

Trilepton Analysis: The $WH \rightarrow WWW \rightarrow l\nu l\nu l\nu$ Signal

Neutrinos and MET, Leptons With Small Opening-Angle

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Summary

1 Neutrinos

2 Leptons w/ Small Opening Angle

- ΔR Dists.
- E_T of Jets and Close Higgs Pair Jet

Shown Before: Neutrino E_T (WRONG)

According to TLorentzVector: $E_T = \frac{E \cdot P_T}{\sqrt{P_T^2 + Z^2}}$

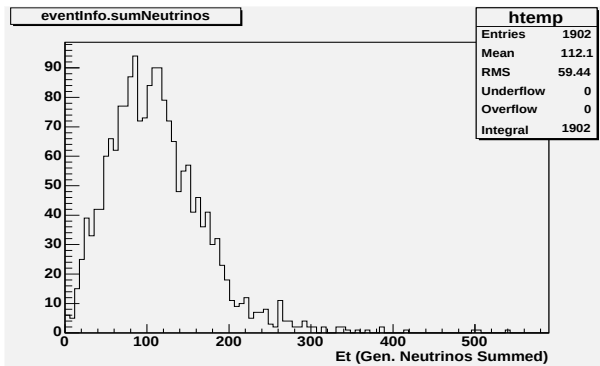


Figure: E_T according to TLorentzVector.

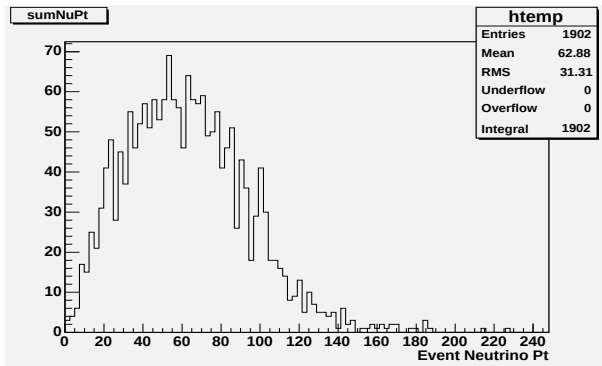
Summed Neutrino P_T 

Figure: P_T according to TLorentzVector.

Reconstructed MET

Low energy region filled in compared to summing neutrinos.

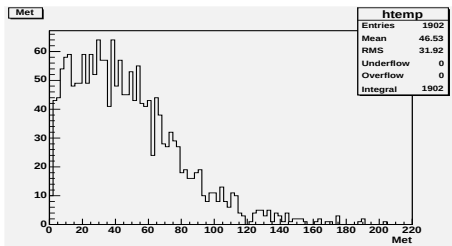


Figure: Missing E_T (TStnMetBlock::Met[4]) of events passing the triplepton filter.

Reconstructed Missing E_T in ntp_14

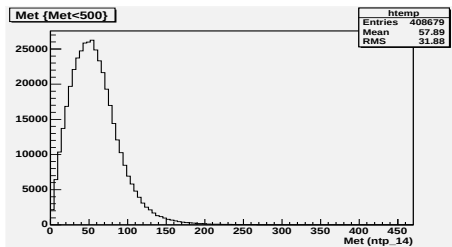


Figure: Missing E_T in ntp_14.

Close Leptons

- Presently: Leptons w/ $\Delta R < 0.4$ not used.
- $267/1902 = 0.14$ have a close lepton pair.
- $208/267 = 0.78$ both Leptons from Higgs.

General ΔR Among Leptons (1st and 2nd)

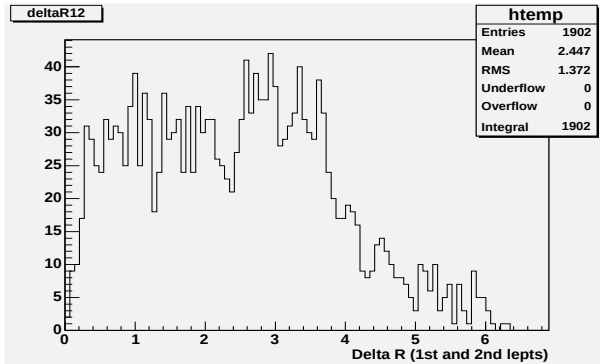


Figure: ΔR between the leading and 2nd generator-level leptons.

General ΔR Among Leptons (1st and 3rd)

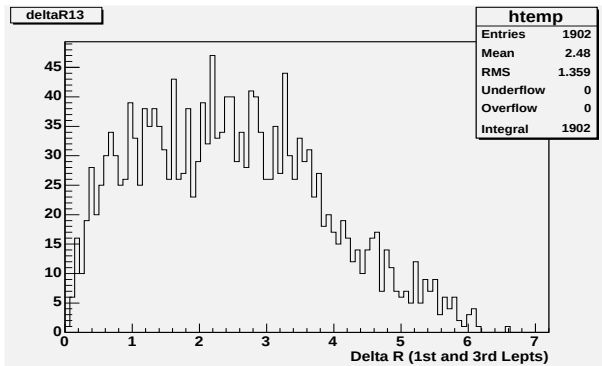


Figure: ΔR between the leading and 3rd generator-level leptons.

General ΔR Among Leptons (2nd and 3rd)

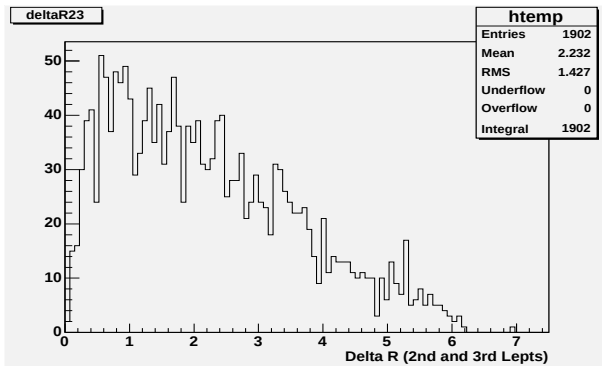


Figure: ΔR between the 2nd and 3rd generator-level leptons.

ΔR Between Higgs Leptons

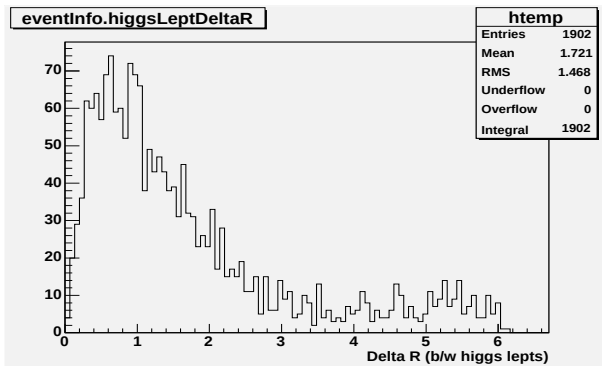


Figure: ΔR between the two leptons that directly decay from the Higgs. Notice that the distribution indicates these two leptons generally tend to be closer together.

ΔR From Close Higgs Leptons To W Brem Lept.

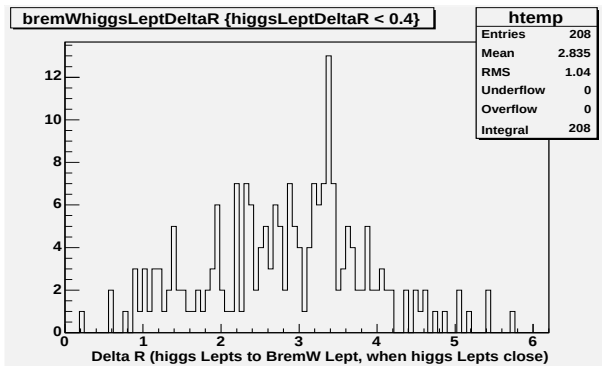


Figure: ΔR between the average angular position of the two Higgs leptons and the lepton from the Brem W for the 208 events where the two Higgs leptons are close ($\Delta R < 0.4$).

Leading Jet Energy

Any Jet containing a generator-level W lepton ($\Delta R < 0.4$) or has $E_T < 10.0$ GeV not counted. From this point on, I'm dealing with event where the three leptons are found, matched, pass quality cuts.

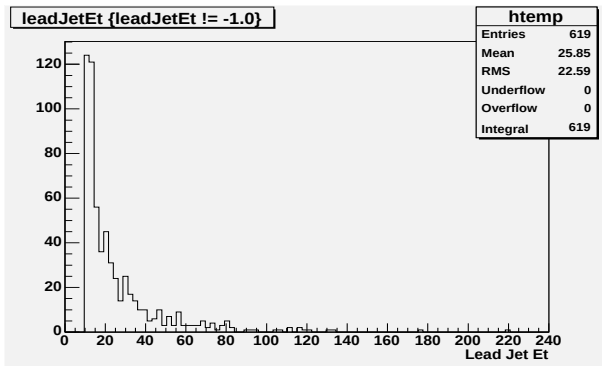


Figure:

Jet with Close Higgs Lepts.

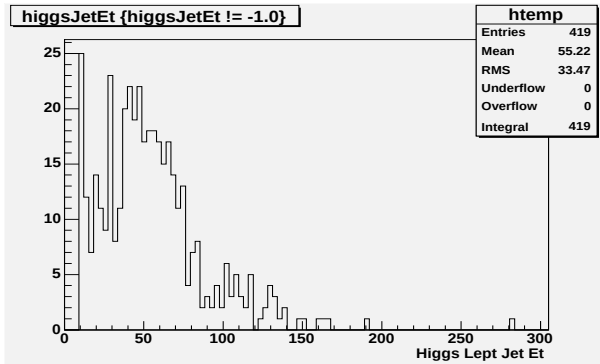


Figure:

Jet with Close Higgs Lepts. (zero-Jet bin)

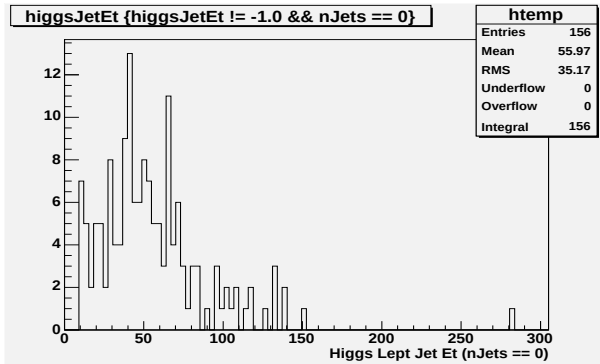


Figure:

Still working on...

- Next:
 - Use matching to label reconstructed leptons as from the Higgs or the W radiating the Higgs.
 - Observe for close Higgs leptons: EmE, HadE, EOverP, etc.