

W Mass Measurement in CEPC

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EW Meeting

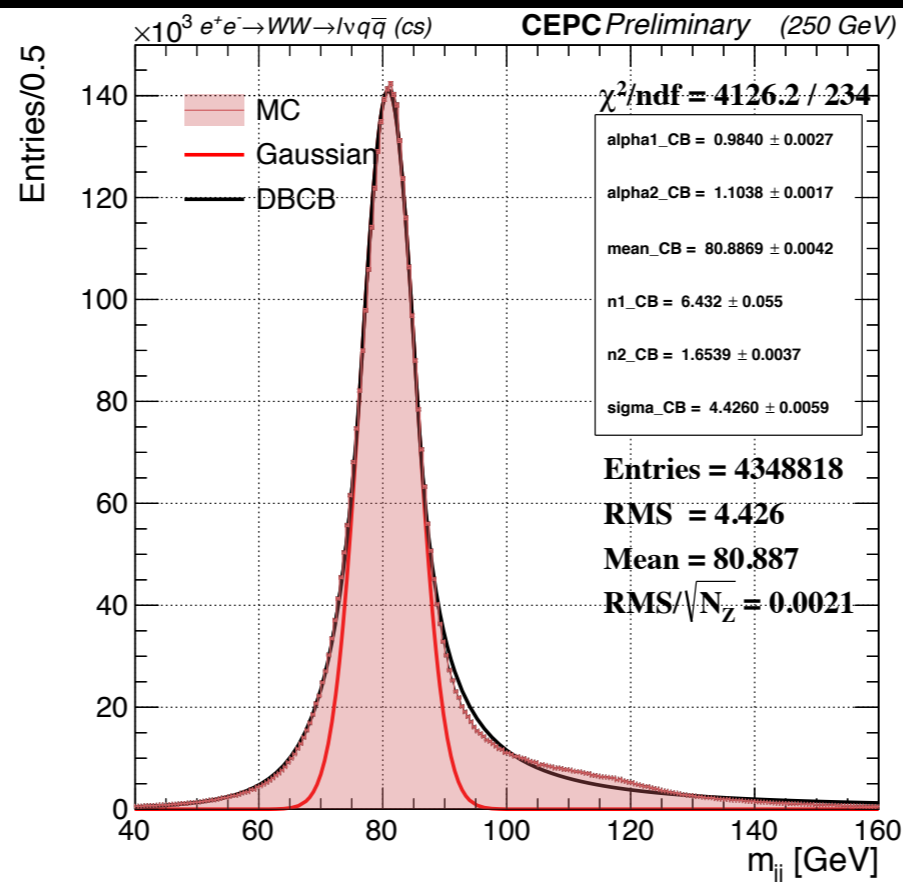
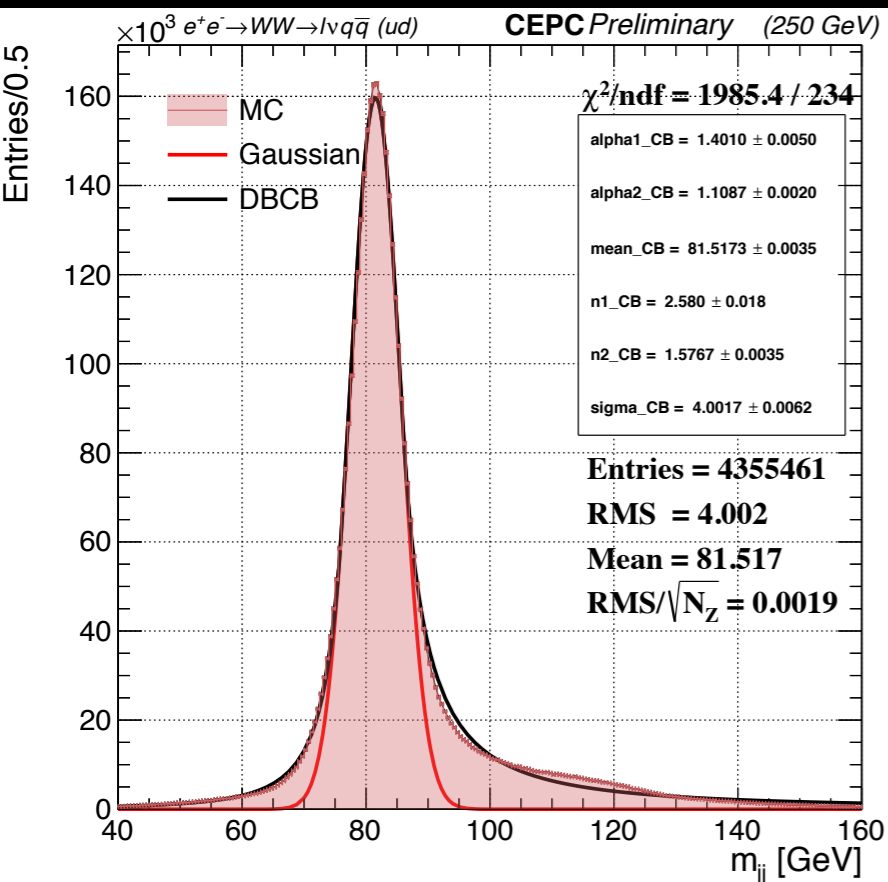
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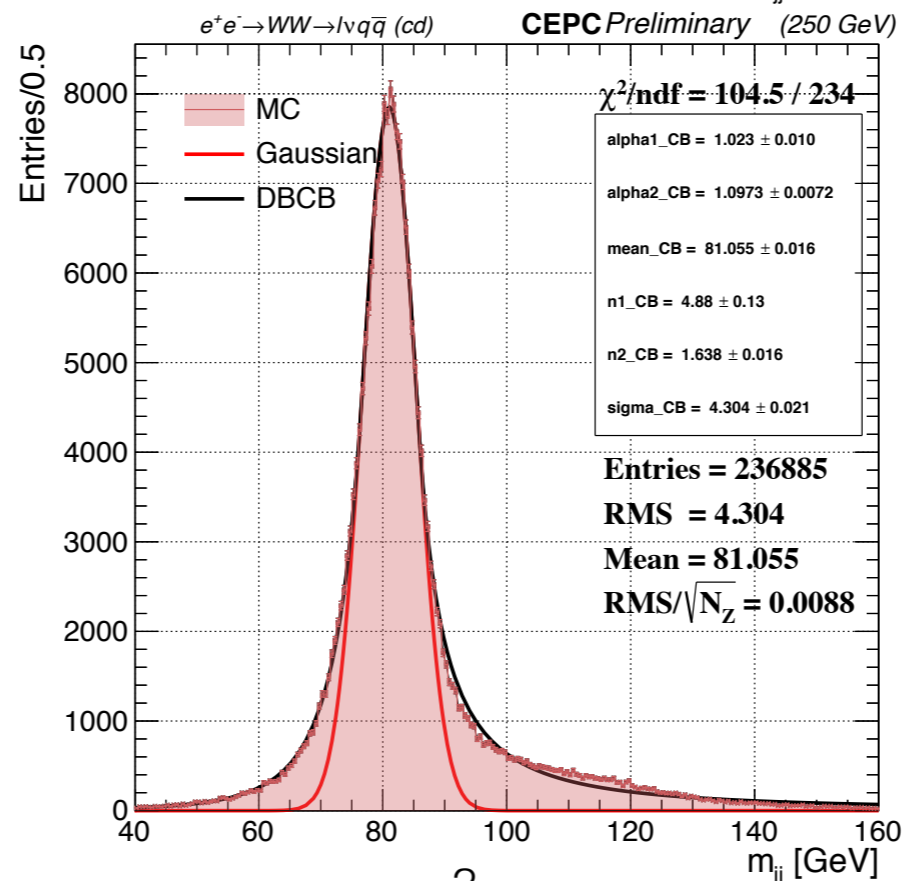
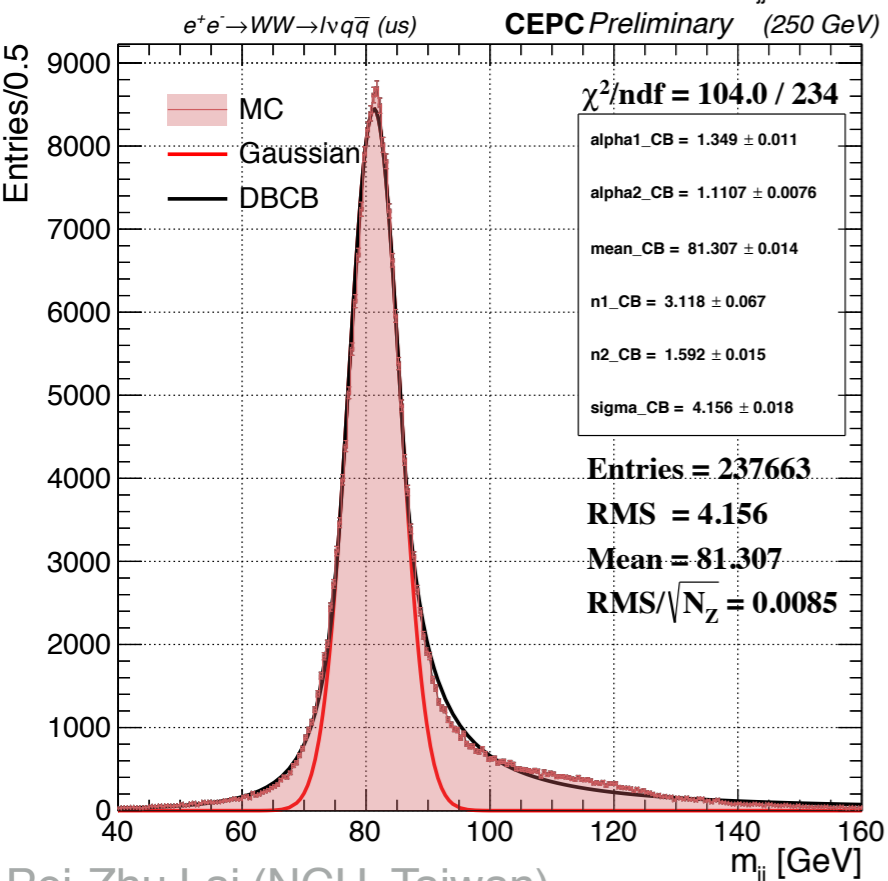


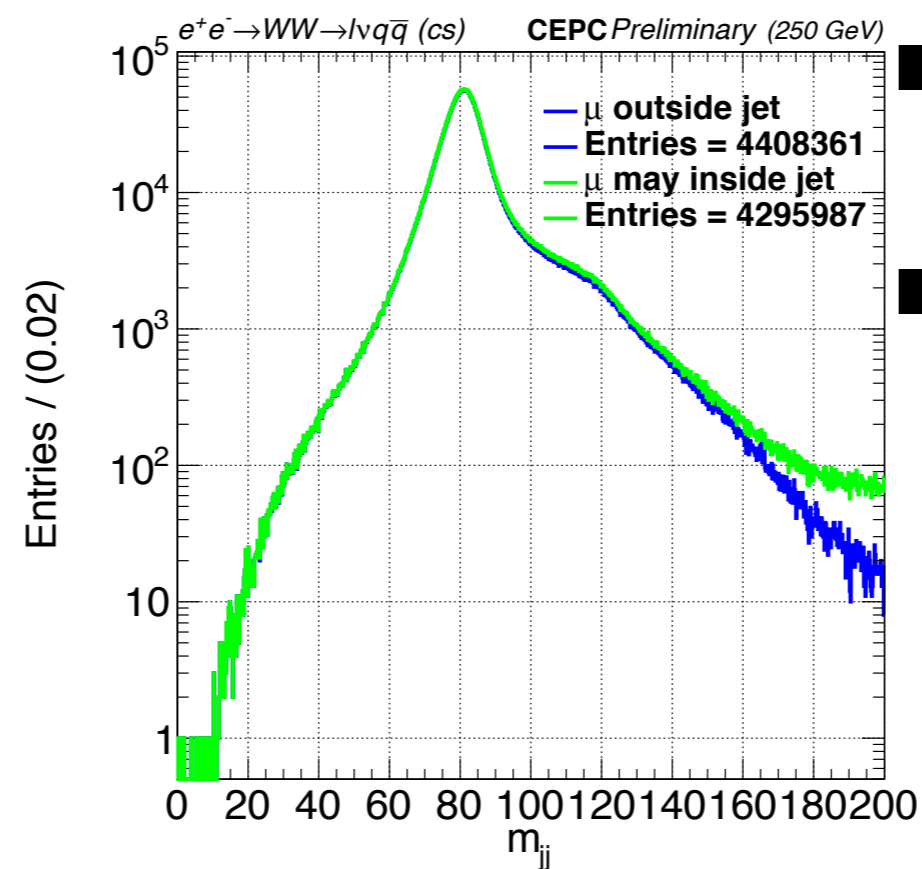
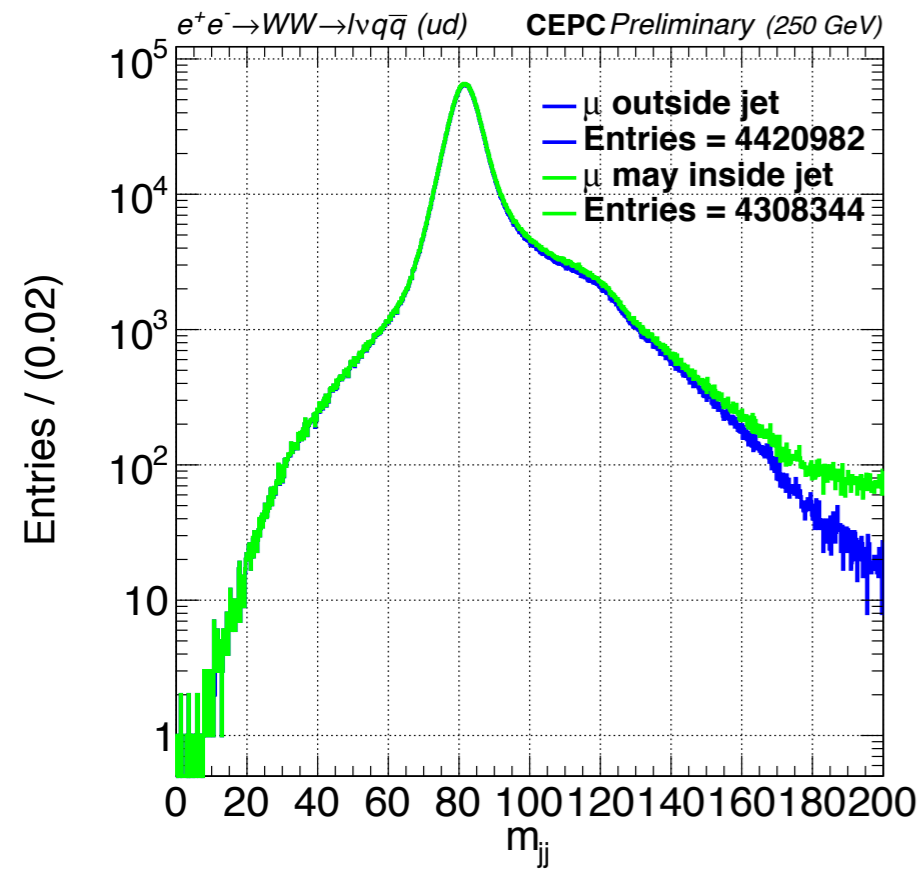
- Reco dijet invariant mass performance after veto the event which polluted by muon.

W->(ud, cs, us, cd) (40 < m_W < 160)

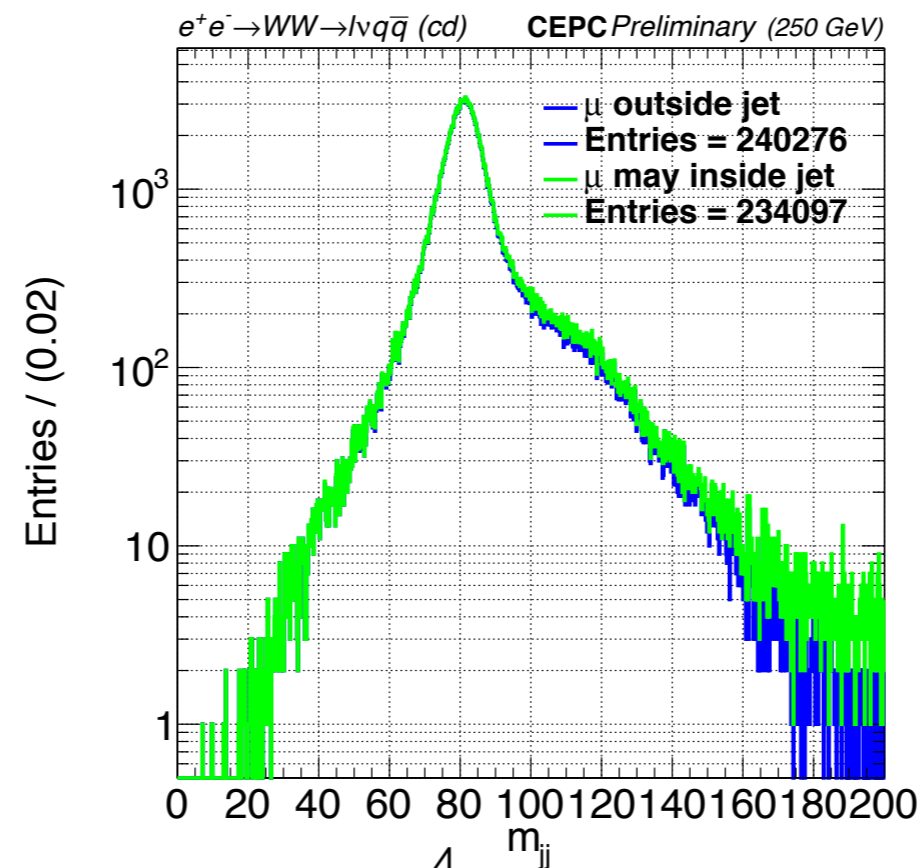
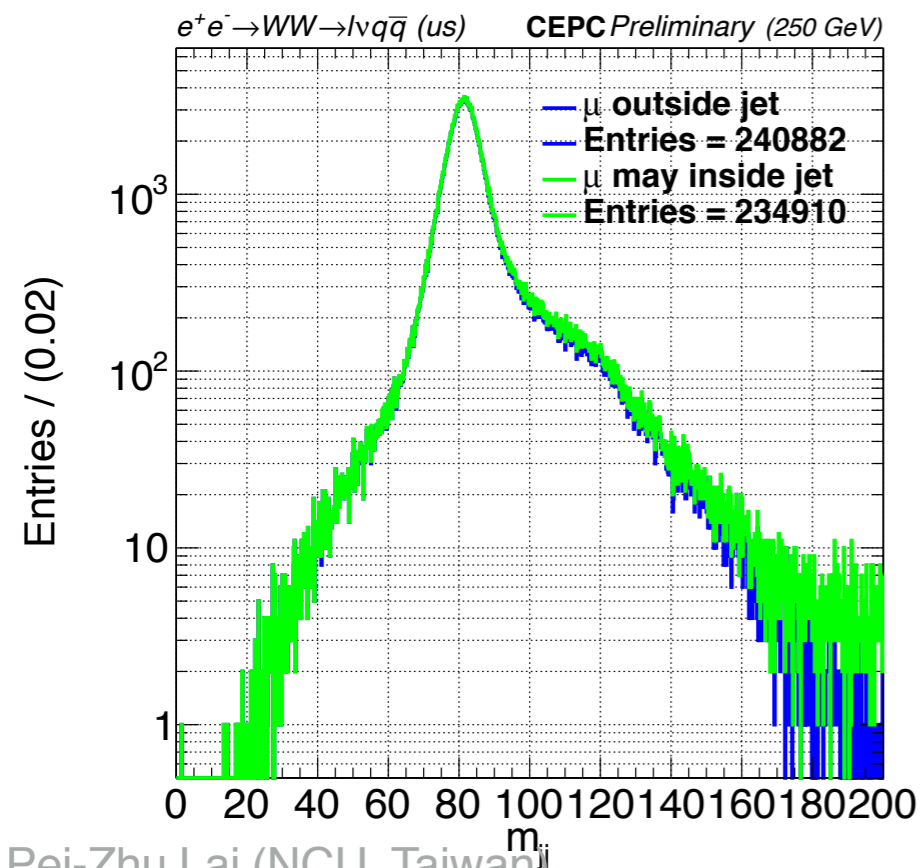


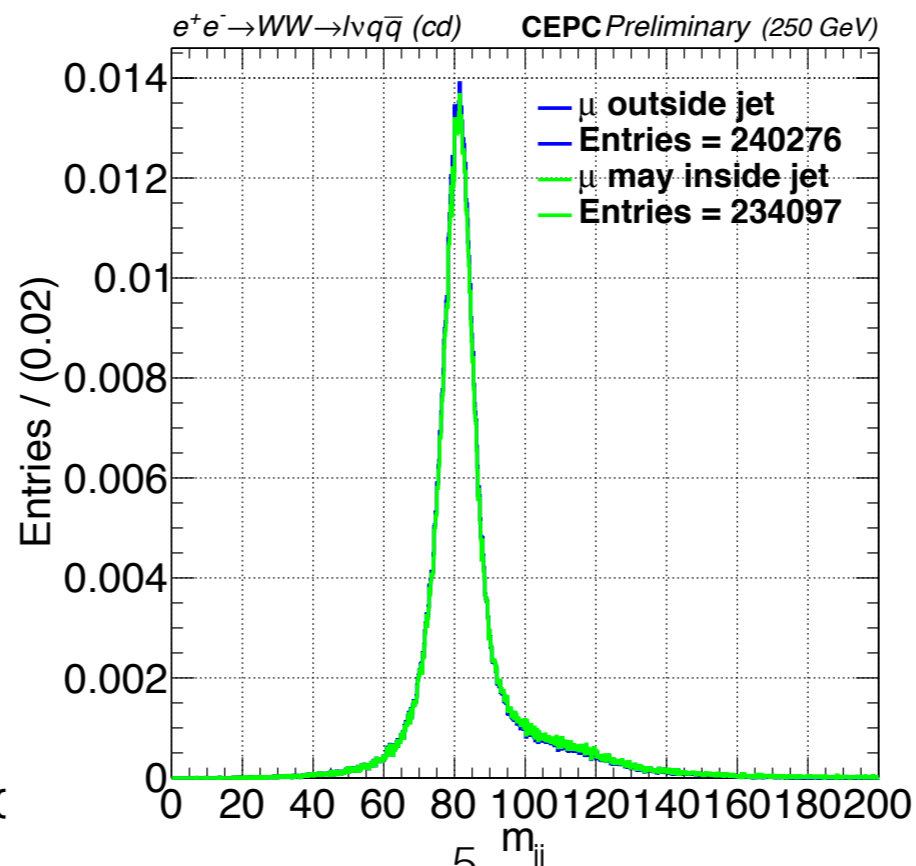
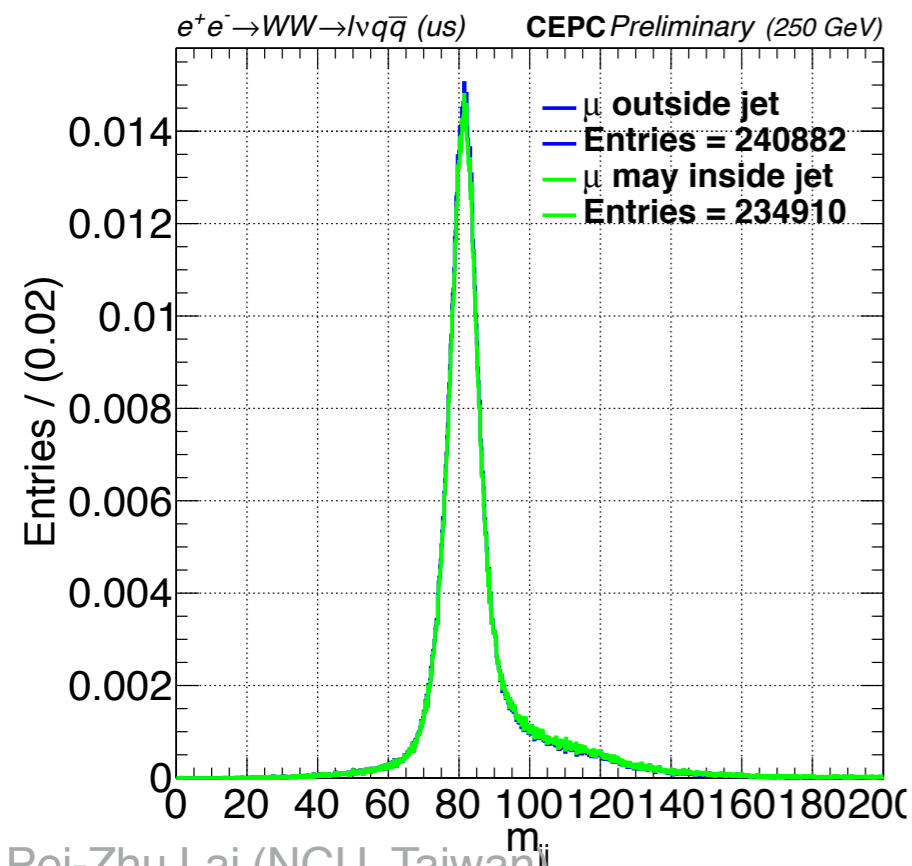
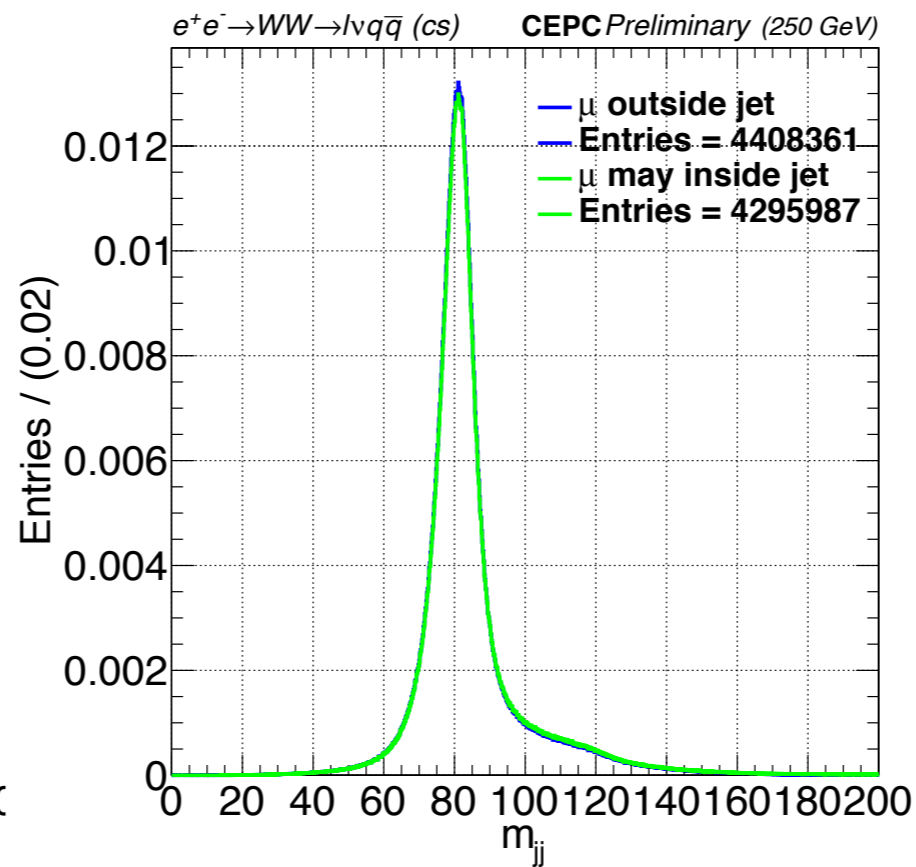
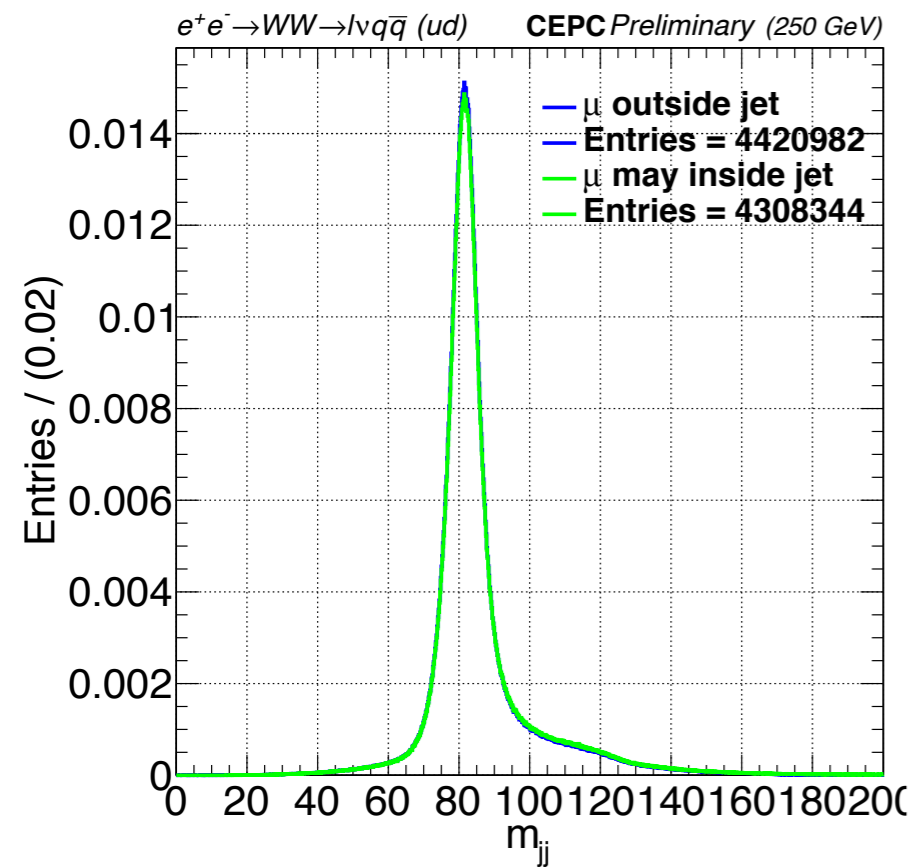
- Calculate the value from the fitting results.
- The number of cross generations decay is less than the same generation decay.





■ The muon came from another W dose influence the high mass tail.
 ■ But.....

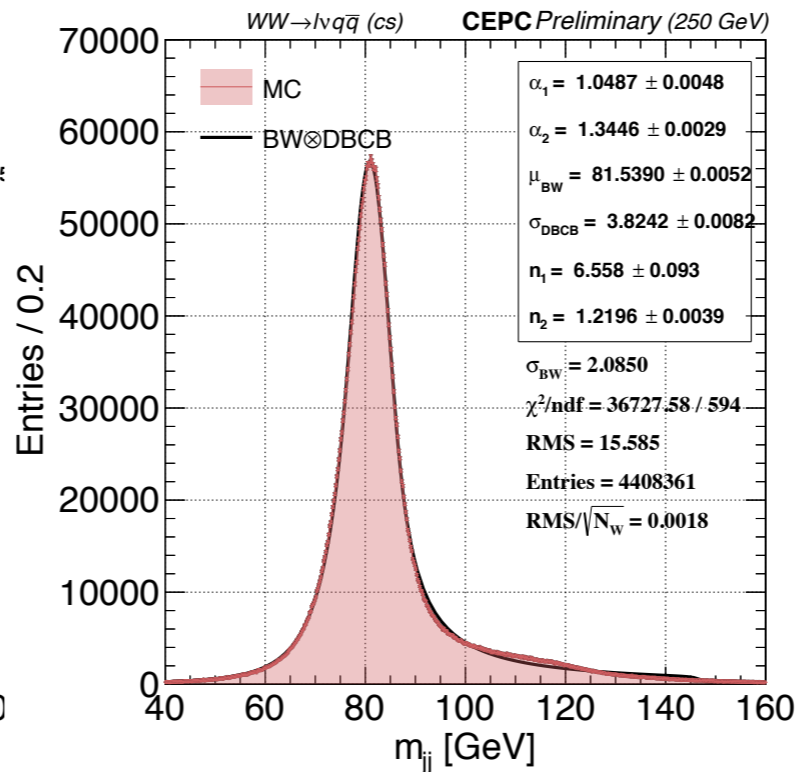
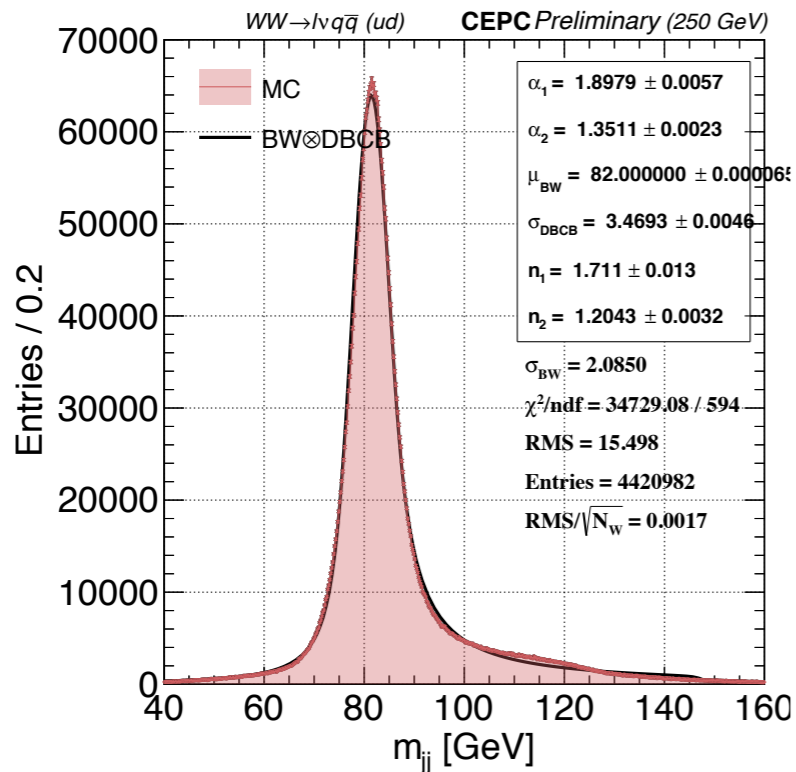




- The influence is tiny as we expected.
- The shoulder still there. What is the next step to remove the shoulder, or it is the intrinsic result.

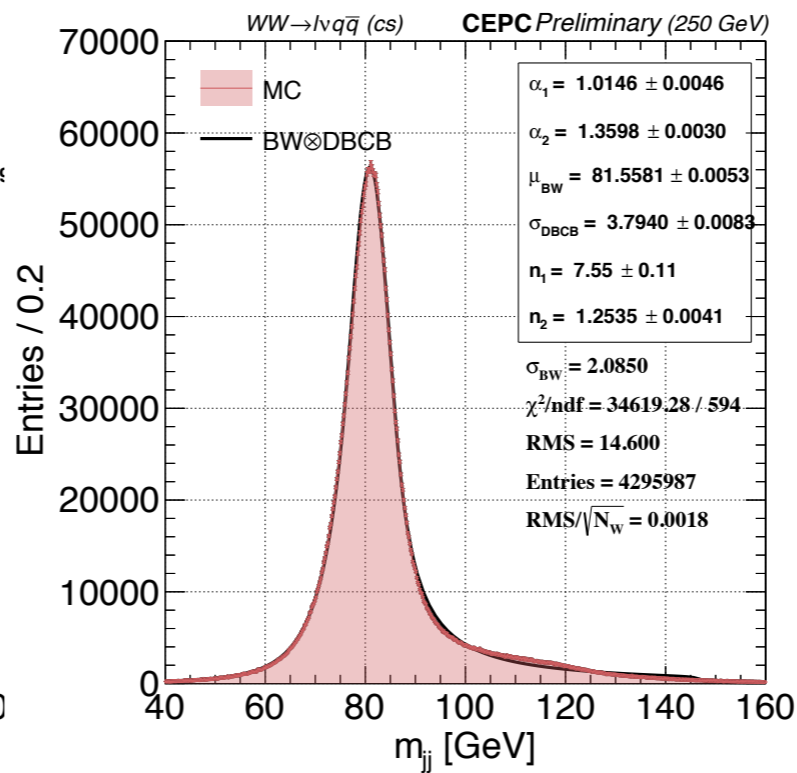
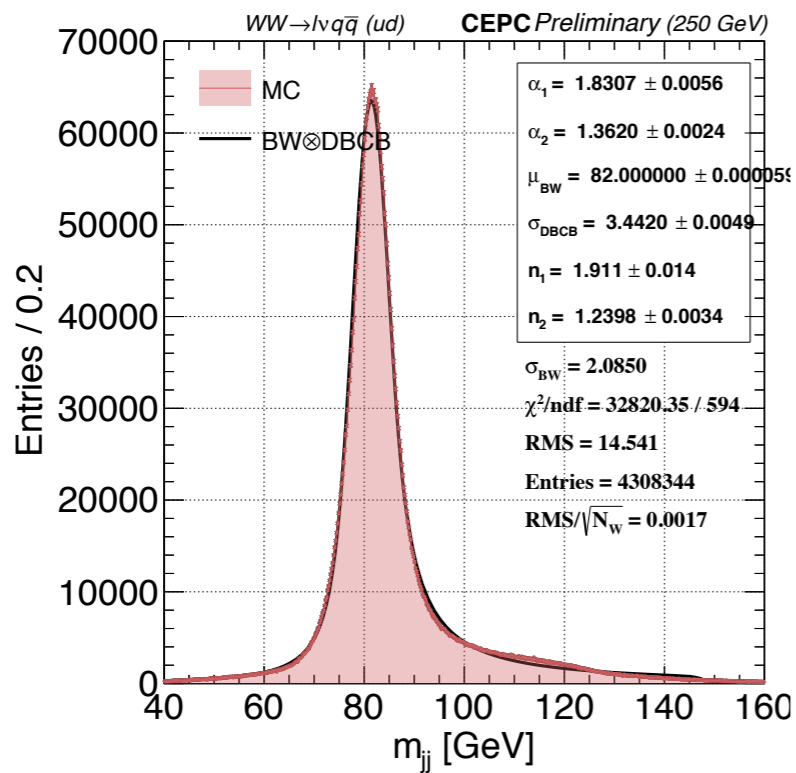
Veto μ Polluted Events (ud, cs)

Before



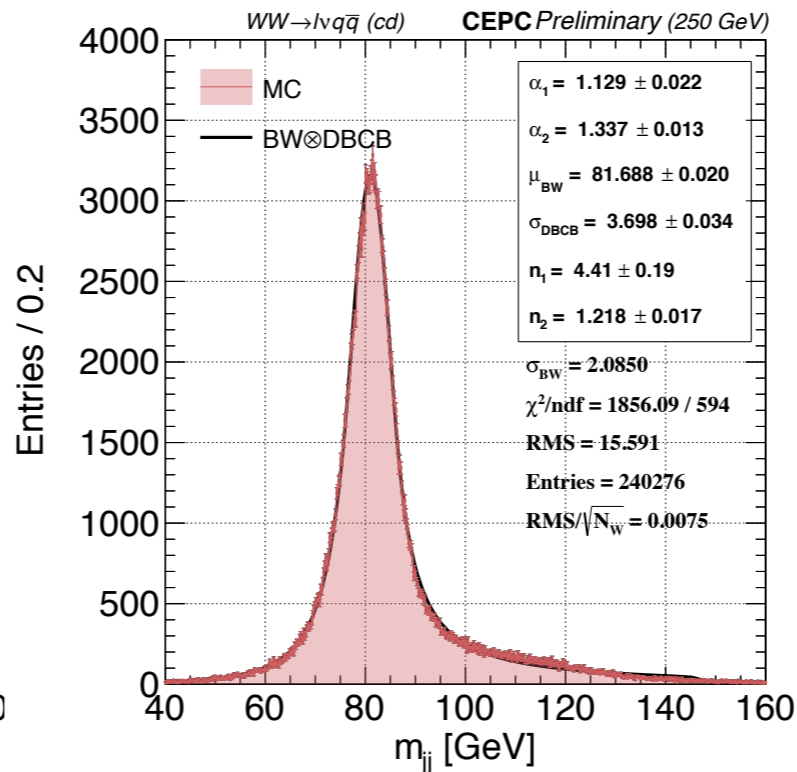
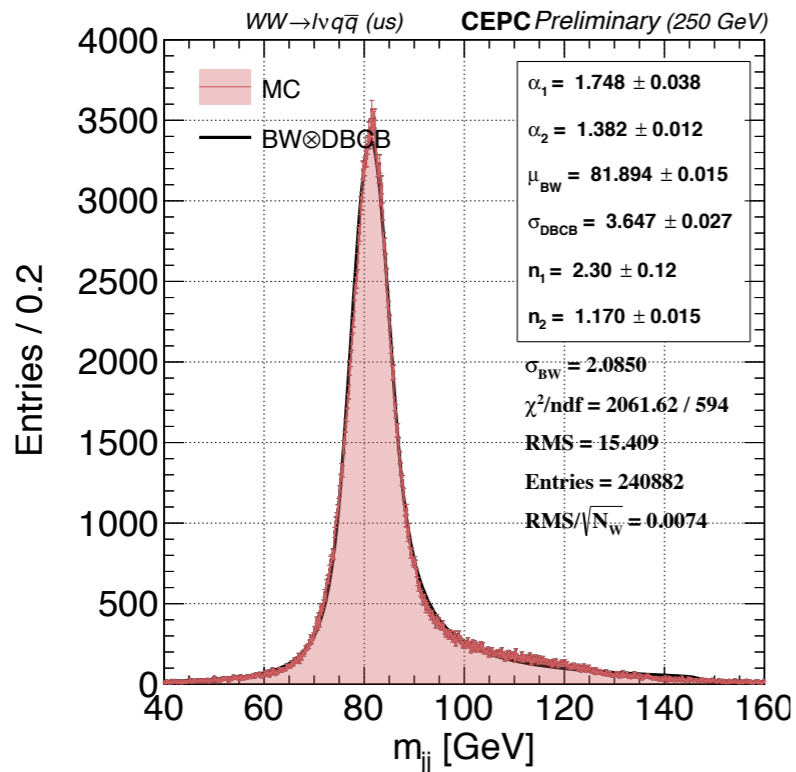
■ After veto μ polluted events, the mean of BW become a little bit greater, but RMS and sigma become slightly smaller.

After



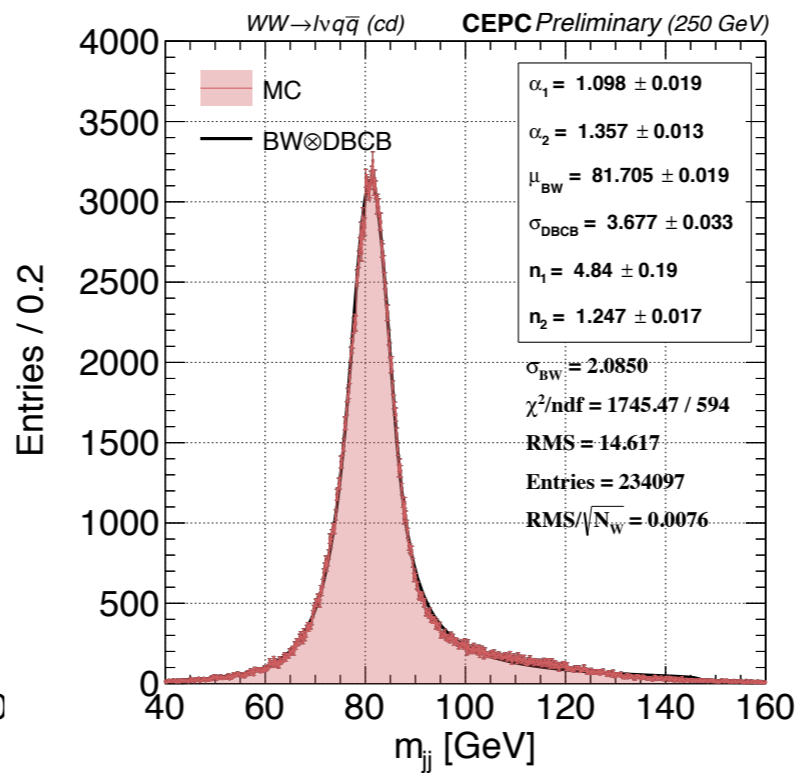
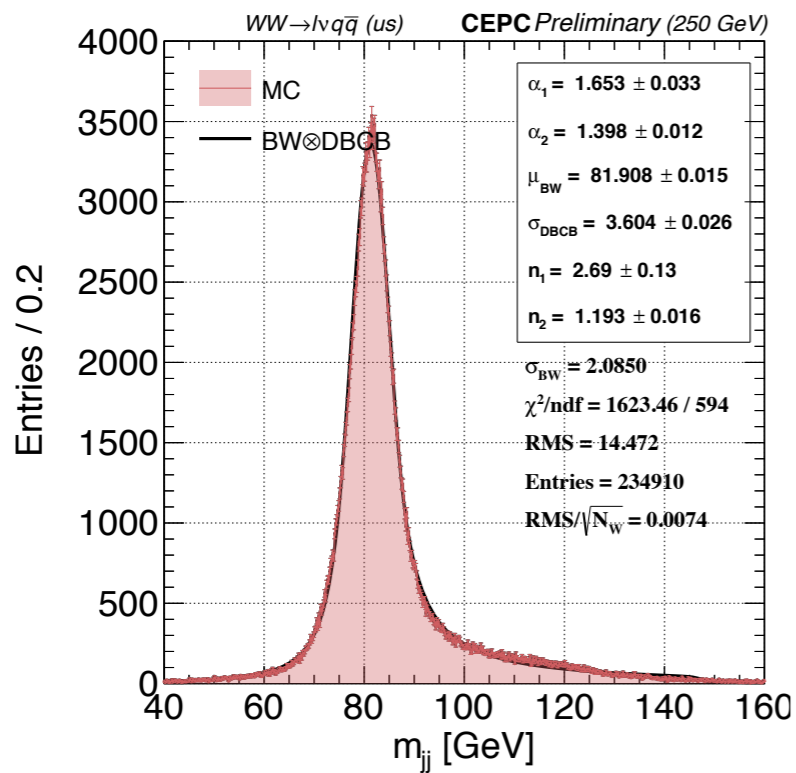
Veto μ Polluted Events(us, cd)

Before



■ After veto μ polluted events, the mean of BW become a little bit greater, but RMS and sigma become slightly smaller.

After



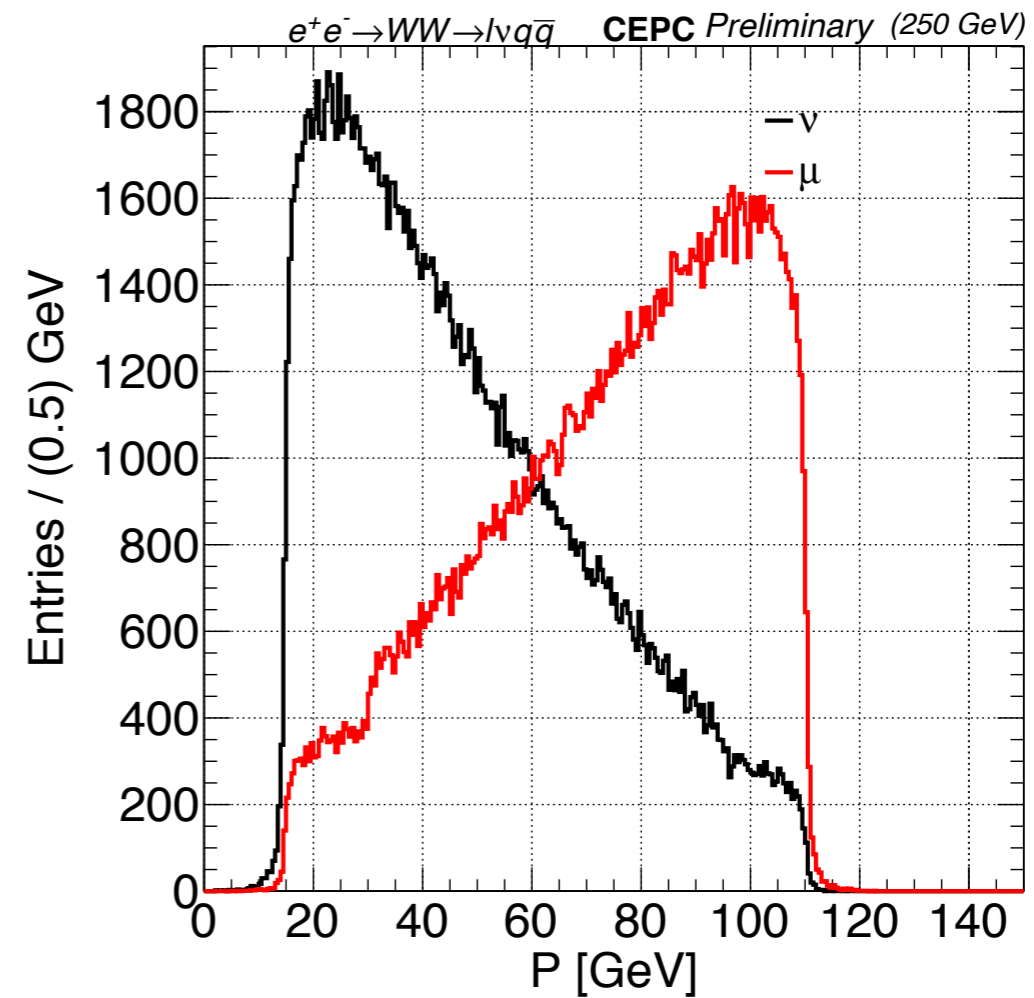
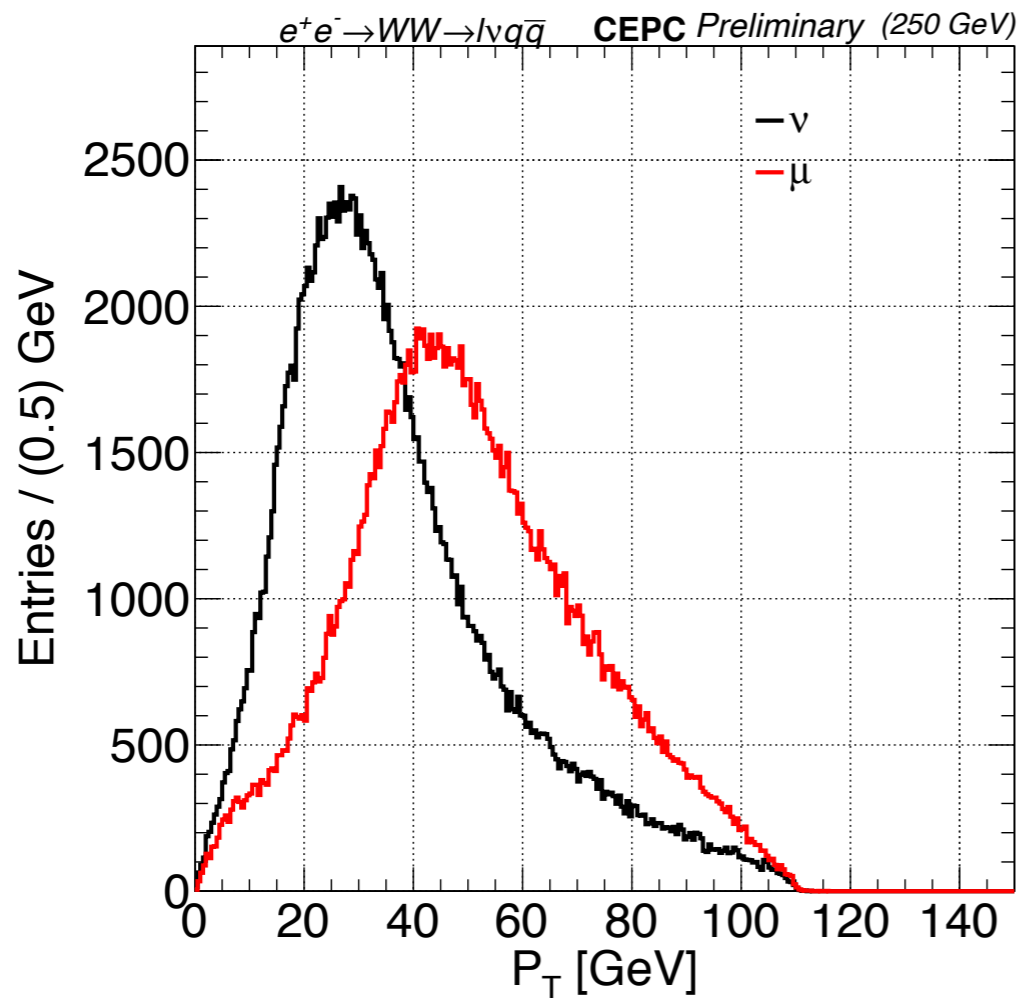
Before	WW→lvud	WW→lvcs	WW→lvus	WW→lvcd
Entries	4420982	4408361	240882	240276
σ_{DBCB}	3.469	3.824	3.647	3.698
μ_{BW}	82.000	81.539	81.894	81.688
RMS/ $\sqrt{N_z}$	0.0017	0.0018	0.0074	0.0075

After	WW→lvud	WW→lvcs	WW→lvus	WW→lvcd
Entries	4308344	4295987	234910	234097
σ_{DBCB}	3.442	3.794	3.502	3.677
μ_{BW}	82.000	81.558	81.908	81.705
RMS/ $\sqrt{N_z}$	0.0017	0.0018	0.0074	0.0076

- **The additional muon is not the dominant reason for the “shoulder” on high mass region. Come back to the start, try to find out the reason which caused the shoulder.**

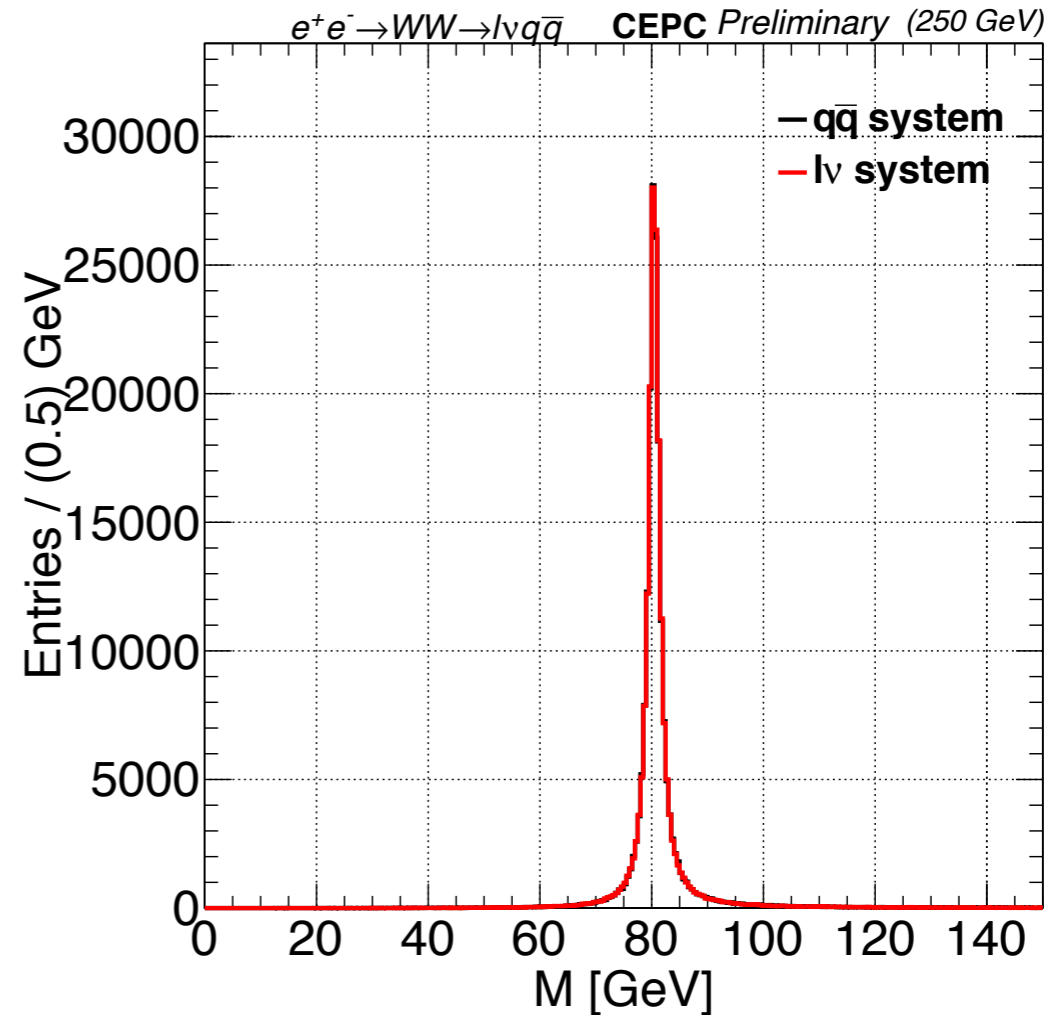
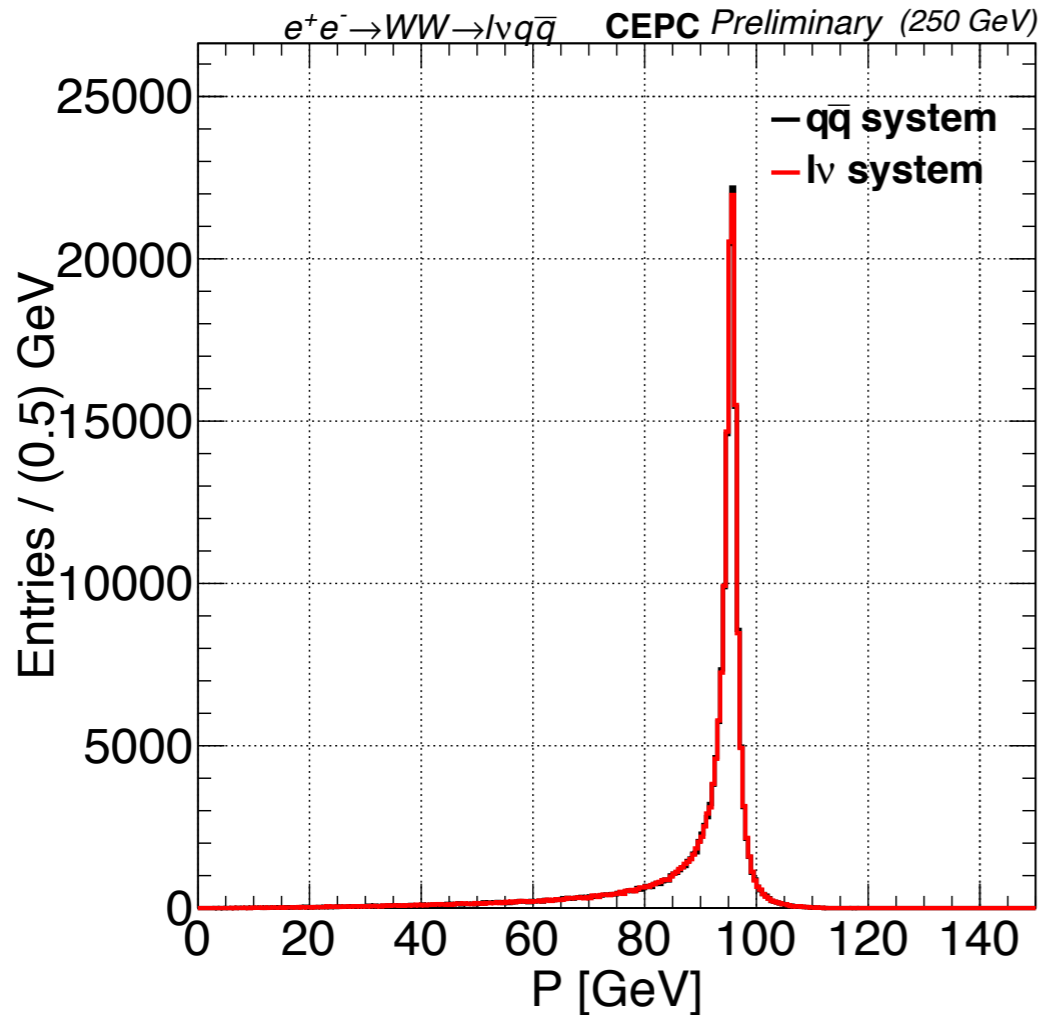


Back up



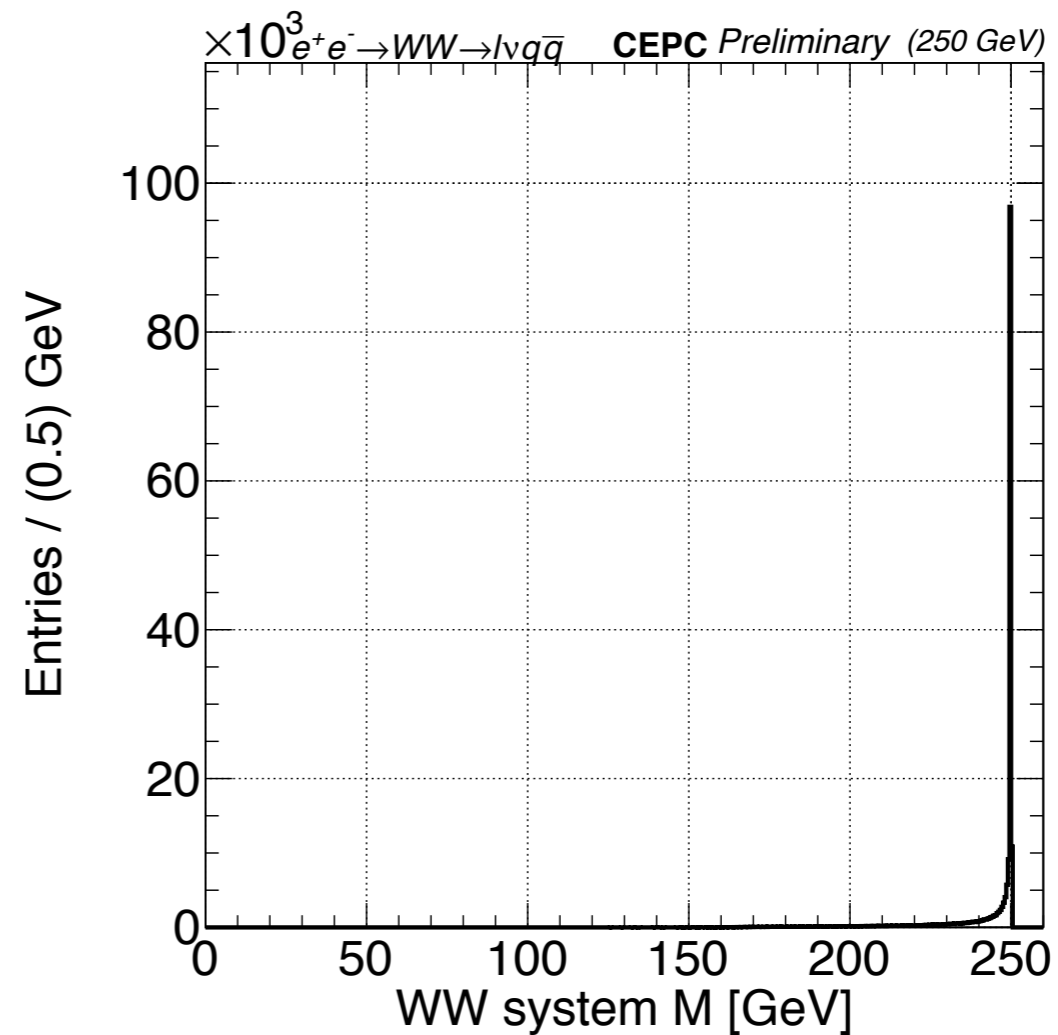
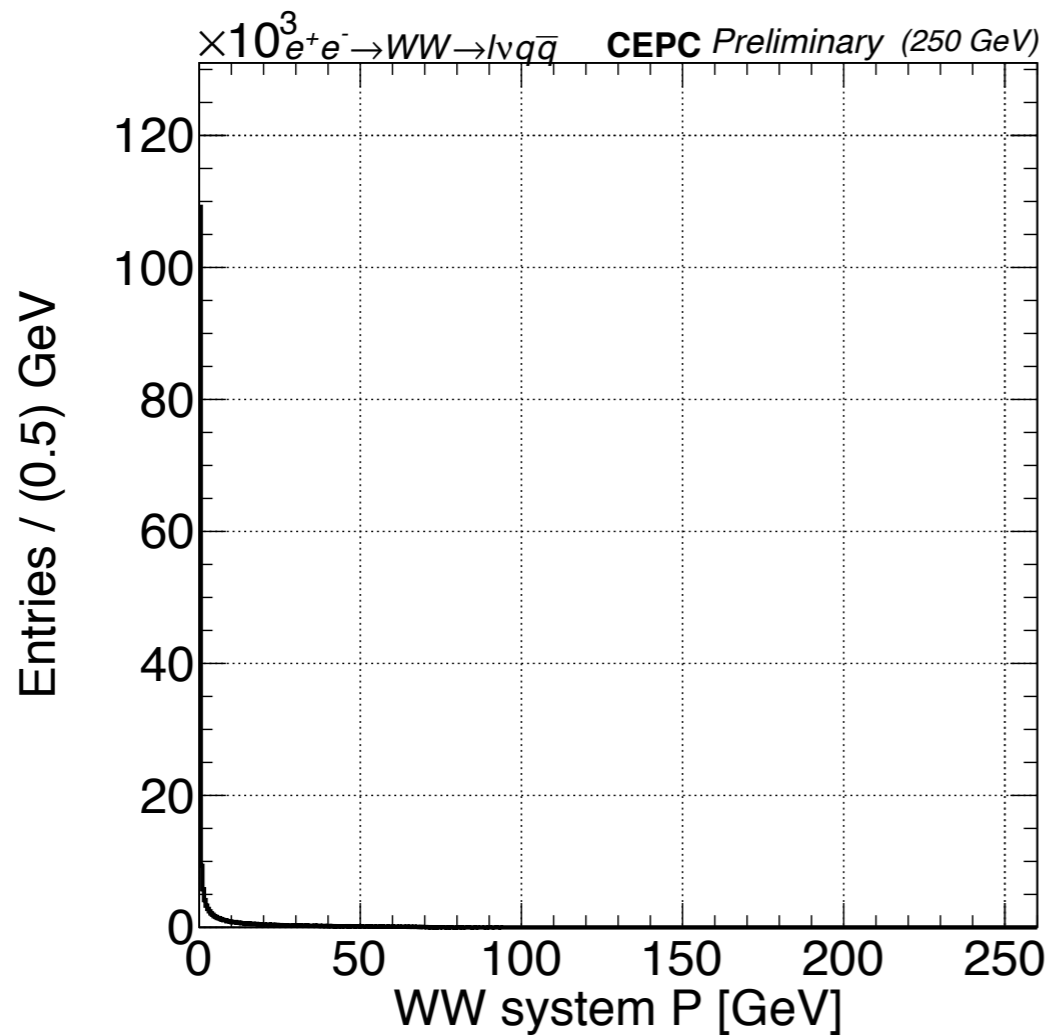
■ MC true plots.

■ The muon and neutrino have really different kinematic distribution.



■ MC true plots.

■ W momentum must be something wrong and I am still looking for. However, the difference of these two plots is $P()$ and $M()$. They are calculated by same TLorentz object.



■ MC true plots.

■ WW system is at rest and central-of-mass energy is at 250 GeV.

- **Use the another sample to study JER and JES**
- **My data-driven calibration**
- **The different calibration comparison (Nominal, Global calibration, JES calibration which is studied by MC, data-driven calibration)**

- **From Maarten:**
 - **Try to veto muon in the reco jet and gen jet in WW process.**
 - **Compatibility between the reco mass and the truth mass.**
Study both m_{jj} and m_{vis} in particle flow object list and truth particle list (veto muon in W) and then M_{reco}/M_{truth} . (Normally, now should find comparable M_{reco}/M_{truth} ratios in both cases.)