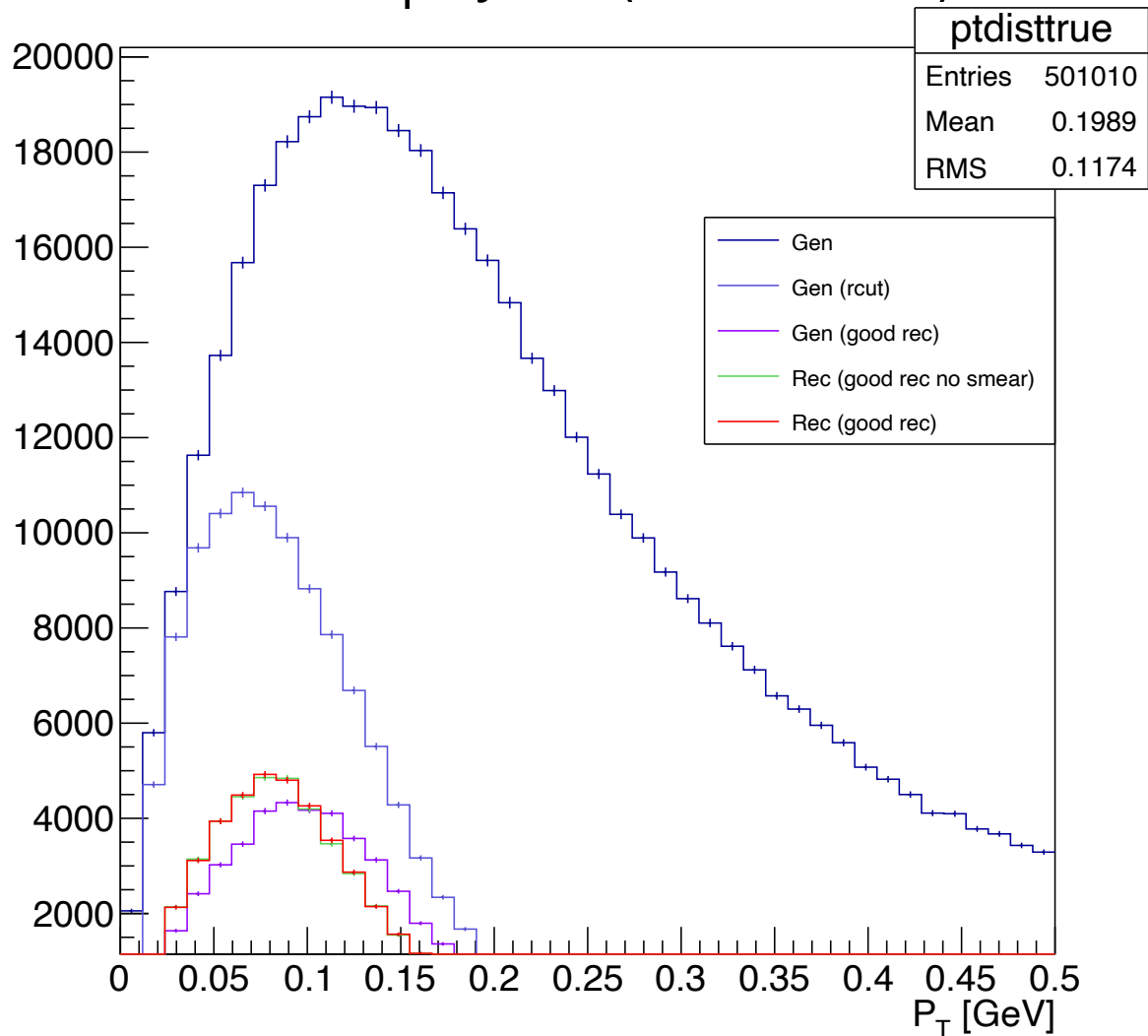


**Monte Carlo Variables**  
**2020-05-13**  
**RadLab Group Meeting**  
**Benard Mulilo**

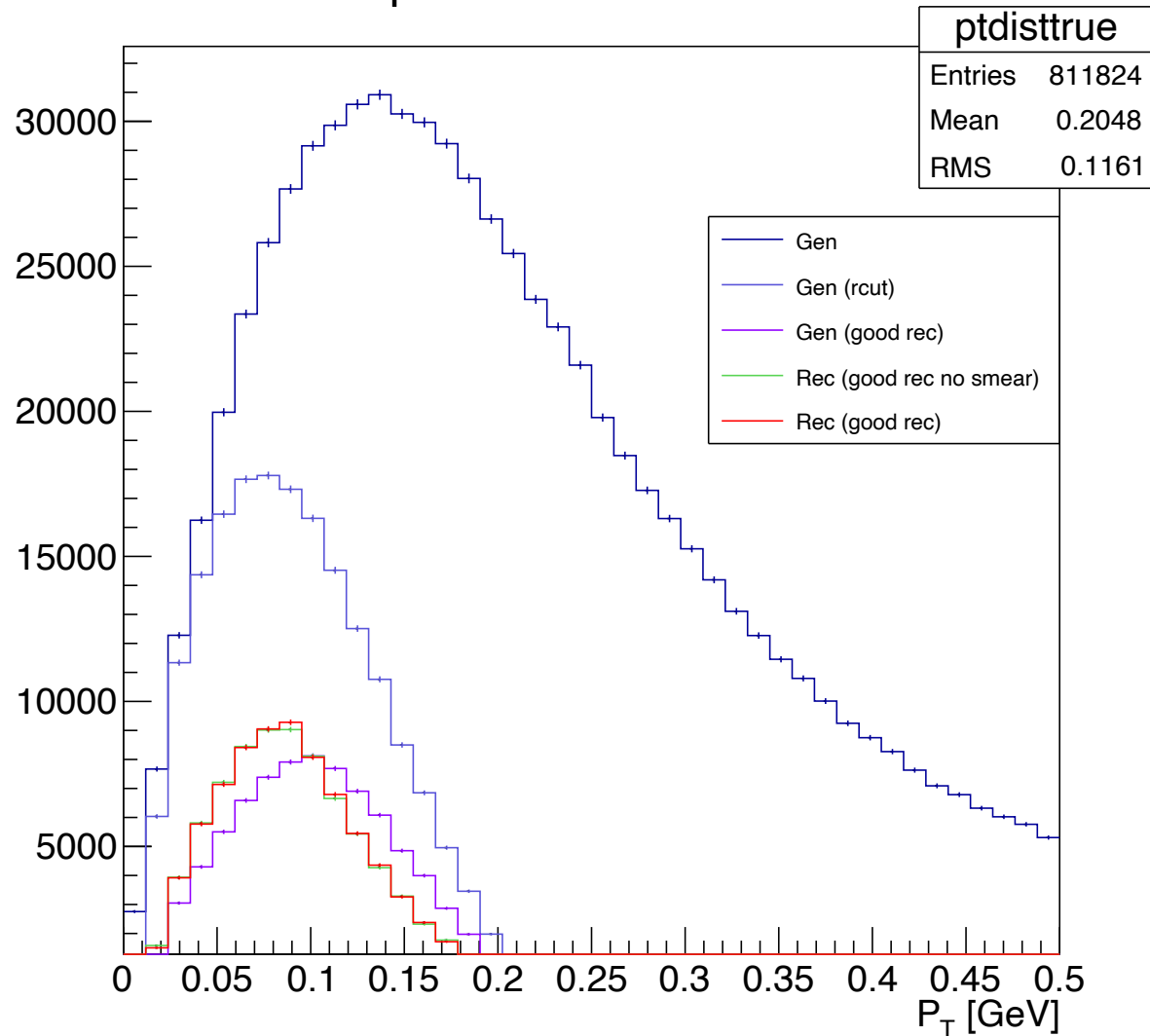
OLD MC

True  $P_T$  Pythia (all neutrons)



PYTHIA

True  $P_T$  pythiacs (all neutrons)



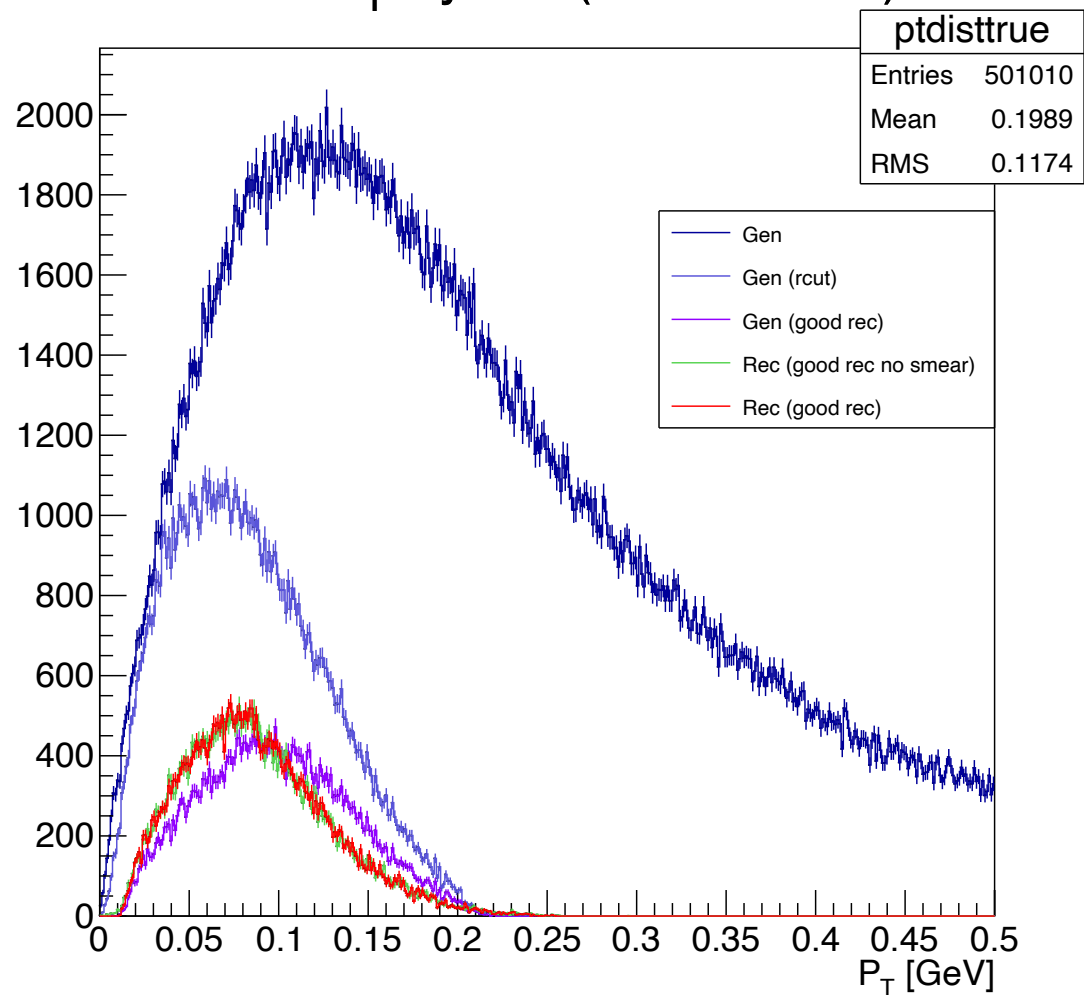
NEW MC

OLD MC

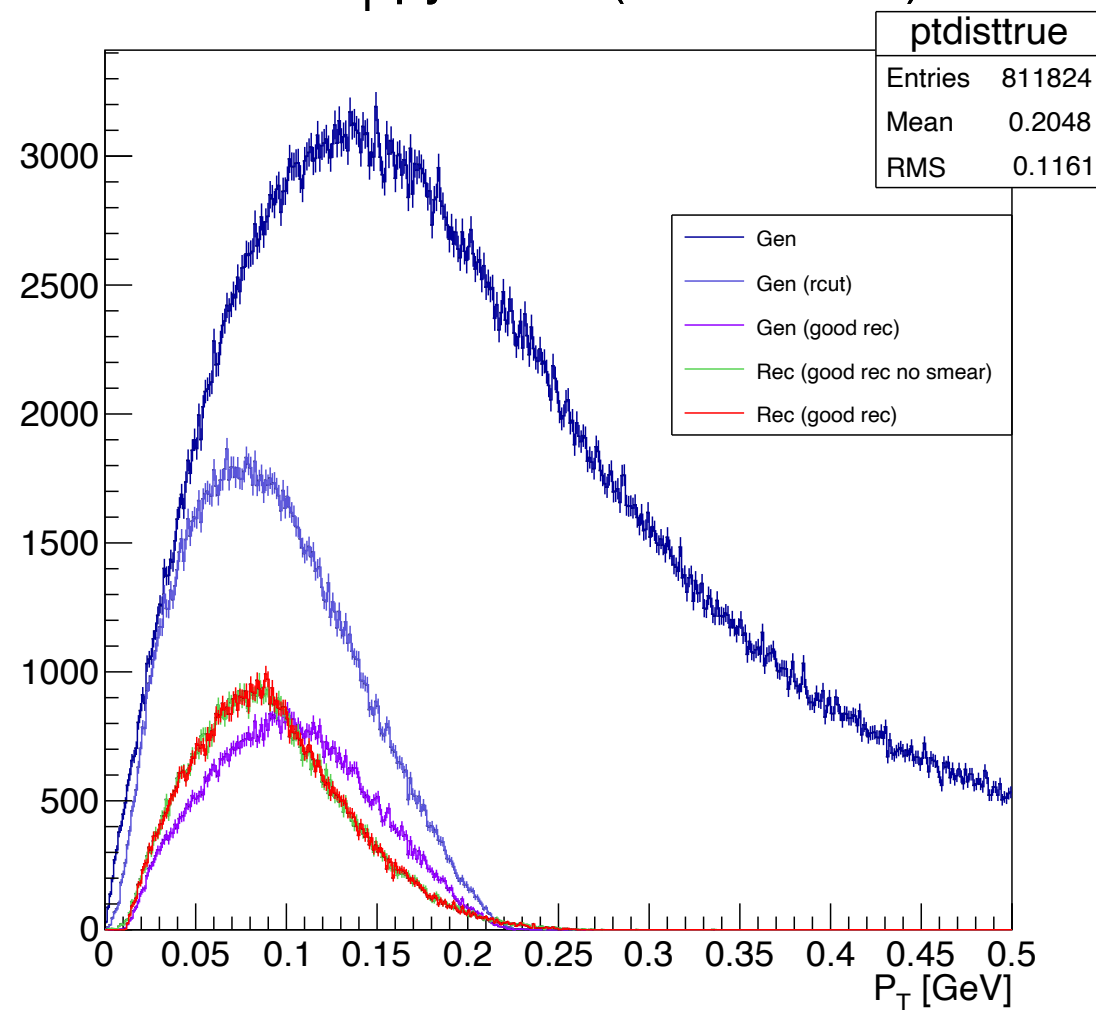
PYTHIA

NEW MC

True  $P_T$  Pythia (all neutrons)



True  $P_T$  pythiacs (all neutrons)

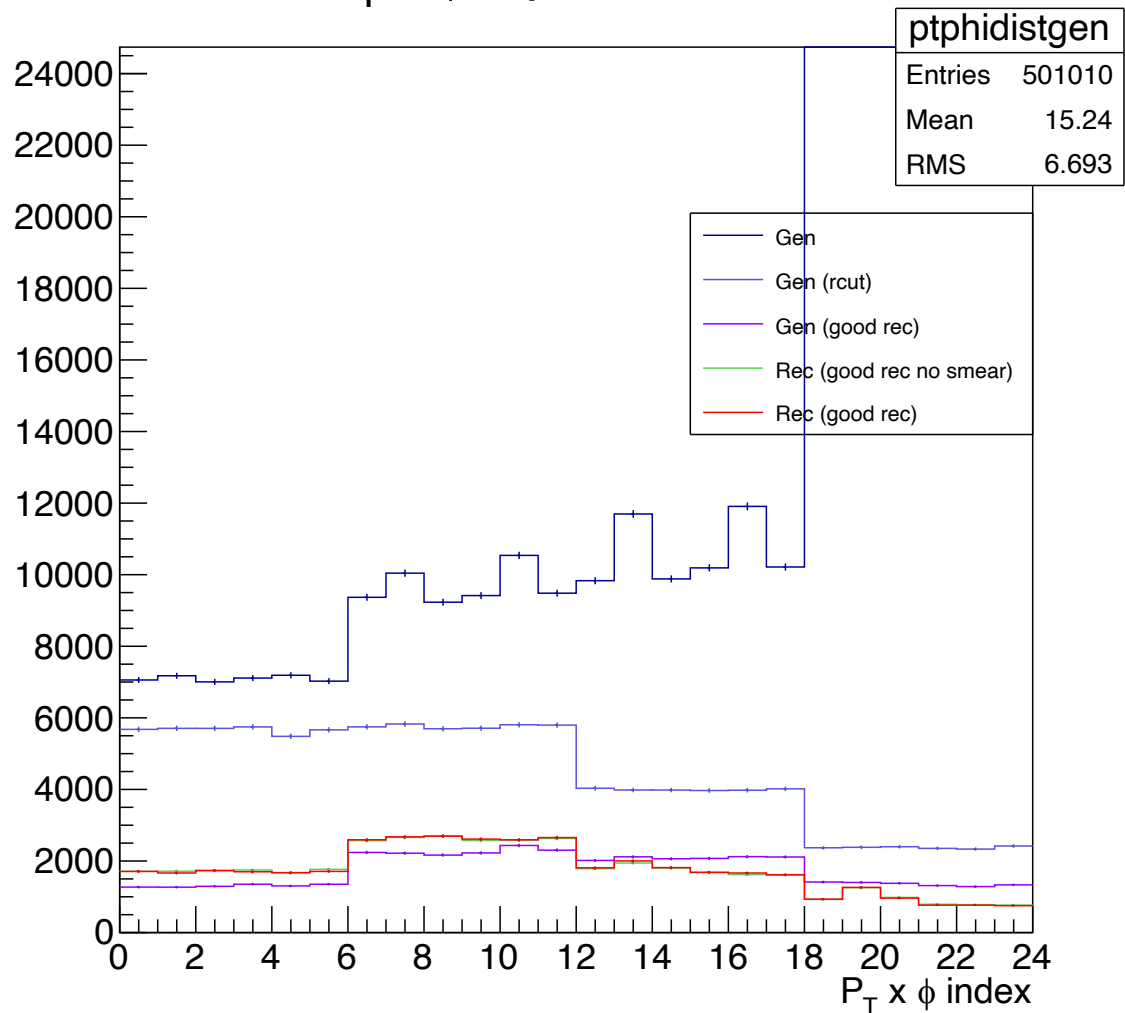


OLD MC

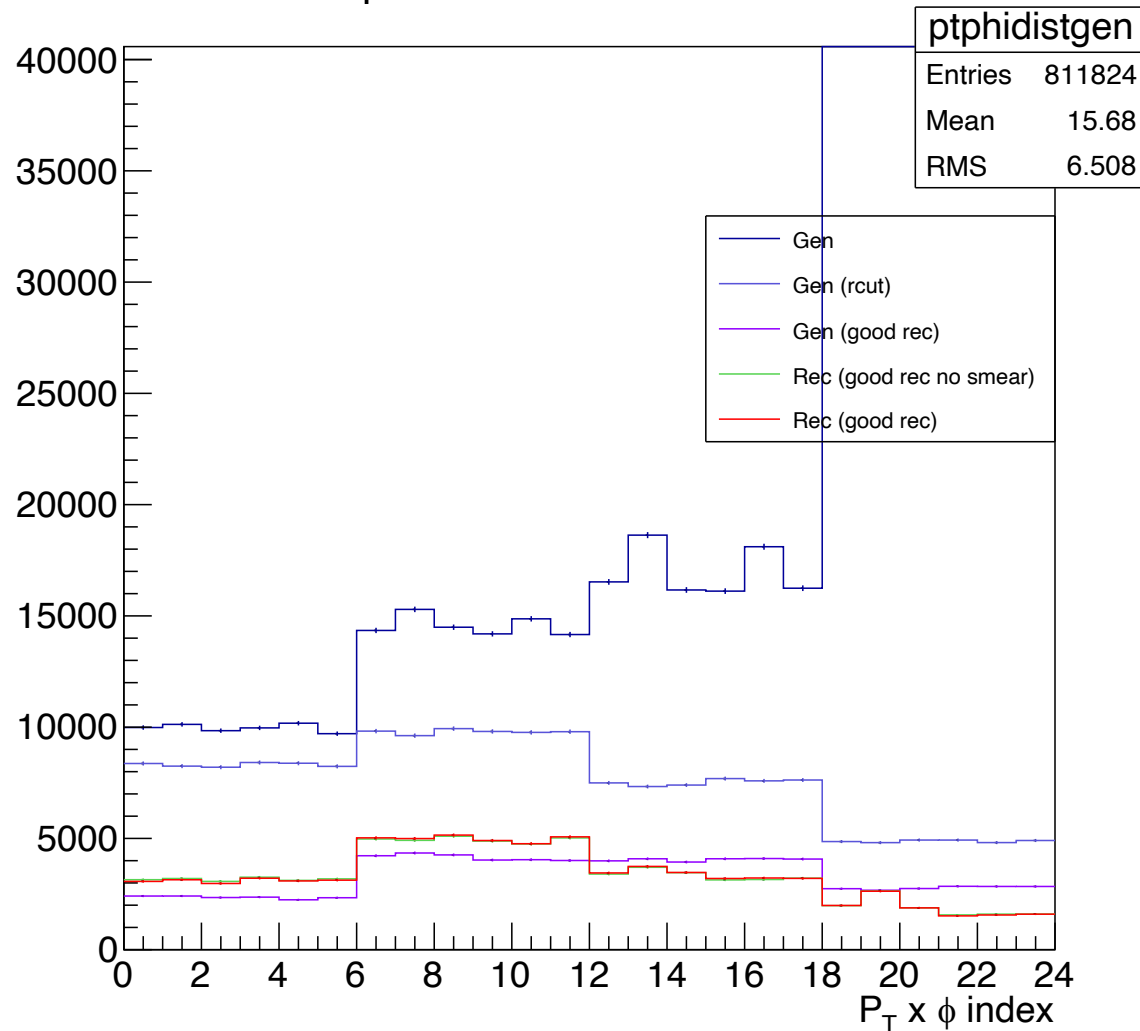
PYTHIA (Old binning)

NEW MC

True  $P_T \times \phi$  Pythia (all neutrons)

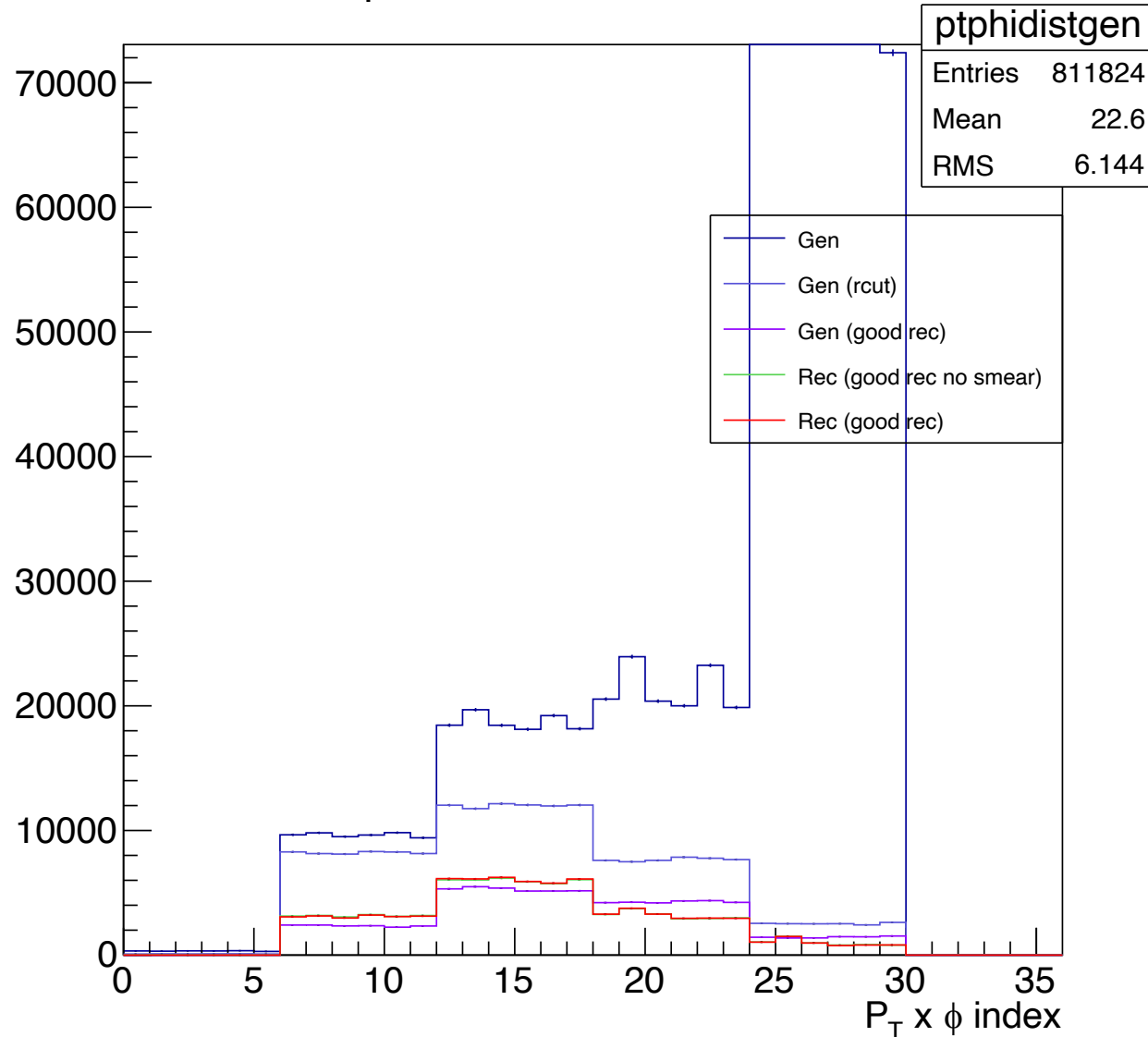


True  $P_T \times \phi$  pythiacs (all neutrons)



# PYTHIA

True  $P_T \times \phi$  pythiacs (all neutrons)



PYTHIA (Old binning)

New binning:

0.01, 0.06, 0.11, 0.16, 0.21

**0.0**, 0.01, 0.06, 0.11, 0.16, 0.21, **0.4**

Outer bins 0.0 and 0.4 to be included in the unfolding only

Plot not well reproduced yet binning not well adjusted.

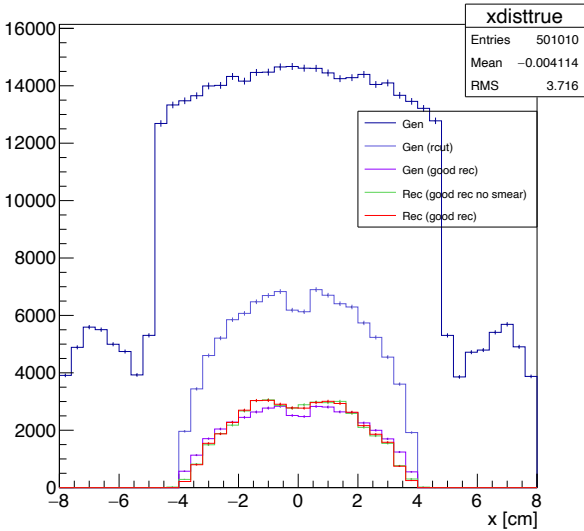
Need to use variable binning instead of fixed binning.

# PYTHIA

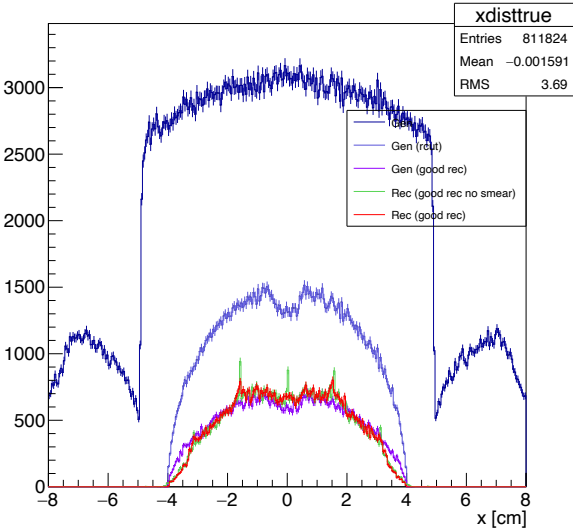
OLD MC

NEW MC

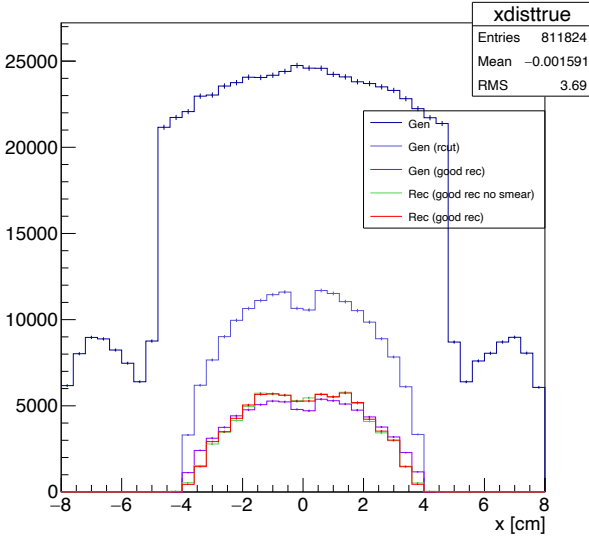
True x Pythia (all neutrons)



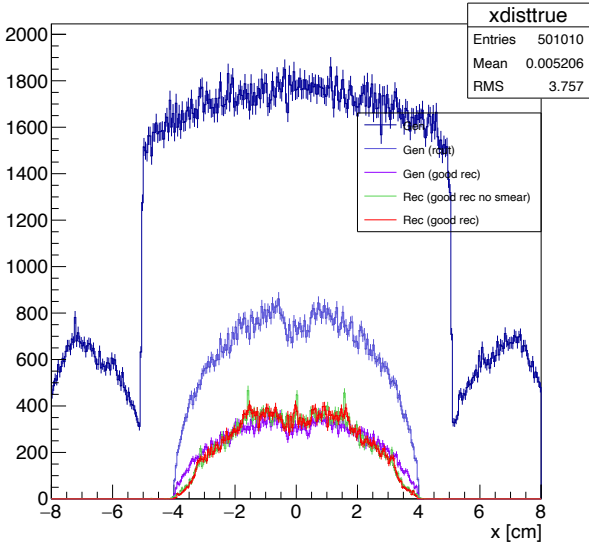
True x pythiacs (all neutrons)



True x pythiacs (all neutrons)



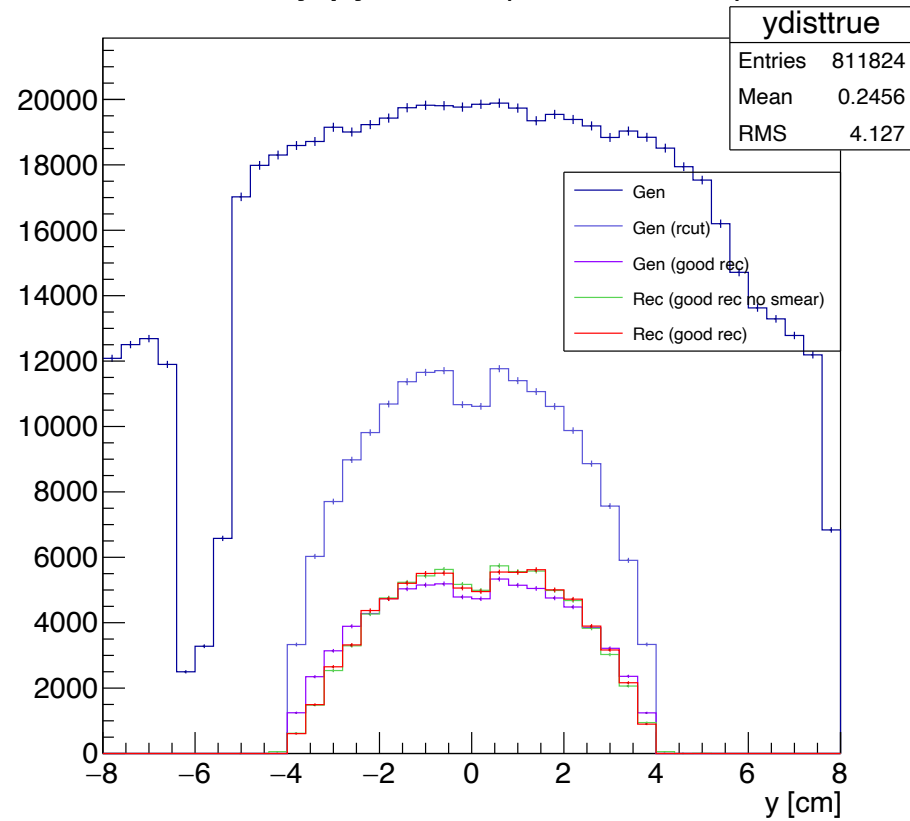
True x Pythia (all neutrons)



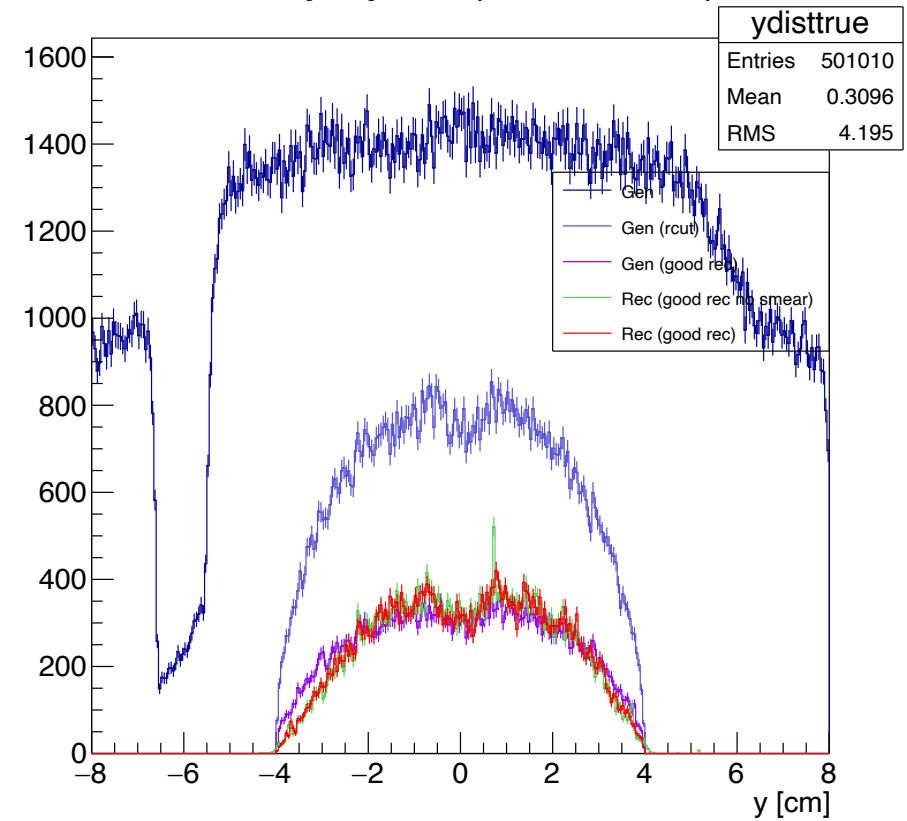
# PYTHIA

## NEW MC

True y pythiacs (all neutrons)



True y Pythia (all neutrons)

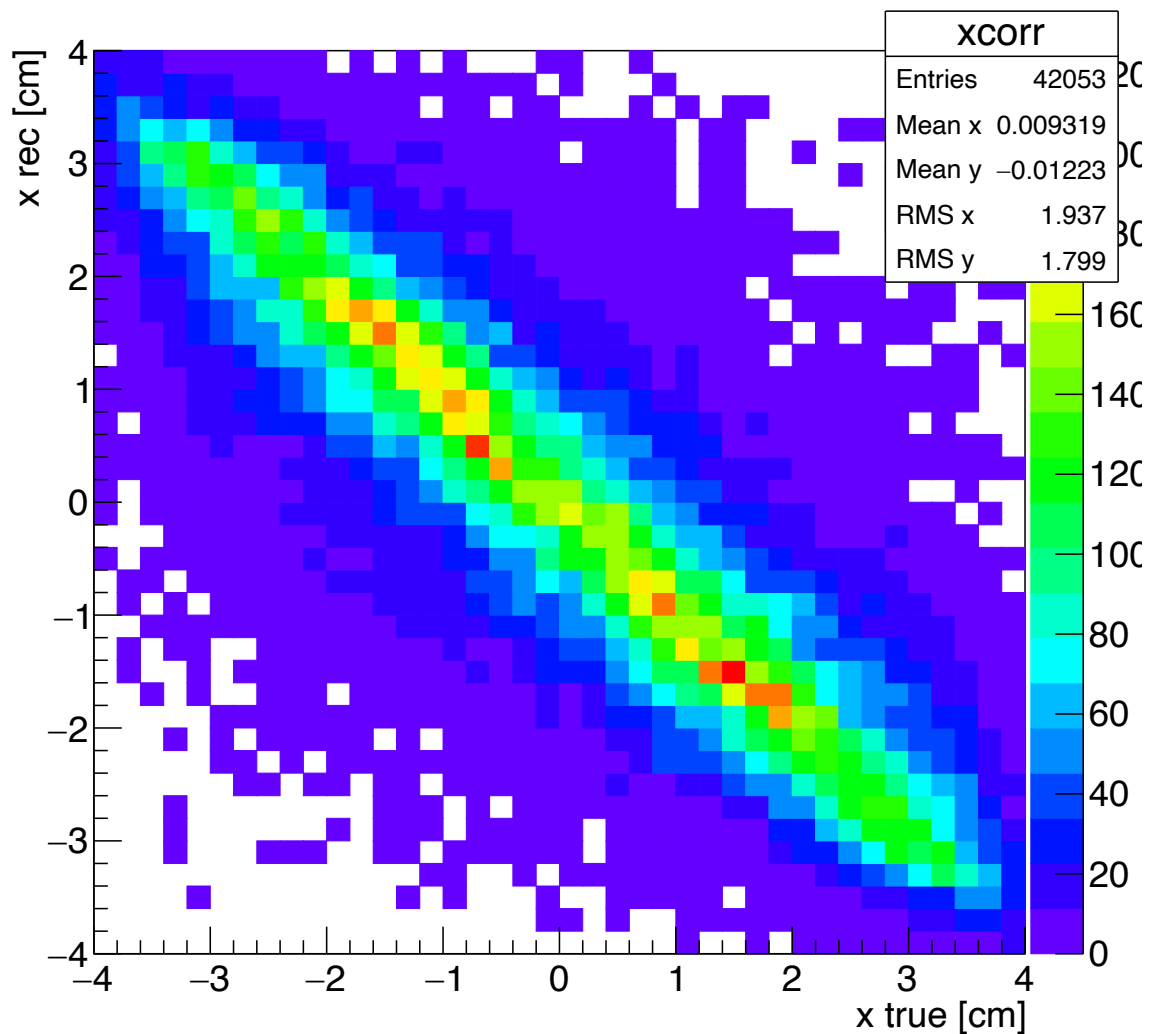


# OLD MC

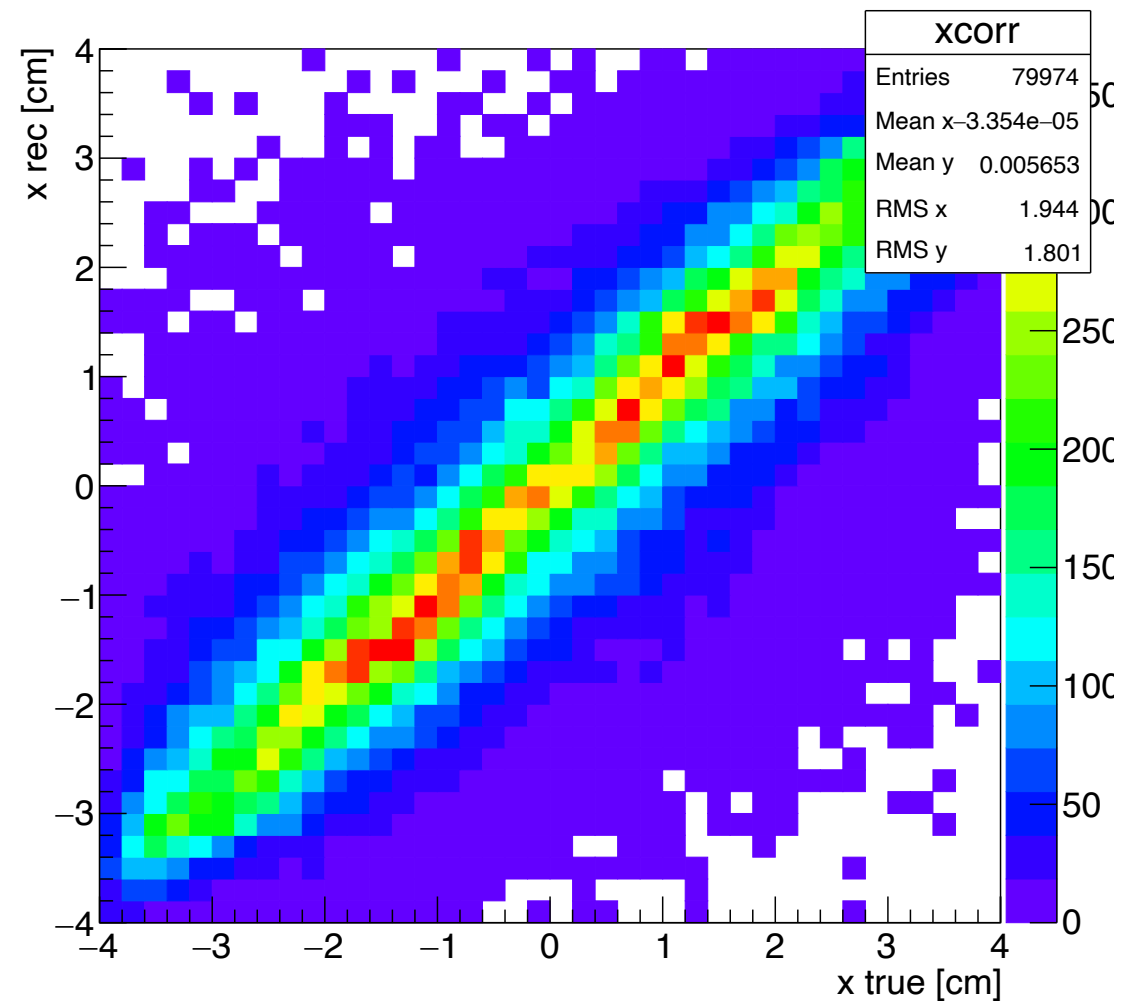
# PYTHIA

# NEW MC

True x vs Reco x (for good neutrons) Pythia



True x vs Reco x (for good neutrons) pythiacs



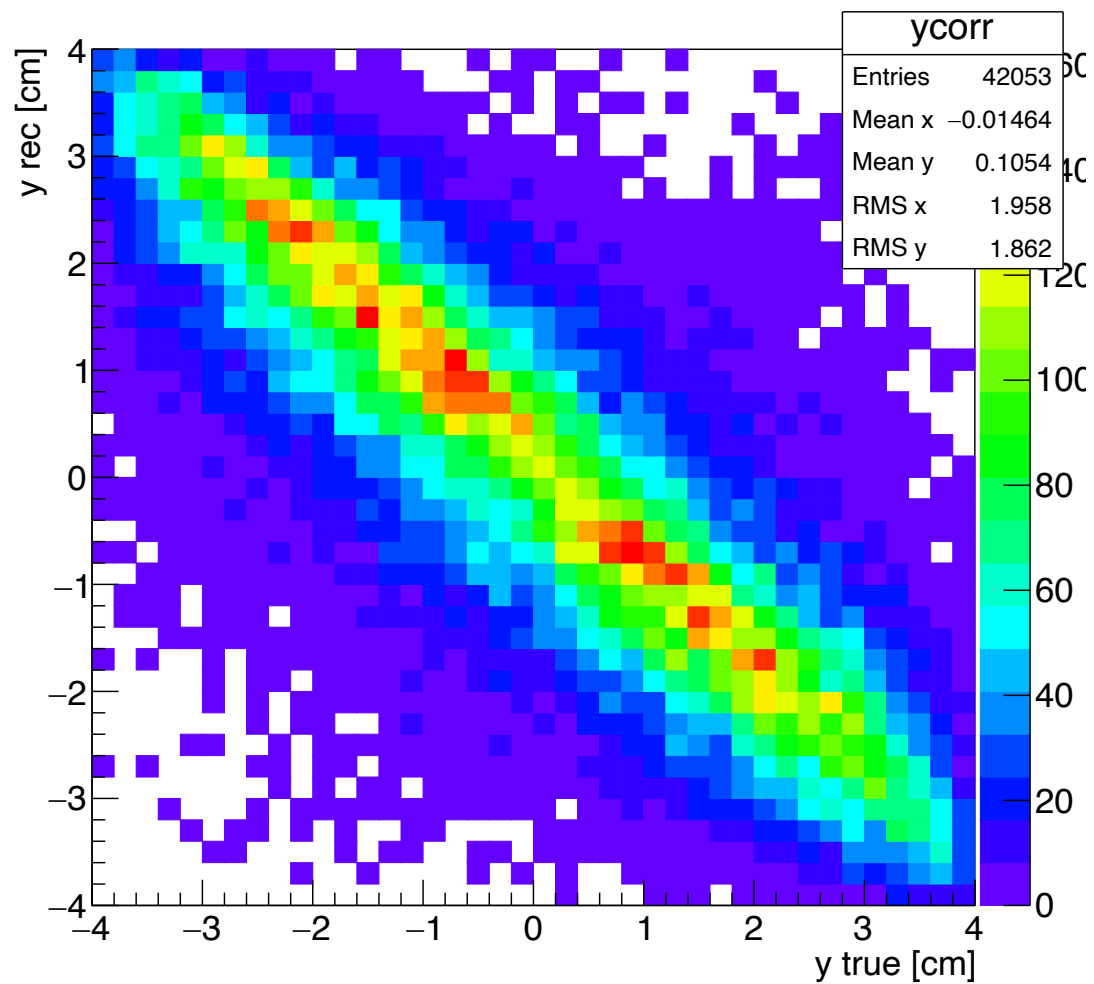


# OLD MC

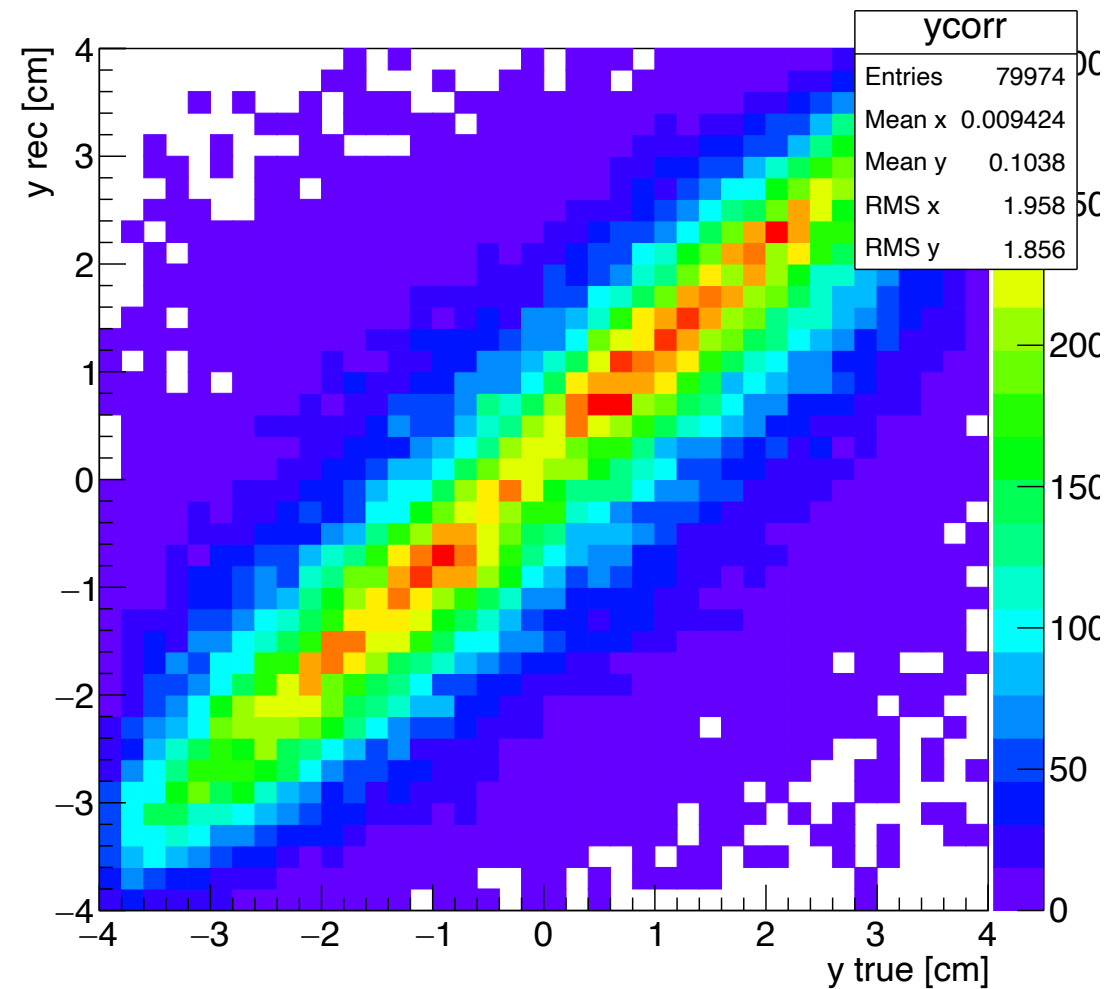
# PYTHIA

# NEW MC

True y vs Reco y (for good neutrons) Pythia



True y vs Reco y (for good neutrons) pythiacs



## Summary:

- For the pt in phi, trying to fix binning problem from fixed to variable binning
- X[ipart] variable (no noise) still shows some spikes with  $> 1$  nsmd cut when fine binning is used but spikes disappear with course binning.
- Need to flip the coordinate signs for the old monte carlo when I use new code.