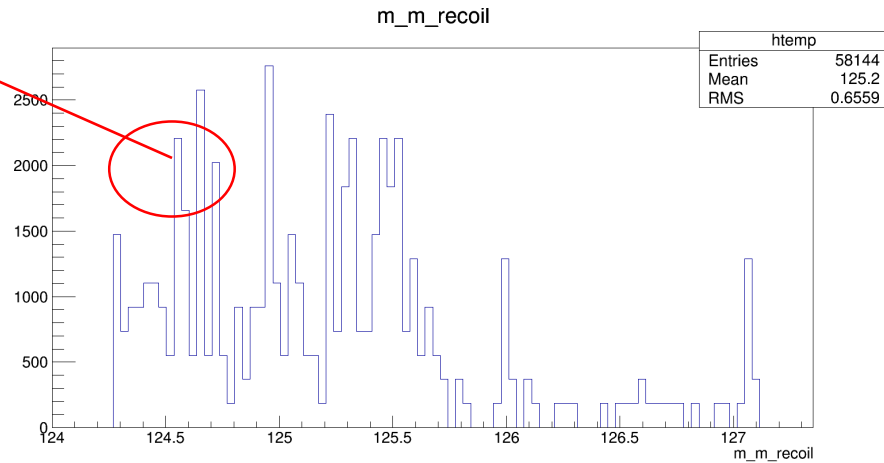# Hig2inv progress work

Tanyh
2018/10/25
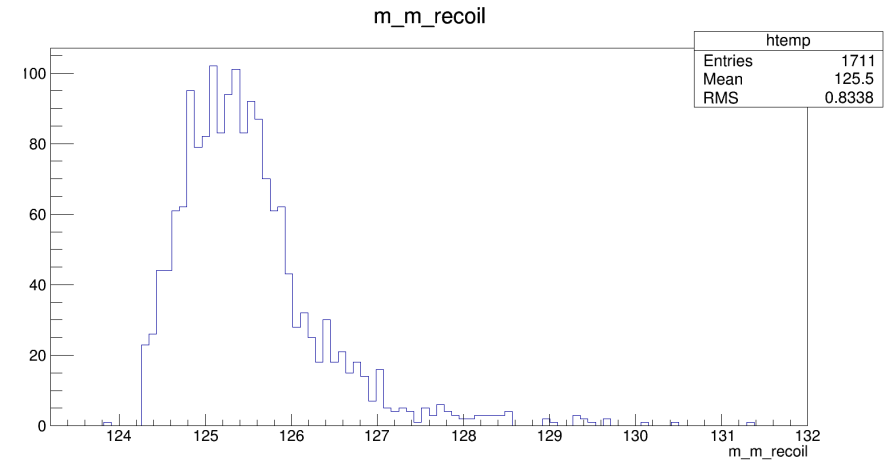
Trying to fit multiple times but failed.

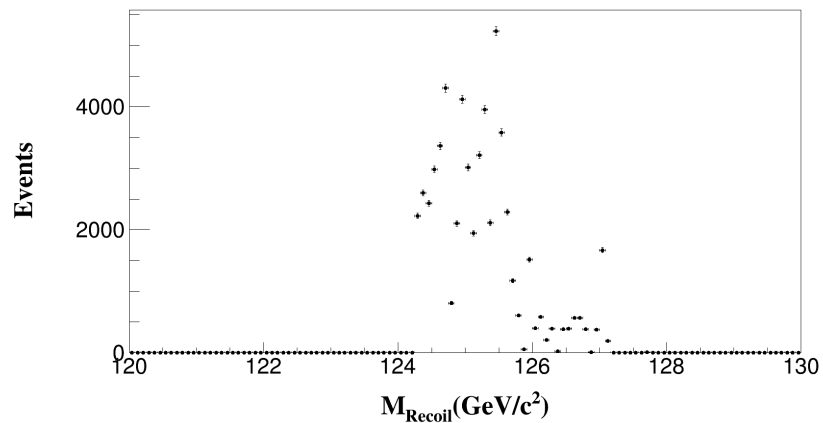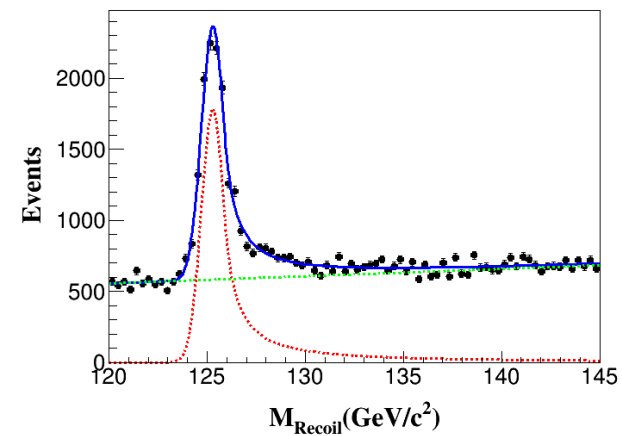## Background distribution

Strange distribution

Signal distribution

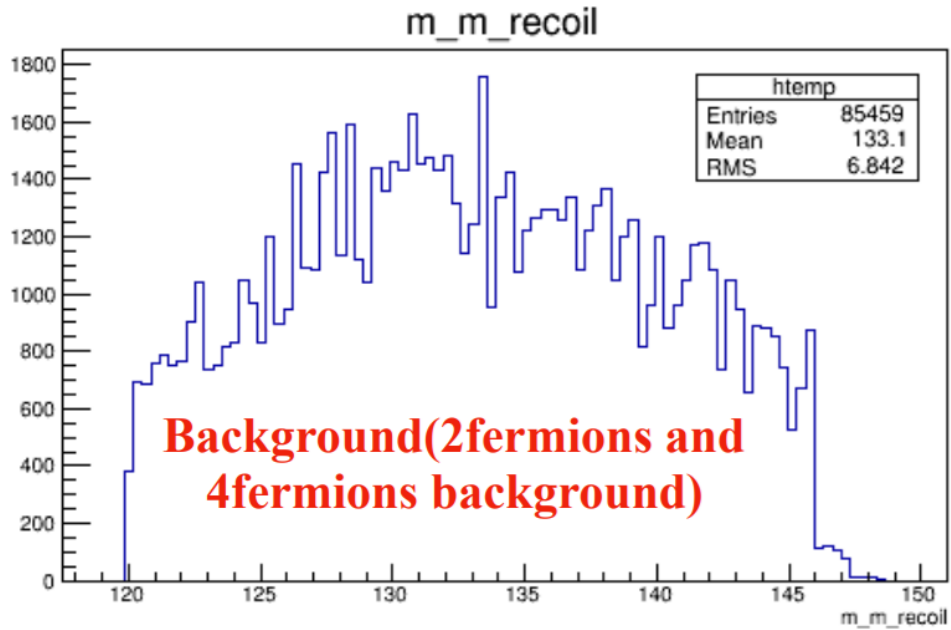Background + signal data points distribution(I can't fit it)

I think the normal fit.(No BDT, no scale)

Question in BDT:

Maoqiang's result

My result

Background(2fermions and 4fermions background)

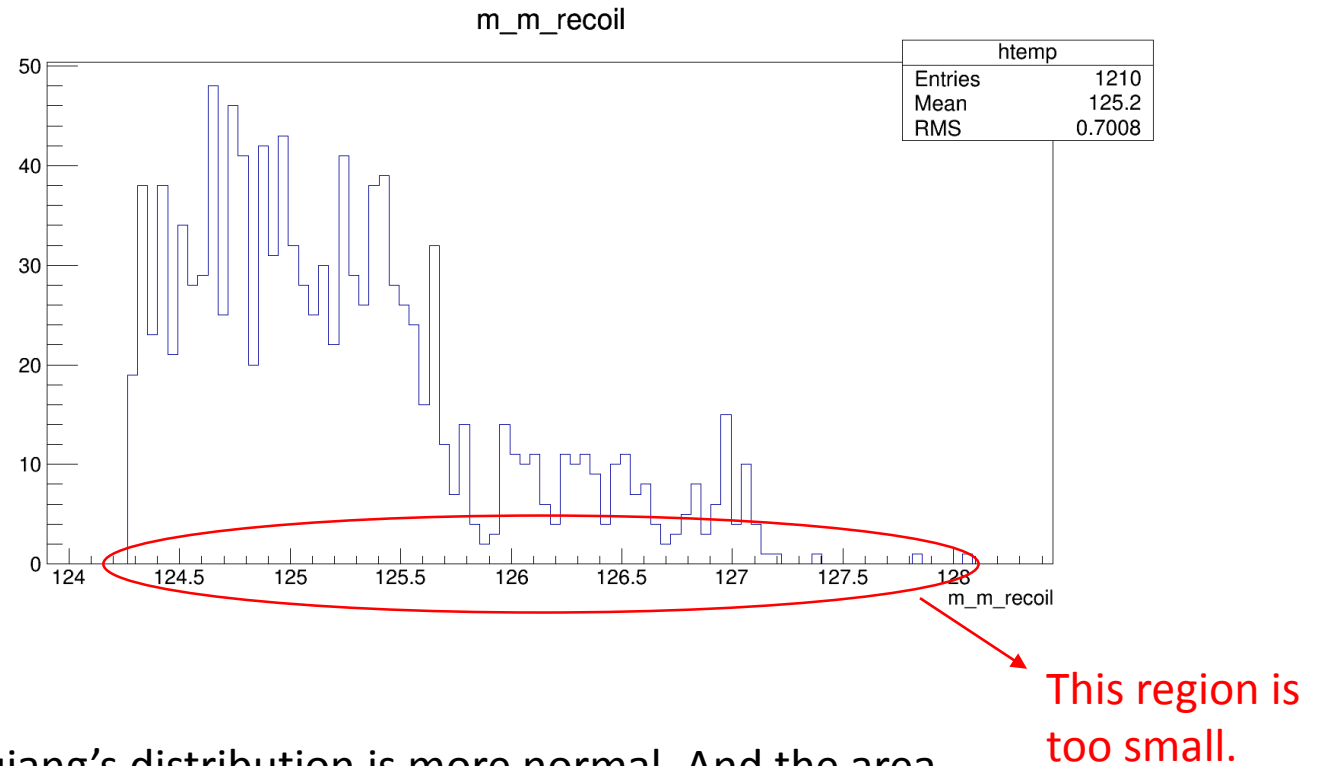This region is too small.

My background number is small, but I think maoqiang's distribution is more normal. And the area of horizontal axis is small in my result.
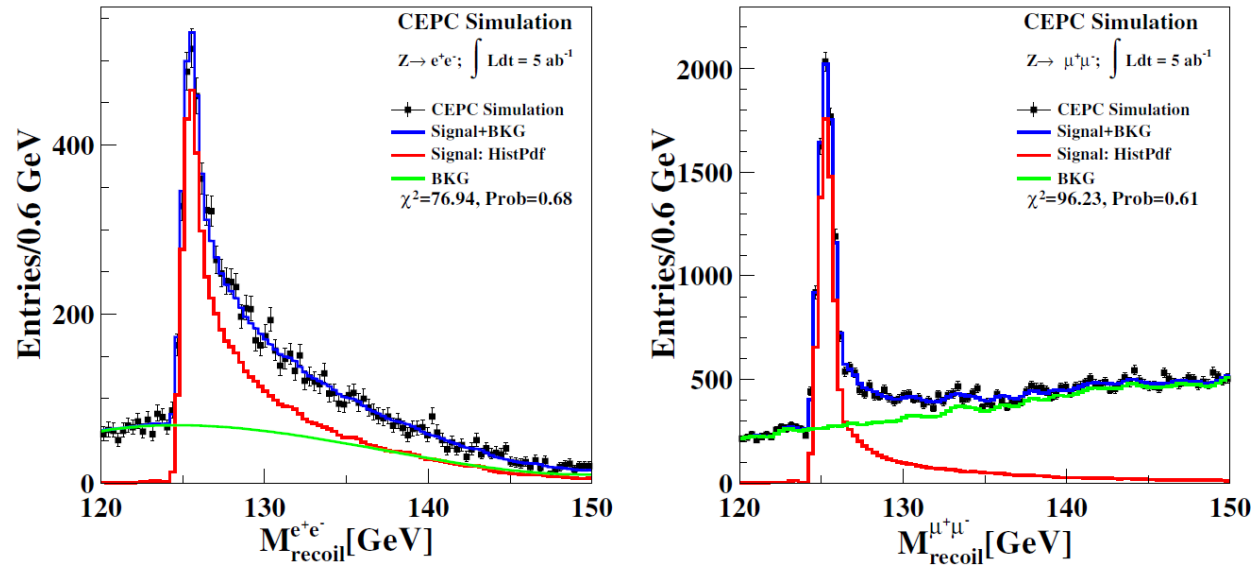
I think I should learn BDT.

From Moxin's paper:

Fig. 3. The recoil mass spectrum of leptonic channels in the measurement of the invisible decay mode of the Higgs boson with $Br(H \to \text{inv.}) = 50\%$. The dots with error bars represent the CEPC simulation. The solid (blue) line indicates the fit. The dashed (red) and the long-dashed (green) line are the signal and the background, respectively.

Our Br(H->inv.) = 0.106%. And our signal will be much lower than the signal of Moxin's.

With the shape obtained, the relative precisions of $\delta\sigma_{ZH(inv)}/\sigma_{ZH(inv)}$ based on different assumptions of $Br(H \to \text{inv.})$ is calculated, and plotted in Fig. 4. Meanwhile, by using the likelihood ratio test method [23], the upper limit of $Br(H \to \text{inv.})$ at 95% confidence level is estimated to be 1.30% for $Z(e^+e^-)H(inv)$ channel and 0.90% for $Z(\mu^+\mu^-)H(inv)$ channel.

I saw part of reference 23. I don't know how she get the upper limit of Branch ratio at 95% confidence level .

Thank you