Jet and Heavy Flavor WG Summary

Olga & Brian

02/23/2024

Group Information and Contacts

❑ Mailing List: eic-projdet-jethf-l@lists.bnl.gov
    ❑ https://lists.bnl.gov/mailman/listinfo/eic-projdet-jethf-l

❑ Meeting Indico Pages: https://indico.bnl.gov/category/420/

❑ Wiki Page: https://wiki.bnl.gov/eic-project-detector/index.php/JetsHF

❑ Mattermost Chat: (sign-up link)
https://eic.cloud.mattermost.com/signup_user_complete/?id=i8gnmob4stdrpjfrezhegxs3ew

❑ Conveners
    ❑ Olga Evdokimov – evdolga@uic.edu
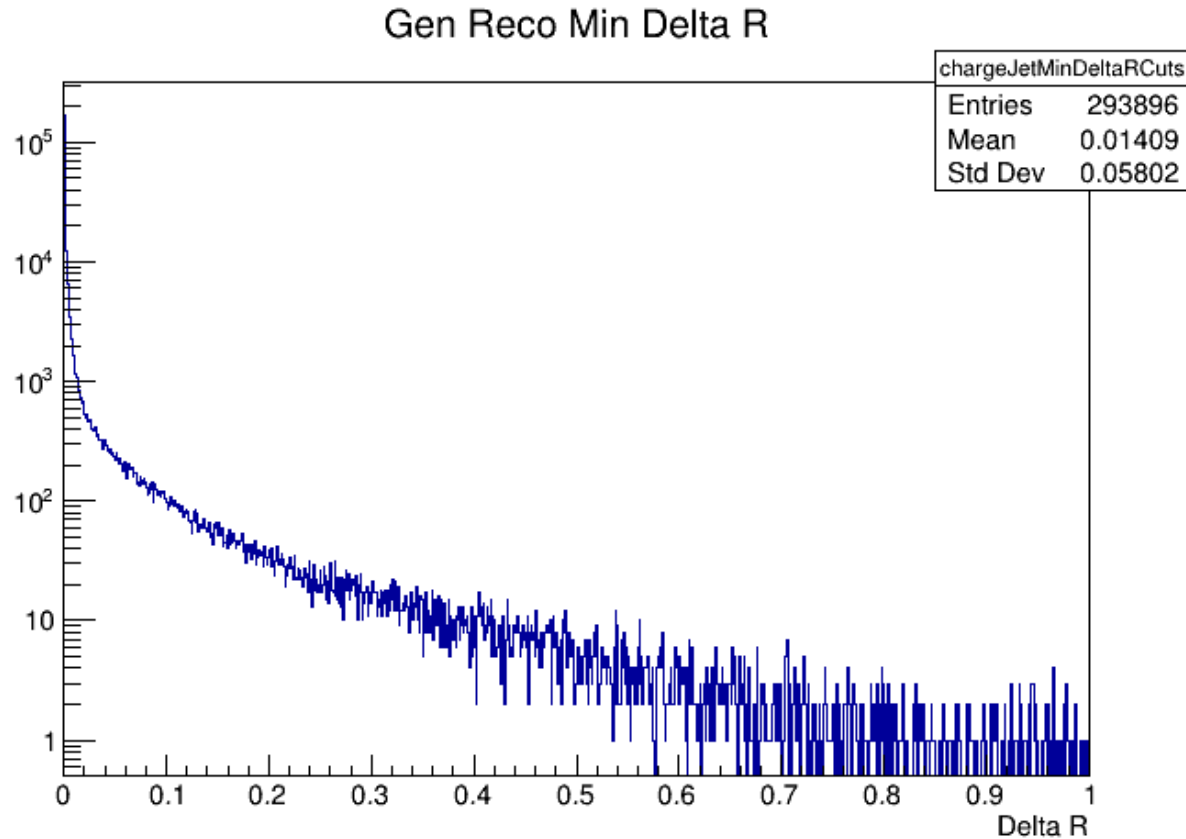   ❑ Brian Page – bpage@bnl.gov

❑ Meetings
   ❑ Wednesdays 12 pm time slot - Biweekly

Simulation Sets To-Dos

❑ Simulation sets needed for the TDR were discussed at the joint S&C and Analysis meeting on Feb 14

➤ A filtered D0 sample was the only additional request from Jets and HF

❑ Several To-Dos were also discussed:

➤ Ensure D0 sample steering file is consistent with nominal DIS samples
  o Needs to be done

➤ Verify beam effects settings are still valid
  o Elke believes current settings should still be accurate

➤ Decide how to handle Pythia8 sample with Q2 between 1 and 10
  o Will have a broader discussion about Pythia 6 vs 8 at a future meeting

Jet Performance TDR Plots: Gen-Reoc Association

Gen Reco Min Delta R

chargeJetMinDeltaRCuts	
Entries	293896
Mean	0.01409
Std Dev	0.05802

Jet Constituent Diff Vs Min Delta R

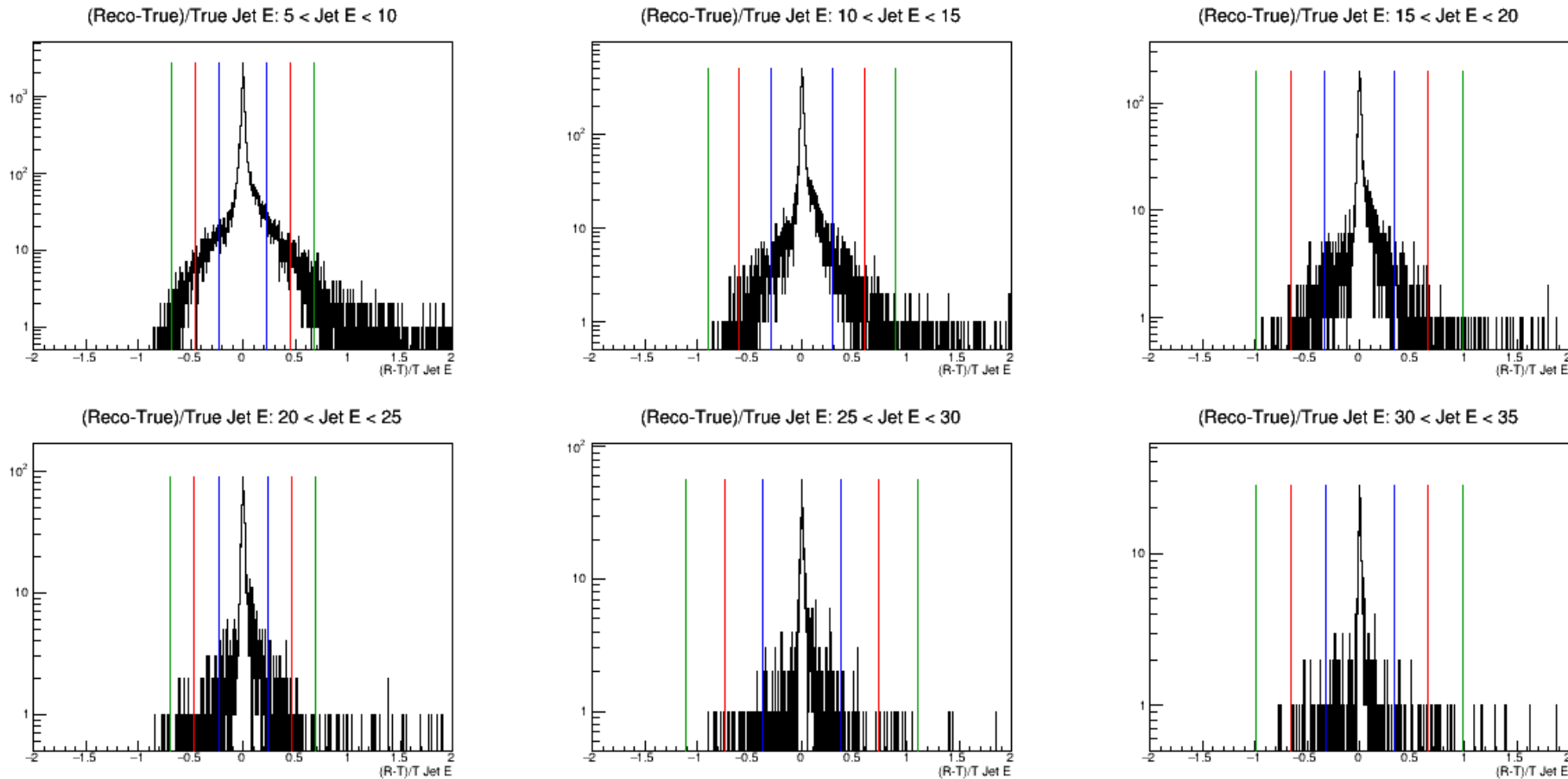| chargeJetConsDiffVsMinDeltaRCuts	
Entries	293896
Mean x	0.01409
Mean y	0.4588
Std Dev x	0.05802
Std Dev y	0.4859

- ❑ Need to define the association between generated and reconstructed jets – choose a delta R of 0.25 for now

- ❑ To-Do: look into effects of varying this parameter
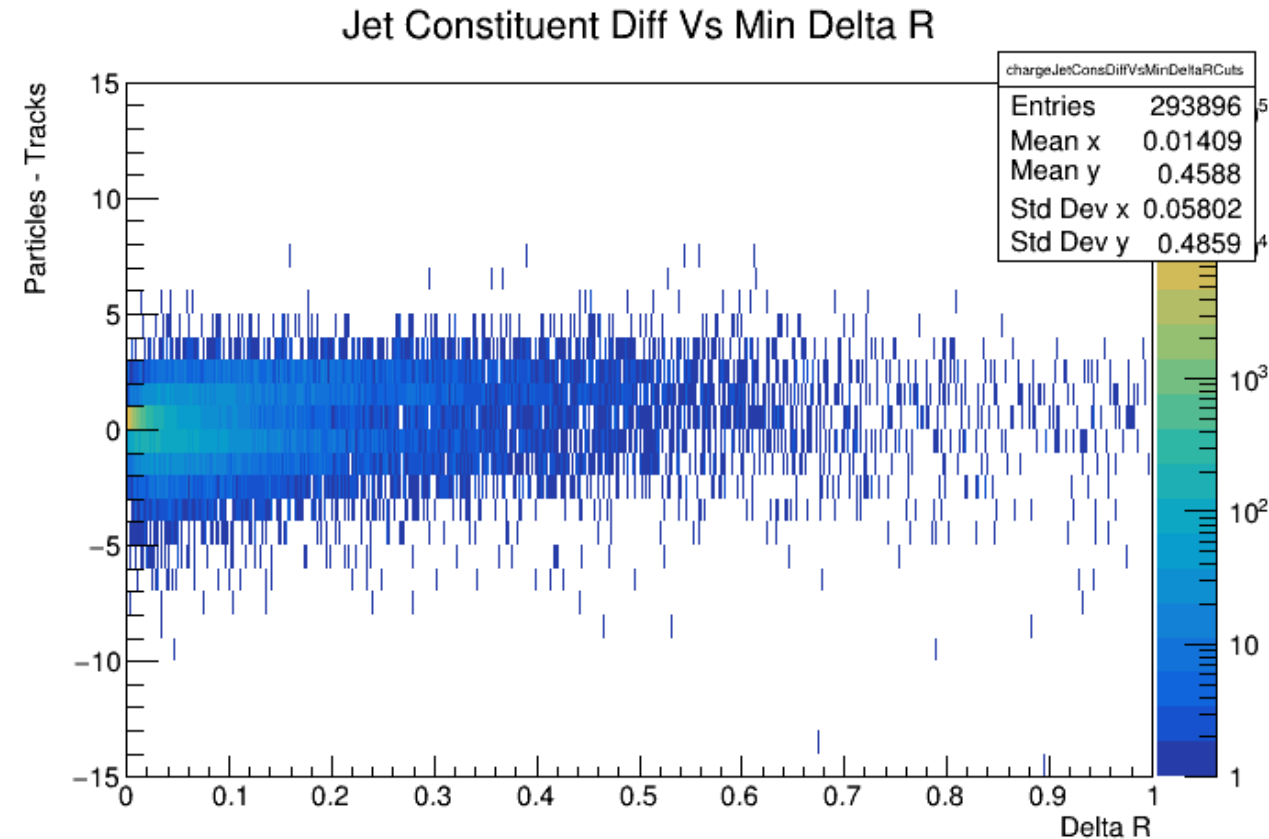
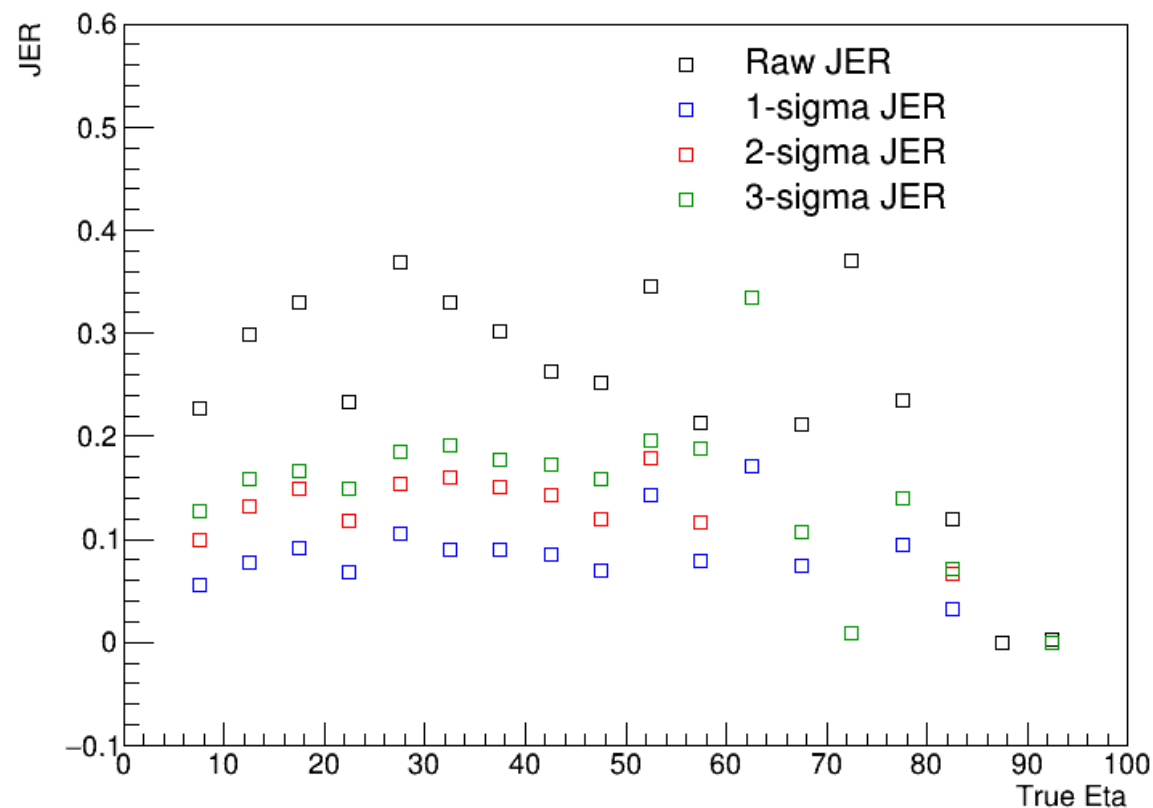# Jet Performance TDR Plots: Characterizing Tails

- ❑ Define JES and JER as mean and RMS of distribution over some truncated range

- ❑ Find RMS of full distribution and define truncated range as 1, 2, or 3 times RMS centered around the bin with the larges value

- ❑ Recalculate mean and RMS within this range

Jet Performance TDR Plots: Characterizing Tails

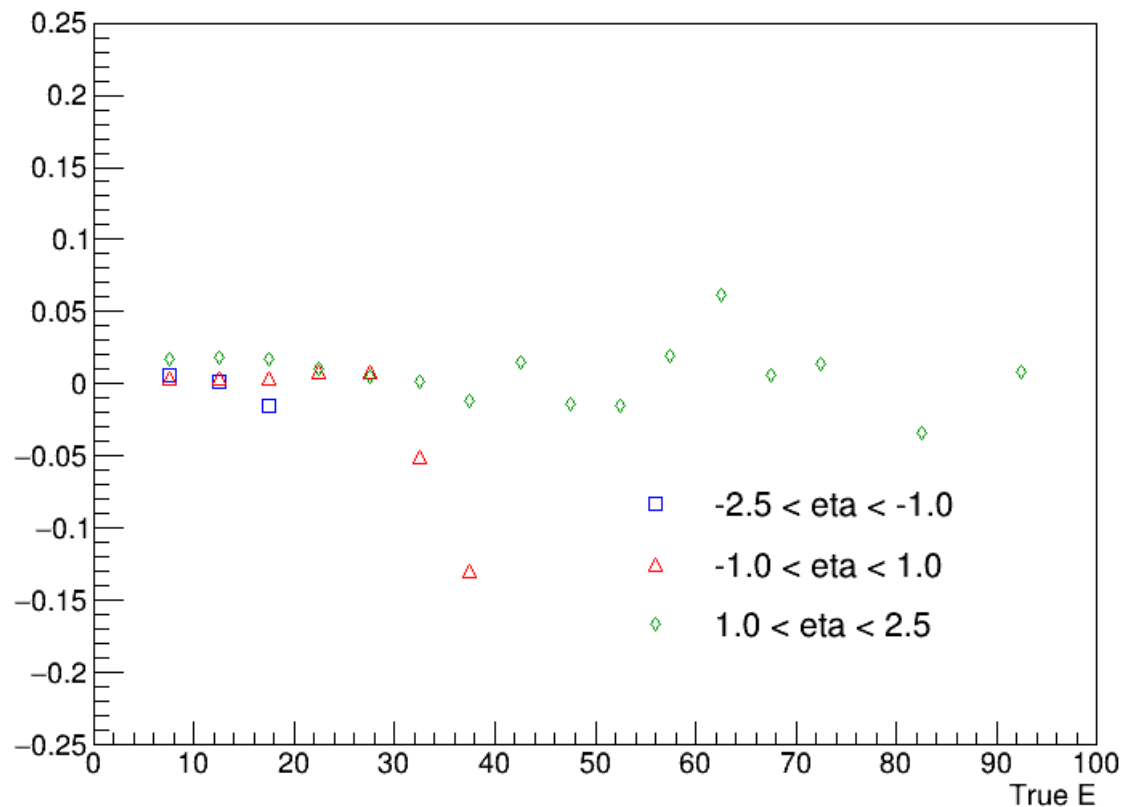## Jet Energy Scale Sigma Comp Vs Eta

Legend: Raw JES, 1-sigma JES, 2-sigma JES, 3-sigma JES
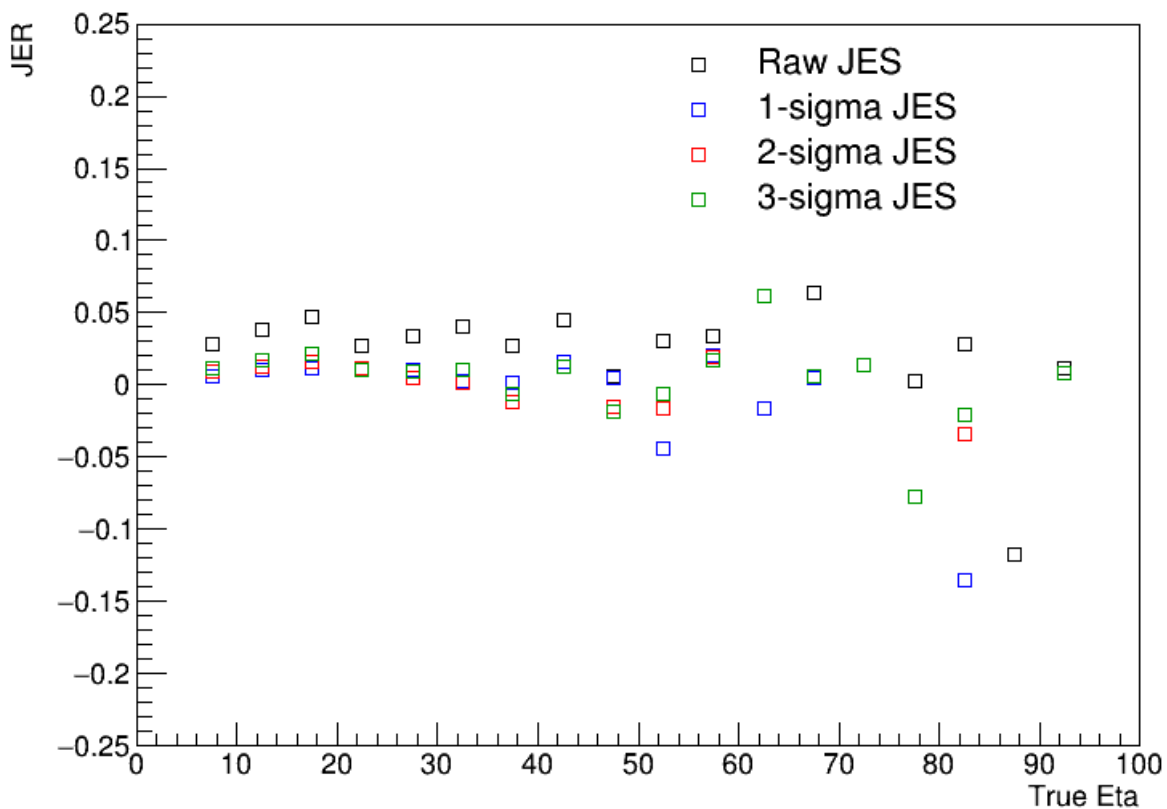
Jet Energy Resolution Sigma Comp Vs Eta

Legend: Raw JER, 1-sigma JER, 2-sigma JER, 3-sigma JER

❑ See effect of different n*RMS truncations on JES and JER

❑ JER more sensitive to this choice

❑ Use 2*RMS for now

Jet Performance TDR Plots: Money Plots
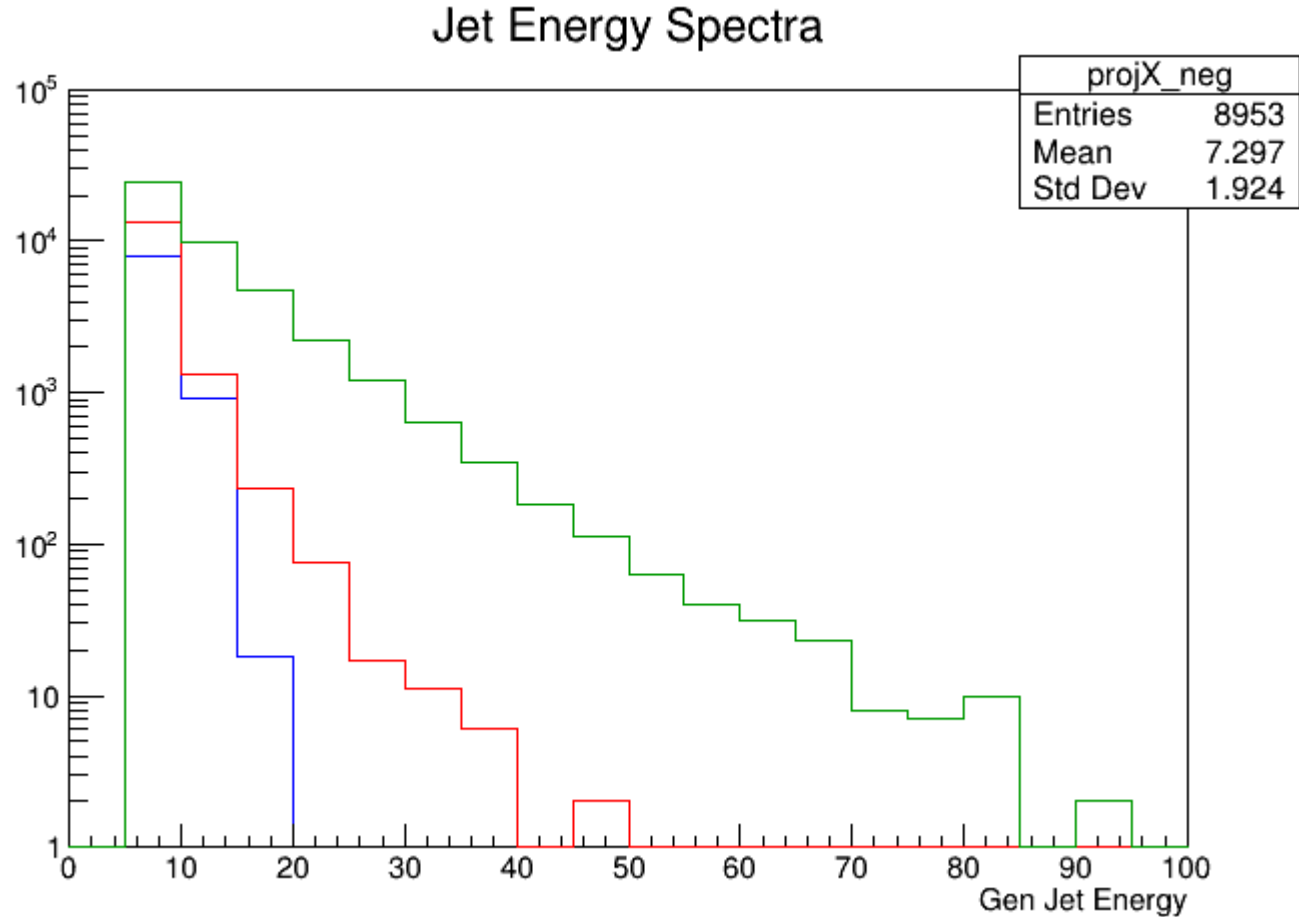
Jet Energy Scale

Jet Energy Resolution

❑ Money plots are JES and JER as a function of energy for different jet eta bins
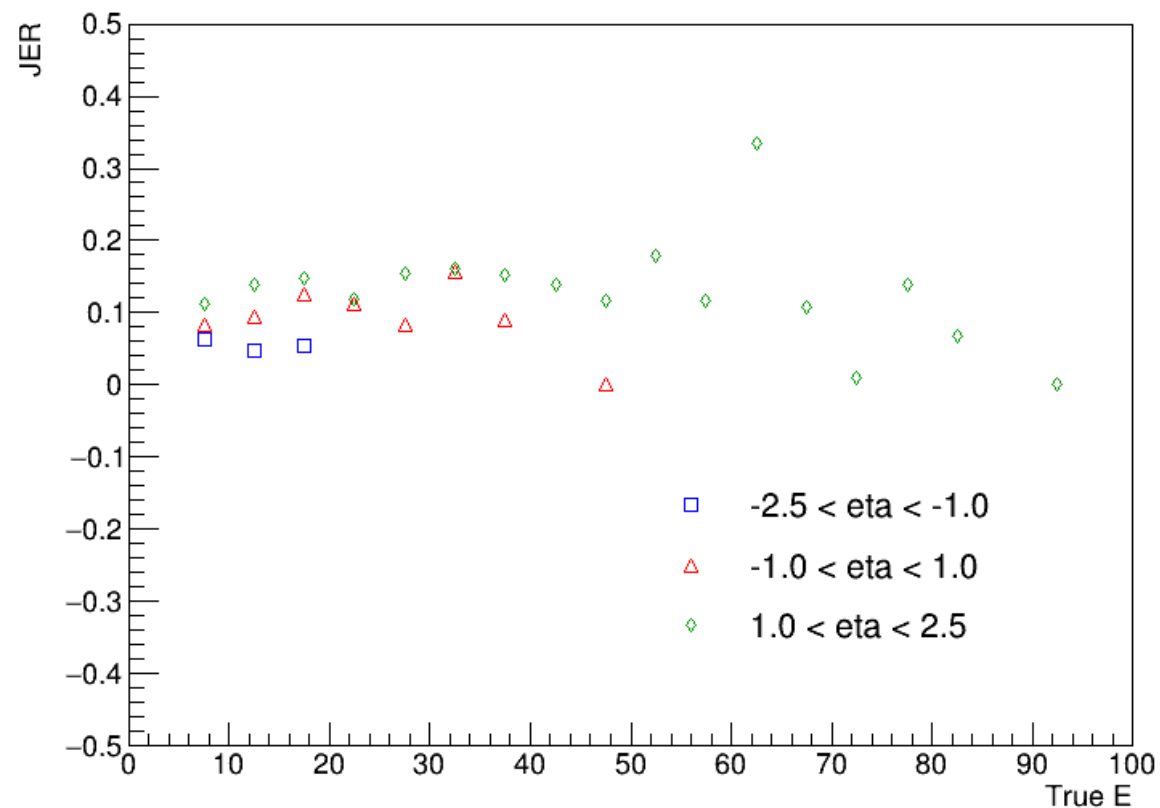
Jet Performance TDR Plots: Statistics

Jet Energy Spectra

projX_neg	
Entries	8953
Mean	7.297
Std Dev	1.924

- ❑ Statistics for money plots

- ❑ Only 500 files from the 18x275 Q2 > 10 NC DIS sample from December campaign