

Jet Energy Resolution for the Dijet Balance Method

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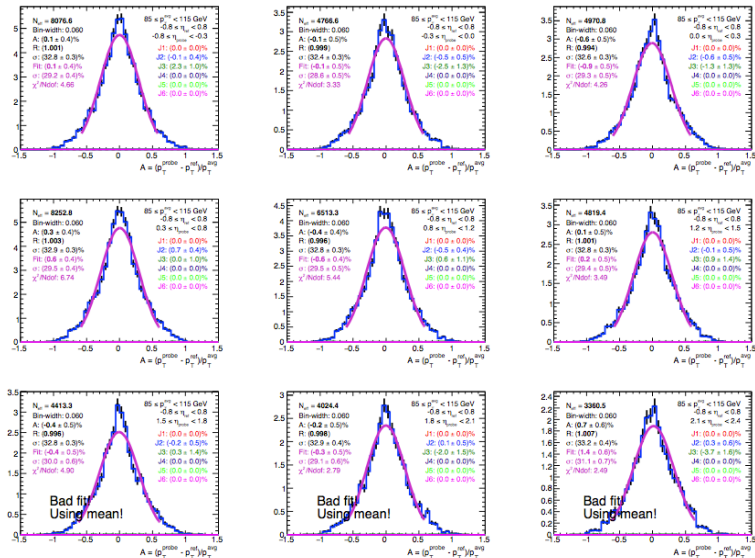


- Used the Dijet Balance Method to find the Jet Energy Resolution for Powheg+Pythia8, Sherpa and Pure Pythia8 MCs.
- Found an issue with the truth resolution being larger than reco for Sherpa, Pure Pythia8 and some bins of Powheg+Pythia8.
 - Restricted the fit of the asymmetry to ± 0.5 .
 - Started checks of ΔR matching of truth and reco jets to be < 0.4 .
- Calculated MC detector resolution from:

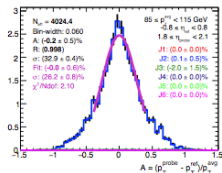
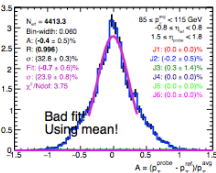
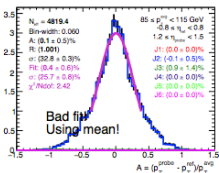
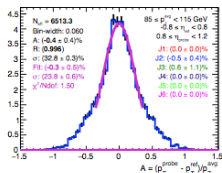
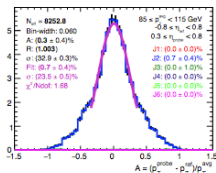
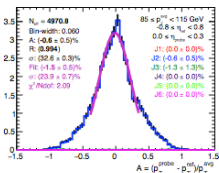
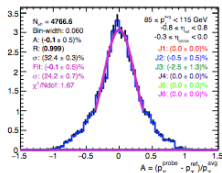
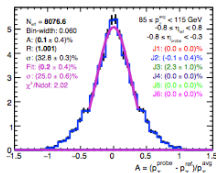
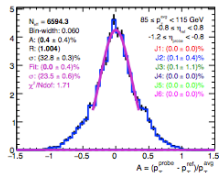
$$\frac{p_T^{reco} - p_T^{truth}}{p_T^{reco}}$$

in bins of (p_T^{reco}, η) for ΔR matched jets for each MC.

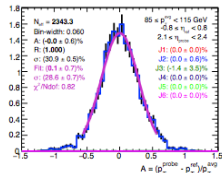
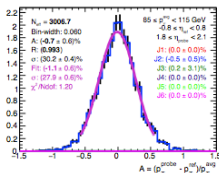
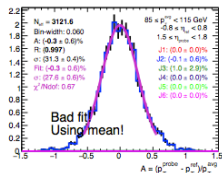
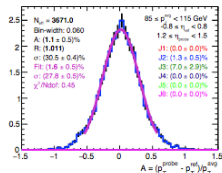
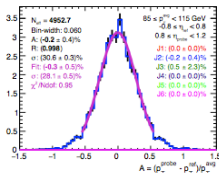
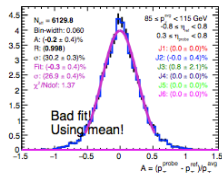
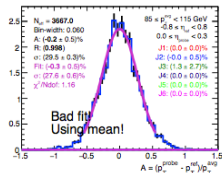
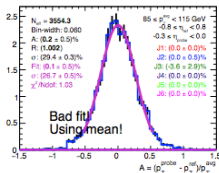
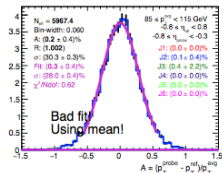
Sherpa Truth: Before any restrictions



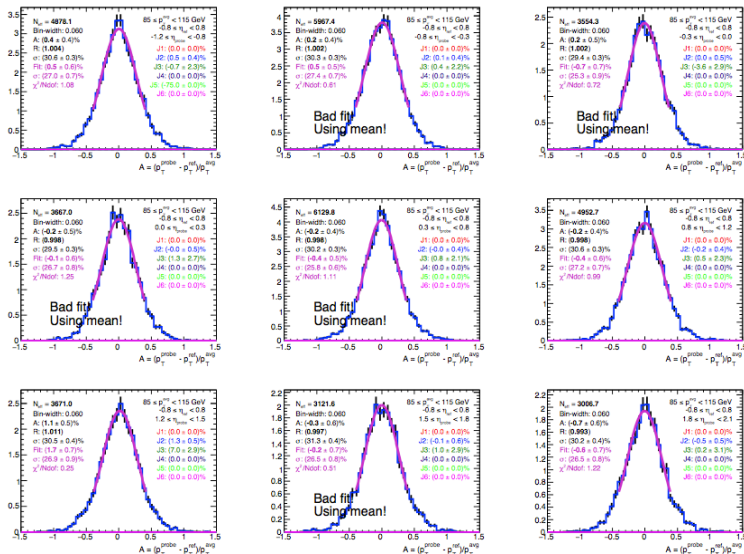
Sherpa Truth: After restriction to fit



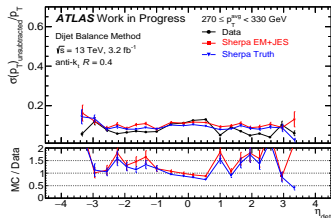
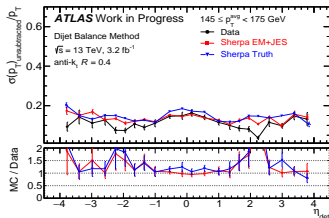
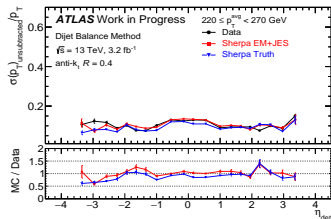
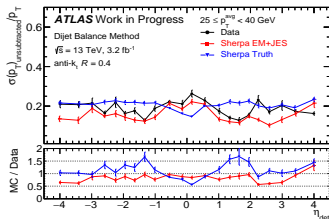
Sherpa Reco: Before any restrictions



Sherpa Reco: After restriction to fit

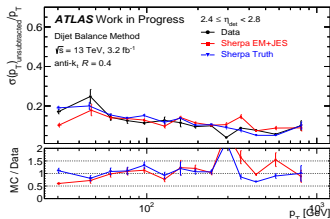
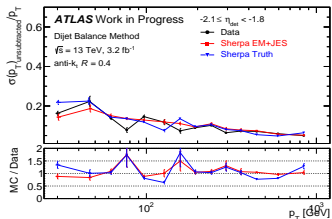
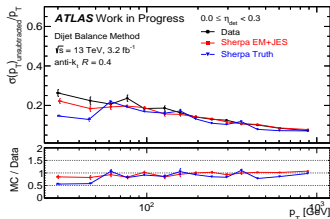
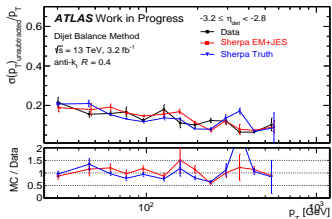


Sherpa unsubtracted $\sigma(P_T)/P_T$ vs η_{det} with restrictions

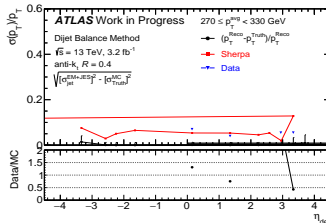
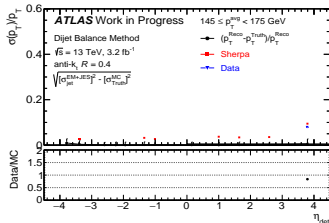
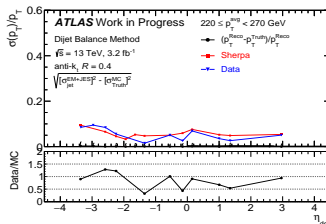
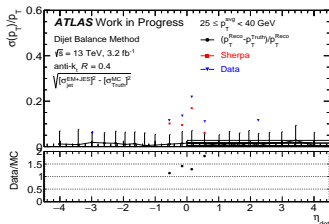


A much smaller number of eta bins of truth are higher than Reco after the fit restriction.

Sherpa unsubtracted $\sigma(P_T)/P_T$ vs P_T with restrictions



Sherpa $\sigma(P_T)/P_T$



- There seems to be an issue with the line connecting points here (Working on it).

To-Do:

- Continue to fix bug with DeltaR matching to check if this is the problem.
 - Find reason behind truth being larger than reco if matching doesn't fix the problem.
- Fix bugs in code causing lack of connecting points.
- Start looking at the bisector method.