Measurement of Top Quark Momentum at the ILC

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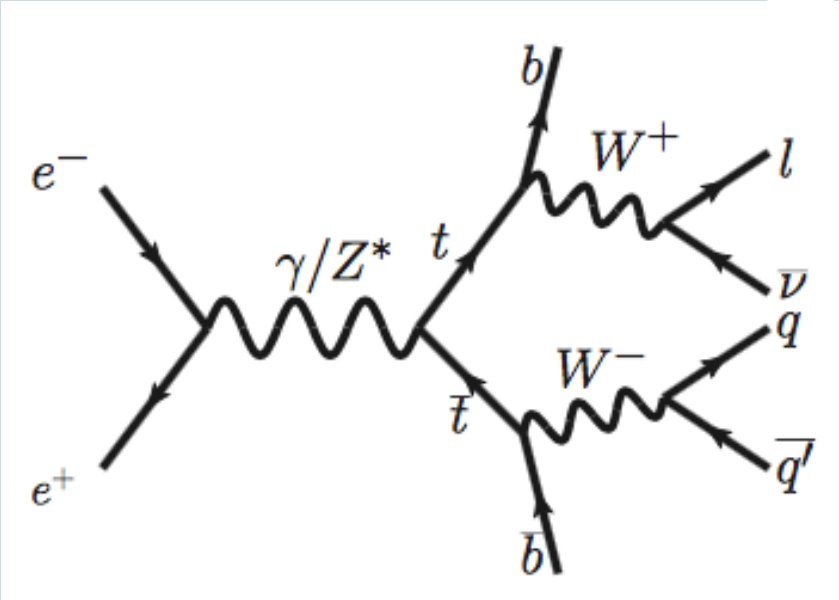
ttbar -> 4-jet mode Analysis



Simulation Set Up

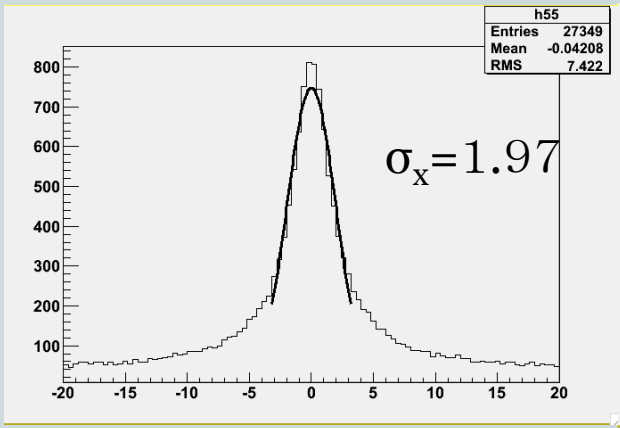
$\sqrt{s}$ =347GeV

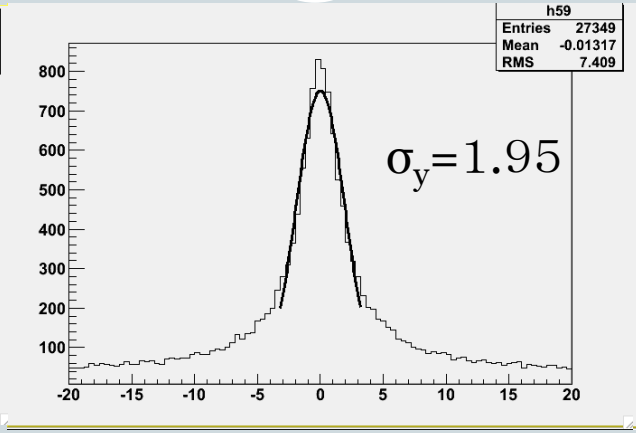
L_{int}[eL(-80)pR(+30)]=100fb^{-1}
L_{int}[eR(+80)pL(-30)]=100fb^{-1}

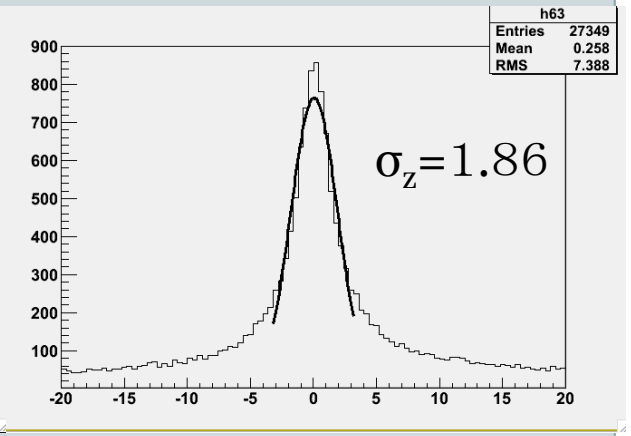
We need the correctly reconstructed b and bbar quark.

-> We check the three components of b and bbar jet.

Correct Assignment





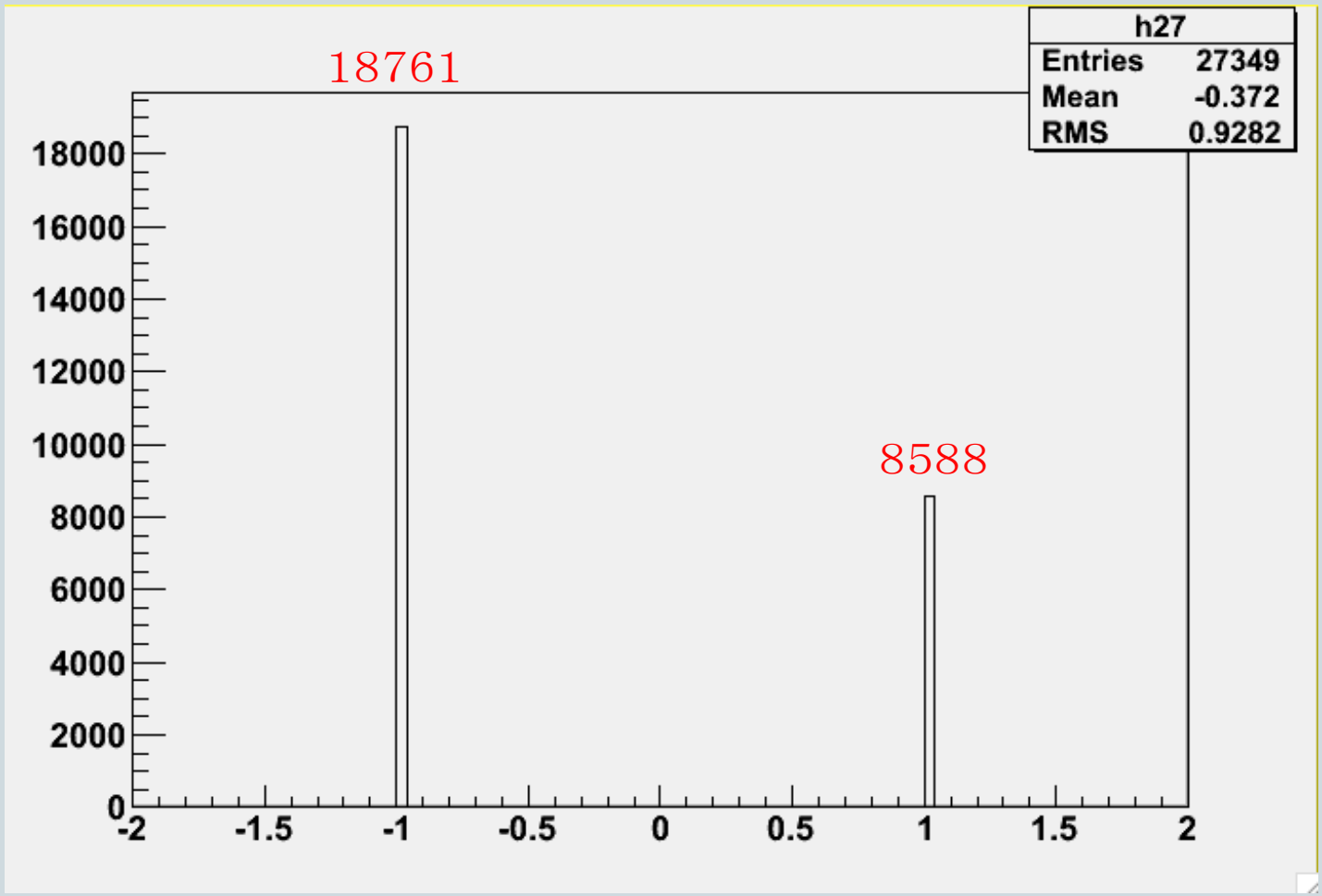


Pbbar_x_rec-Pbbar_x_MC Pbbar_y_rec-Pbbar_y_MC Pbbar_z_rec-Pbbar_z_MC

$$\text{Pbbar\_x\_MC} - 5\sigma_x < \text{Pbbarr\_x\_rec} < \text{Pbbar\_x\_MC} + 5\sigma_x$$
$$\text{Pbbar\_y\_MC} - 5\sigma_y < \text{Pbbarr\_y\_rec} < \text{Pbbar\_y\_MC} + 5\sigma_y$$
$$\text{Pbbar\_z\_MC} - 5\sigma_z < \text{Pbbarr\_z\_rec} < \text{Pbbar\_z\_MC} + 5\sigma_z$$

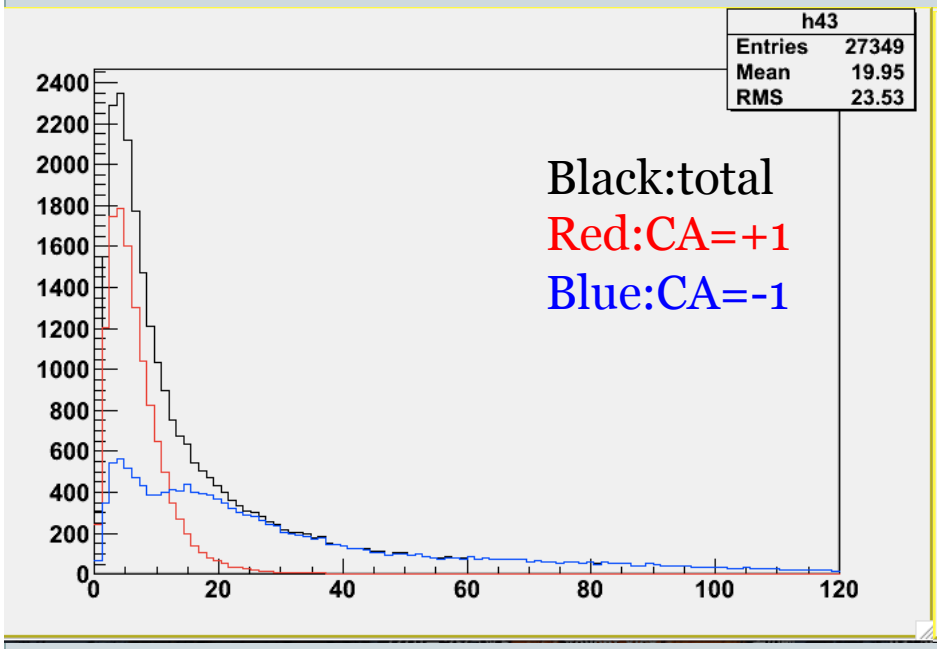
We confirm that six components(bx, by, bz, bbarx, bbary, bbarz) satisfy these conditions.
If so, Correct Assignment(CA)=+1.
If not so, CA=-1

Correct Assignment

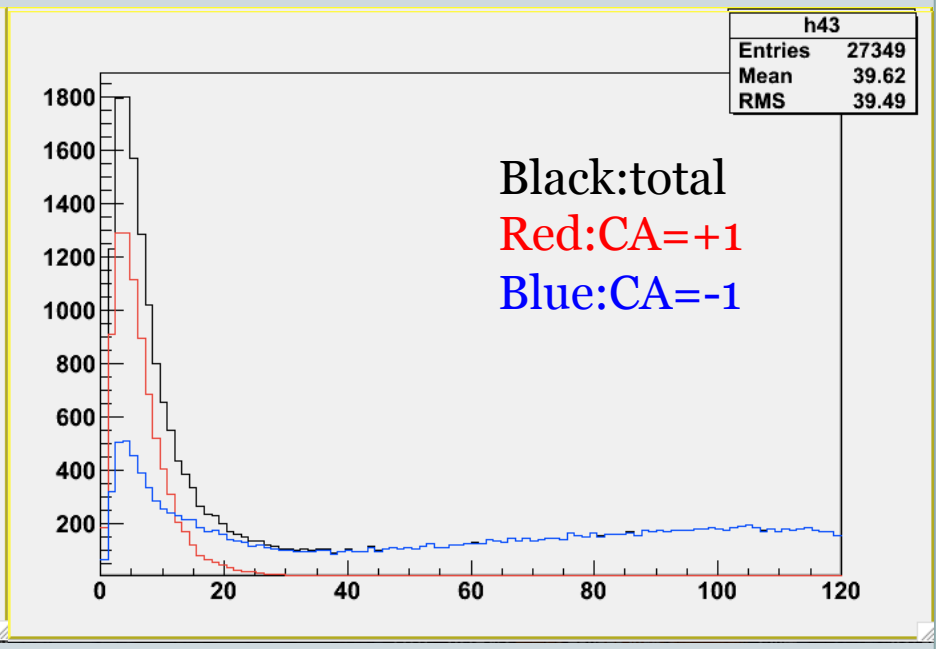


|Pt_rec-Pt_MC|

cosbW=minnimum

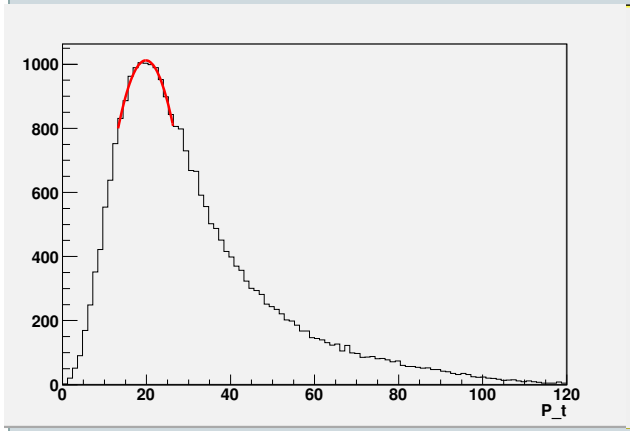


χ^2=minnimum



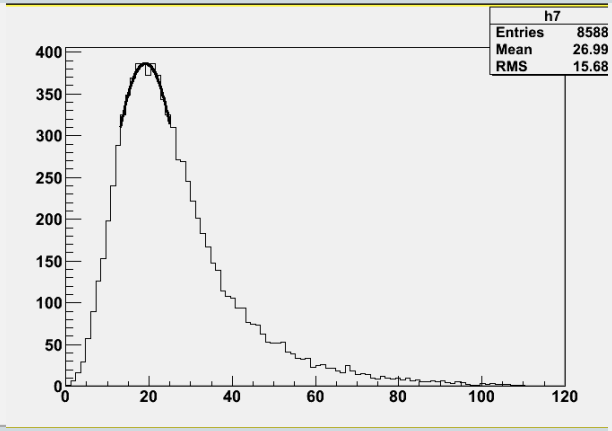
Top Momentum Distributione(left handed)

Ozawa-san's result



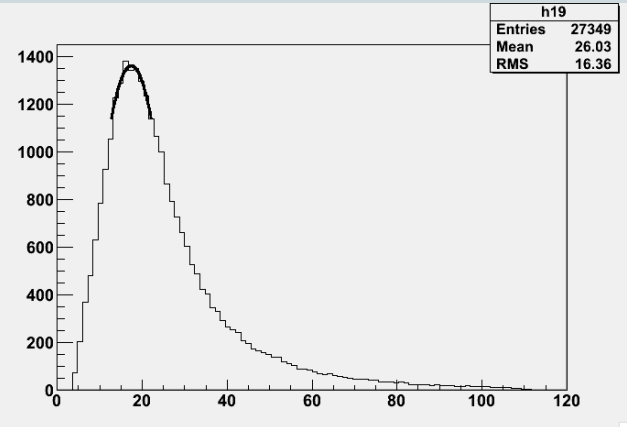
P_peak=19.9±0.243 GeV

CA=+1



P_peak=19.1±0.398 GeV

MC truth



P_peak=17.4±0.250 GeV

momentum peak position 19.9 -> 19.1

Plan

- I will explore the event of CA=-1, and I will check what is wrong.
- I will try to fit top momentum distribution for all range.