

# **STUDY IN TOP PAIR CREATION THRESHOLD RANGE**

**KIYOAKI OZAWA**

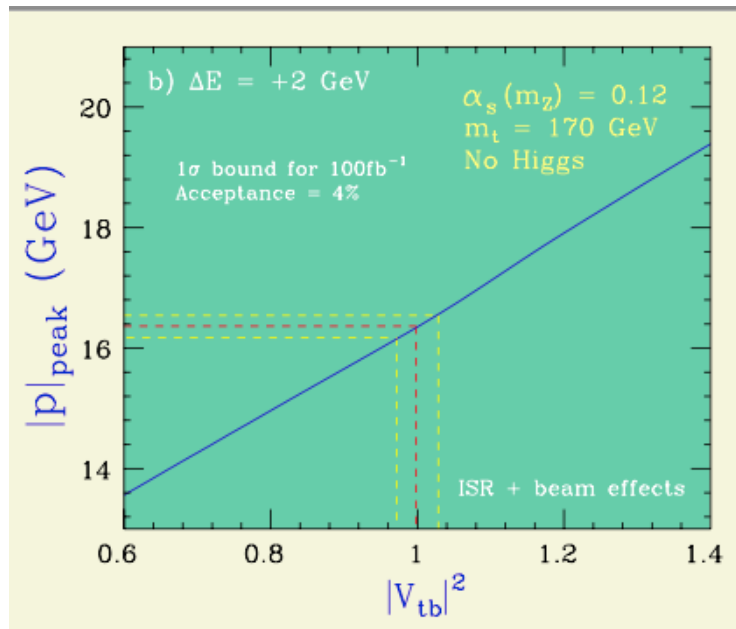
# MOMENTUM MEASUREMENT

The change of the peak position of the momentum histogram is seen when we change a value of  $V_{tb}$  and  $\alpha_s$  in Monte Carlo.

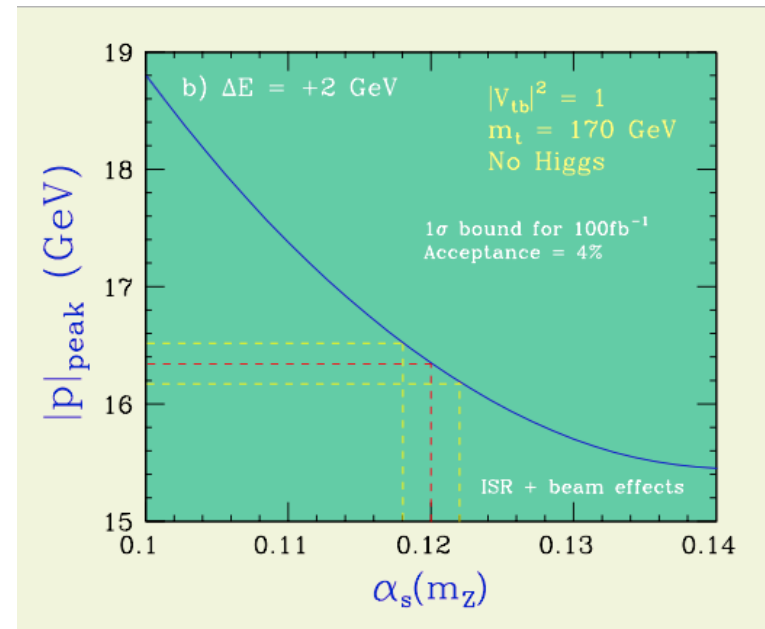
Thus we can measure either value from peak position if we know another value by other measurement.

If I can make the histogram correctly, we can see following figures which show the peak position when  $V_{tb}$  or  $\alpha_s$  changing .

$V_{tb}$

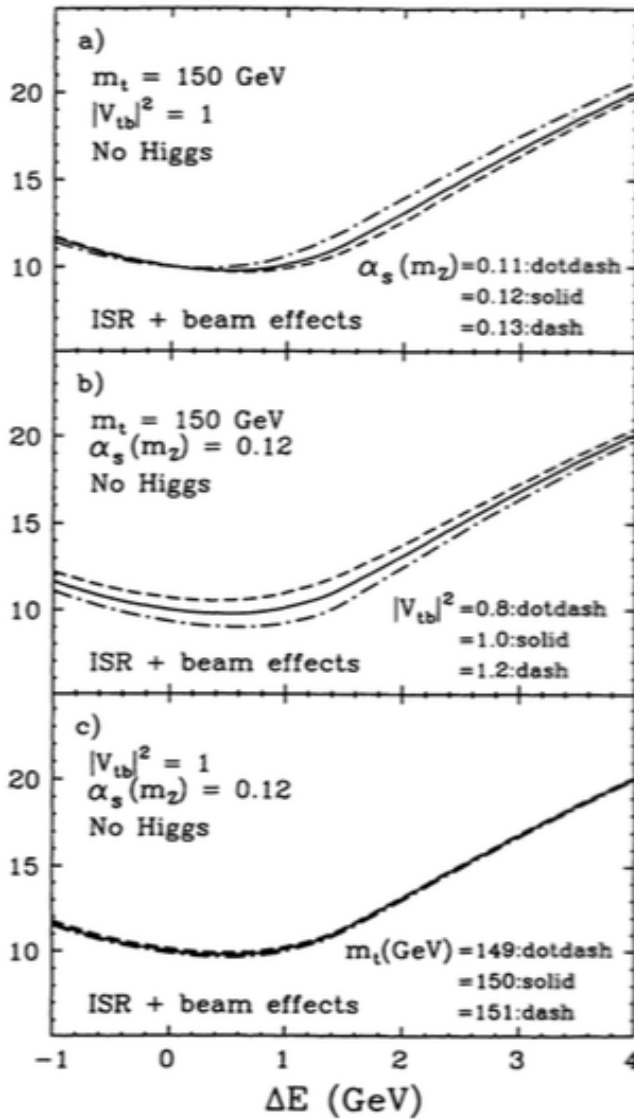
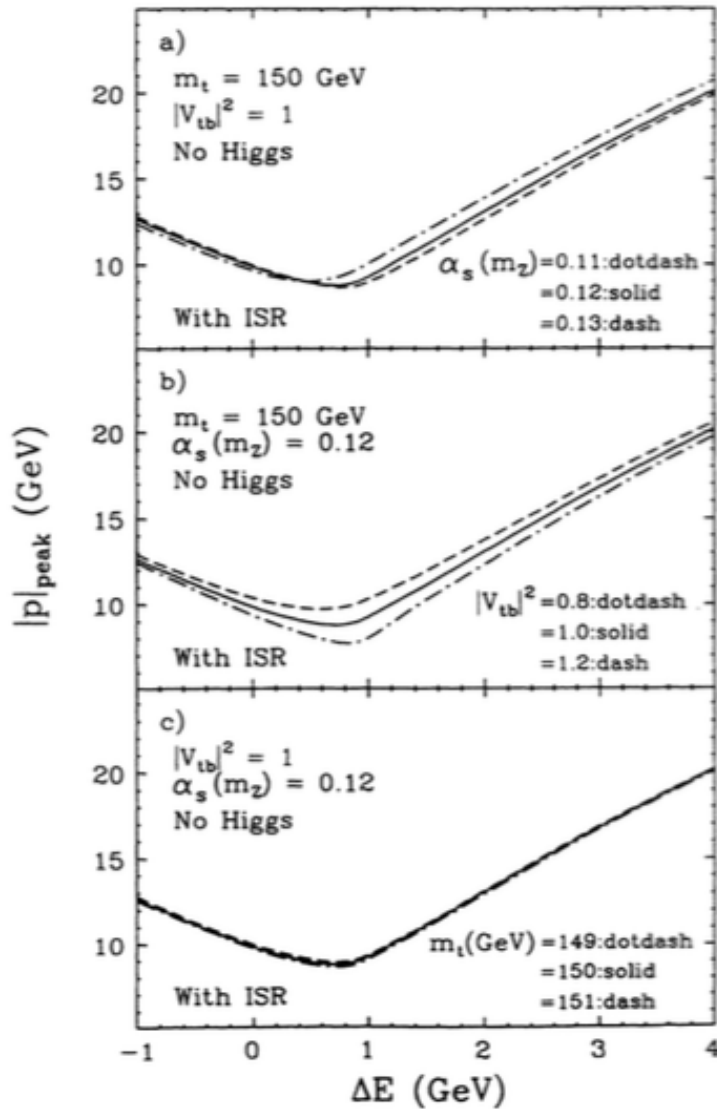


$\alpha_s$



No beam effect

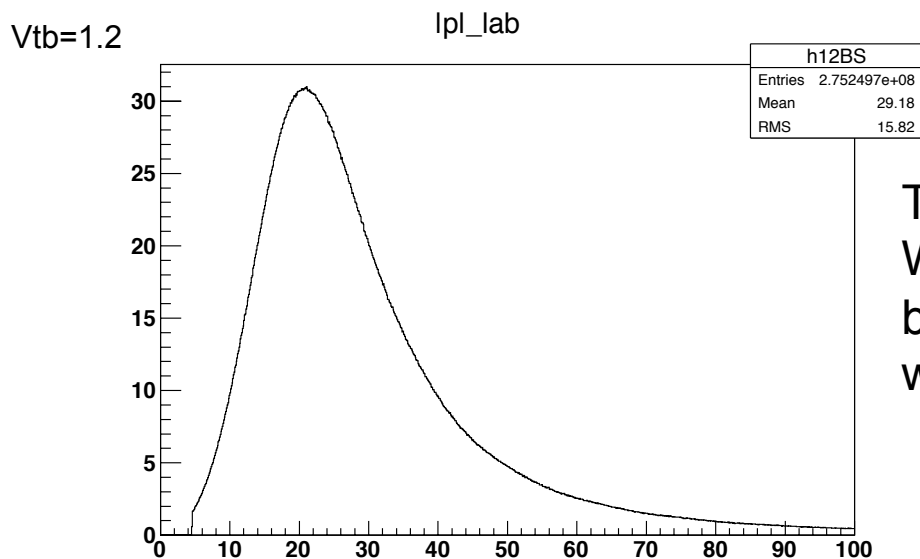
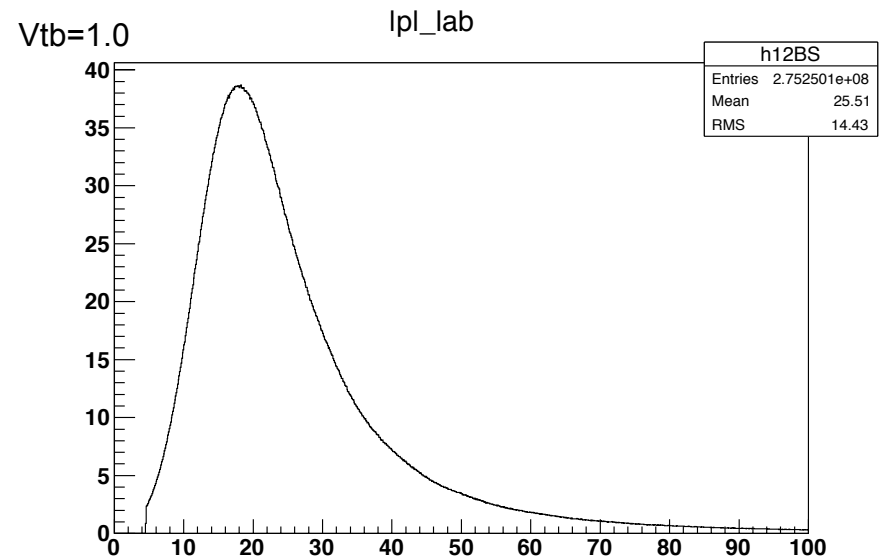
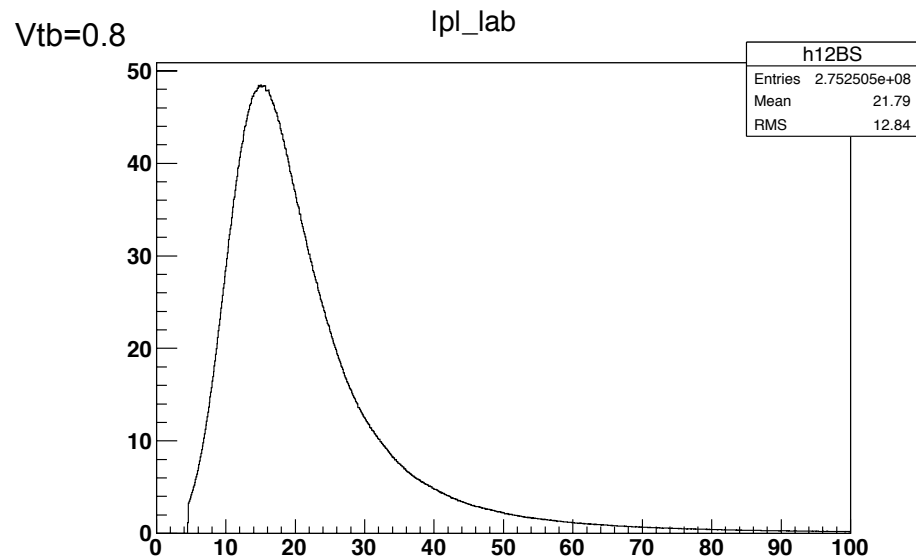
Beam effect



The graph of right and left are almost same in  $\Delta E > 1.5 \text{ GeV}$ . Therefore I analyze it in  $E_{1S} + 2 \text{ GeV}$ .

$$\Delta E = \sqrt{s} - \sqrt{s_{1S}}$$

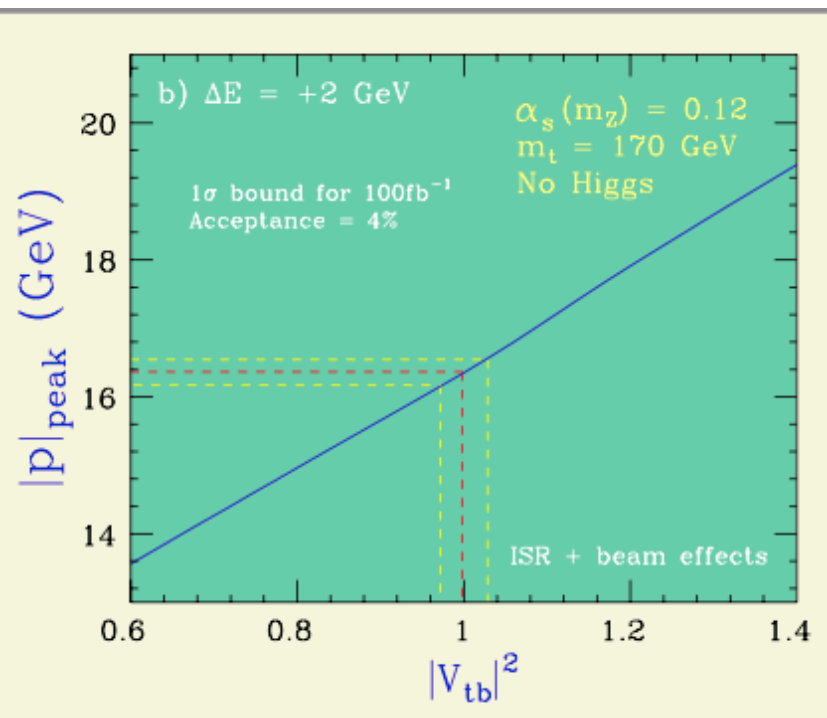
# MOMENTUM HISTOGRAM BY THE VTB CHANGE



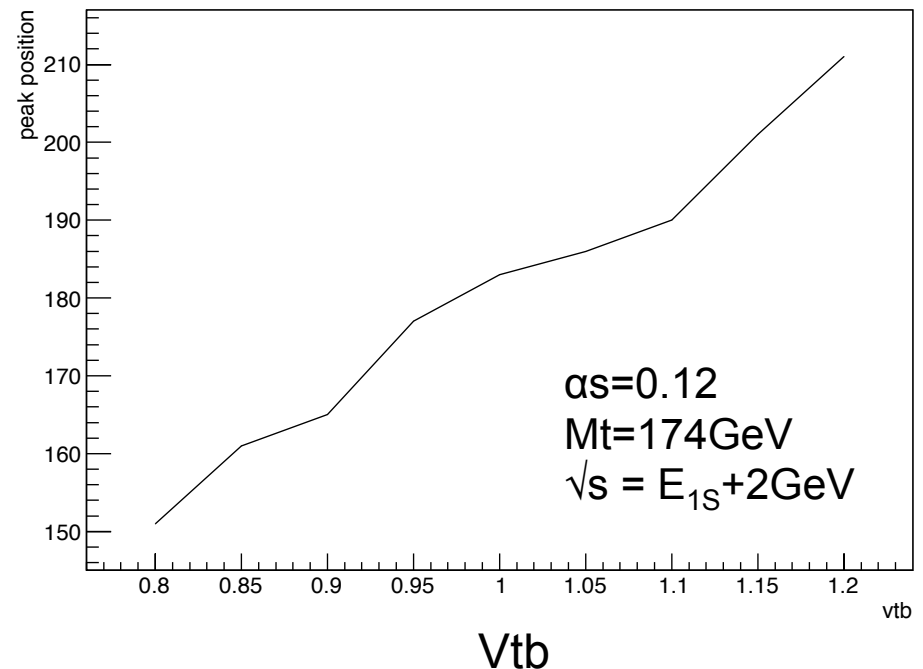
The histogram is smooth.  
When Vtb grows, the peak position increases  
because the top decays shorter distance  
where the potential is deeper.

# PEAK POSITION BY THE VTb CHANGE

A right figure is made by physsim with no beam effect.  
To check whether I can make histogram correctly,  
I plot peak positions at 9 points from  $V_{tb} = 0.8 \sim 1.2$  by 0.05.  
It seems to increase monotonically.



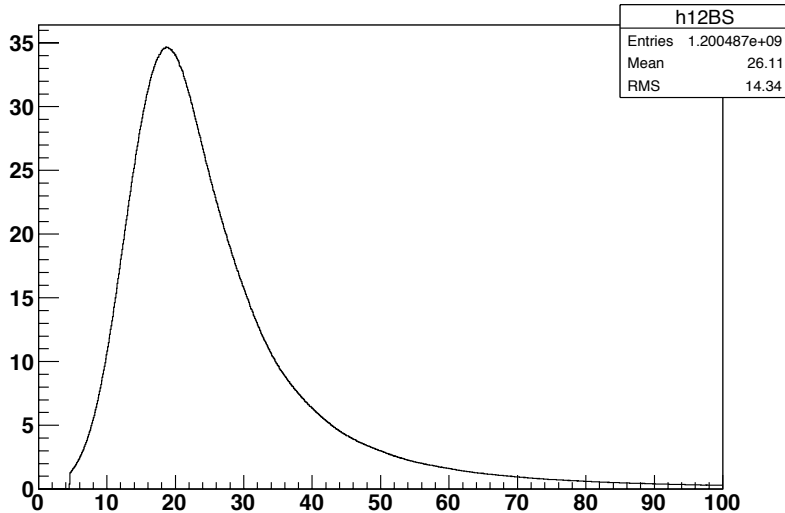
peak of momentum hist



# MOMENTUM HISTOGRAM BY THE ALPHA\_S CHANGE

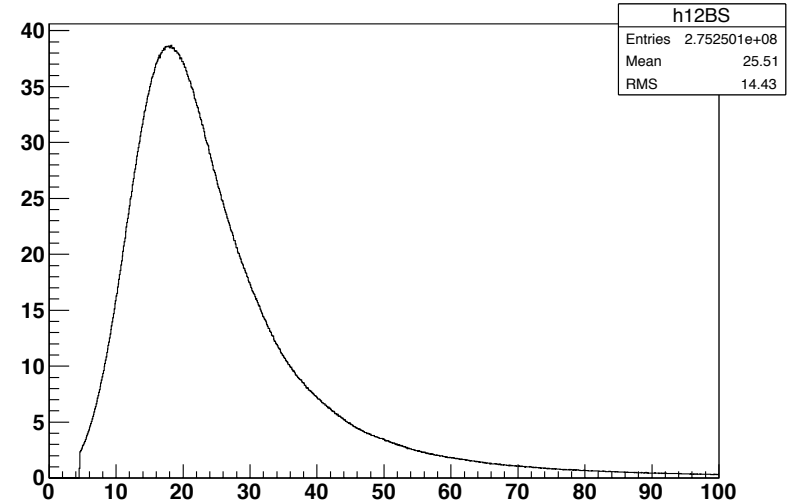
$\alpha_s=0.10$

lpl\_lab



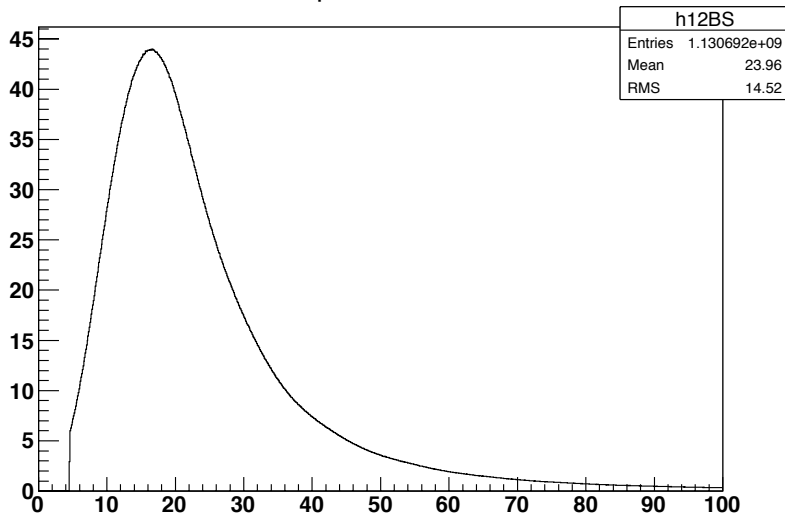
$\alpha_s=0.12$

lpl\_lab



$\alpha_s=0.14$

lpl\_lab



$E_{1S}$  is depend on  $\alpha_s$  as following

$$E_{1S} \sim -\alpha_s^2 m_t$$

When  $\alpha_s$  grows, the peak position decreases because  $E_{1S}$  falls down

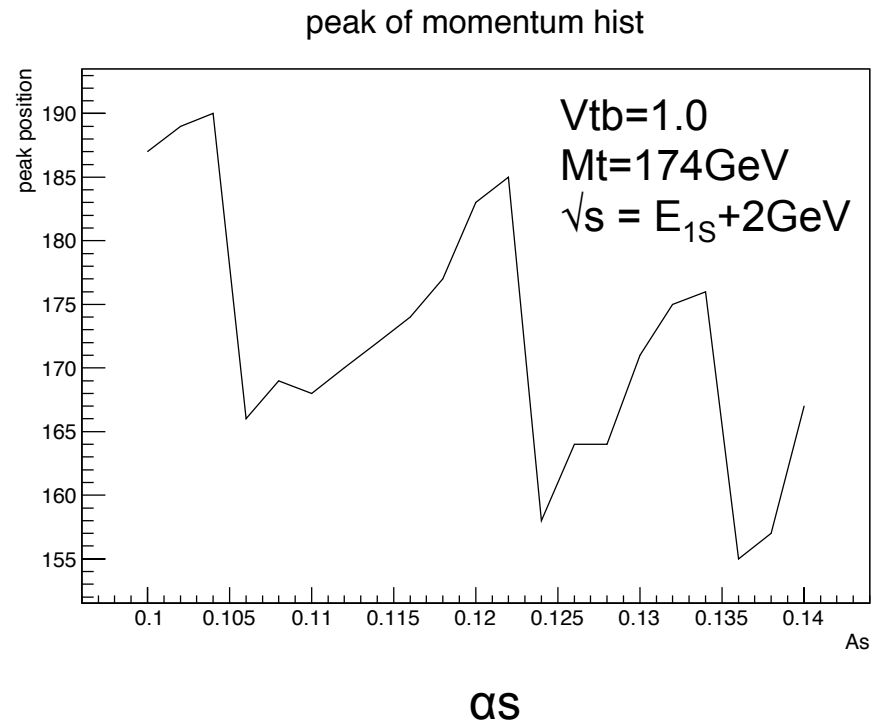
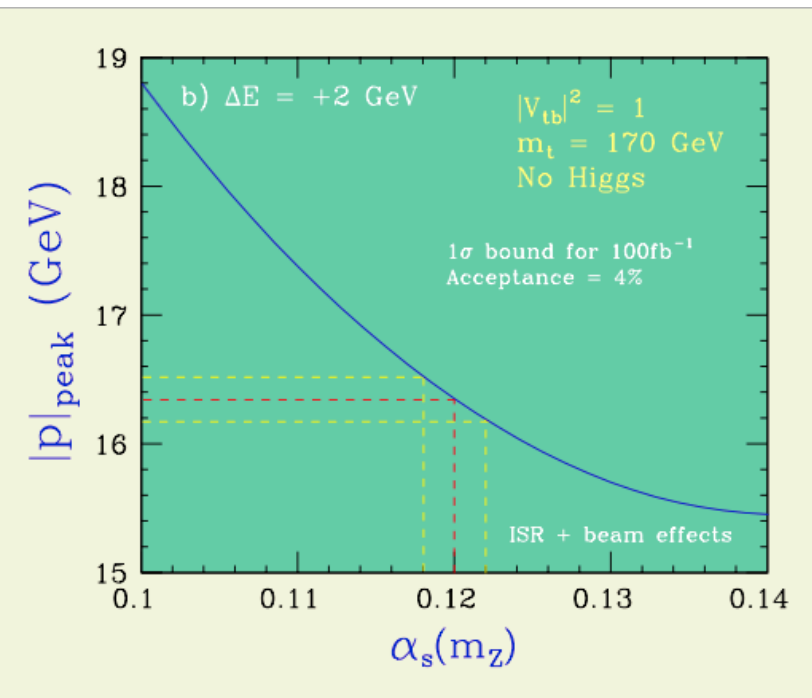
# PEAK POSITION BY THE ALPHA\_S CHANGE

A right figure is made by physsim with no beam effect.

I plot 21 points by 0.02 from  $\alpha_s = 0.10 \sim 0.14$

The right figure show zigzag line doesn't decrease monotonically.

It is thought that this is caused by the table of the green function is rough.



# SUMMARY AND PLAN

The histogram when  $V_{tb}$  changing seems to change correctly.

I make the graph of the peak position when  $\alpha_s$  changing by adjusting the table of the green function again.

When it is over, I fit these histogram with the histogram of the reconstructed top.