Forward-Backward Asymmetry Study in $Z \rightarrow \mu\mu$

Mengran Li

2018.5.21

Modified parameters in Whizard generator

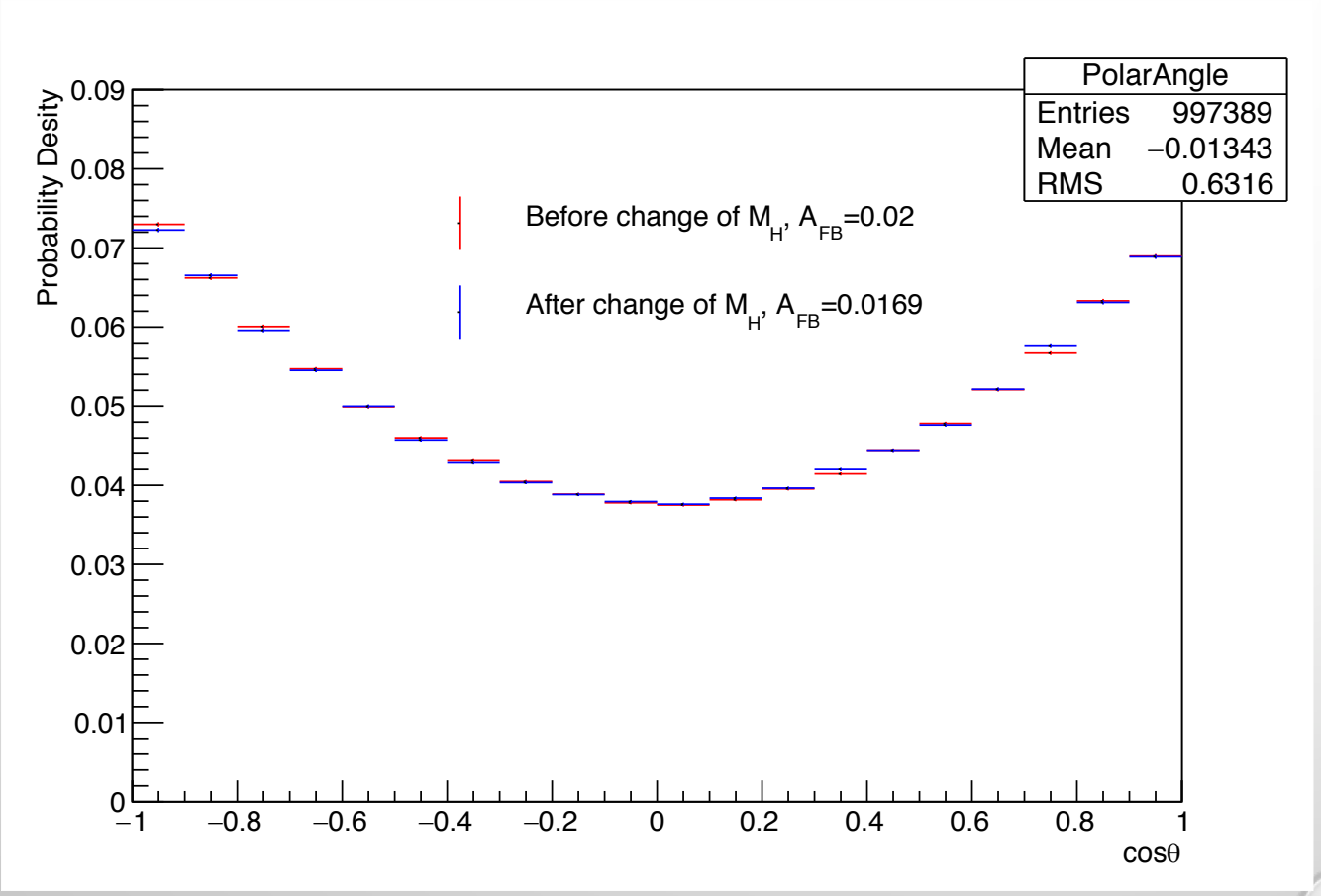
Looked into SM parameters setting in Whizard. And modified one weird number:

M_H = 200 GeV -> M_H =125.09 GeV

And redo 1M Zuu simulation sample at 91.1876 GeV,

Calculation for A_{fb} =0.0169, very close to PDG and gFitter results: 0.0171 ± 0.001

New generation and simulation results



PDG and gFitter results: 0.0171 ± 0.001

Equation 1:

$A_{FB} = (F-B)/(F+B)$,

Where F is count for events with $\cos\theta>1$, and B is that for $\cos\theta<1$.

Equation 2:

Fit function to $P_0+P_1\cos\theta+P_2\cos^2\theta$, ($P_0 \simeq P_2$)

And $A_{FB} = P_1/P_0$

My calculation:

E1:0.0169

E2:0.0167

Next Step

- Will Do full simulation to see whether the change of polar angle distribution will affect the angle resolution result