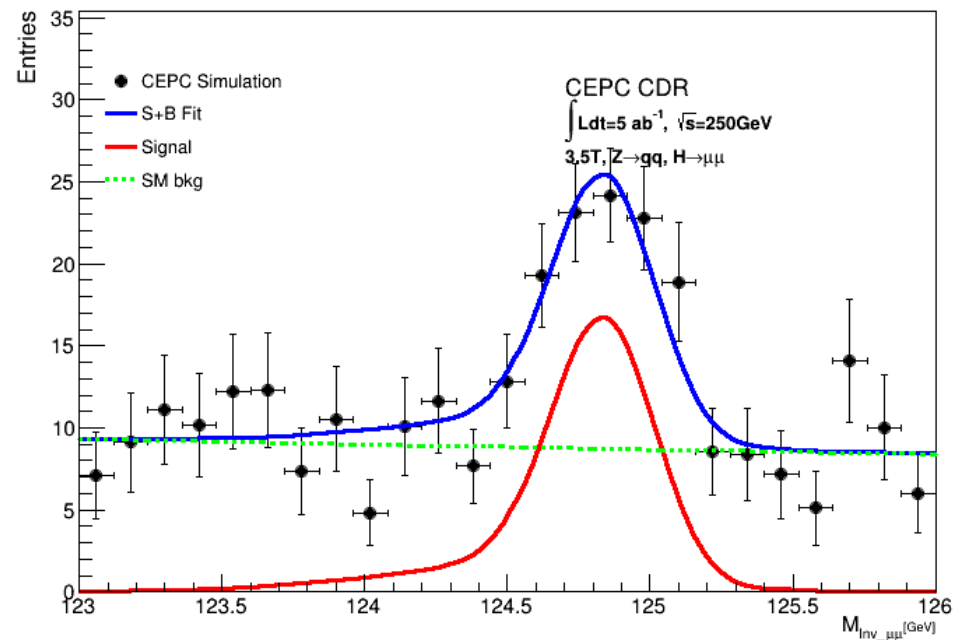
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2018-01-23

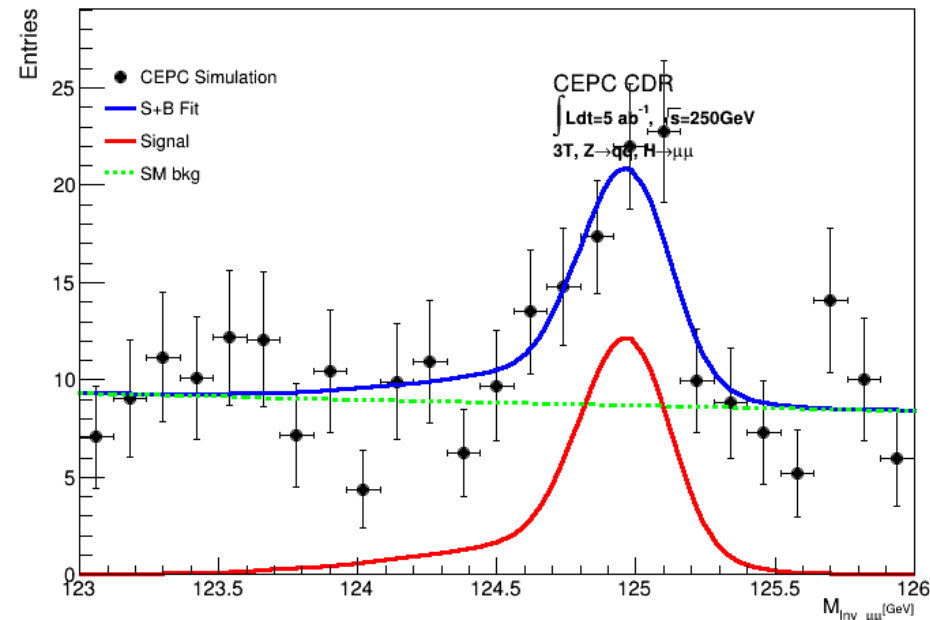
Zhenwei's Final selection, S+B



**3.5T, 74 Events,
precision:16.5%**



**3T, 52 Events,
precision:21.5%**



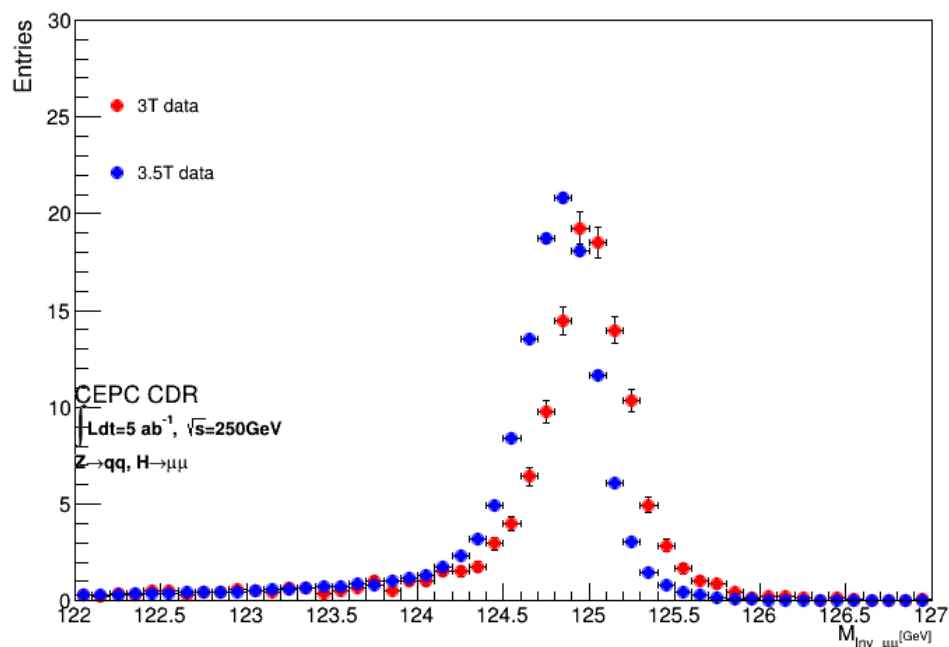
Cut flow

Events(scaled)	3.5T	3T	Ratio
$120 < M_{\mu\mu} < 130$	134.1	112.5	1.19
$M_{j1} > 4.2$ $M_{j2} > 2.8$ $M_{jj} > 76.0$ $20 < P_{T_{\mu^+\mu^-}} < 64$ $-58 < P_{Z_{\mu^+\mu^-}} < 58$ $\cos\theta_{\mu^+} > -0.98$ $\cos\theta_{\mu^-} < 0.98$	116.8	93.43	1.25
$90.9 < M_{Rec_{\mu\mu}} < 93.5$	74	52	1.42

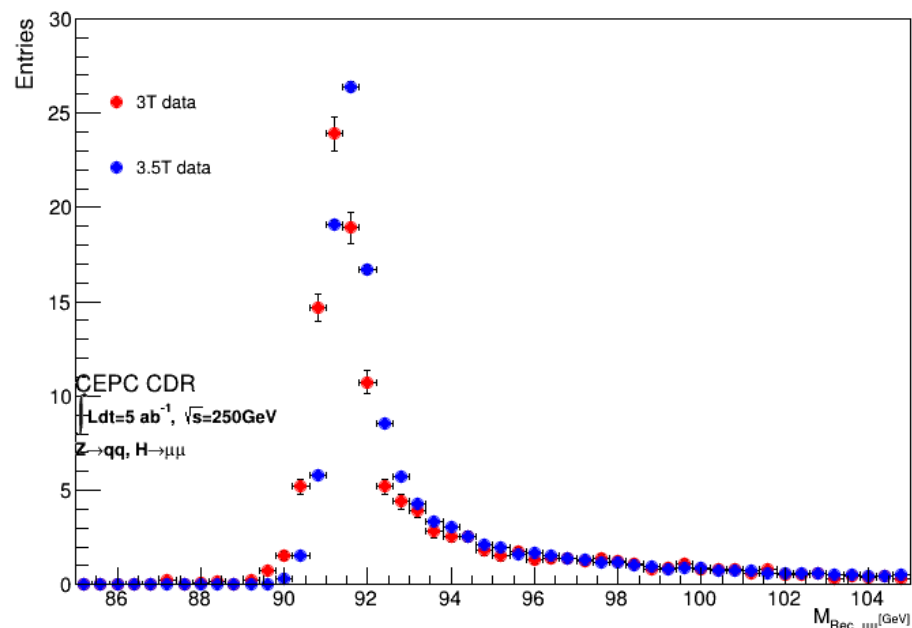
Before all the cut:

Events scaled

H mass



Z mass

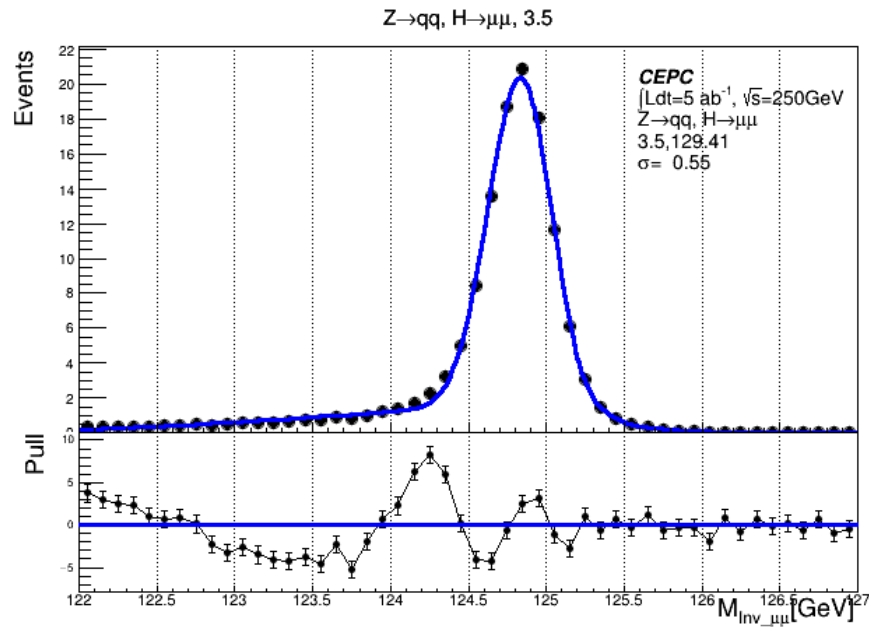


H mass

Use crystal ball+ bifurcated Gaussian to fit:
Mass shift: 0.16;
Resolution: 10.8%

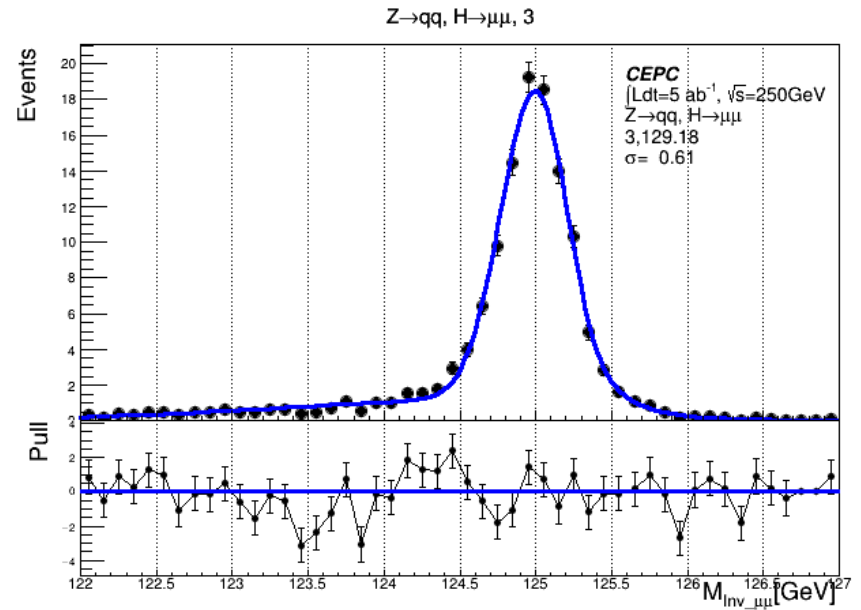
80% $\sigma = 0.21$ Crystal Ball

+20% $\sigma_L = 1.4$, $\sigma_R = 0.15$ bifurcated Gaussian



80% $\sigma = 0.23$ Crystal Ball

+20% $\sigma_L = 1.5$, $\sigma_R = 0.15$ bifurcated Gaussian



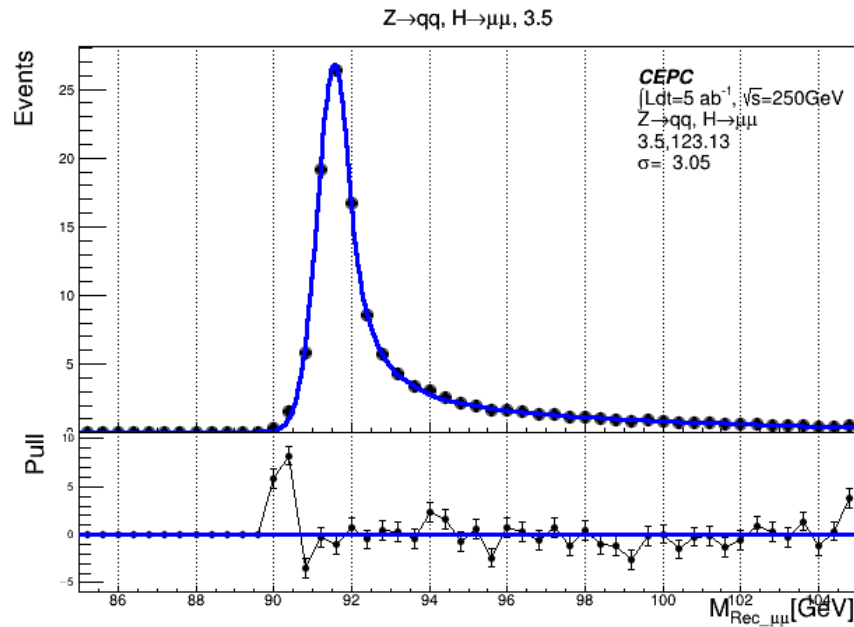
Higgs Mass: 124.84;

Higgs Mass: 125.00;

Z mass

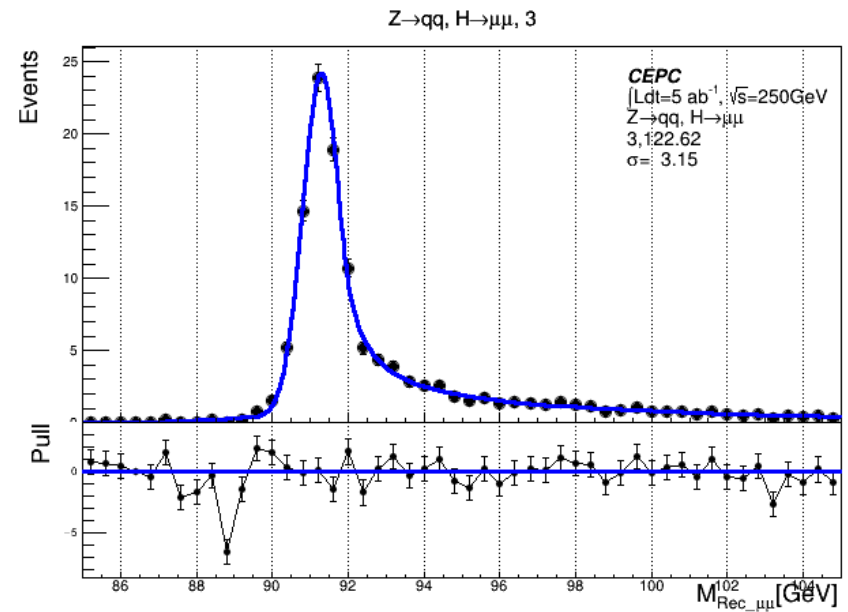
Use crystal ball+ bifurcated Gaussian to fit:
Mass shift: 0.27
Resolution: 14.0%

82% $\sigma = 0.43$ Crystal Ball
+18% $\sigma_L = 0.79, \sigma_R = 7.99$ bifurcated Gaussian



Z Mass: 91.56

89% $\sigma = 0.49$ Crystal Ball
+11% $\sigma_L = 2, \sigma_R = 6.26$ bifurcated Gaussian



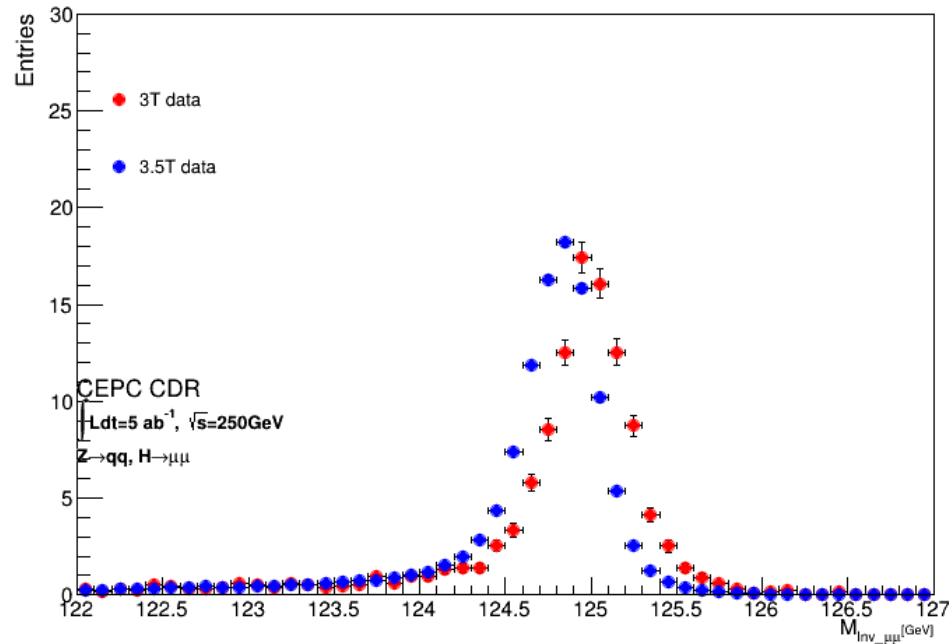
Z Mass: 91.29

Apply cut except mass window:

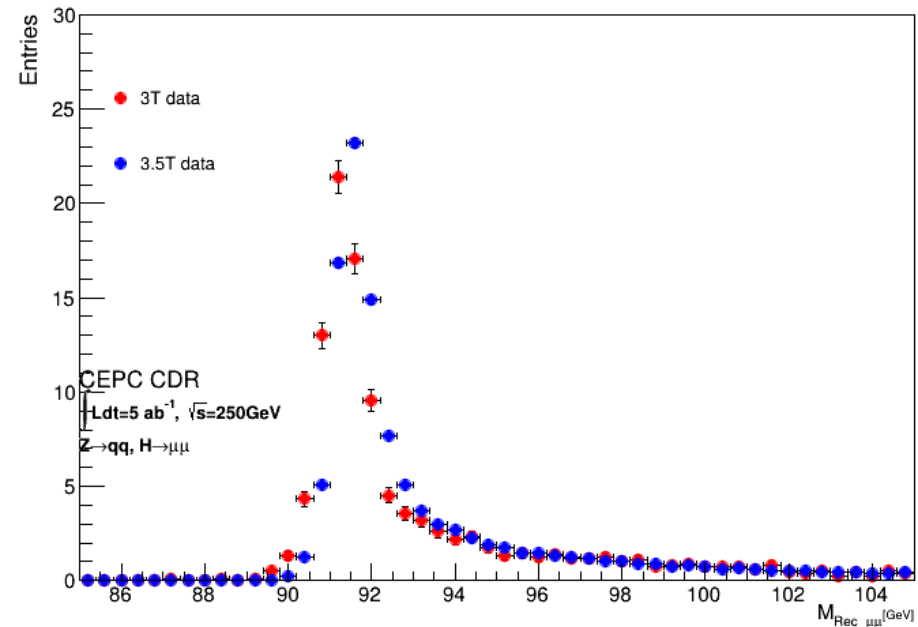


Events scaled

H mass



Z mass

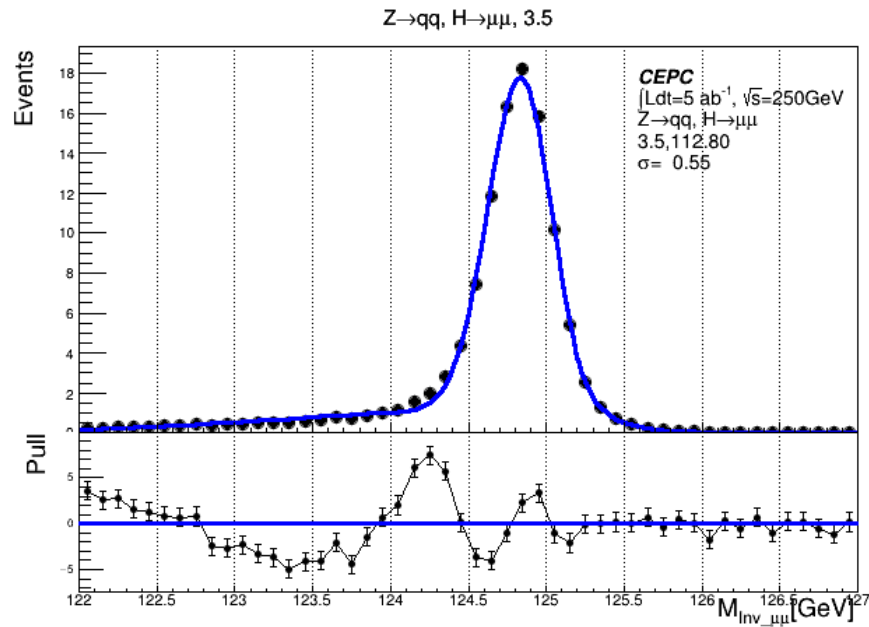


H mass

Use crystal ball+ bifurcated Gaussian to fit:
Mass shift: 0.15;
Resolution: 13.2%

80% $\sigma = 0.21$ Crystal Ball

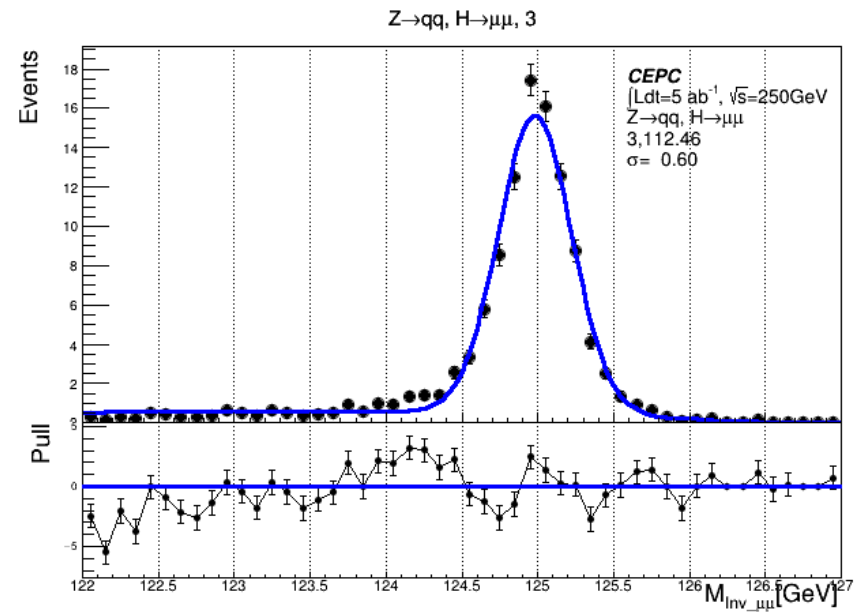
+20% $\sigma_L = 1.4$, $\sigma_R = 0.15$ bifurcated Gaussian



Higgs Mass: 124.83;

80% $\sigma = 0.24$ Crystal Ball

+20% $\sigma_L = 1.8$, $\sigma_R = 0.15$ bifurcated Gaussian

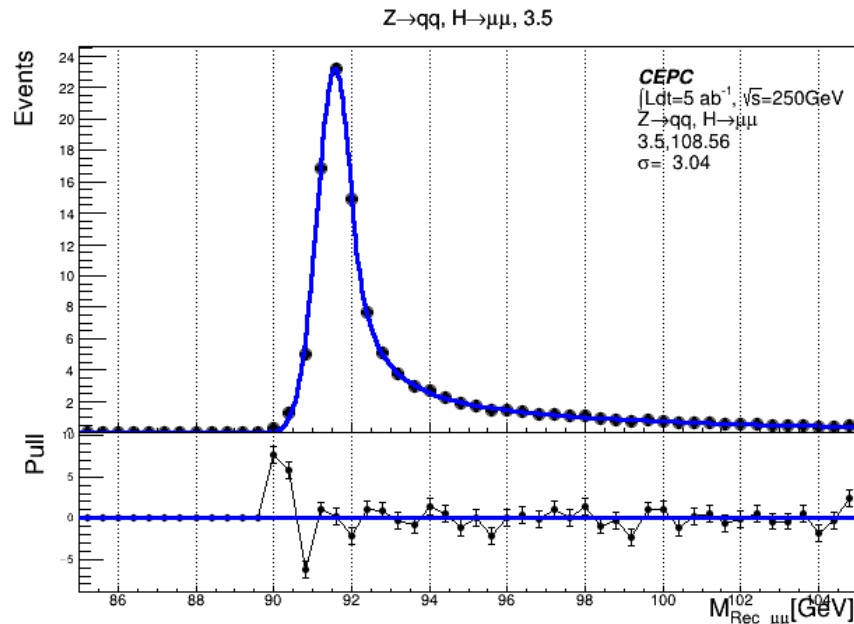


Higgs Mass: 124.98;

Z mass

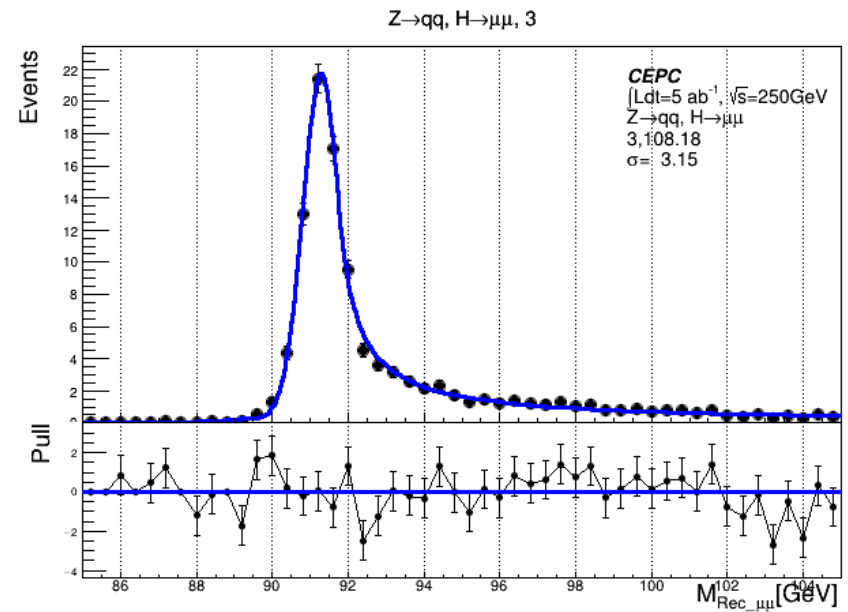
Use crystal ball+ bifurcated Gaussian to fit:
Mass shift: 0.28
Resolution: 10.4%

93% $\sigma = 0.46$ Crystal Ball
+7% $\sigma_L = 0.24, \sigma_R = 6.02$ bifurcated Gaussian



Z Mass: 91.57

97% $\sigma = 0.48$ Crystal Ball
+3% $\sigma_L = 1.8, \sigma_R = 0.38$ bifurcated Gaussian



Z Mass: 91.29