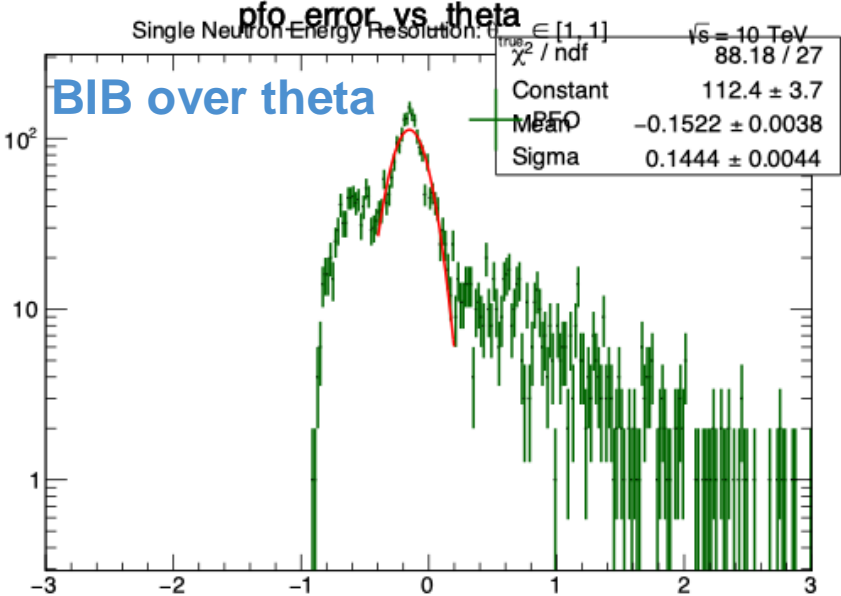
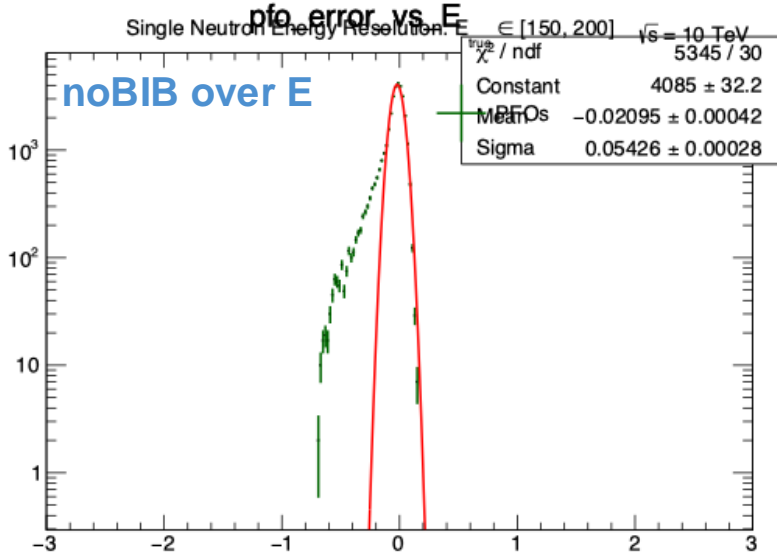


MAIA Neutron Studies

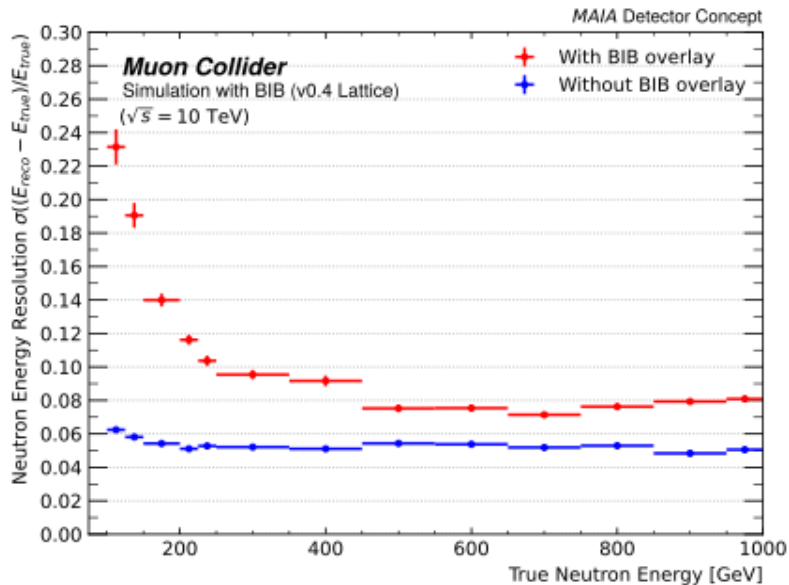
Non-gaussian fitting with BIB

- To try and fit on the true neutron peak:
 - I cut out PFO's with energy < 60 GeV
 - Then only plot neutrons > 80 GeV
 - Adjusted the fitting ranges around the true peak
 - Distributions are easier to fit in theta
 - I could also split up theta fits into finer energy bins

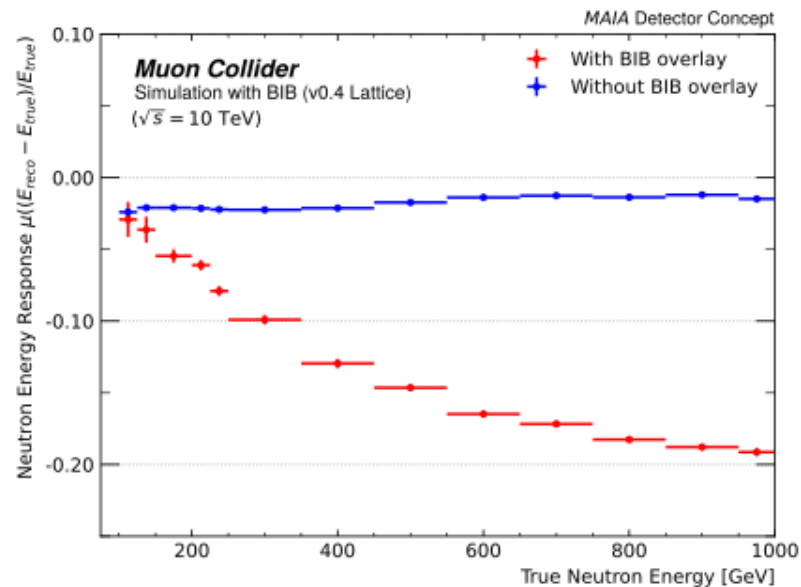


Reso, resp, eff over E bins

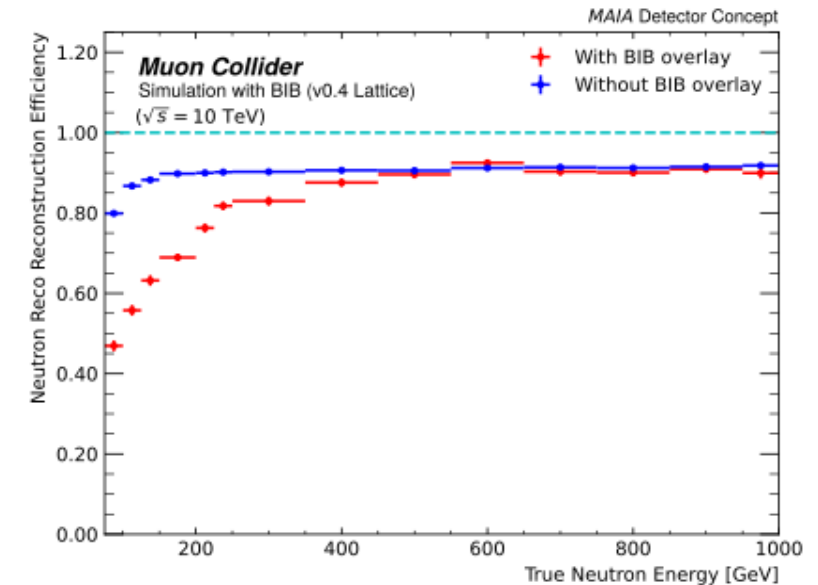
Resolution



Response



Efficiency

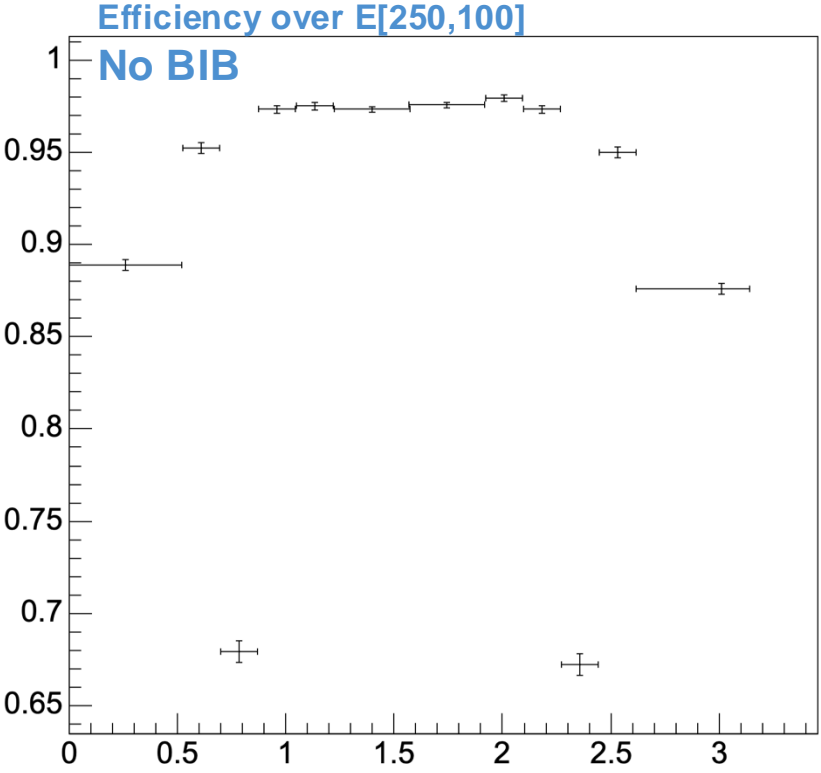
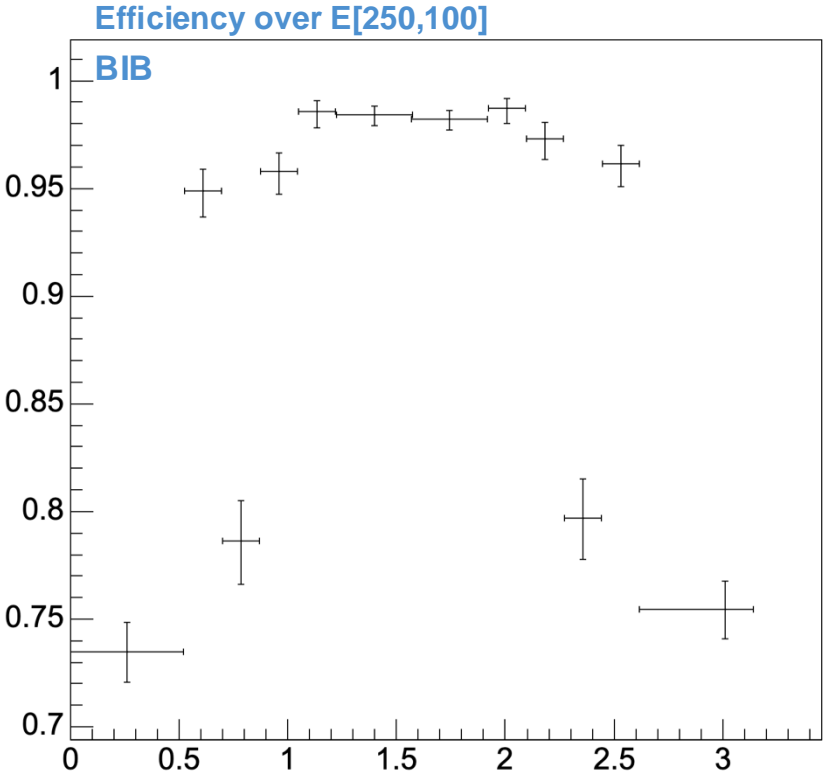


- These plots are getting closer to final results
 - Should I split up my plots like rose is doing over barrel, transition, and endcap?
 - I am limited by stats [21k, 11k, 8k] (number of BIB events per energy batch 0-50, 50-250, 250-1000 GeV)
 - Also, I'm not currently implementing a 2D response calibration with PFOs like rose is especially since the no BIB response is close to 0

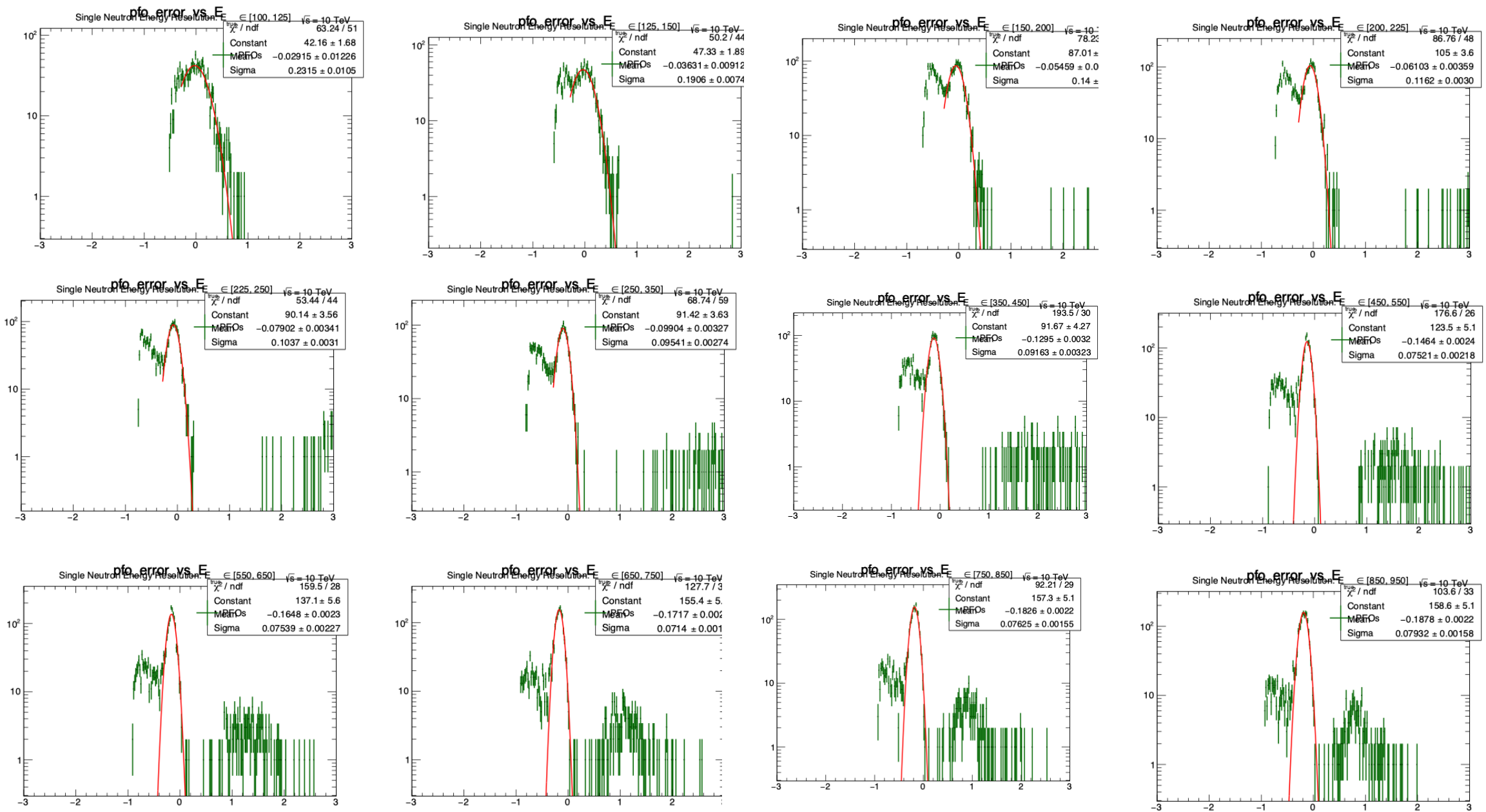
Plots over theta

- **Transition region issues**

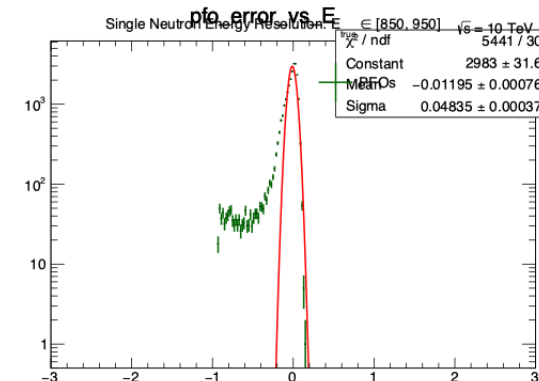
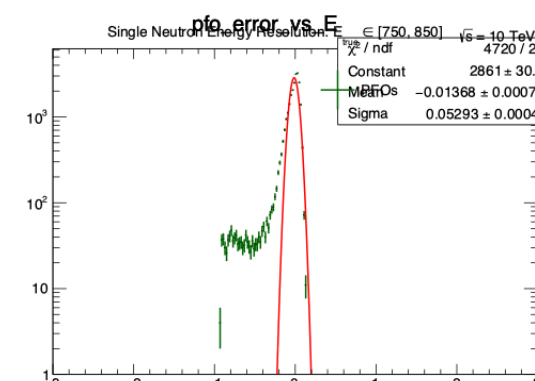
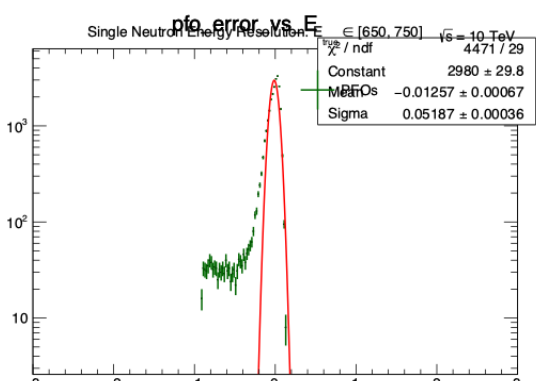
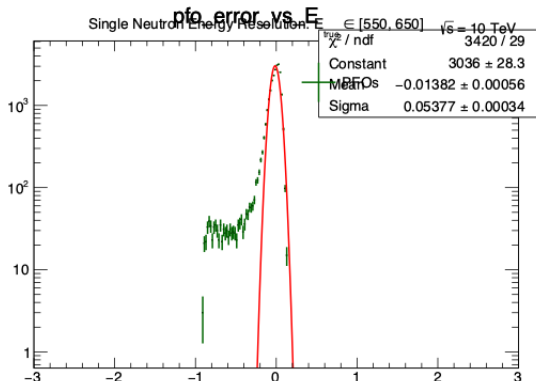
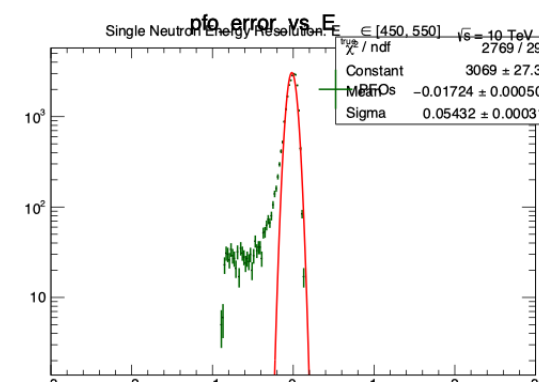
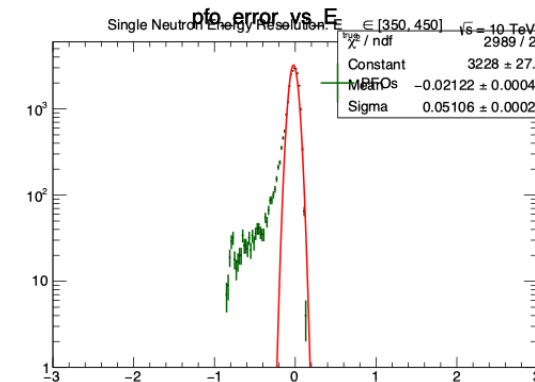
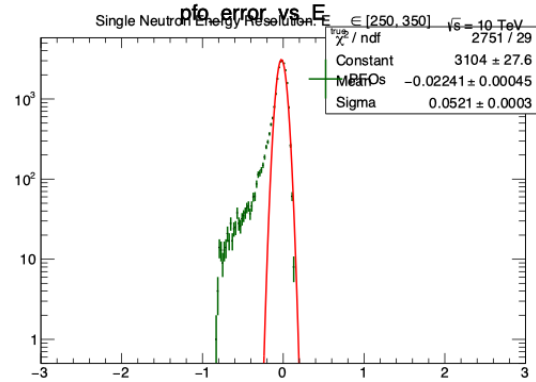
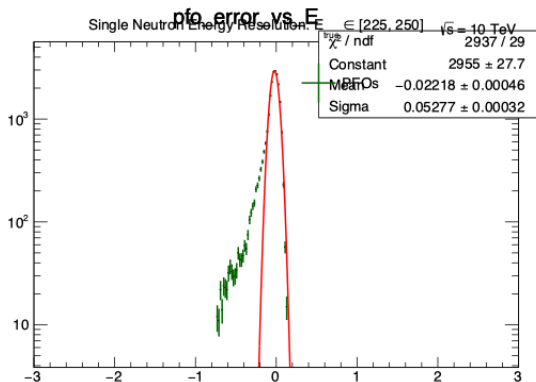
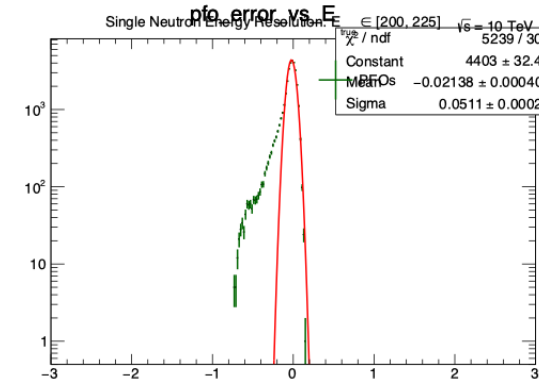
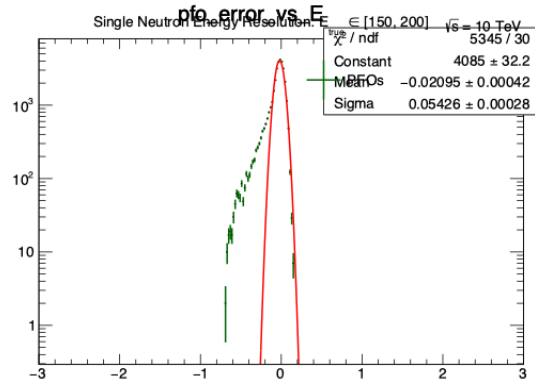
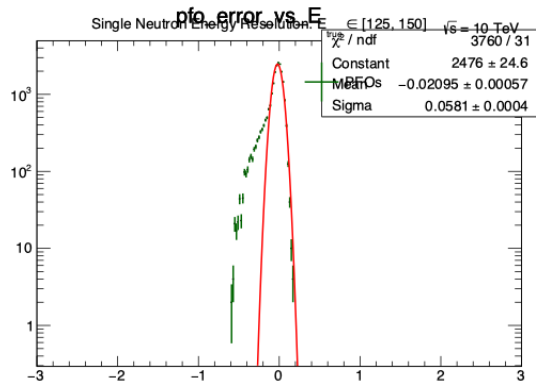
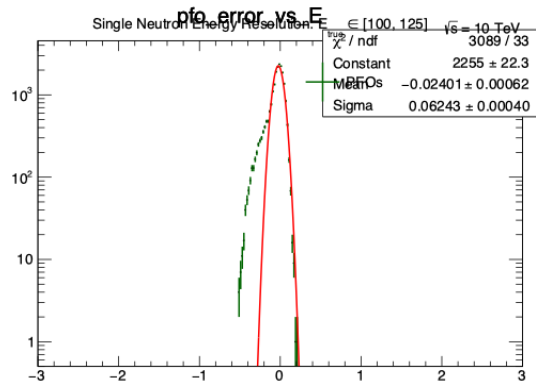
- The transition region has the most issues
 - It is even worse without BIB so there are some fake reconstructed neutrons in this region
- I could generate multiple theta plots over different energy bins to capture this if we like, or I could just use high energy neutrons
 - The issue here is low stats in this batch



Backup slides



BIB Energy subfits



noBIB Energy subfits