Working Meeting

Single Top Analysis

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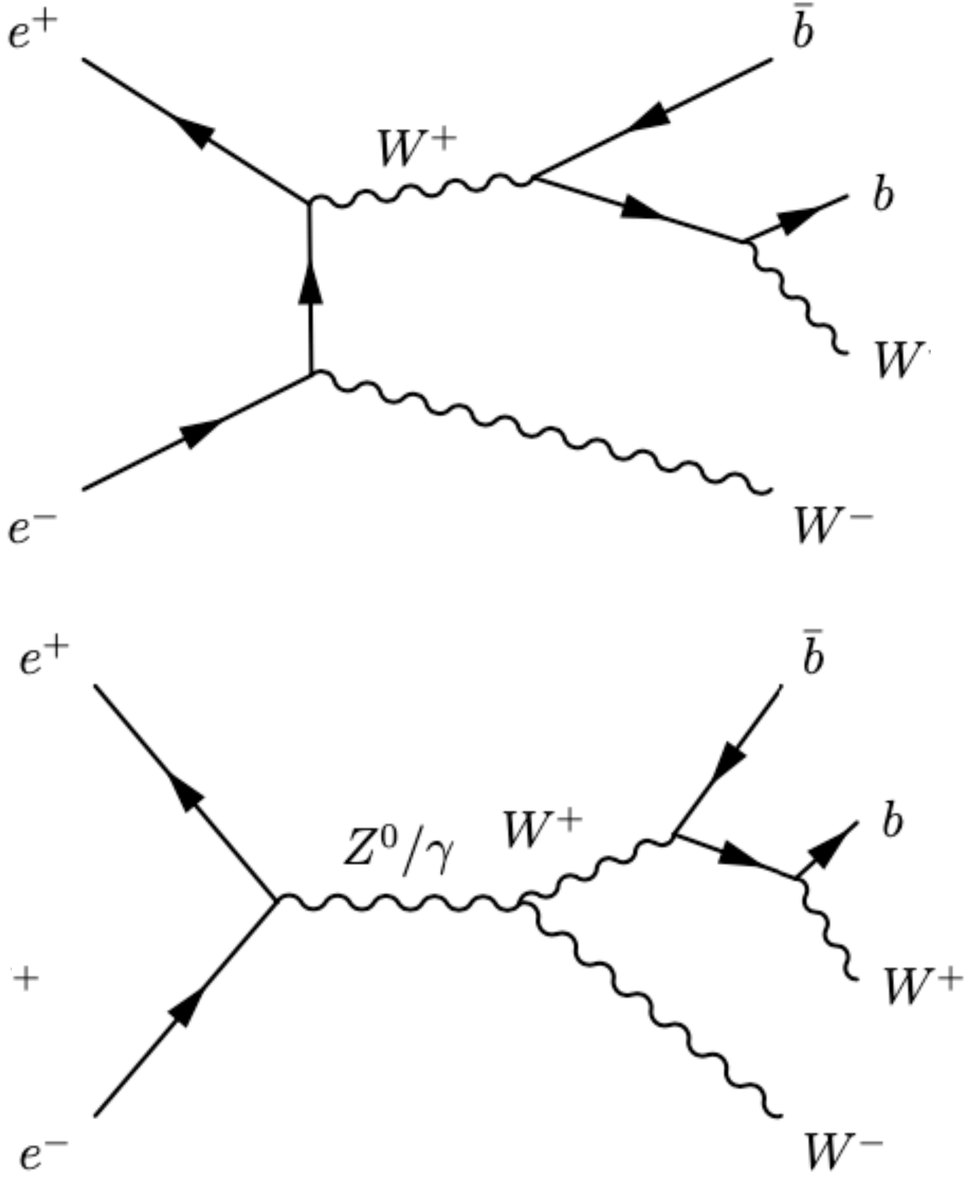
Single Top Analysis

Status

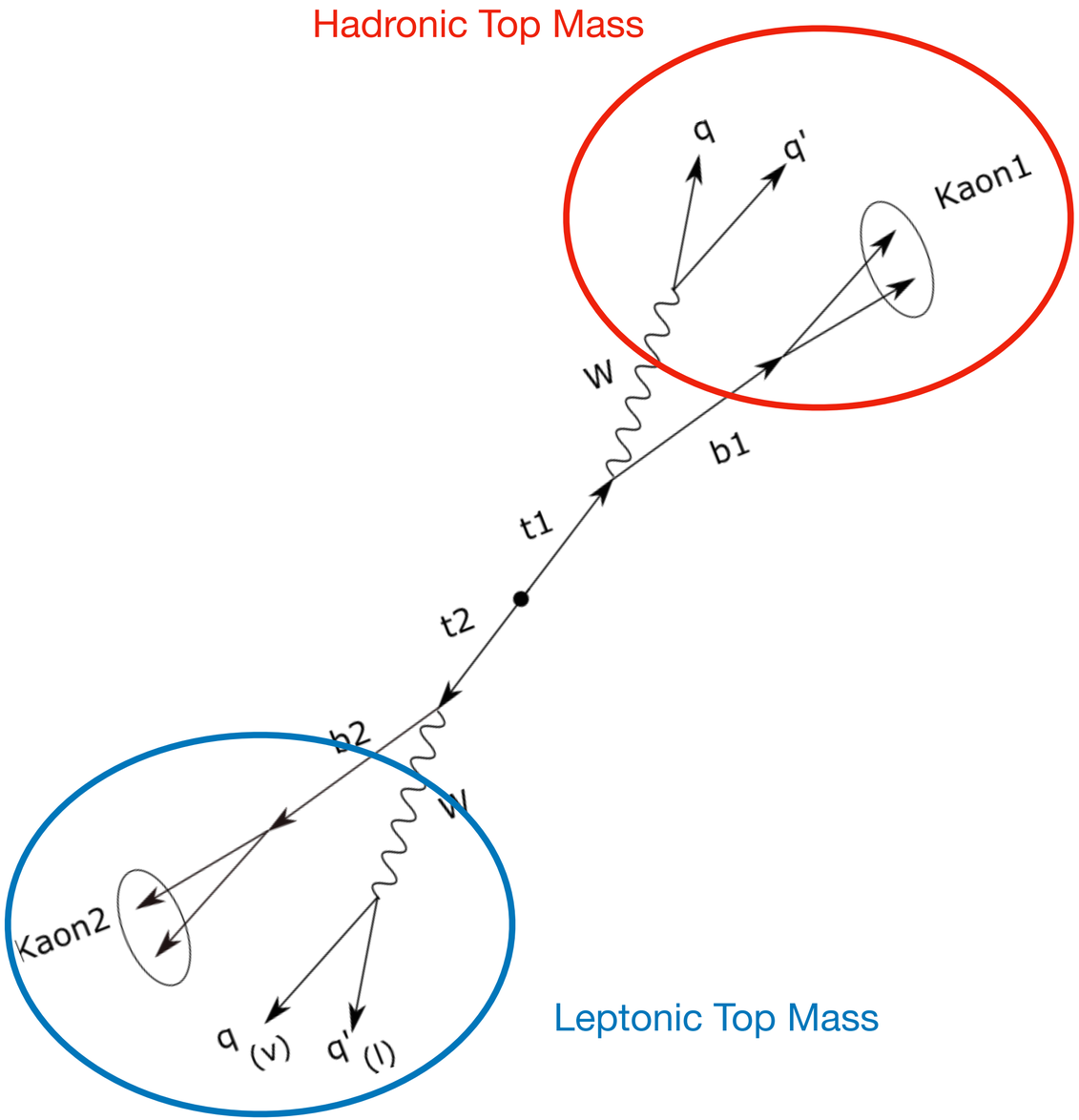
- The single top analysis is shifted from **Parton** level to **Reconstruction** level.
- Reconstructed energies for b-jets were used seek discrepancies in distributions of parton level and selected b-jets.
- Effect of method selections were considered in this analysis.



Single Top Analysis

Status

- François suggested it might be useful to looking into recoil mass distribution compared to Generated (9th Jan.)
- Reconstructed hadronic top mass was compared with Generated ones. Then the recoil mass of those were compared for leptonic top mass analysis.
- Along with application of method 1 to see the effect of single top disappears



Single Top Analysis

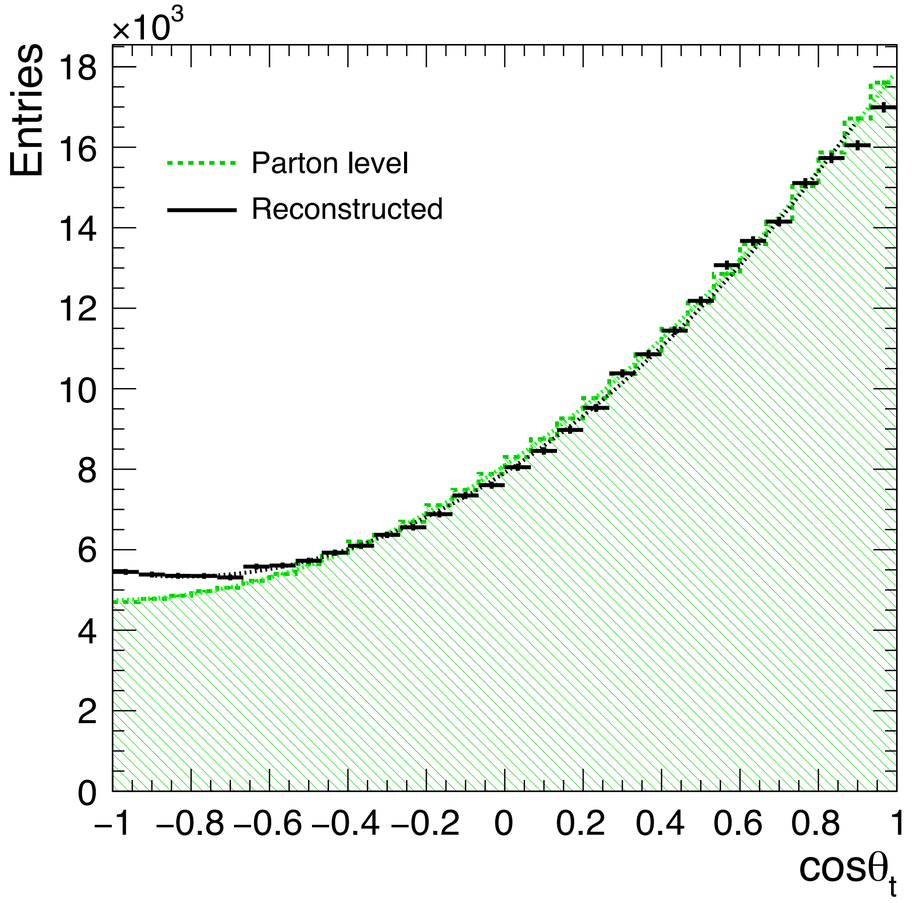


Figure 1: Polar angle distribution of top quark. Single top is rejected from the Parton level (Green).

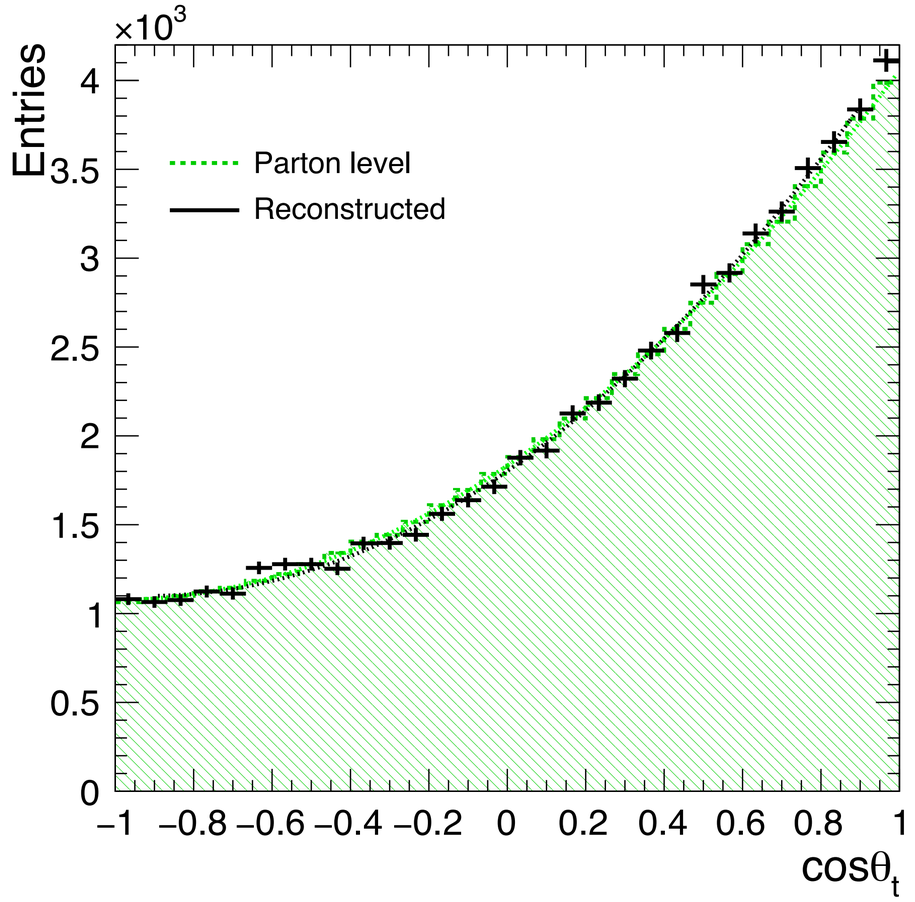
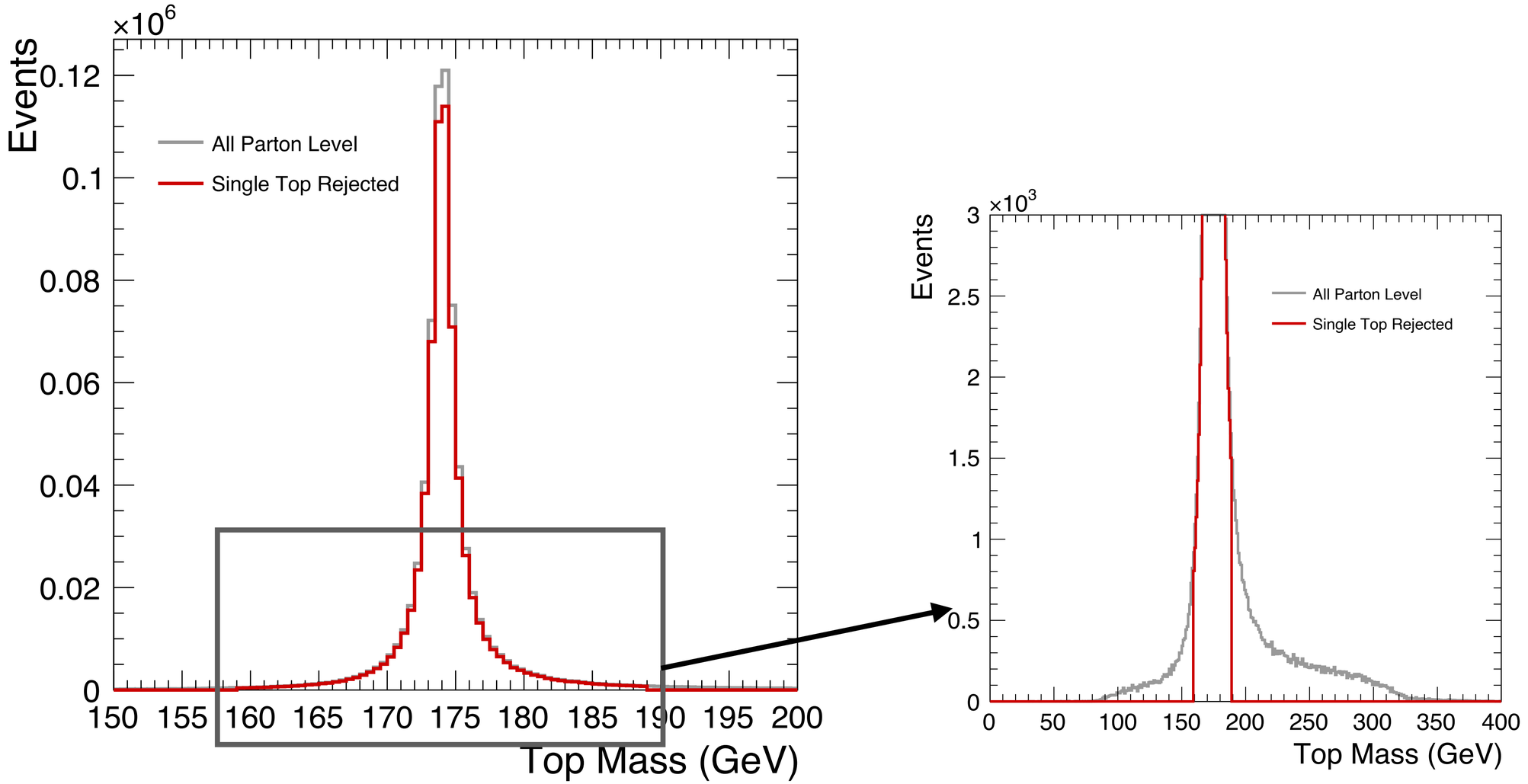


Figure 2: Polar angle distribution of top quark only using **method 1**.

Single Top Analysis



Single Top Analysis

- Distributions of top mass are presented.
- Clearly reconstructed distributions are much wider than generated due to mis-combination of *b*'s or missing energies.
- Lower right distribution shows the reconstructed recoil mass of leptonic top.

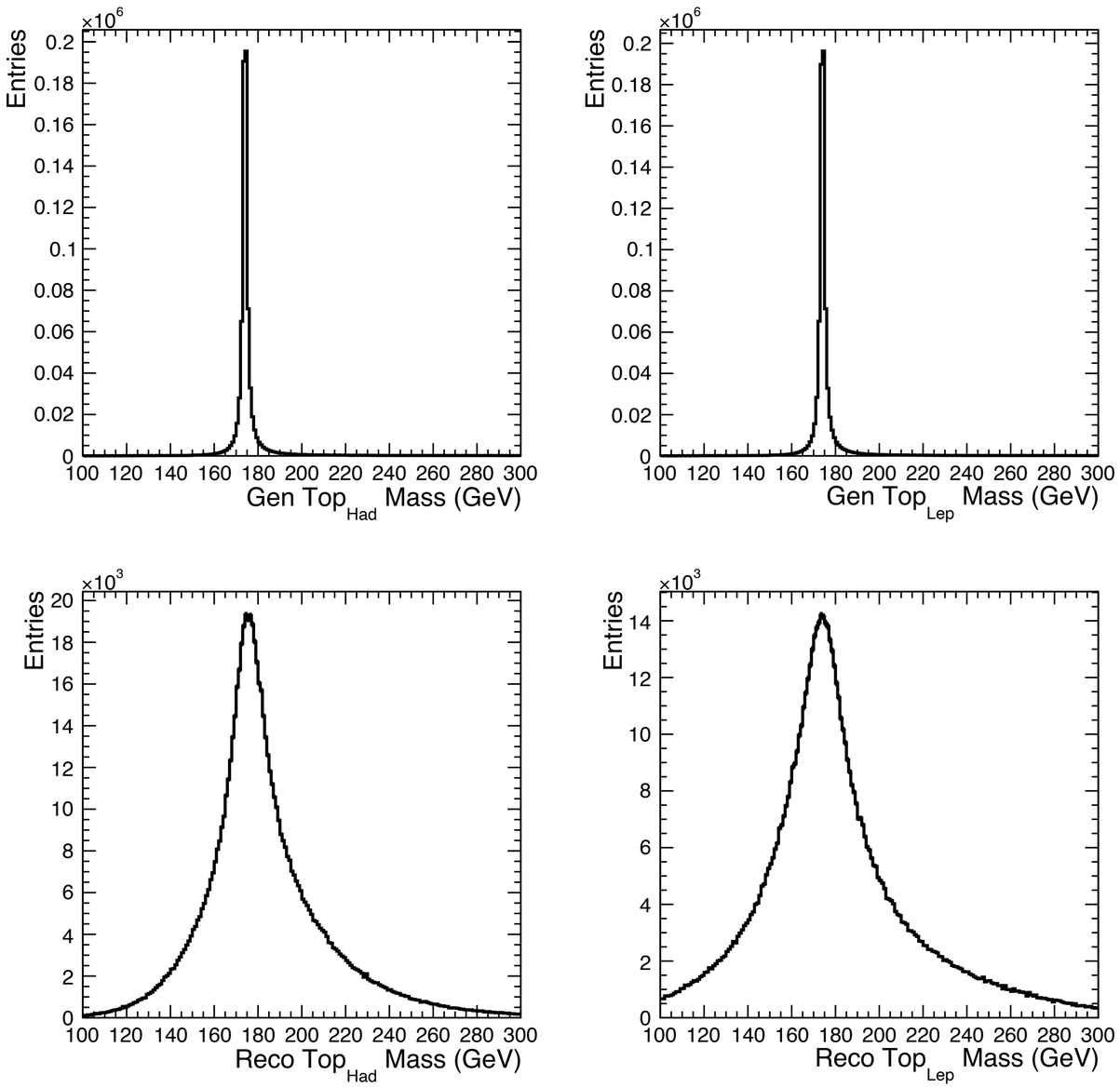


Figure 1: Mass distributions of Hadronic and Leptonic top. Upper half histograms are from generated top and the lower half is from reconstructed.

Single Top Analysis

- Distributions of top mass at MCtop cos θ < -0.9 are shown.
- Statistic has gone down yet not much of differences were confirmed.

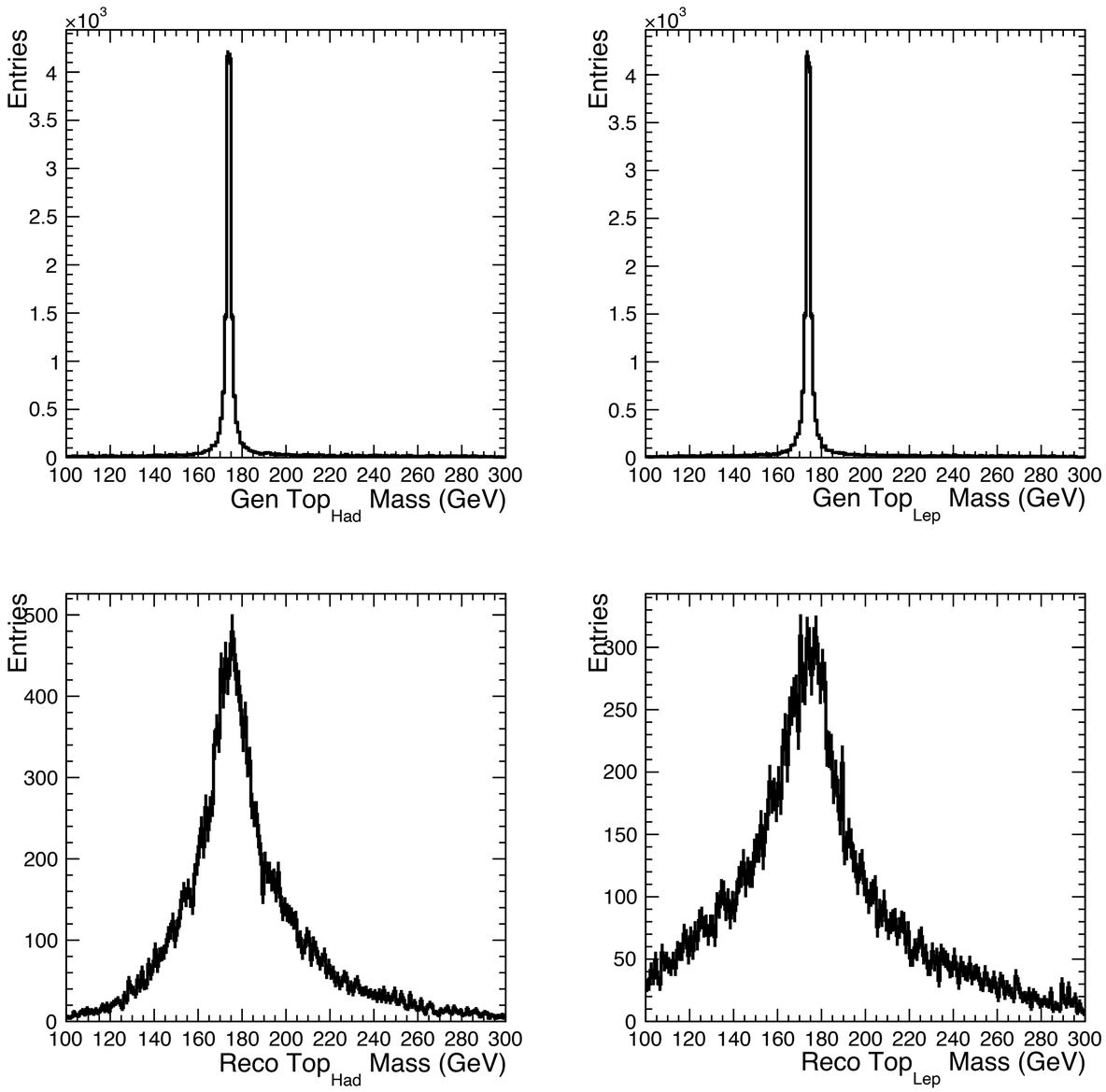
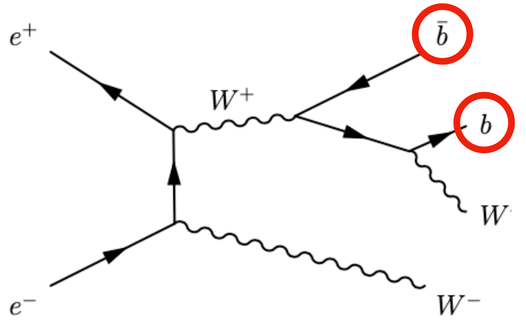
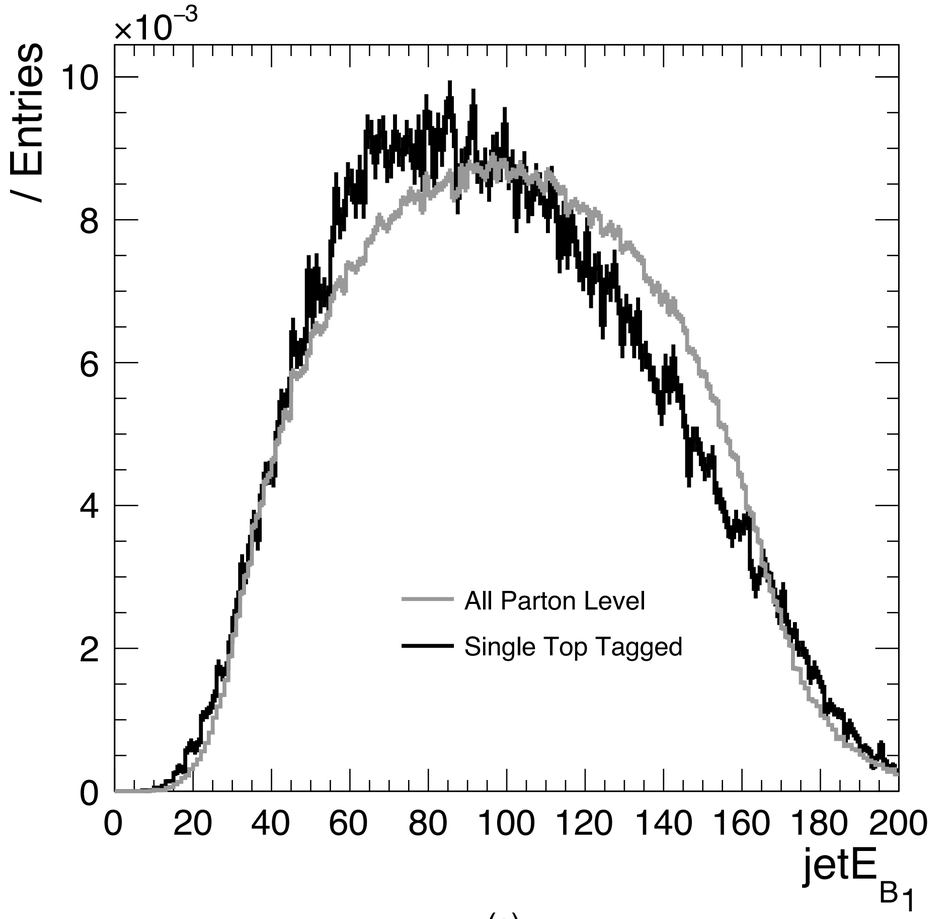


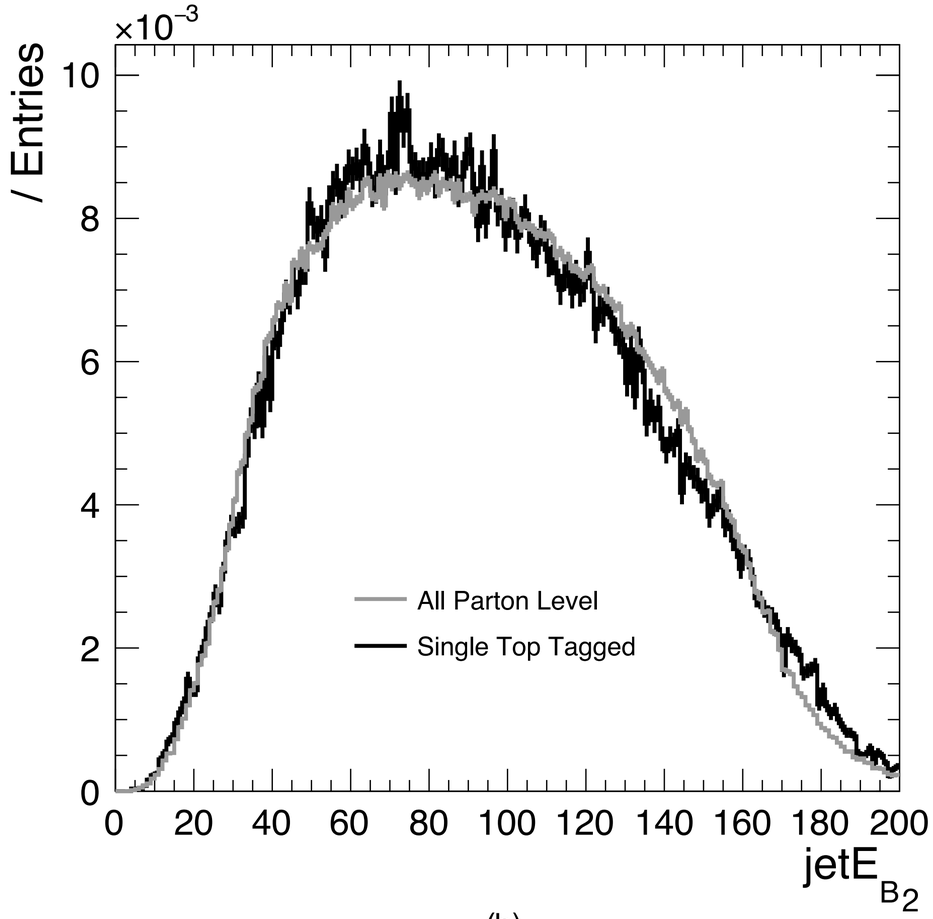
Figure 2: Mass distributions of Hadronic and Leptonic top for cos θ < -0.9

Single Top Analysis





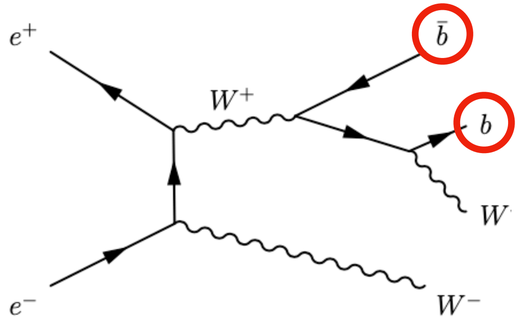
(a)

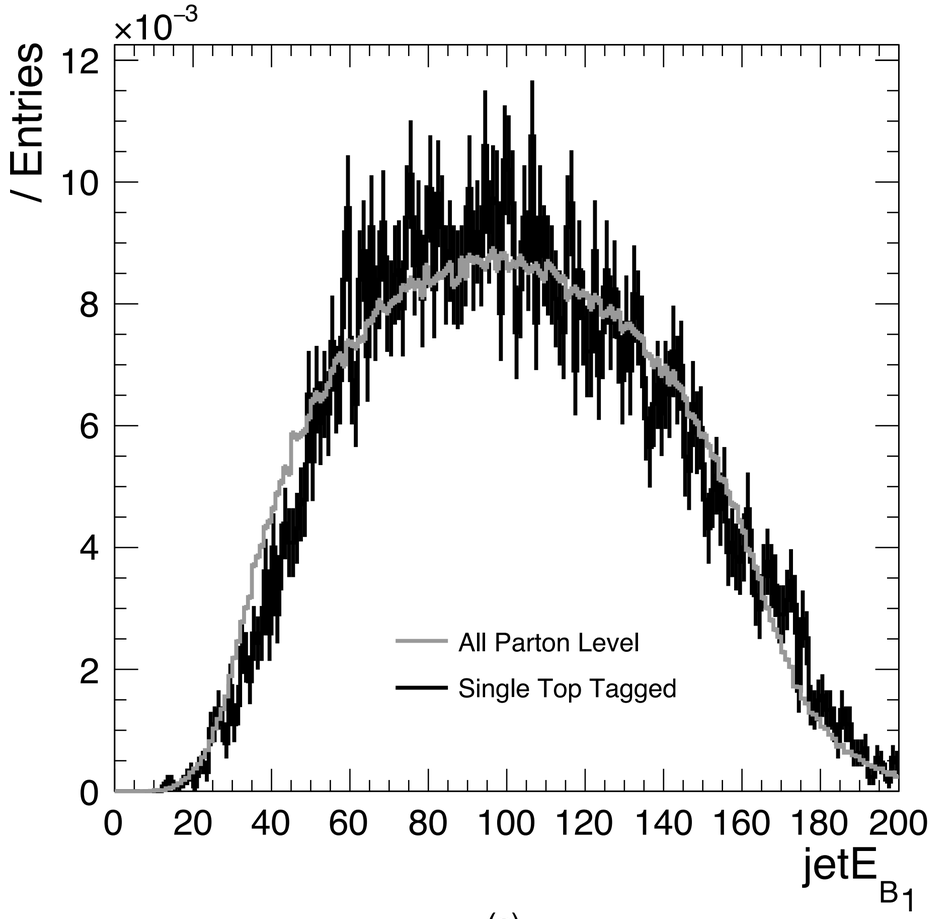


(b)

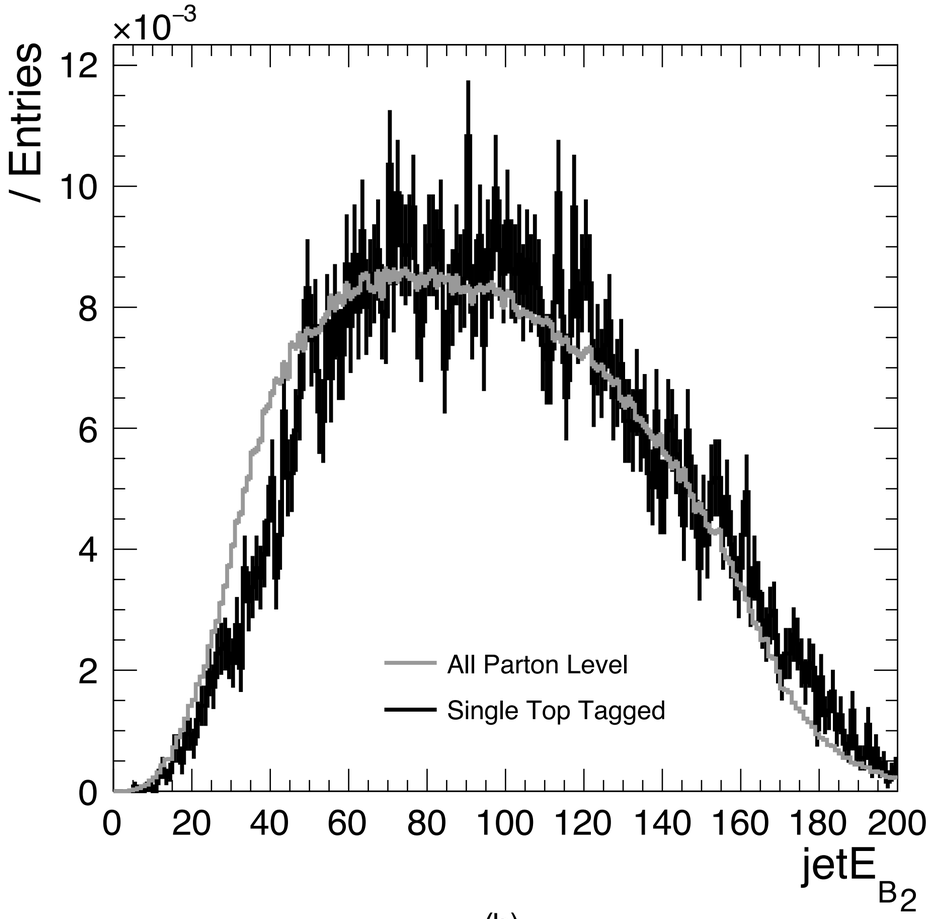
Figure 3: Jet energy distribution of b-jets from (a) hadronic top and (b) leptonic top. Normalized to its bin,

Single Top Analysis





(a)



(b)

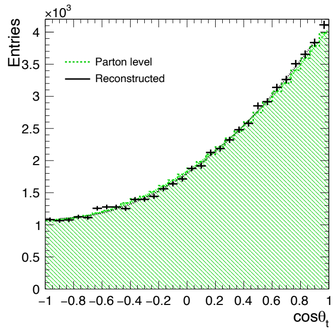
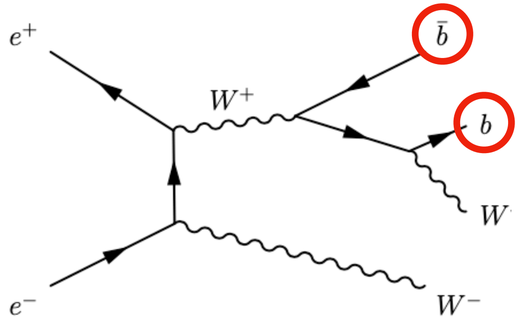
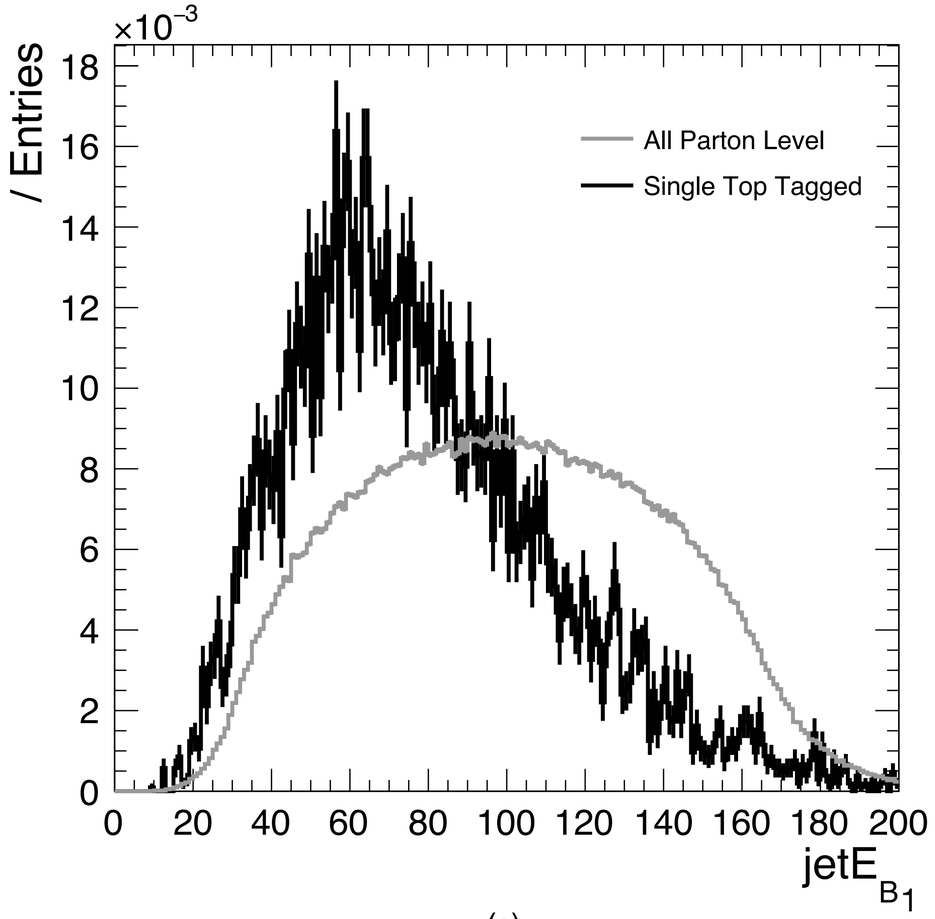


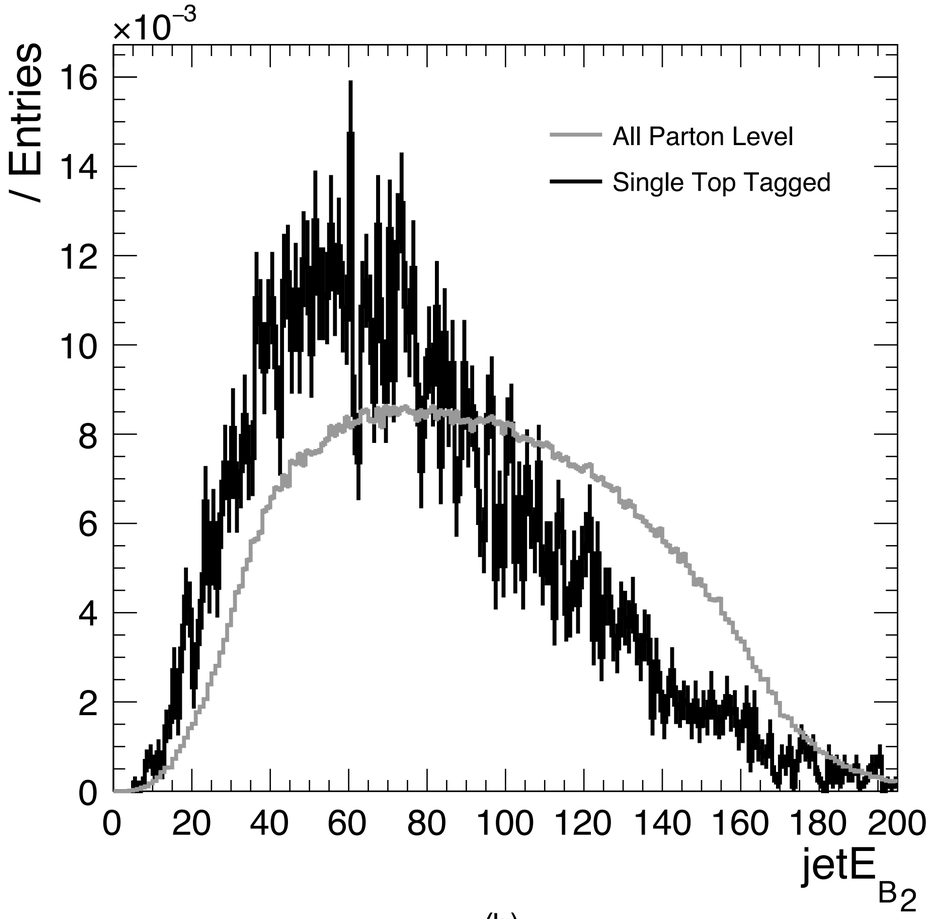
Figure 4: Jet energy distribution of b-jets from (a) hadronic top and (b) leptonic top using **method 1**. Normalized to its bin,

Single Top Analysis





(a)



(b)

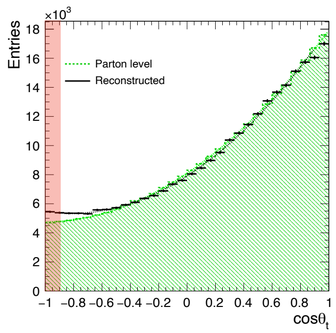
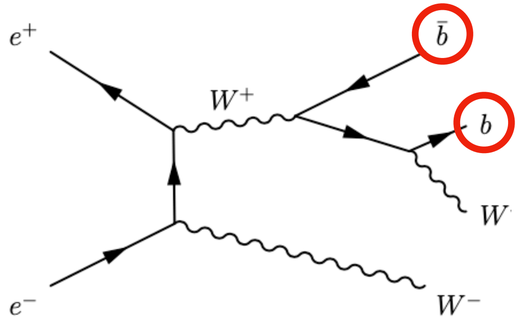
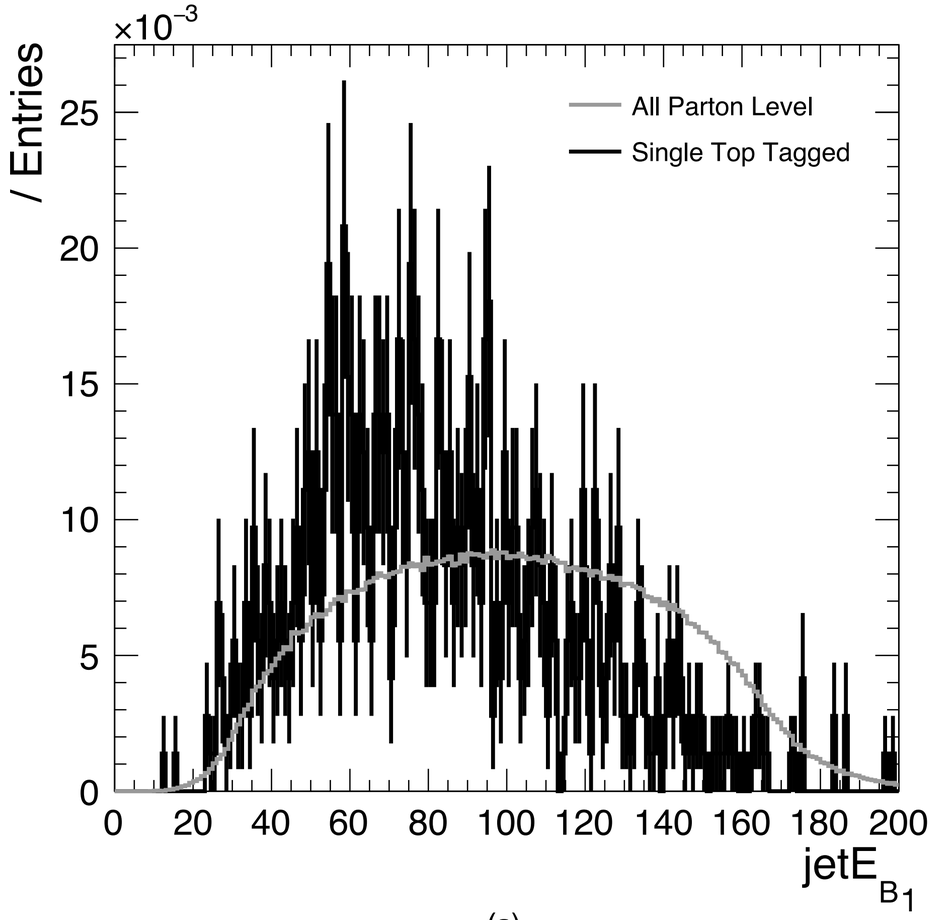


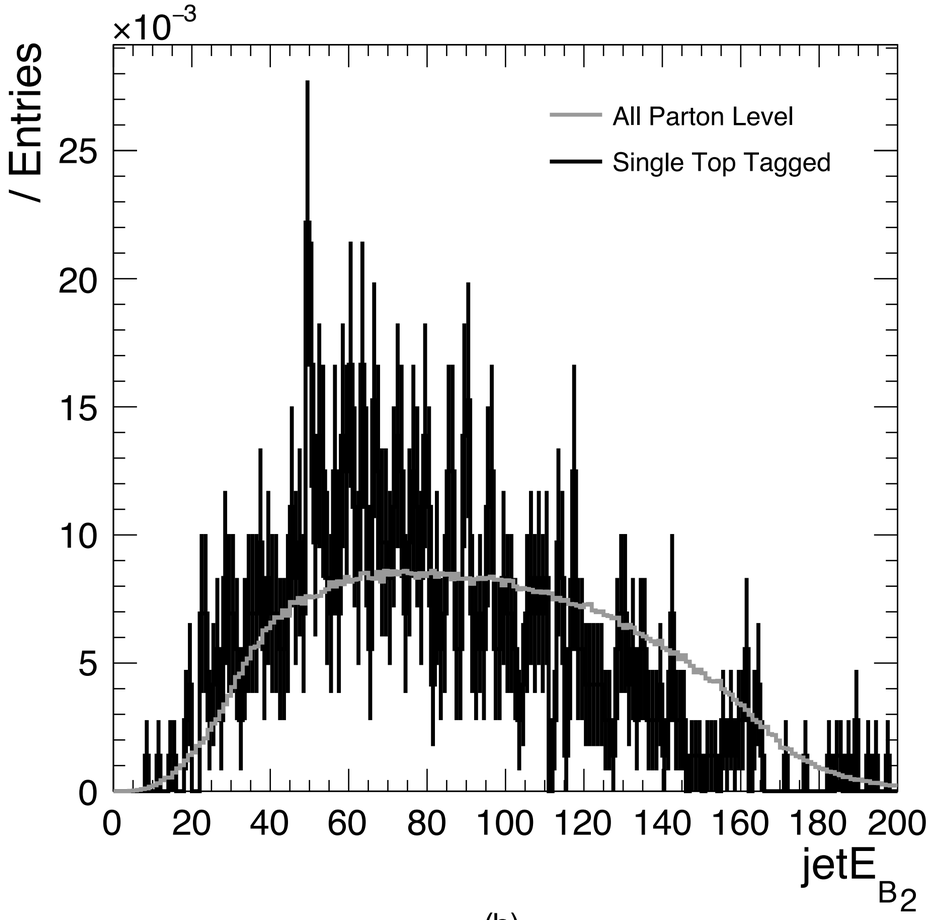
Figure 5: Jet energy distribution of b-jets from (a) hadronic top and (b) leptonic top with **MC Top cos < -0.9.** Normalized to its bin,

Single Top Analysis





(a)



(b)

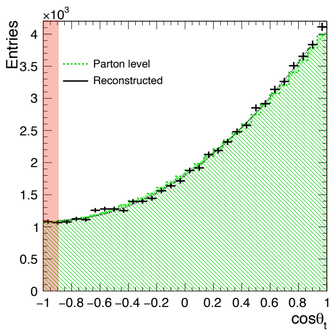
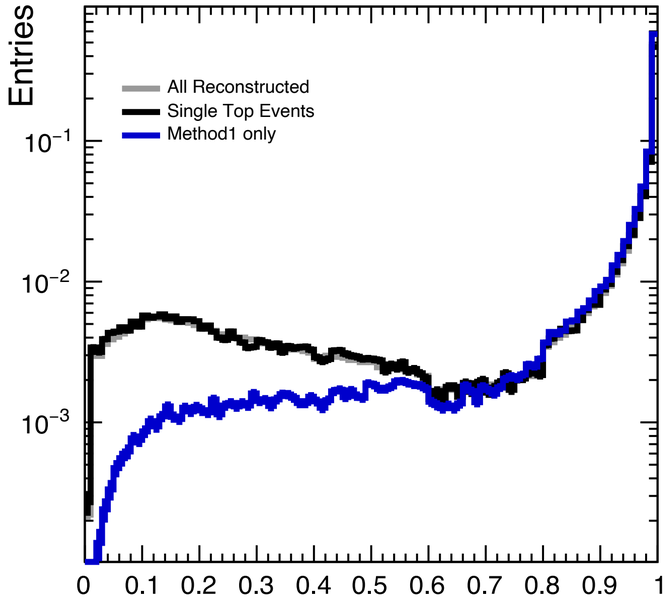
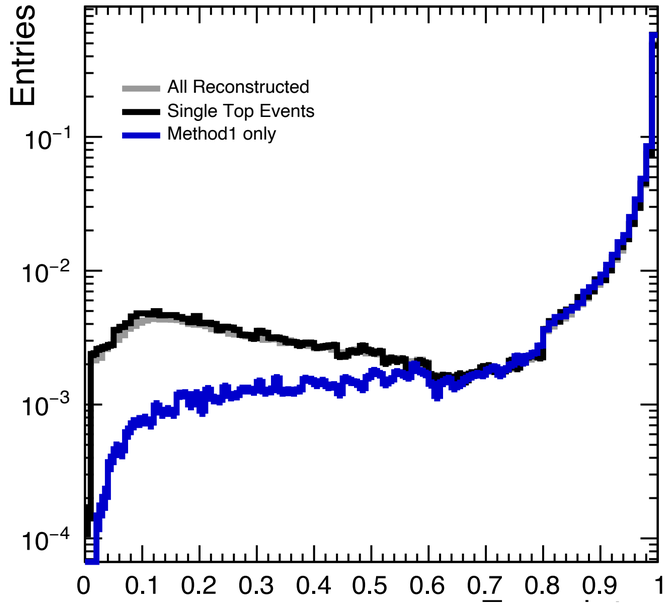


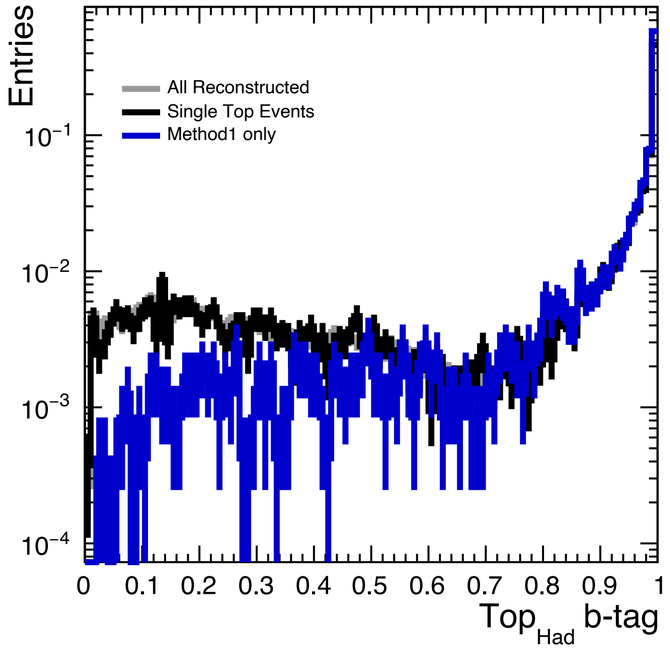
Figure 6: Jet energy distribution of b-jets from (a) hadronic top and (b) leptonic top with **MC Top cos < -0.9 and method 1.** Normalized to its bin,

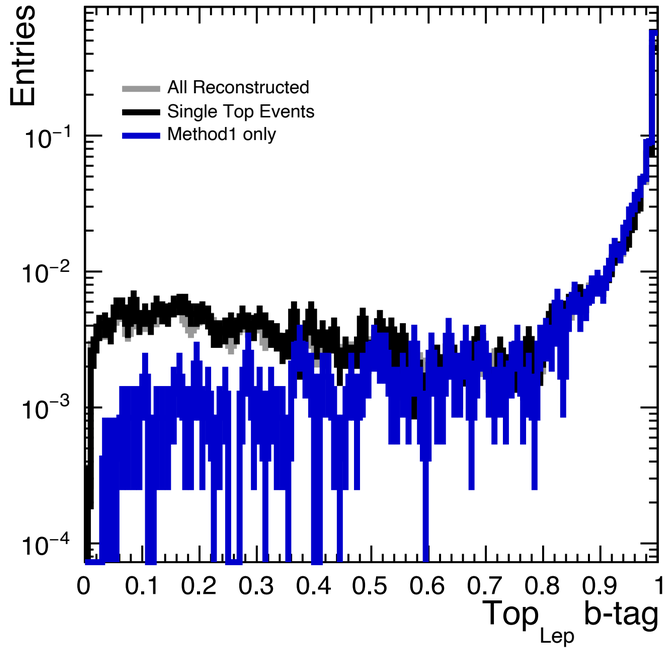
all


Entries
All Reconstructed
Single Top Events
Method1 only
10^{-1}
10^{-2}
10^{-3}
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1


Entries
All Reconstructed
Single Top Events
Method1 only
10^{-1}
10^{-2}
10^{-3}
10^{-4}
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

cos < -0.9


Entries
All Reconstructed
Single Top Events
Method1 only
10^{-1}
10^{-2}
10^{-3}
10^{-4}
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1
$\mathrm{Top_{Had}}$ b-tag


Entries
All Reconstructed
Single Top Events
Method1 only
10^{-1}
10^{-2}
10^{-3}
10^{-4}
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1
$\mathrm{Top_{Lep}}$ b-tag

Backup

Single Top Analysis

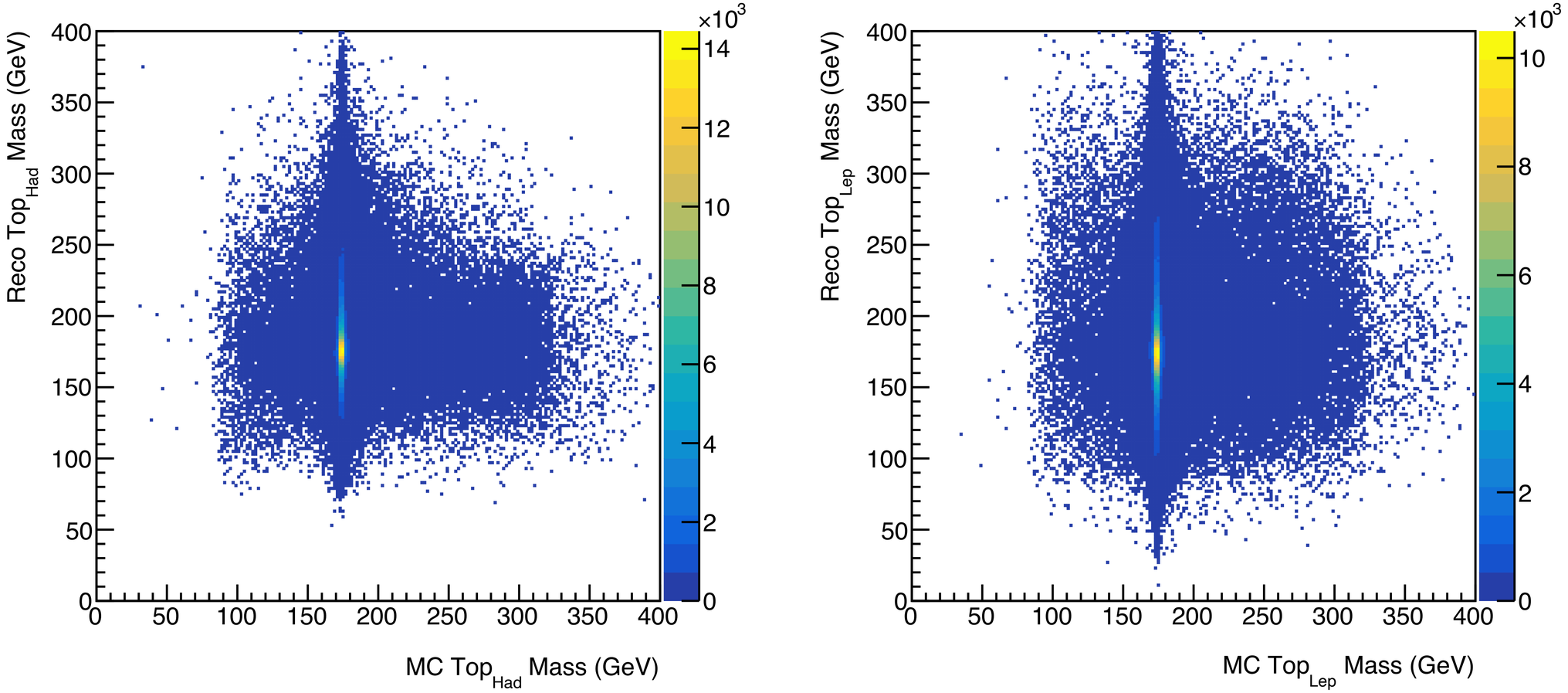


Figure 3: Mass distributions of Hadronic and Leptonic top plotted in 2D histogram.

Single Top Analysis

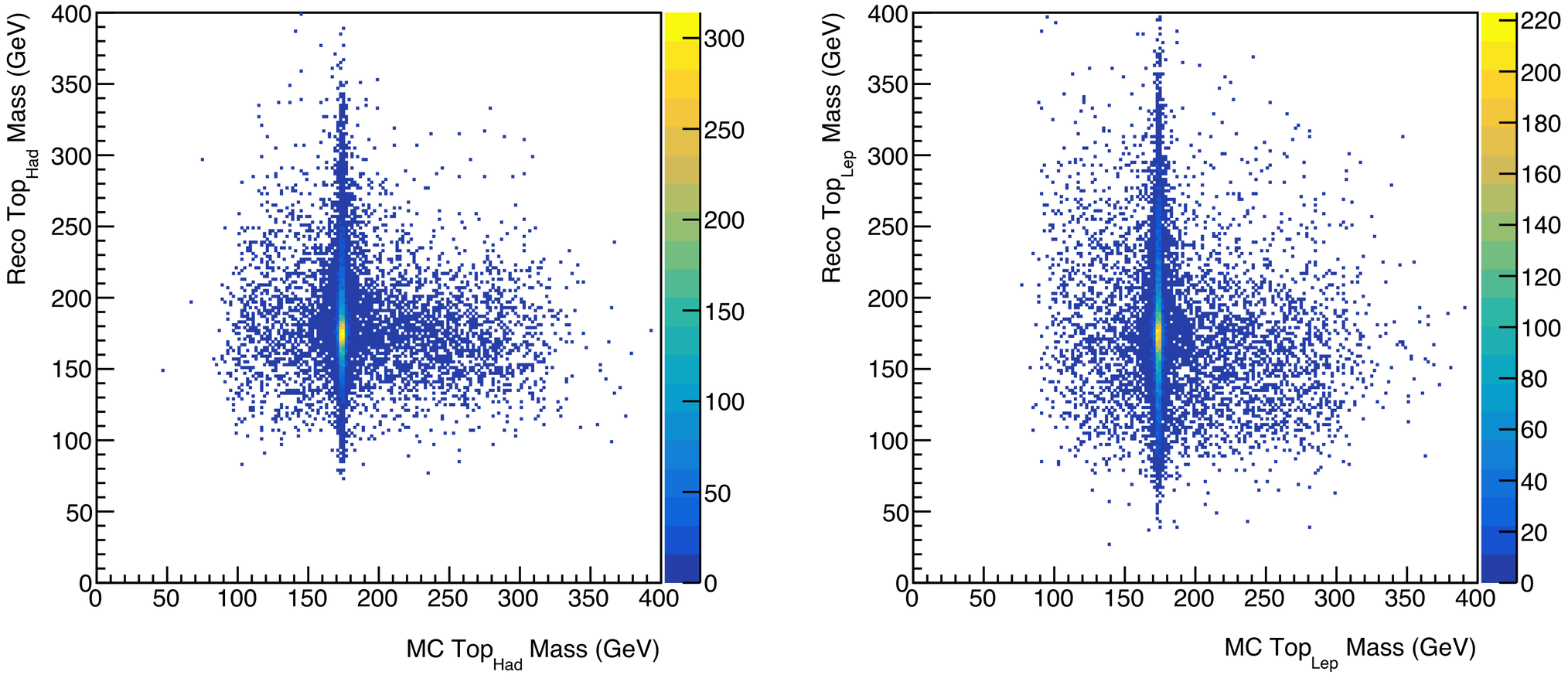


Figure 4: Mass distributions of Hadronic and Leptonic top plotted in 2D histogram for cos θ < -0.9.

Single Top Analysis

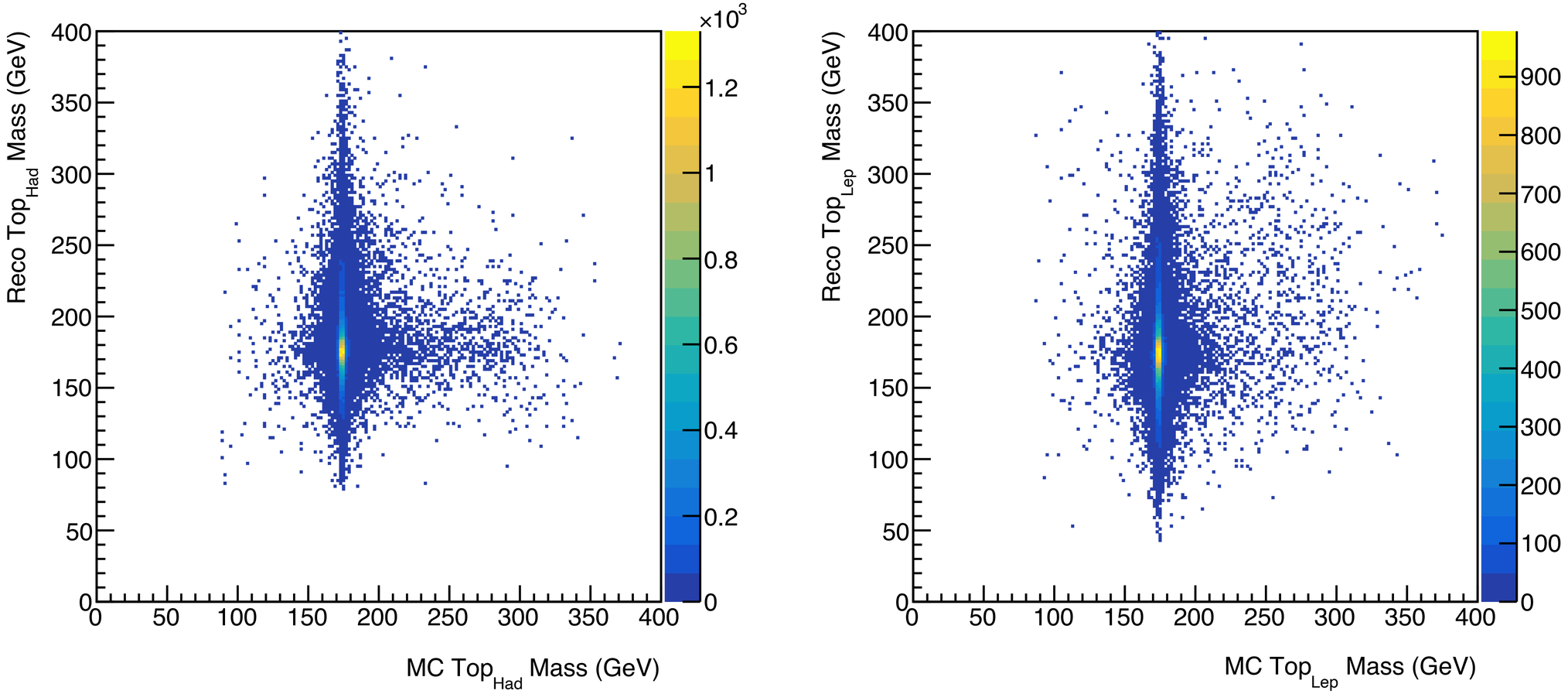
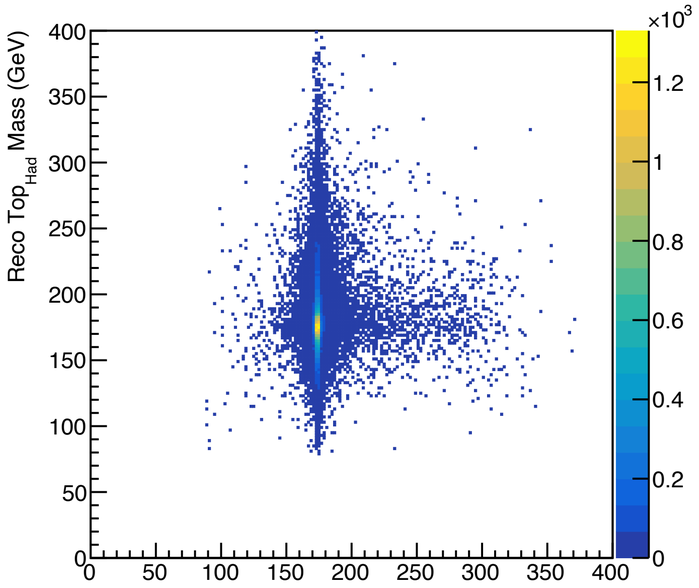
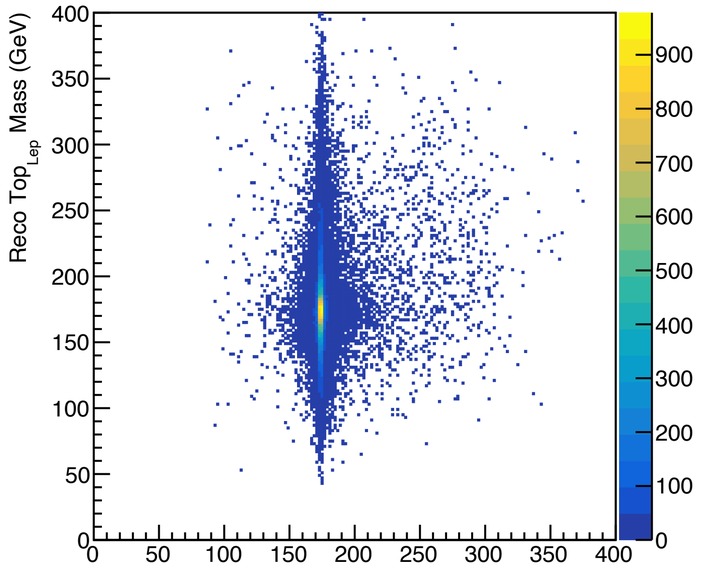


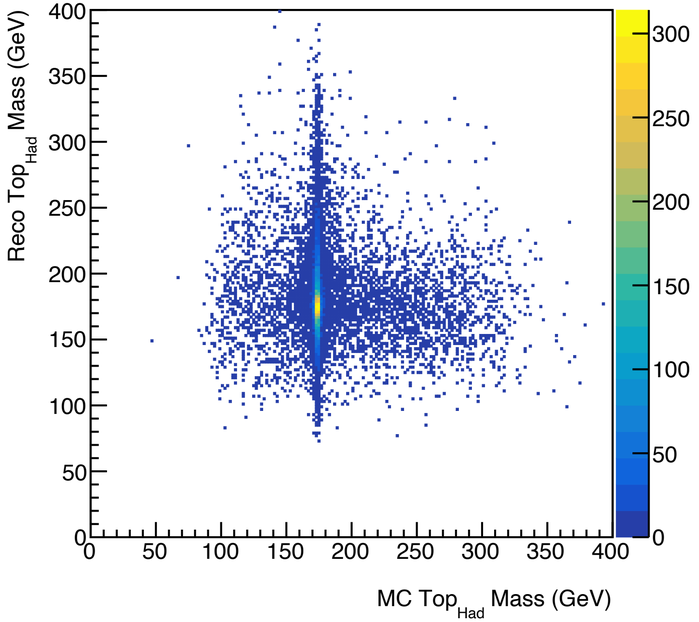
Figure 5: Mass distributions of Hadronic and Leptonic top plotted in 2D histogram for cos θ > 0.9.

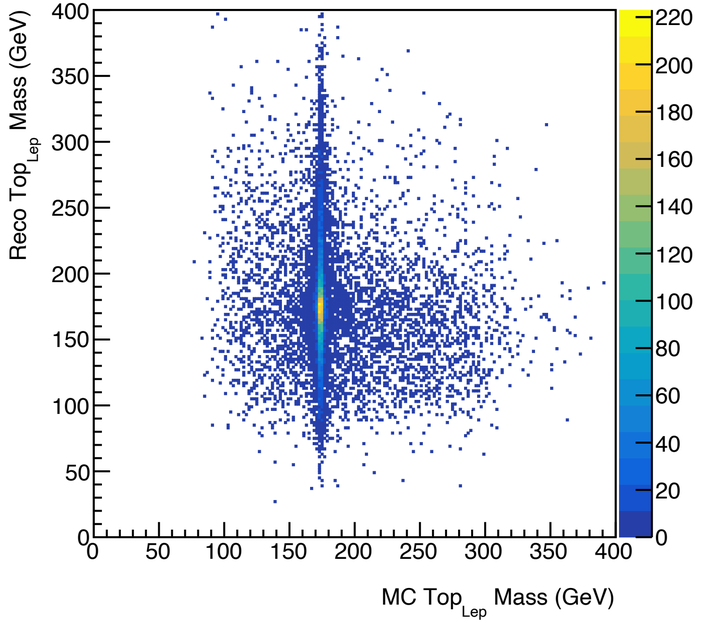
cos θ > 0.9





cos θ < -0.9





Single Top Analysis

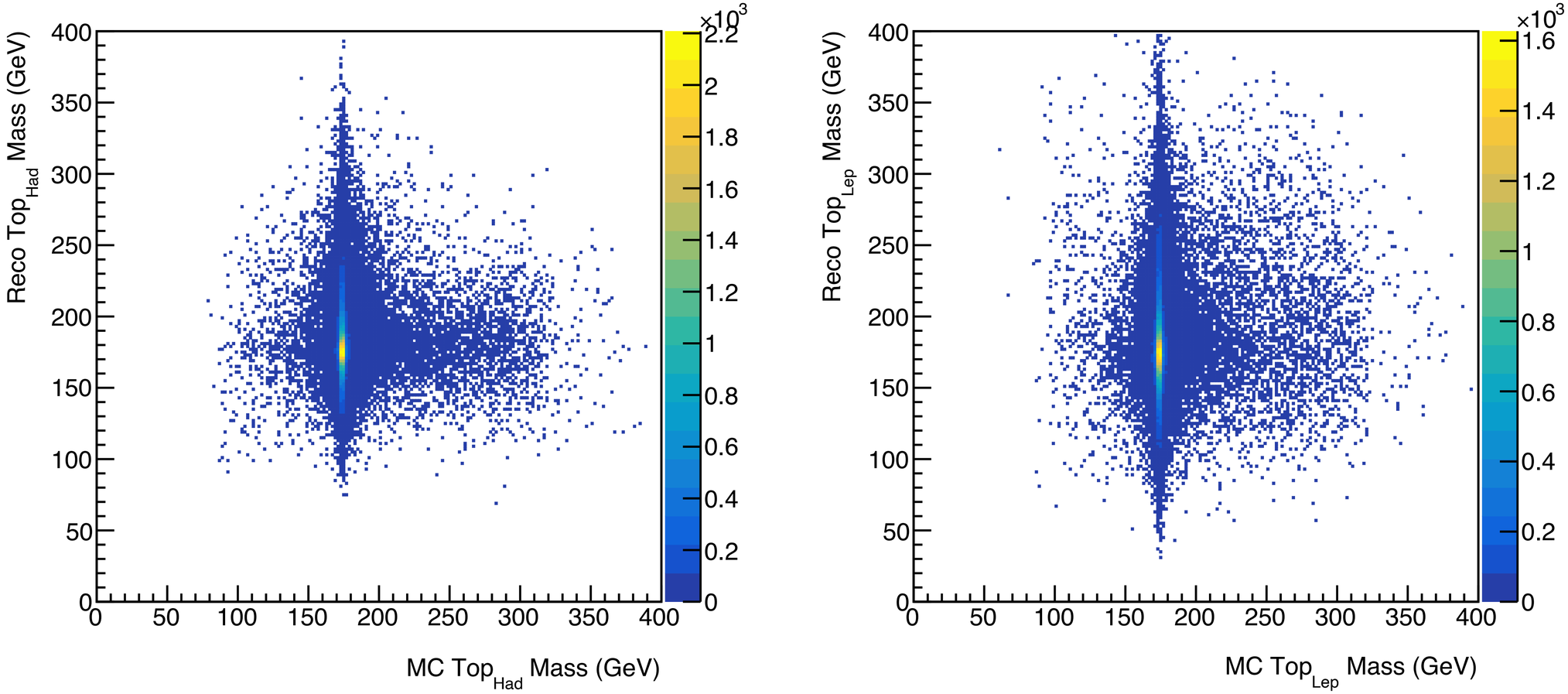
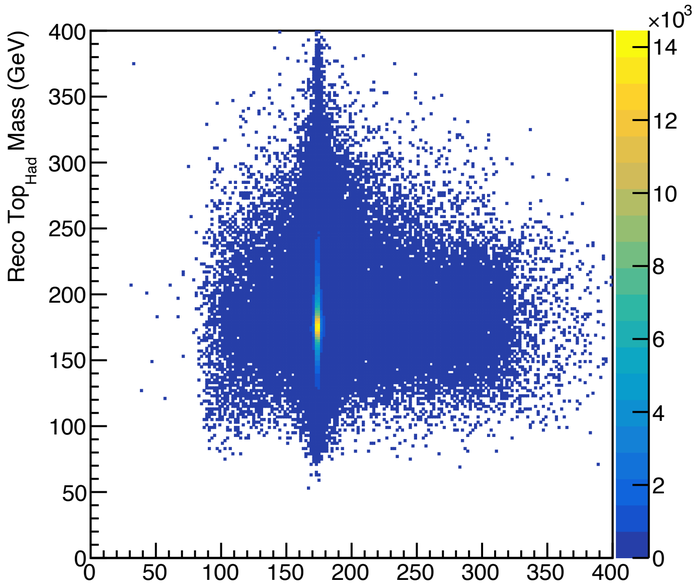
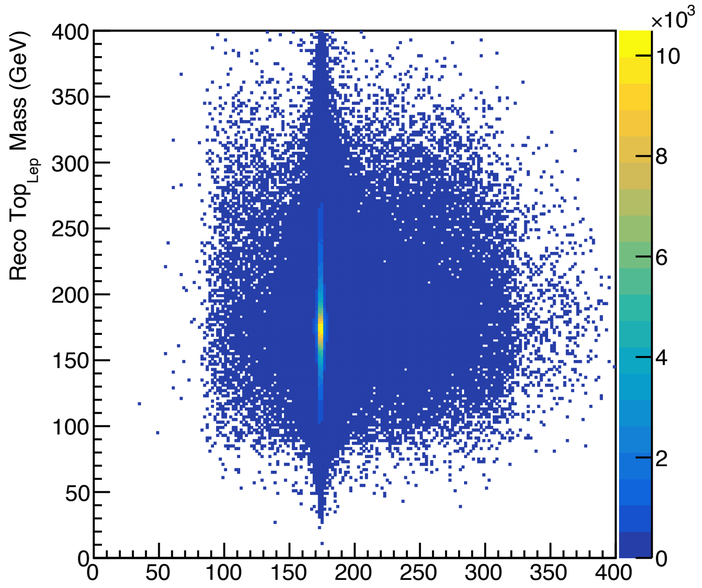


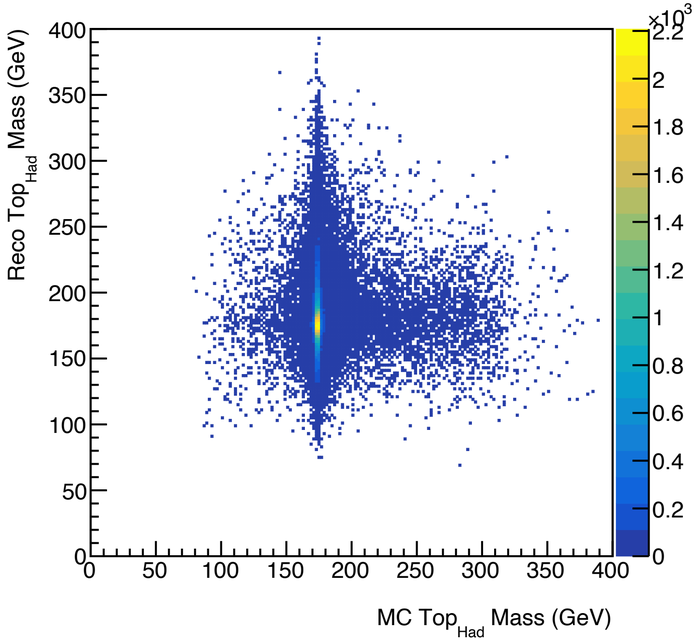
Figure 6: Mass distributions of Hadronic and Leptonic top plotted in 2D histogram for method 1.

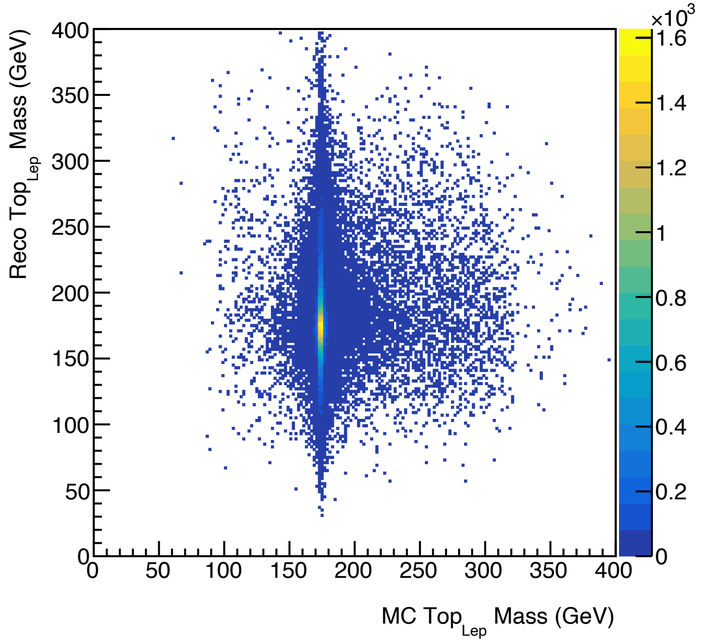
all


Reco Top$_{Had}$ Mass (GeV)
×10^3
0 50 100 150 200 250 300 350 400
0 2 4 6 8 10 12 14


Reco Top$_{Lep}$ Mass (GeV)
×10^3
0 50 100 150 200 250 300 350 400
0 2 4 6 8 10

method 1


Reco Top$_{Had}$ Mass (GeV)
×10^3
0 50 100 150 200 250 300 350 400
0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2 2.2
MC Top$_{Had}$ Mass (GeV)


Reco Top$_{Lep}$ Mass (GeV)
×10^3
0 50 100 150 200 250 300 350 400
0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6
MC Top$_{Lep}$ Mass (GeV)