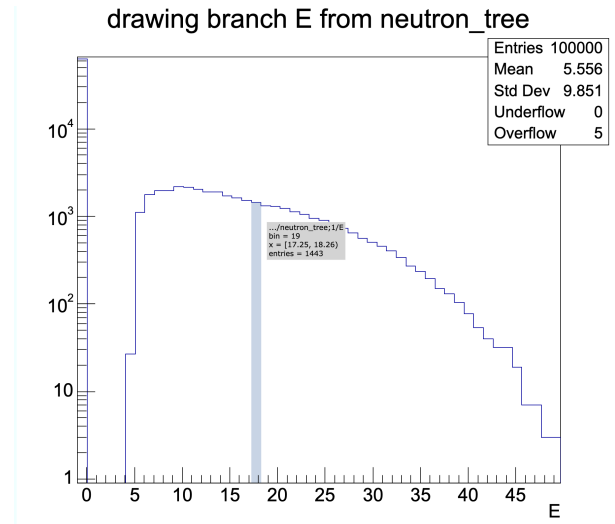
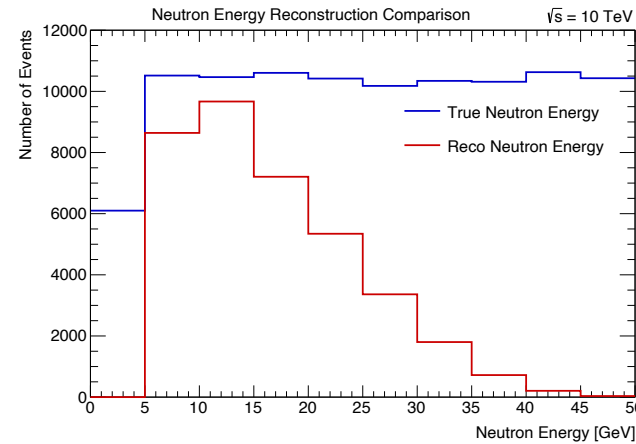


Single Neutron Energy Reconstruction without BIB

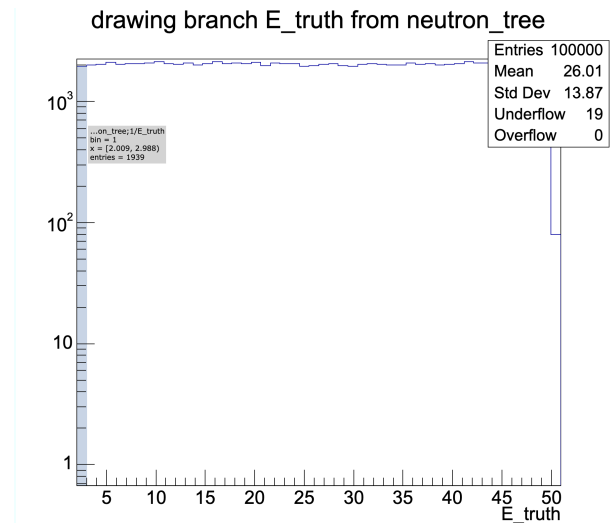
Initial Energy

- **Neutron Energy Reconstruction**

- Higher energy neutrons are not being reconstructed with their full energy
- There are almost no reconstructed neutrons with 0-5 GeV
- This will be apparent in the resolution/response plots as well



Reco Energy

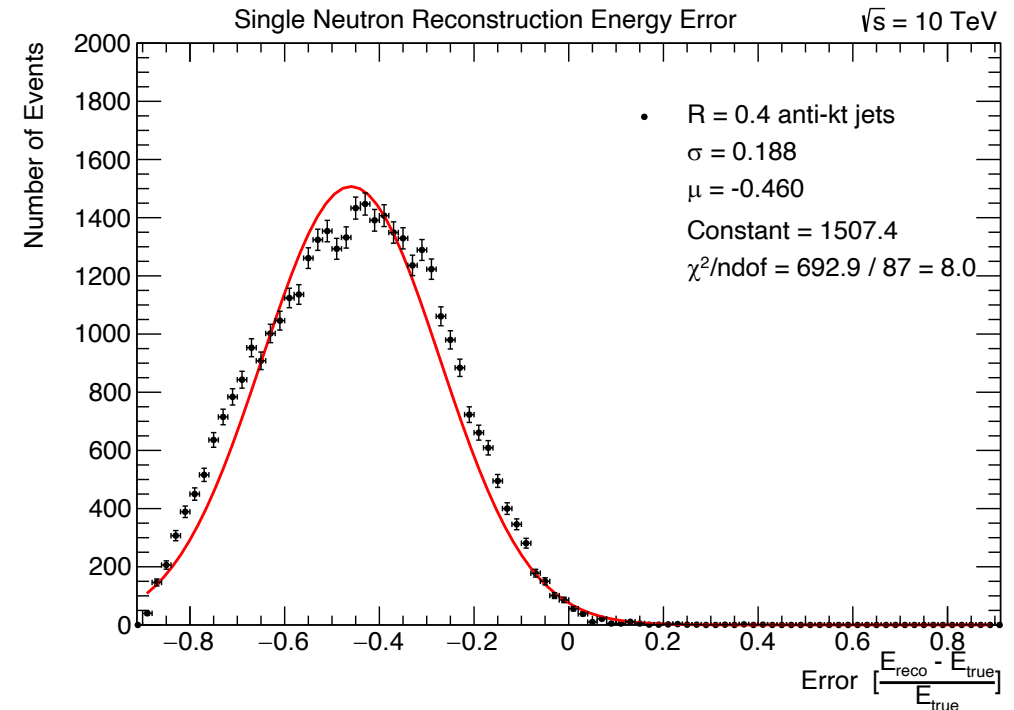
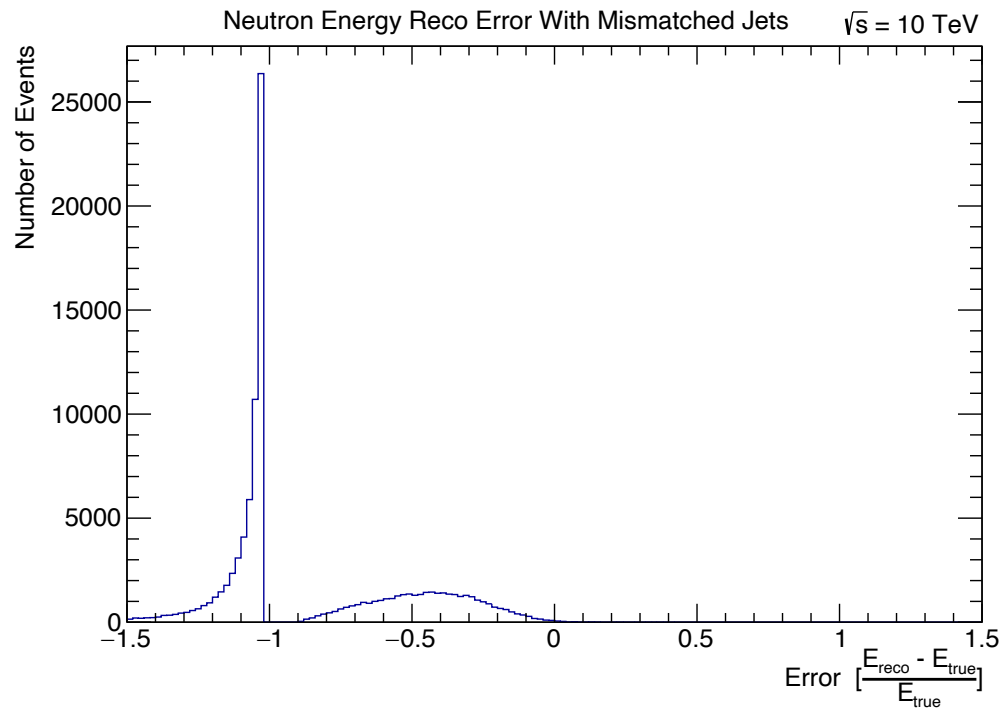


True Energy

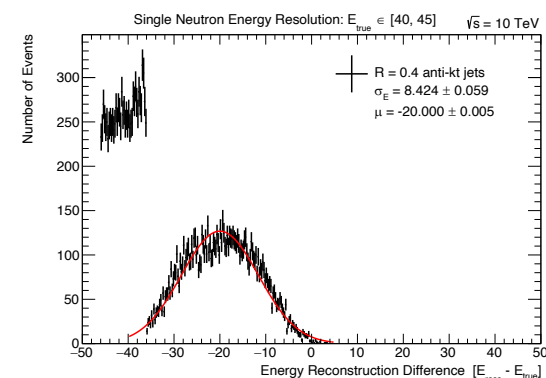
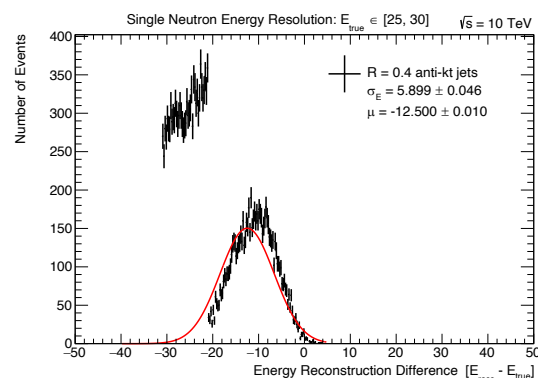
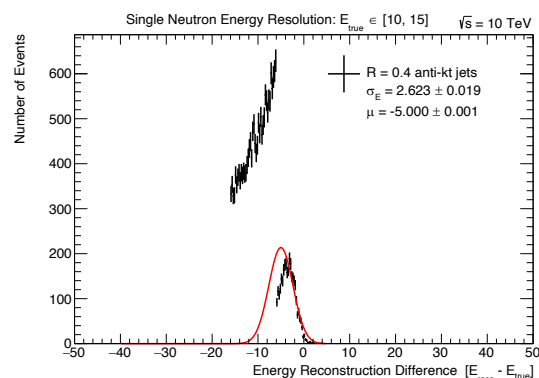
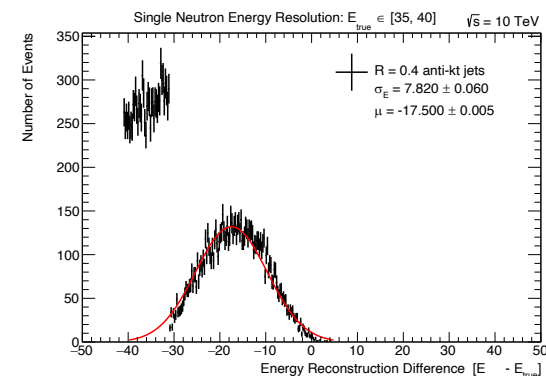
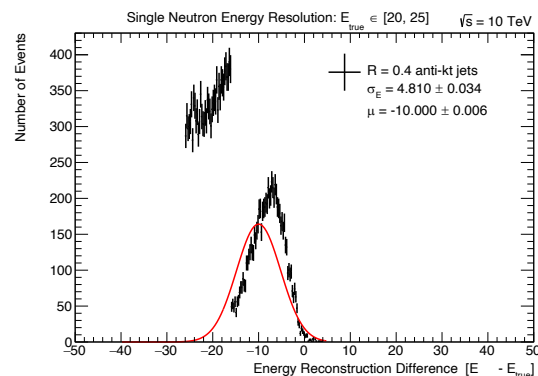
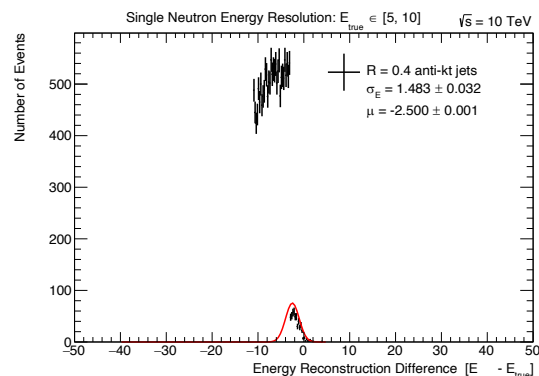
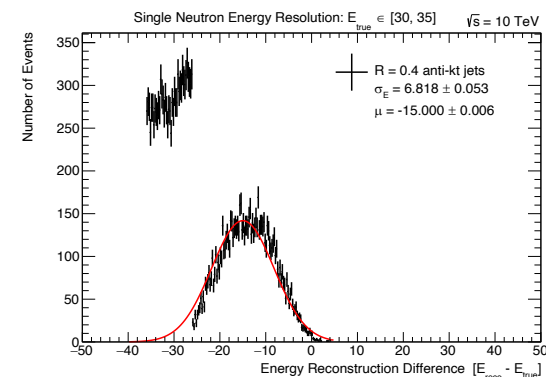
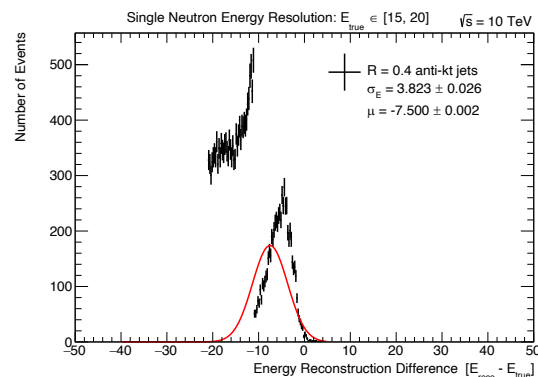
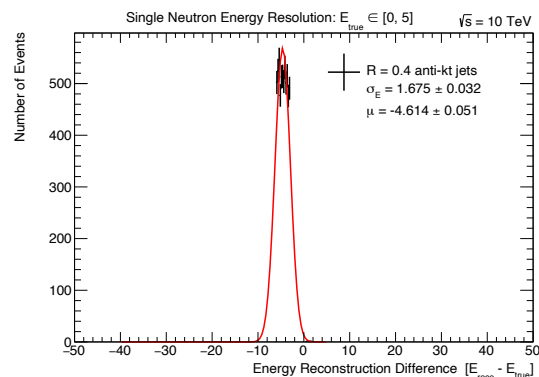
Total Reconstruction Error and Mismatched Jets

- **Mismatched Jets**

- There are still a significant number of generator neutrons that do not result in a matched jet
 - I'm planning to look at dR thresholding instead of jet matching



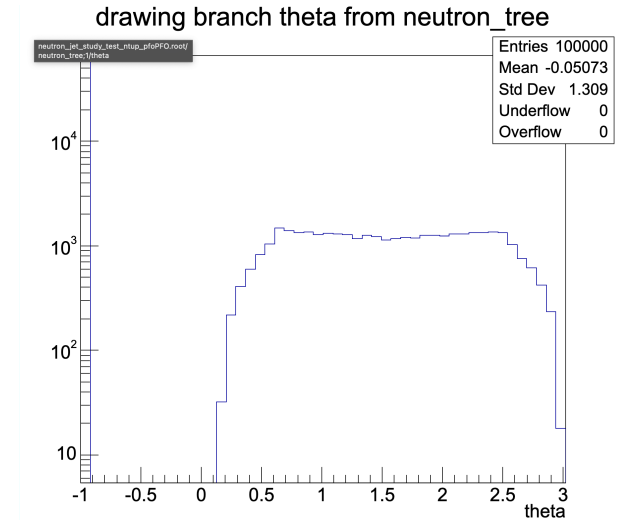
Individual fits without theta cuts



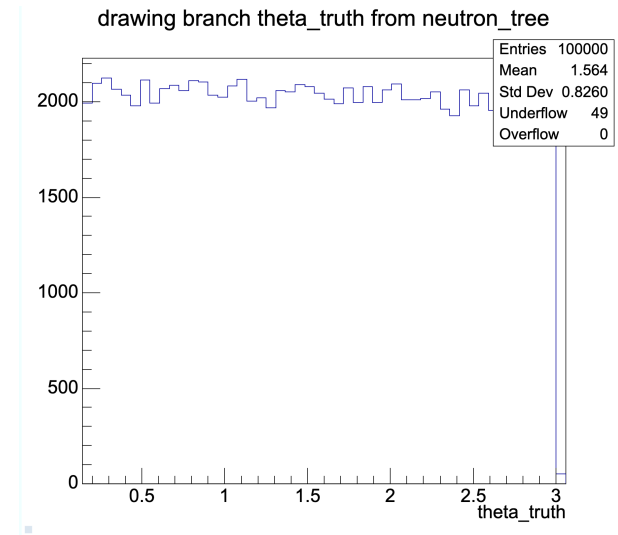
Polar Angle Distribution

- **Neutron Polar Angle**

- The main issue with the subfits is fixed by applying a theta cutoff $1 < \theta < 2$
- This seems to be a similar issue to the one Rose had with barrel and endcap discrepancies

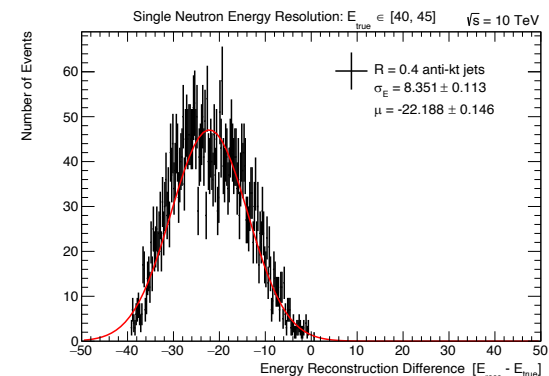
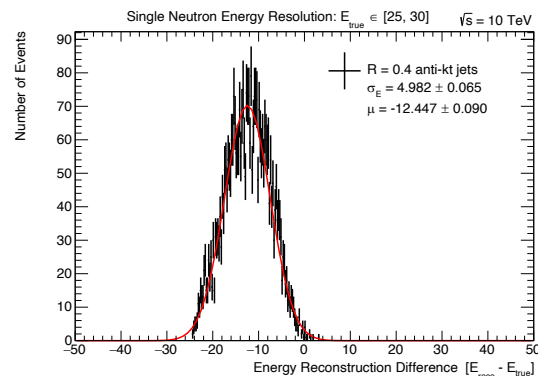
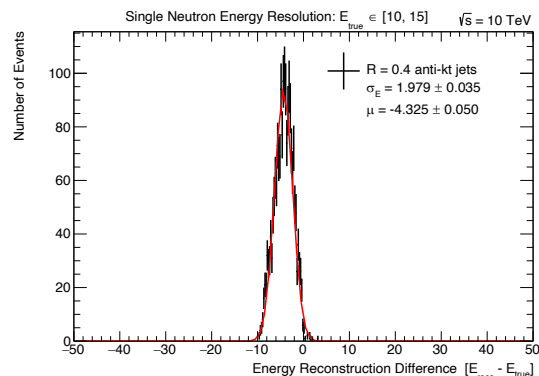
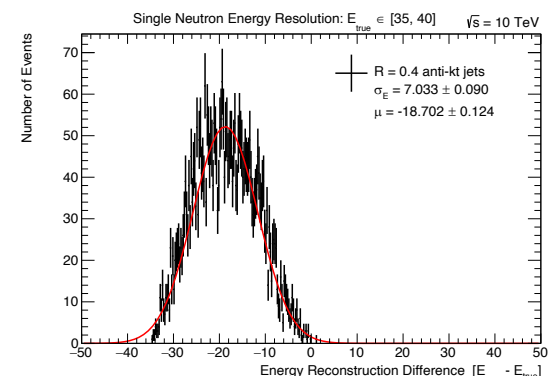
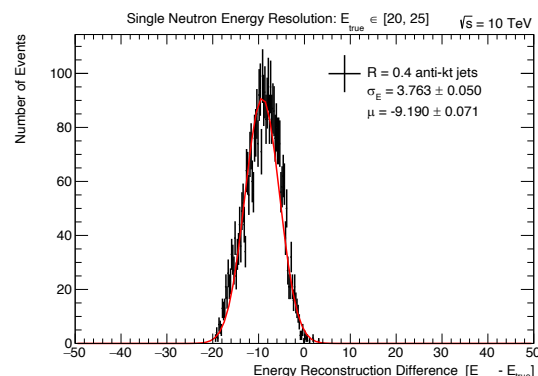
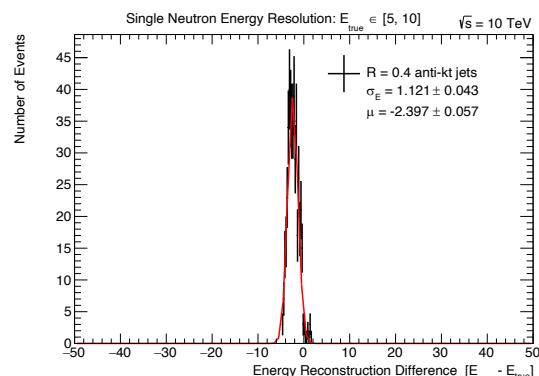
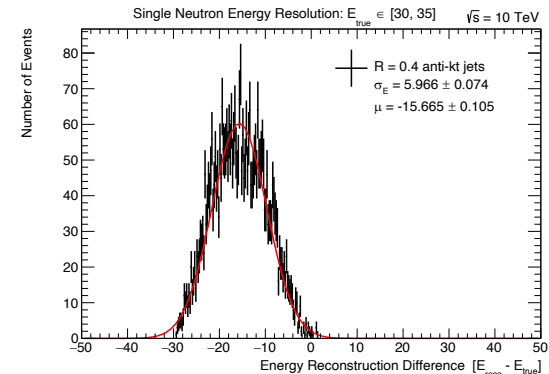
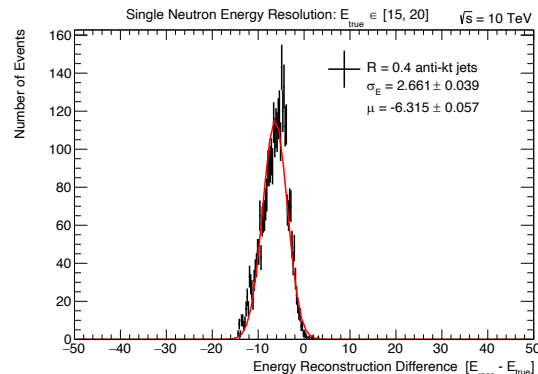
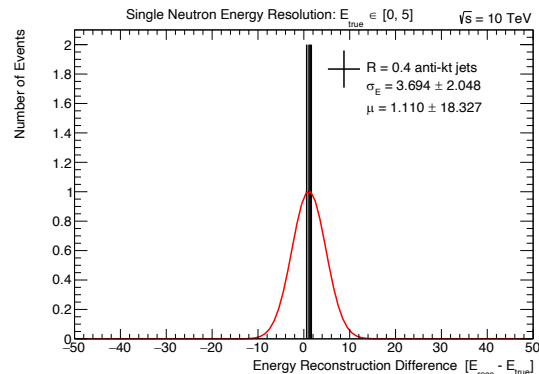


Reco Theta

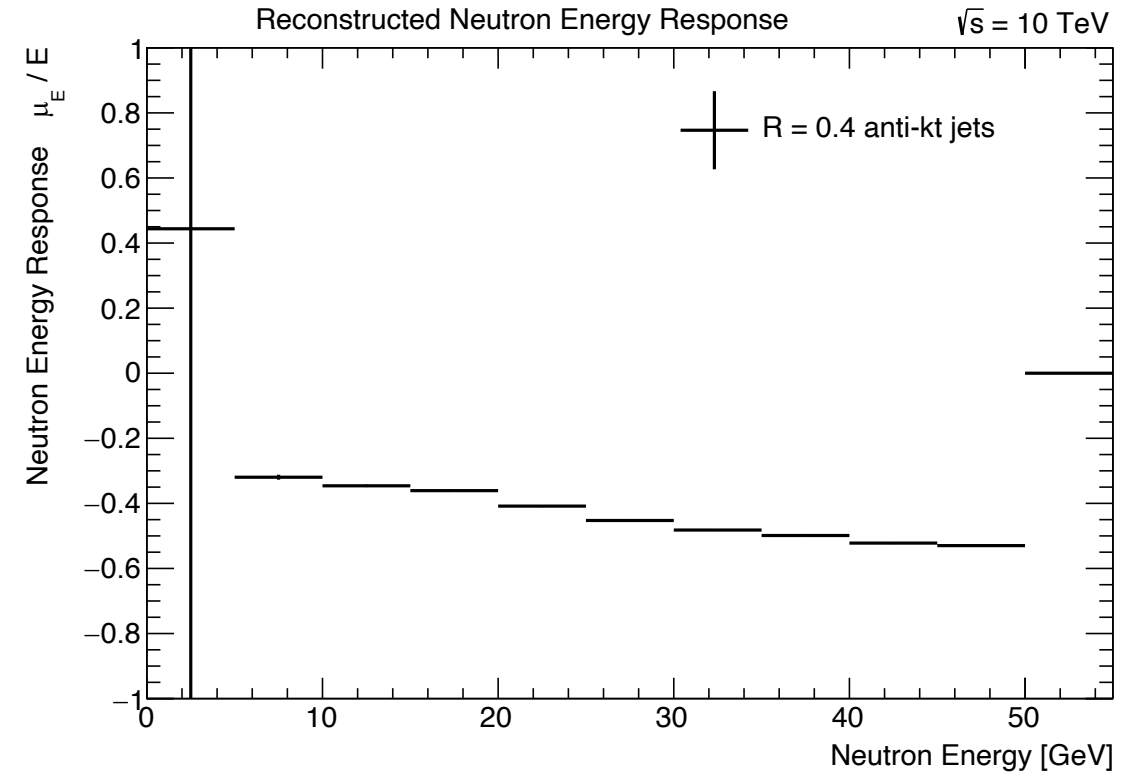
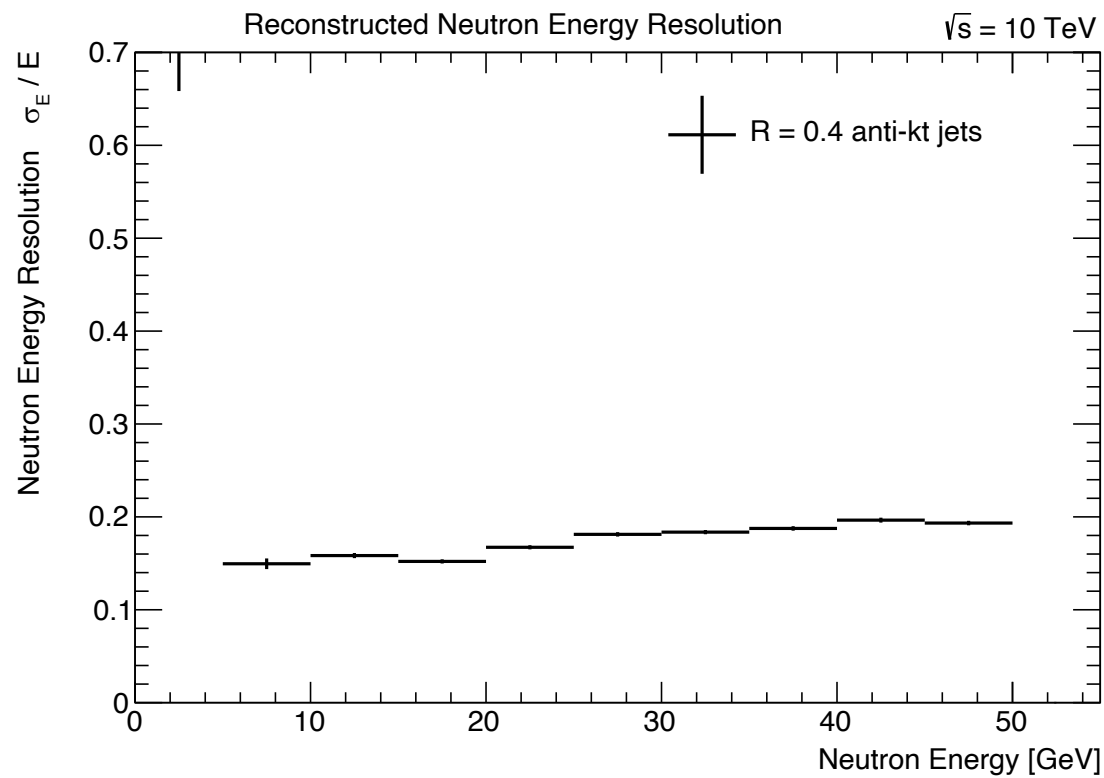


True Theta

Individual Fits with $1 < \text{Theta} < 2$ Cut



Jet Resolution and Response with Theta Cuts



Summary and Next Steps

- **Summary**

- High energy incident neutrons are not being reconstructed as efficiently as low energy ones
- Many incident neutrons do not result in a matched jet
- There seems to be a discrepancy between the calorimeter response between the barrel and the end cap
 - Adding a theta cutoff, the response and resolution both seem good

- **Next Steps**

- Look at the response and resolution for the barrel and endcap calorimeters individually
- Potentially switch the deltaR thresholding instead of jet matching
- Look at resolution dependence on theta