

# $\phi$ -meson update

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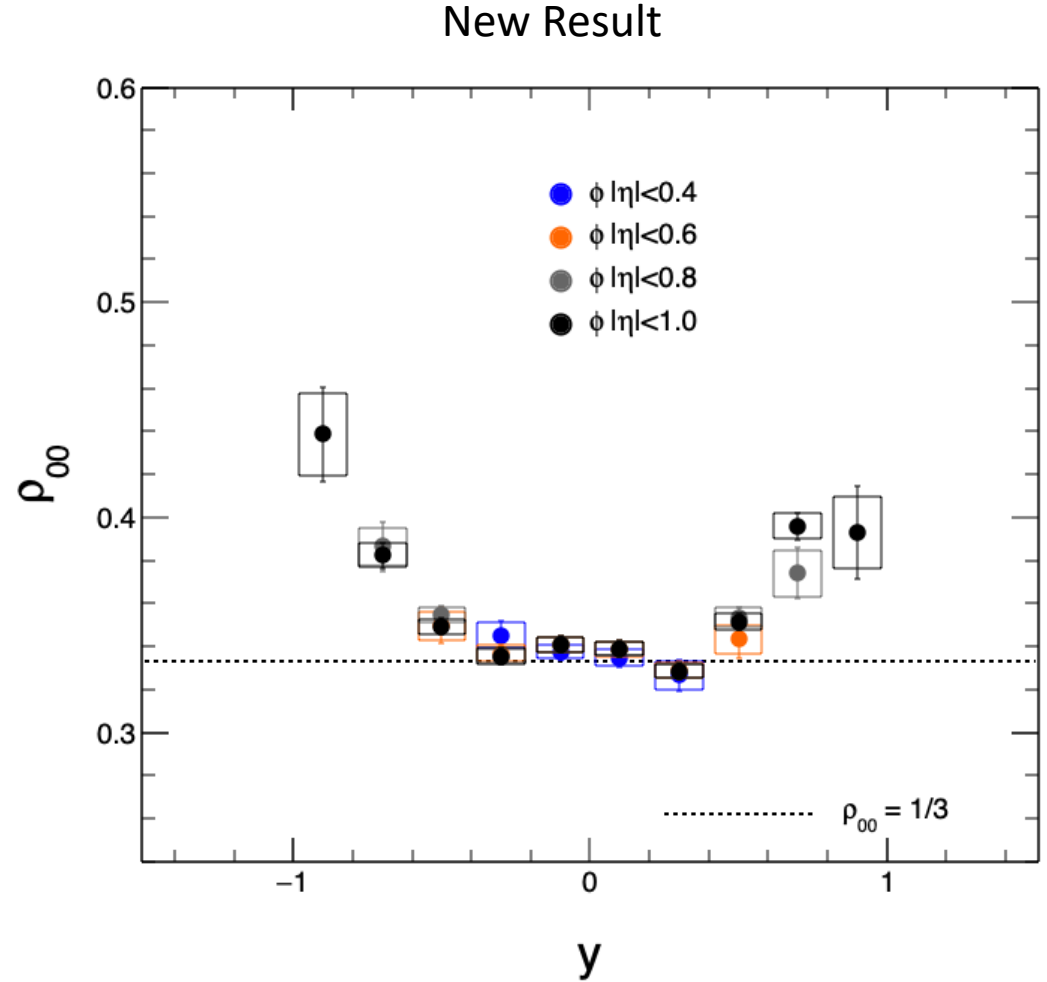
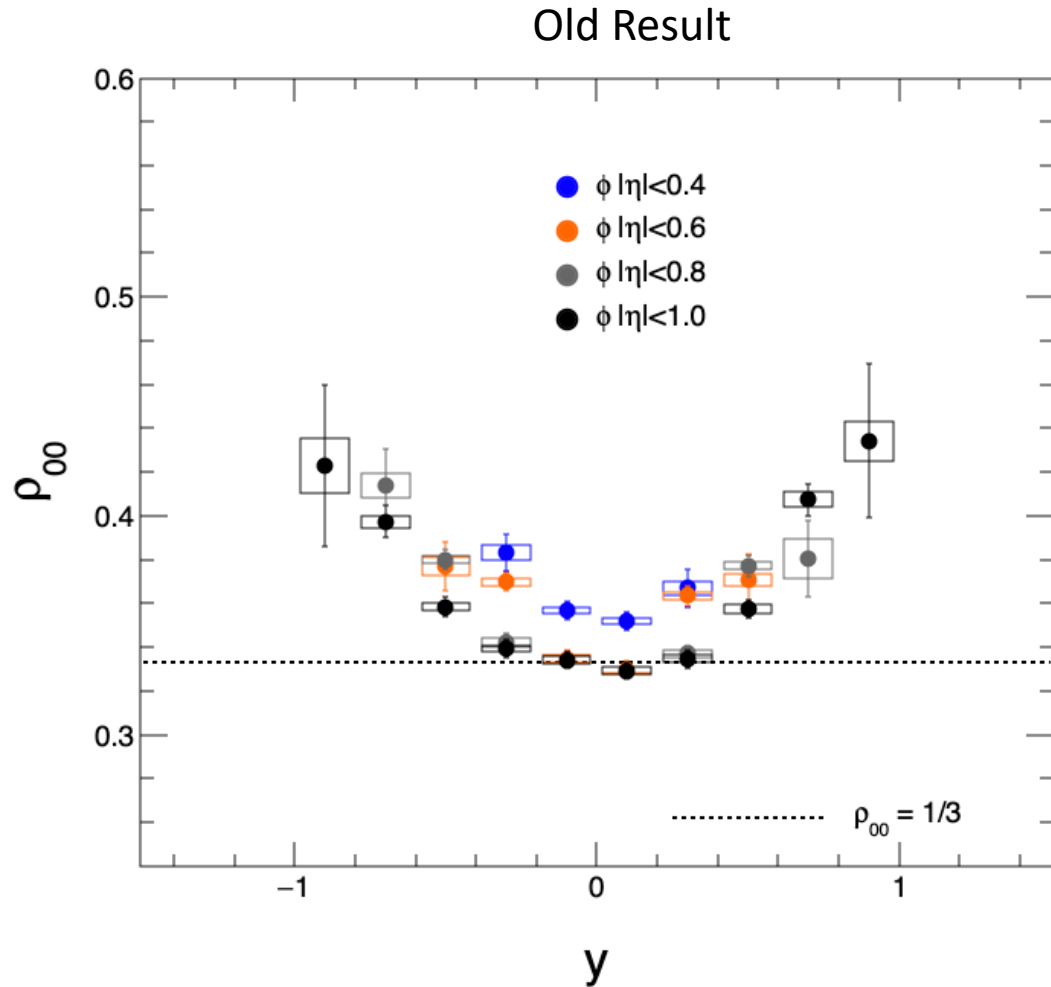
# Updates

- There was an issue in the centrality and rapidity dependent studies, where in some parts of the code, the pT bin was shifted.
  - difference between “<” and “<=”.
- When looking at yield weighted averages of rapidity dependence the results did not agree, I think I was using the yield after efficiency and acceptance was applied to the distributions.
  - Caused edge rapidity bins with high  $\rho_{00}$  to contribute more to the integrated value.
  - Swapped to statistical error weighting for now, since it was easiest to implement in short amount of time.
- After these mistakes were corrected, we finally see agreement between centrality and rapidity dependent minbias results!
- There does appear to be a rapidity dependence which is reflected in the centrality and pT dependent studies.

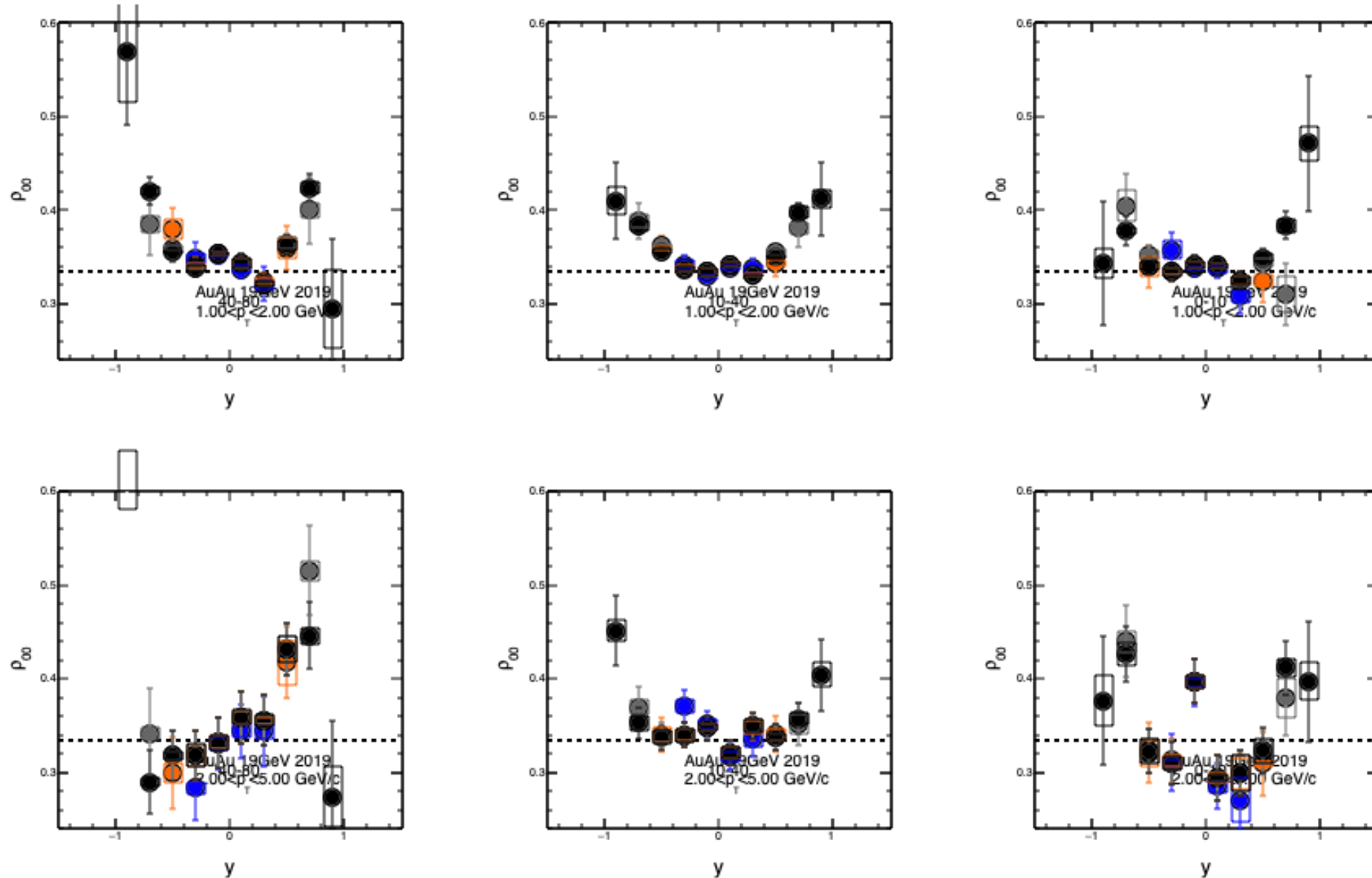
# Current methods

- Use published pT spectra and  $v_2$  in simulation.
- Smear EP according to known 2<sup>nd</sup> order EP in simulation and use this smeared EP to calculate  $|\cos\theta^*|$ .
- Combine acceptance+efficiency and treat this as an overall efficiency.
- Then perform EP Resolution Correction.
- Statistical weighted values for any integrated value.

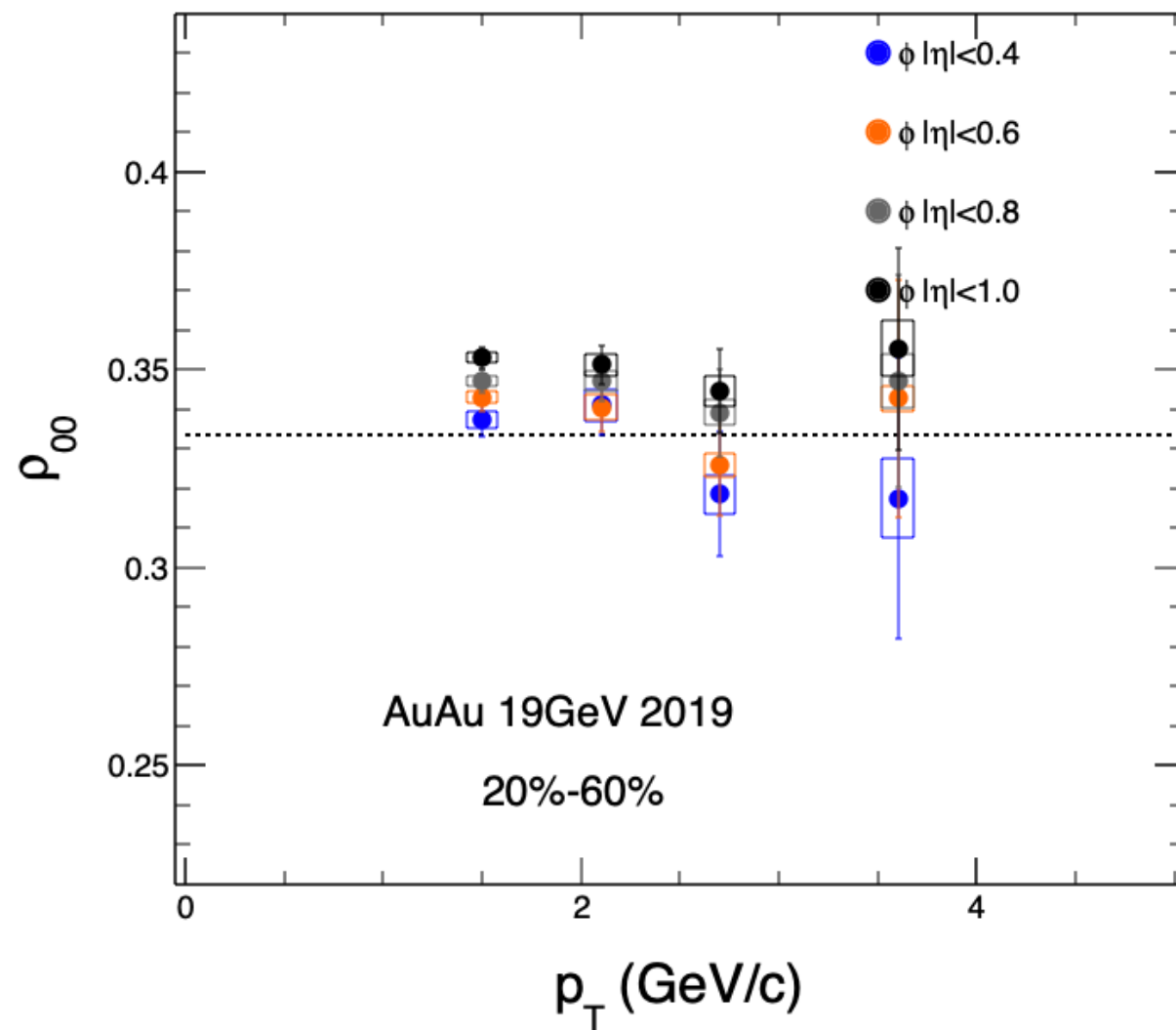
# Rapidity Dependence



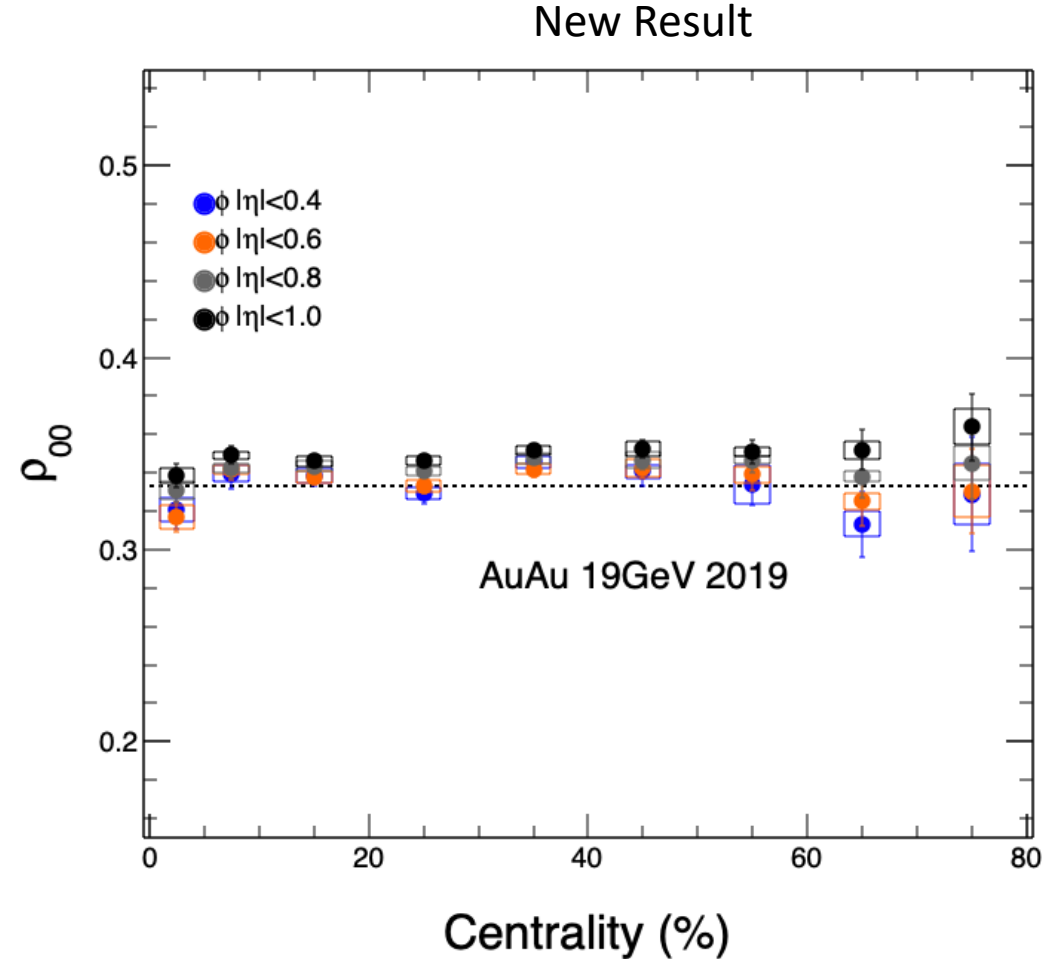
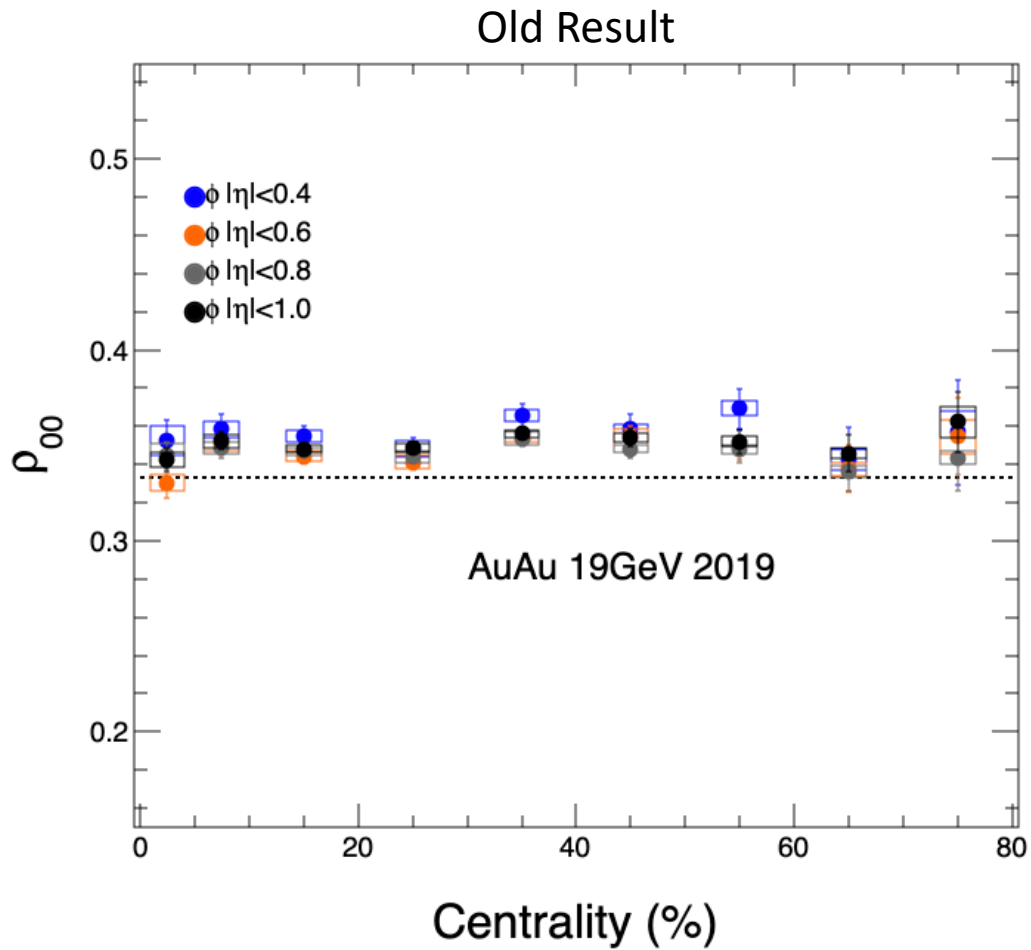
# Rapidity Dependence



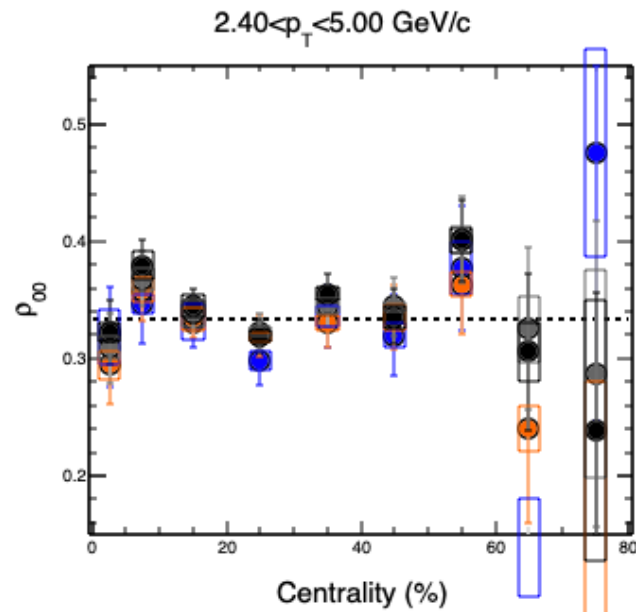
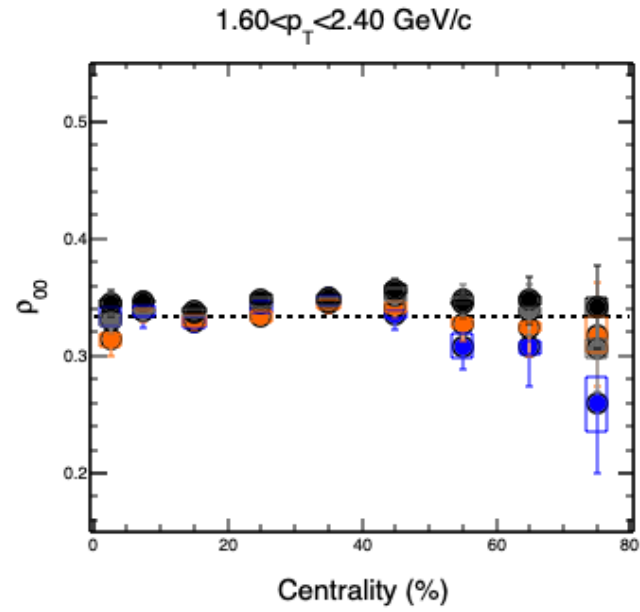
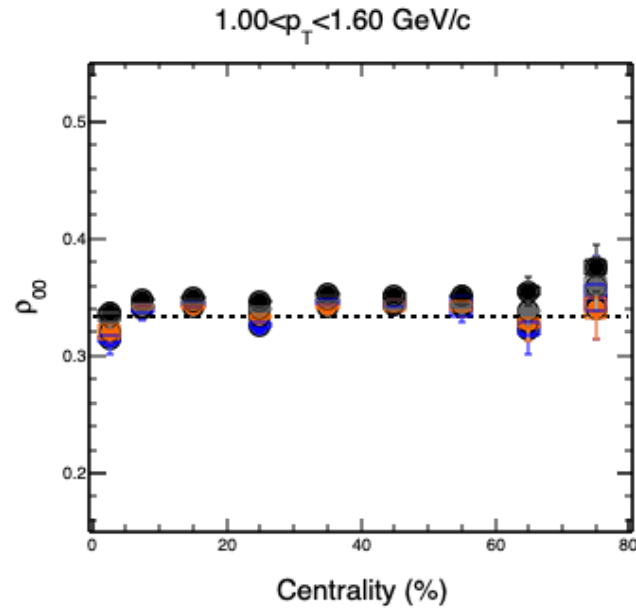
# pT Dependence



# Centrality Dependence



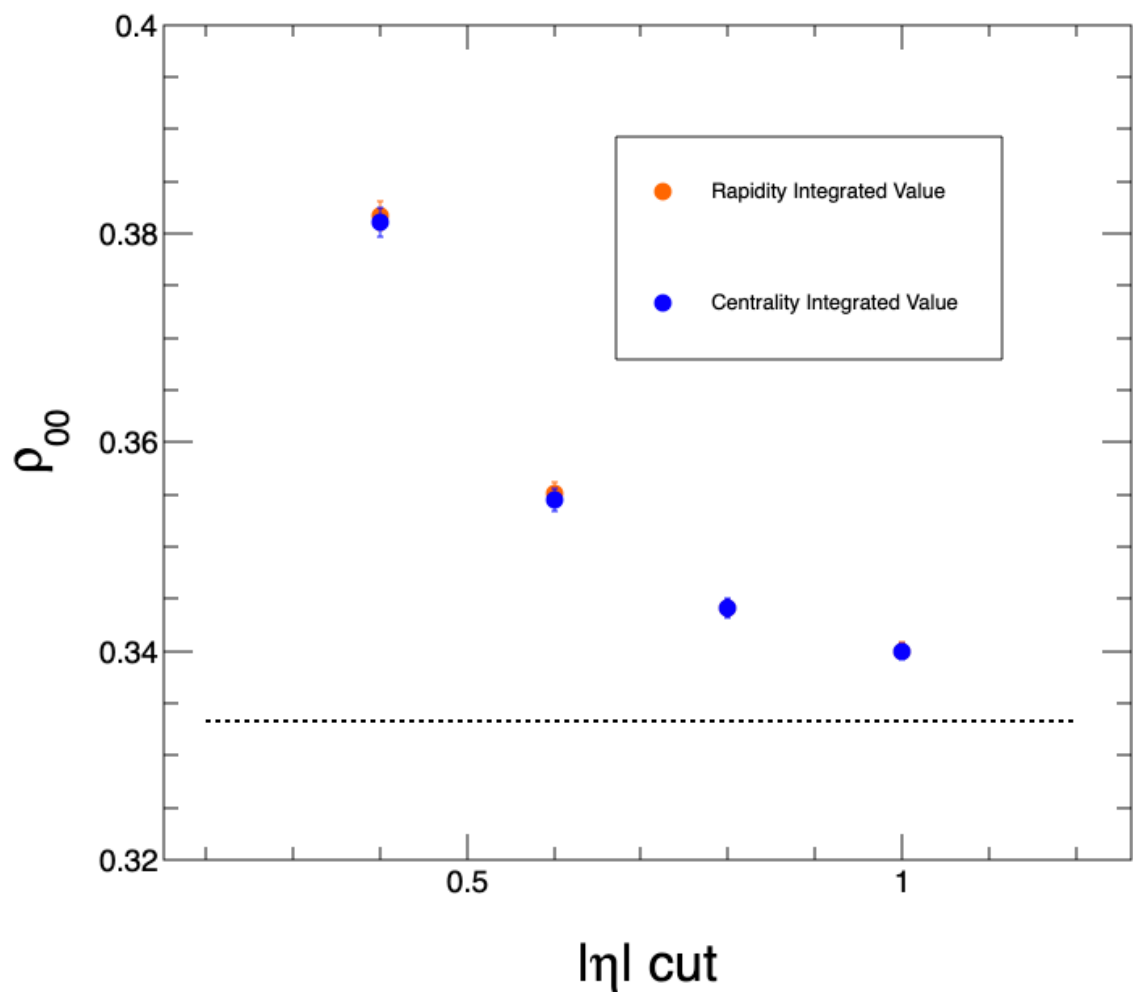
# Centrality Dependence



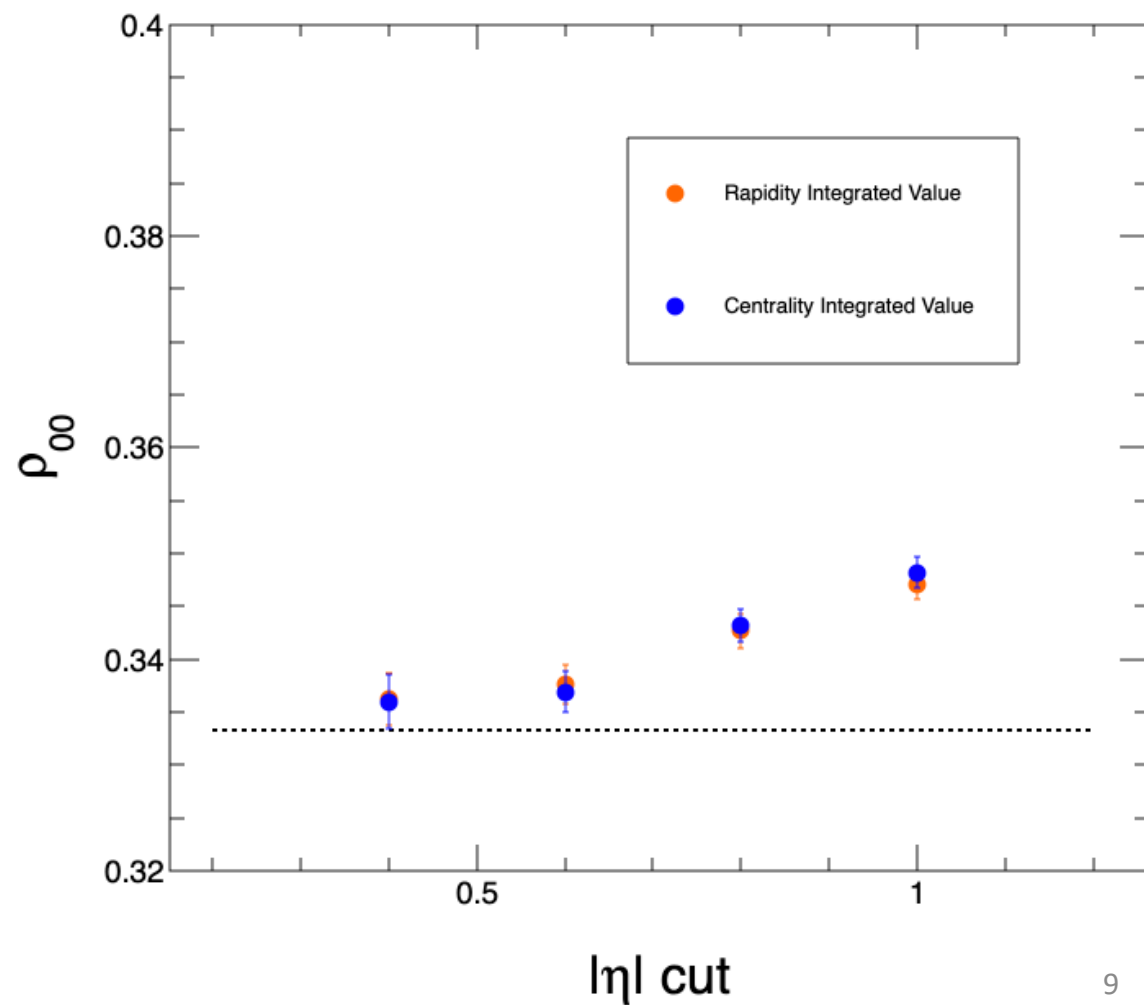


0-80% Centrality  
 $1.0 < p_T < 5.0$  GeV/c

Before Corrections

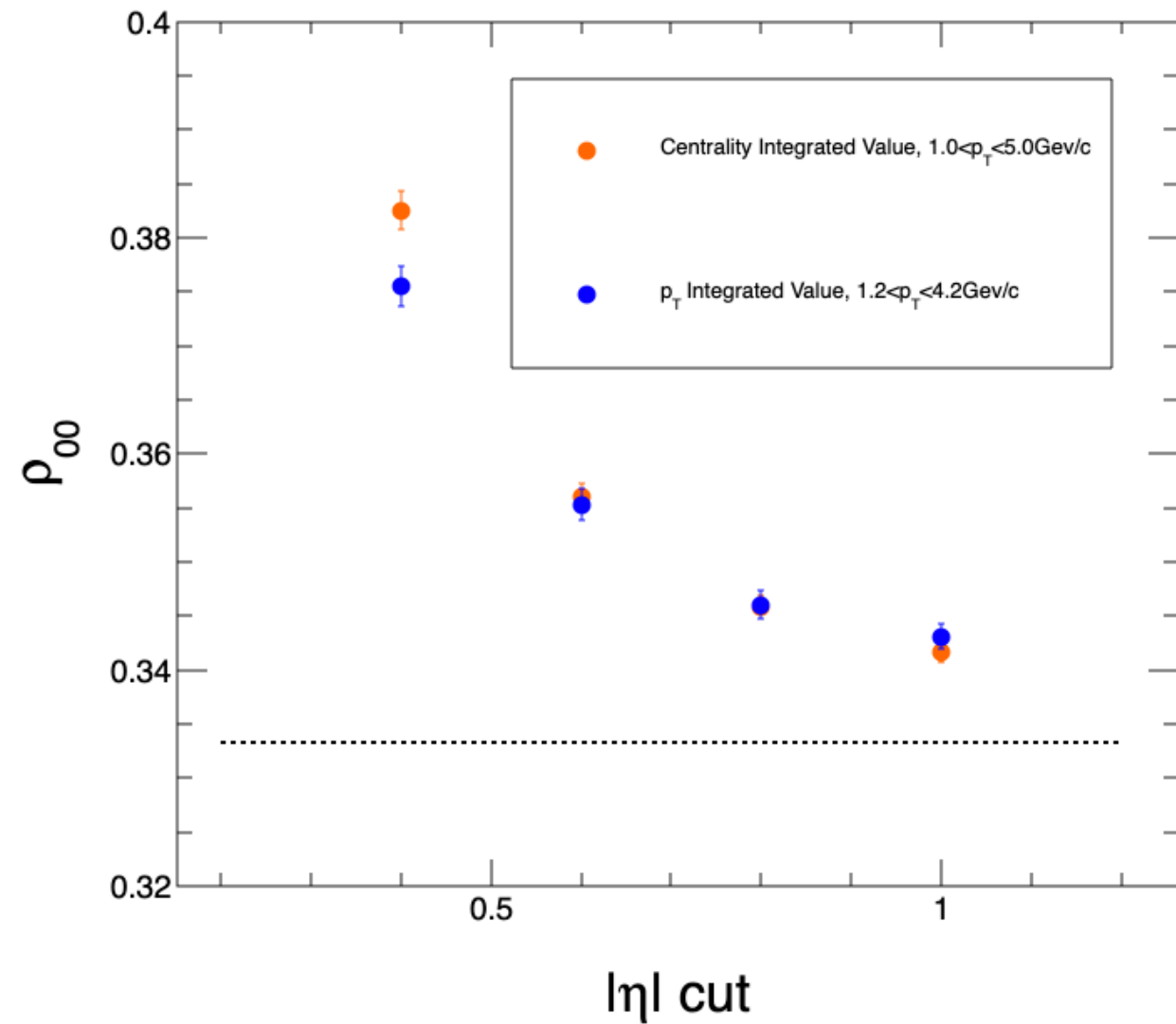


After Corrections

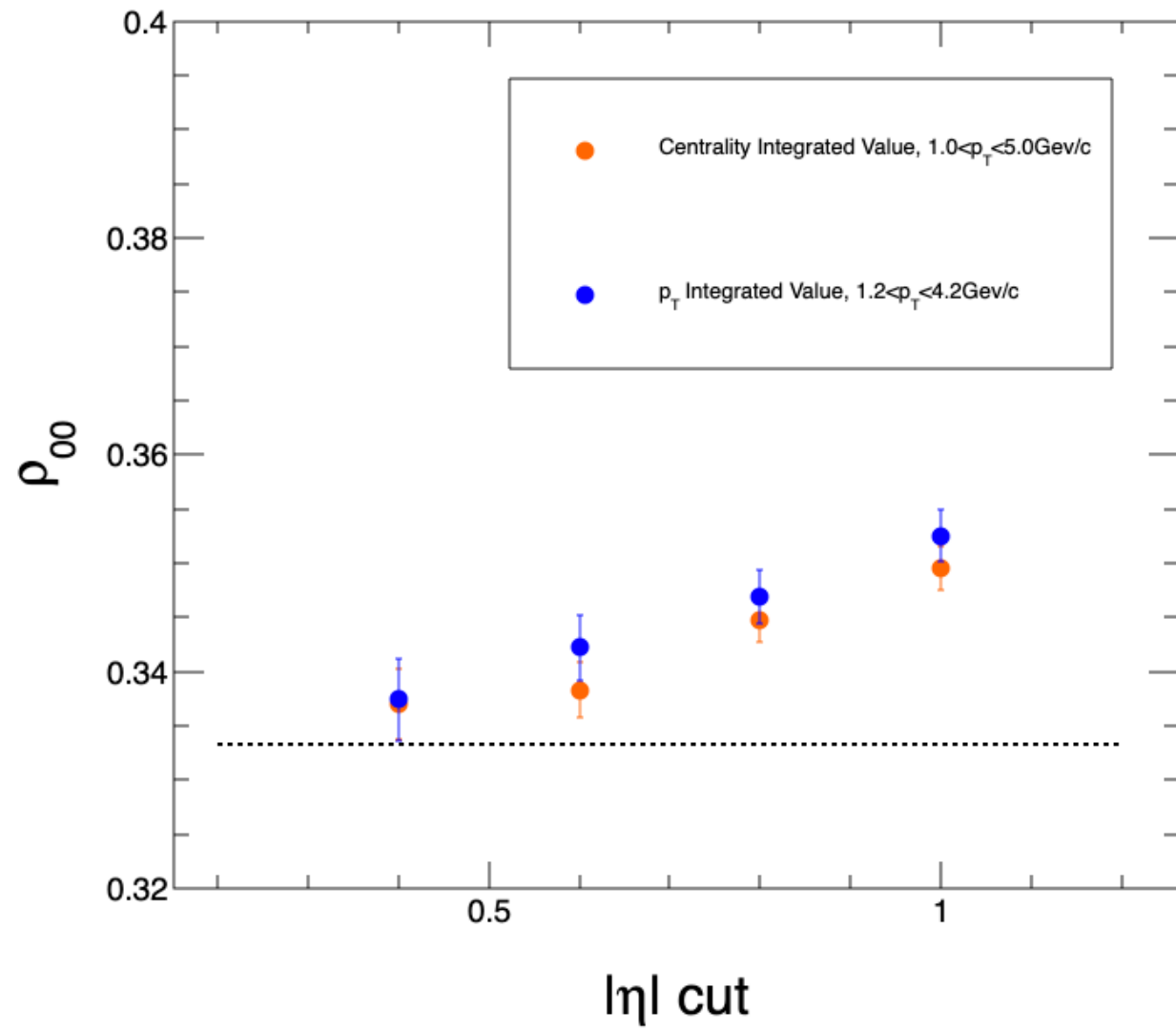


# 20-60% Centrality

## Before Corrections



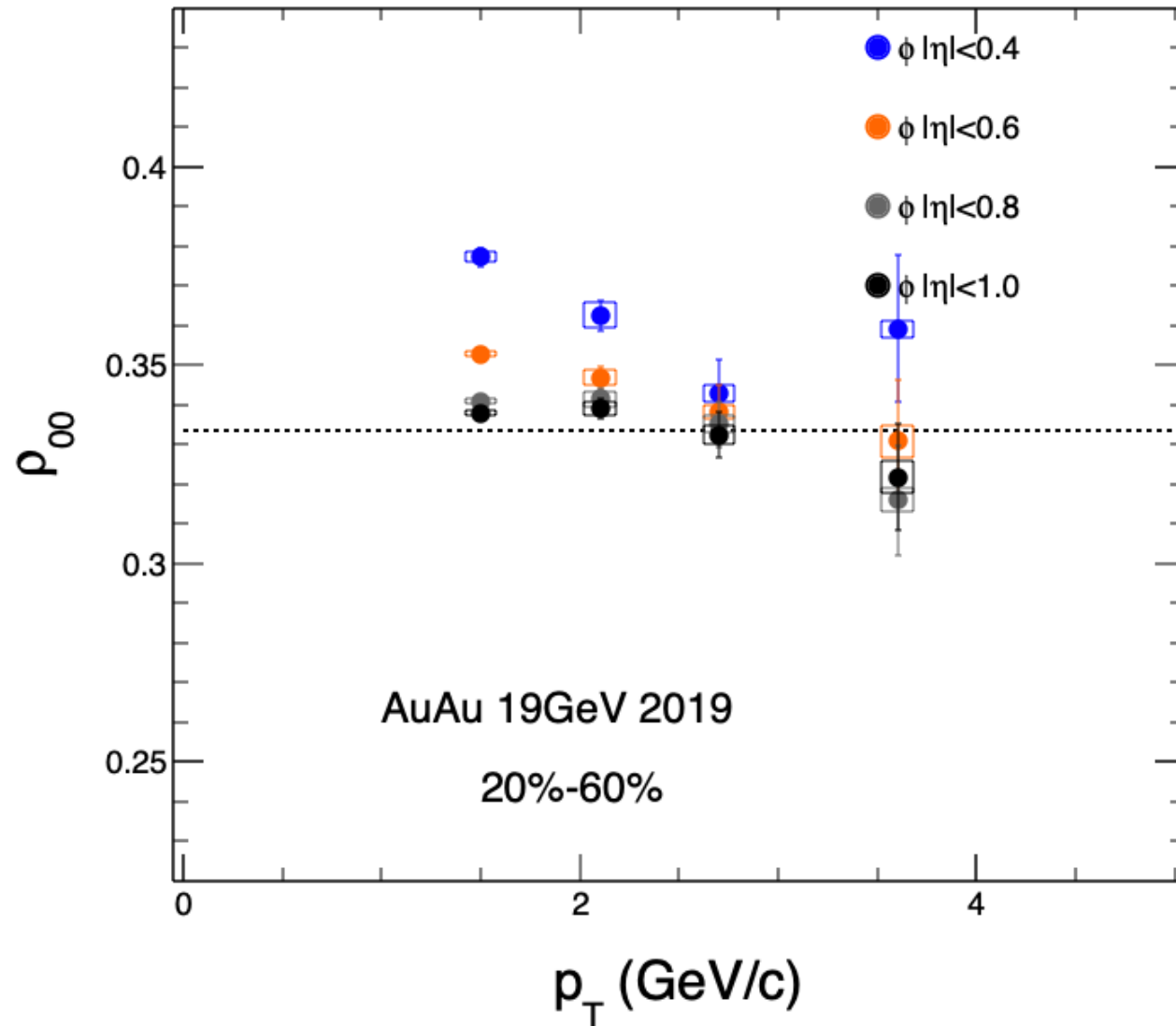
## After Corrections



# First order $\rho_{00}$ status

- I have raw results for 19.6 GeV.
  - Rerun simulation of efficiency and acceptance with 1<sup>st</sup> order EP resolution smearing.
- Started calculating first order EP for 14.6 GeV.

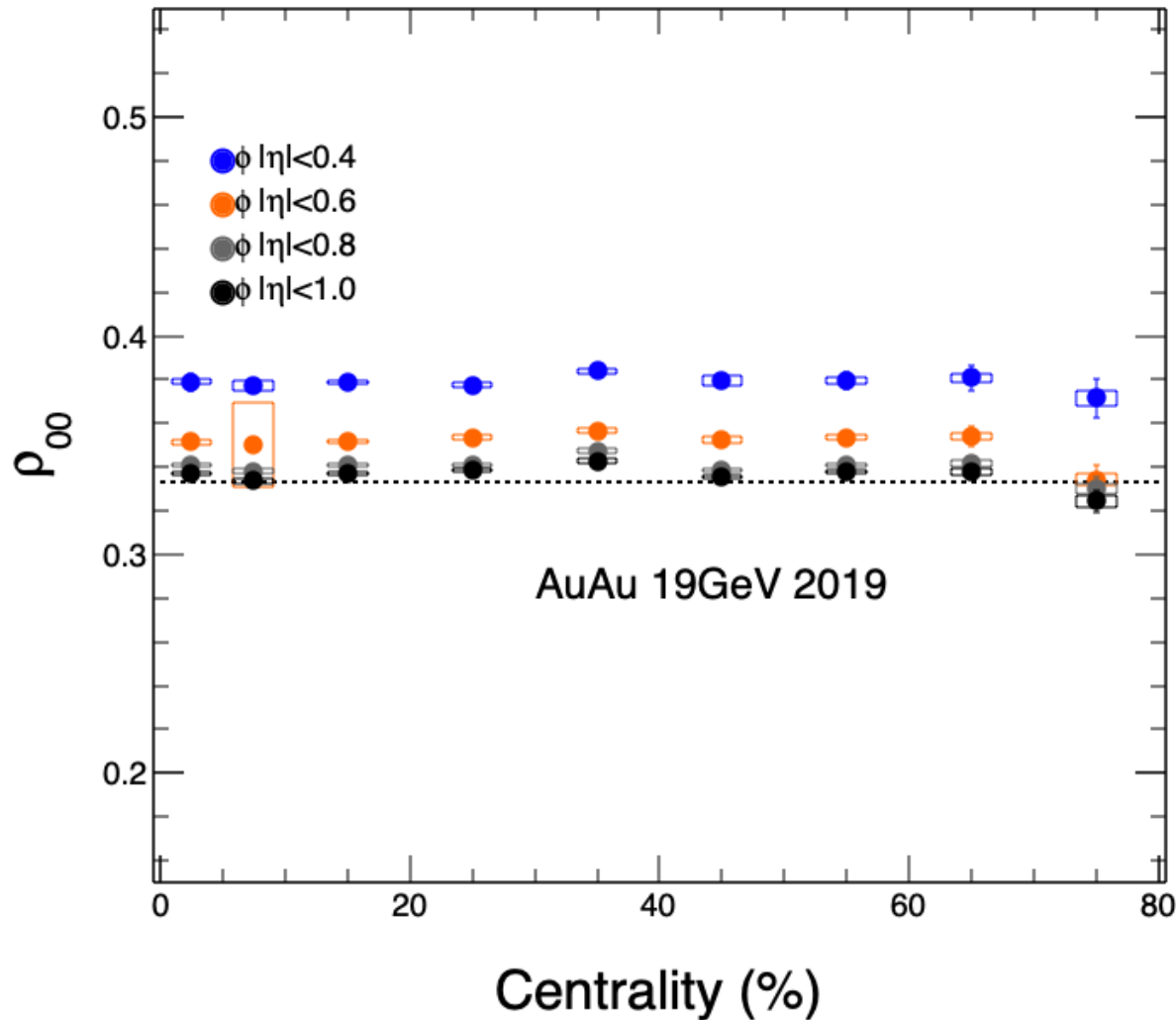
# First order pt dependence



NO CORRECTIONS

Looks like second order raw result.

# First order centrality dependence

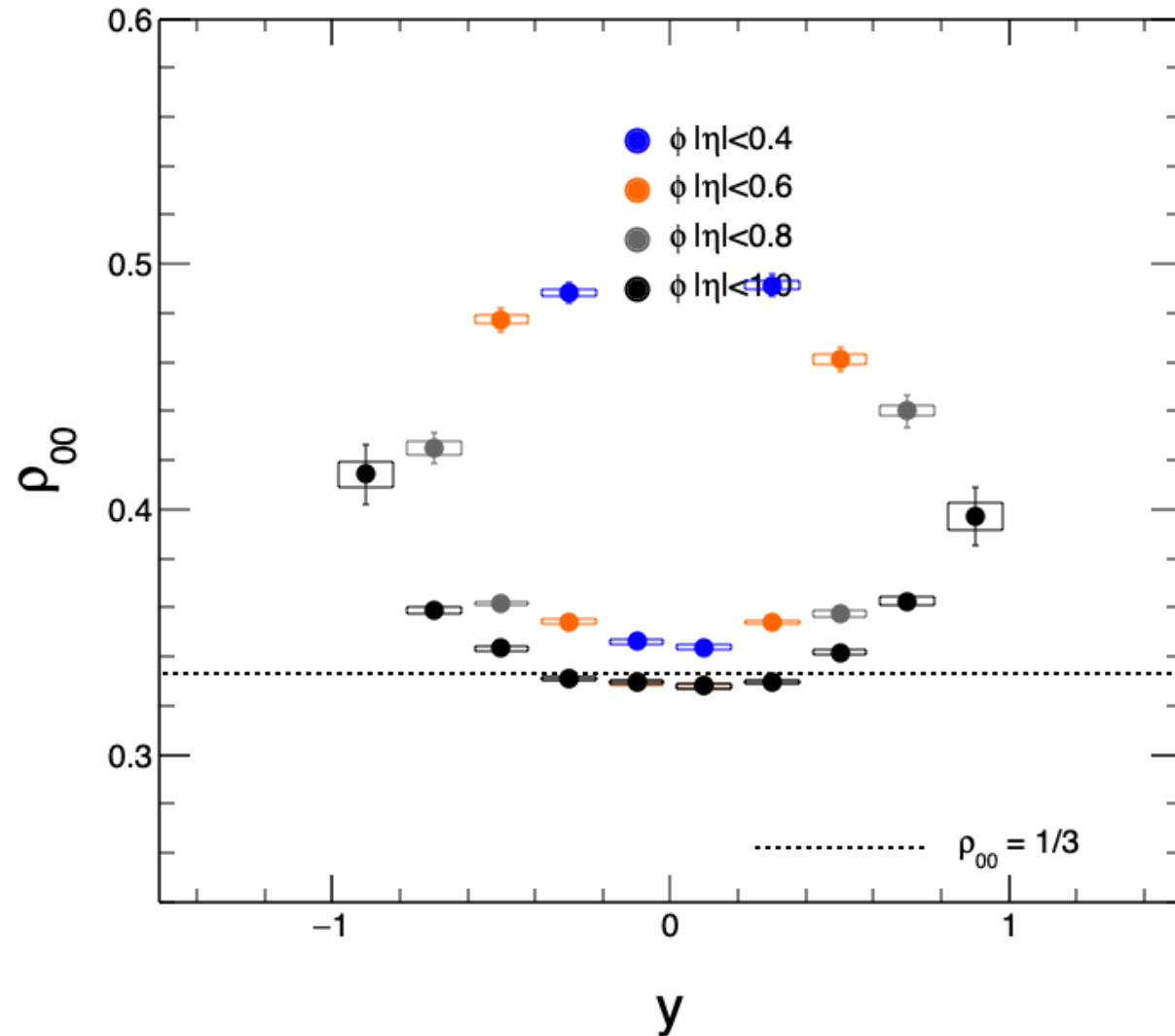


**NO CORRECTIONS**

not sure about systematic error on  $|\eta| < 0.6$ , 5-10% centrality

Looks like second order raw result.

# First order rapidity dependence



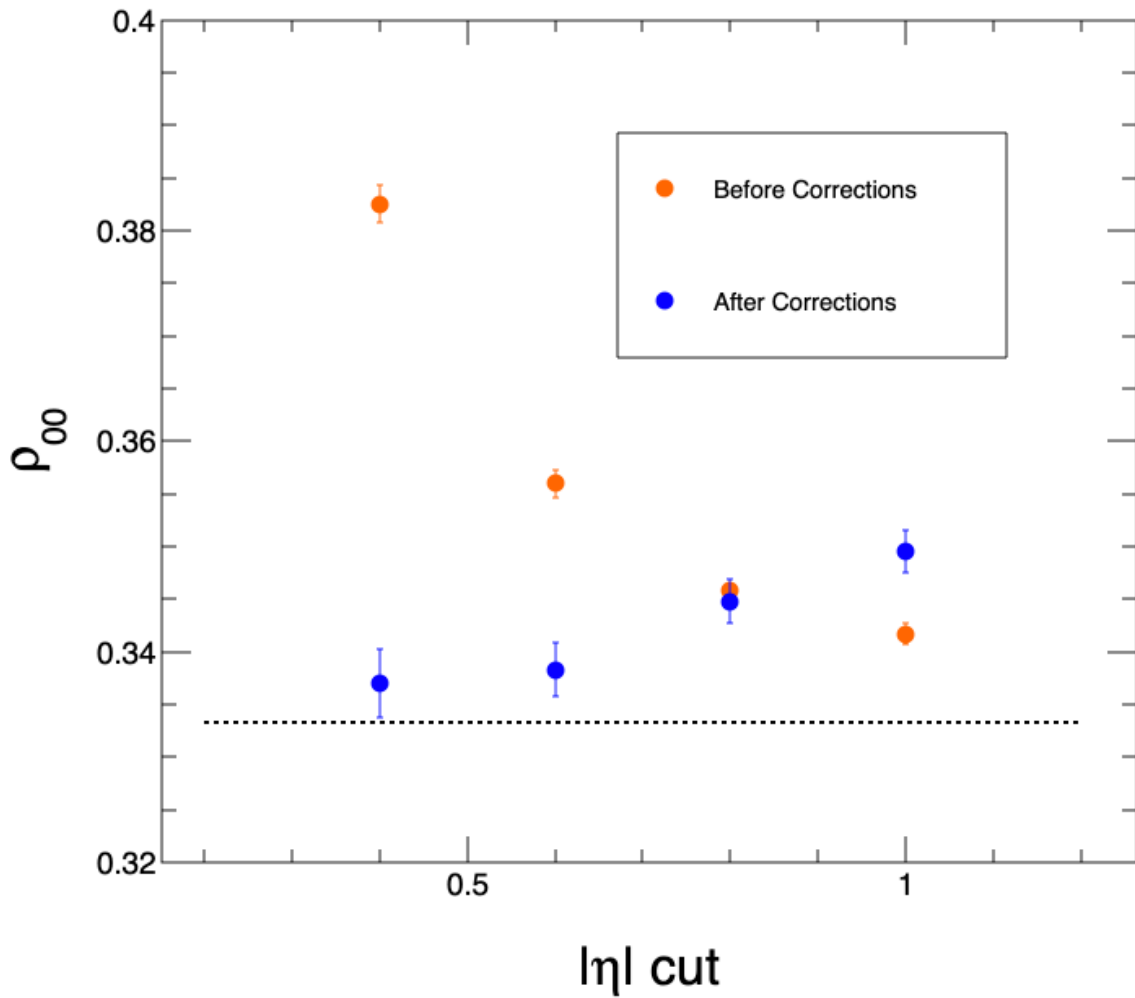
NO CORRECTIONS

Looks like second order  
raw result.

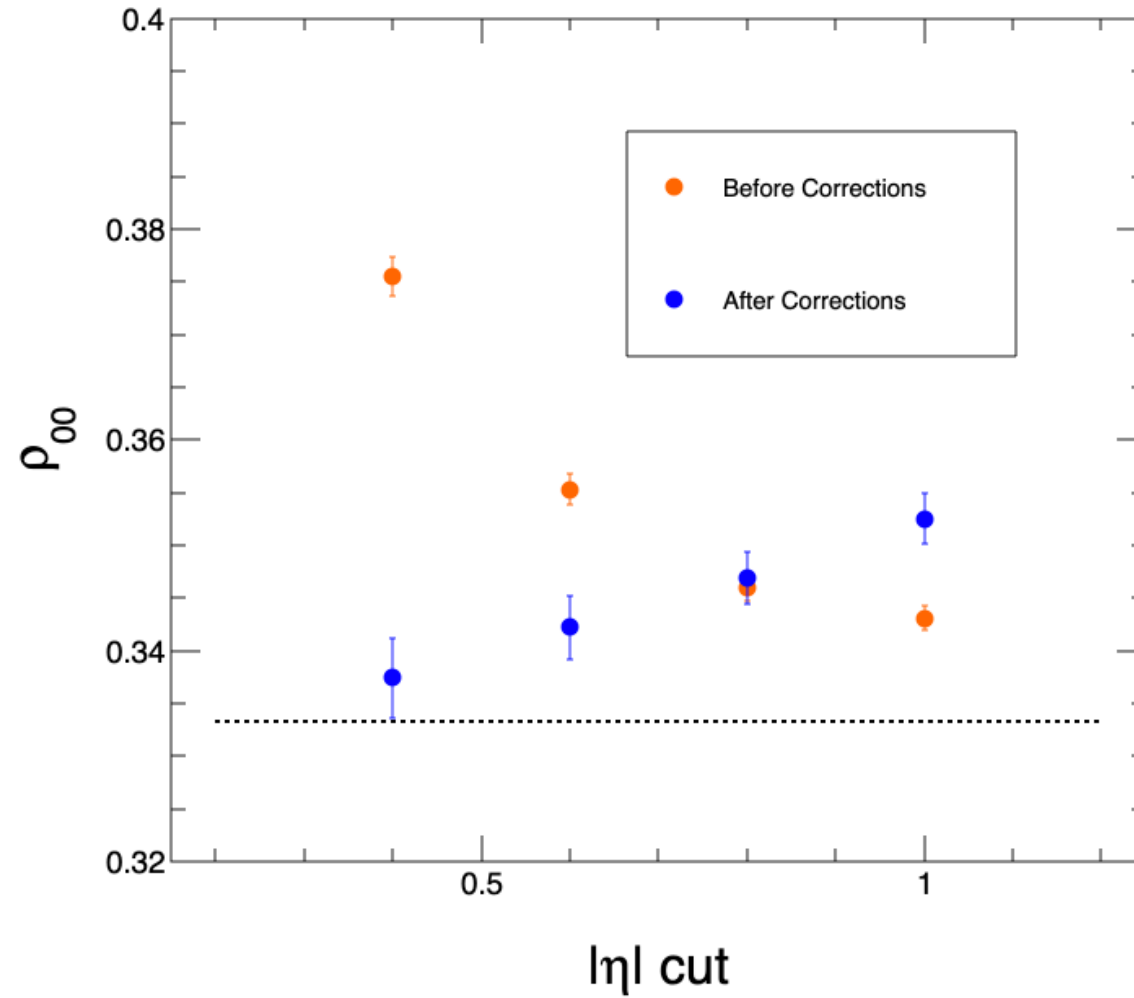
Looks like second order  
raw result.

# Backup

Centrality Dependence  
20-60% Centrality  
 $1.0 < p_T < 5.0$  GeV/c

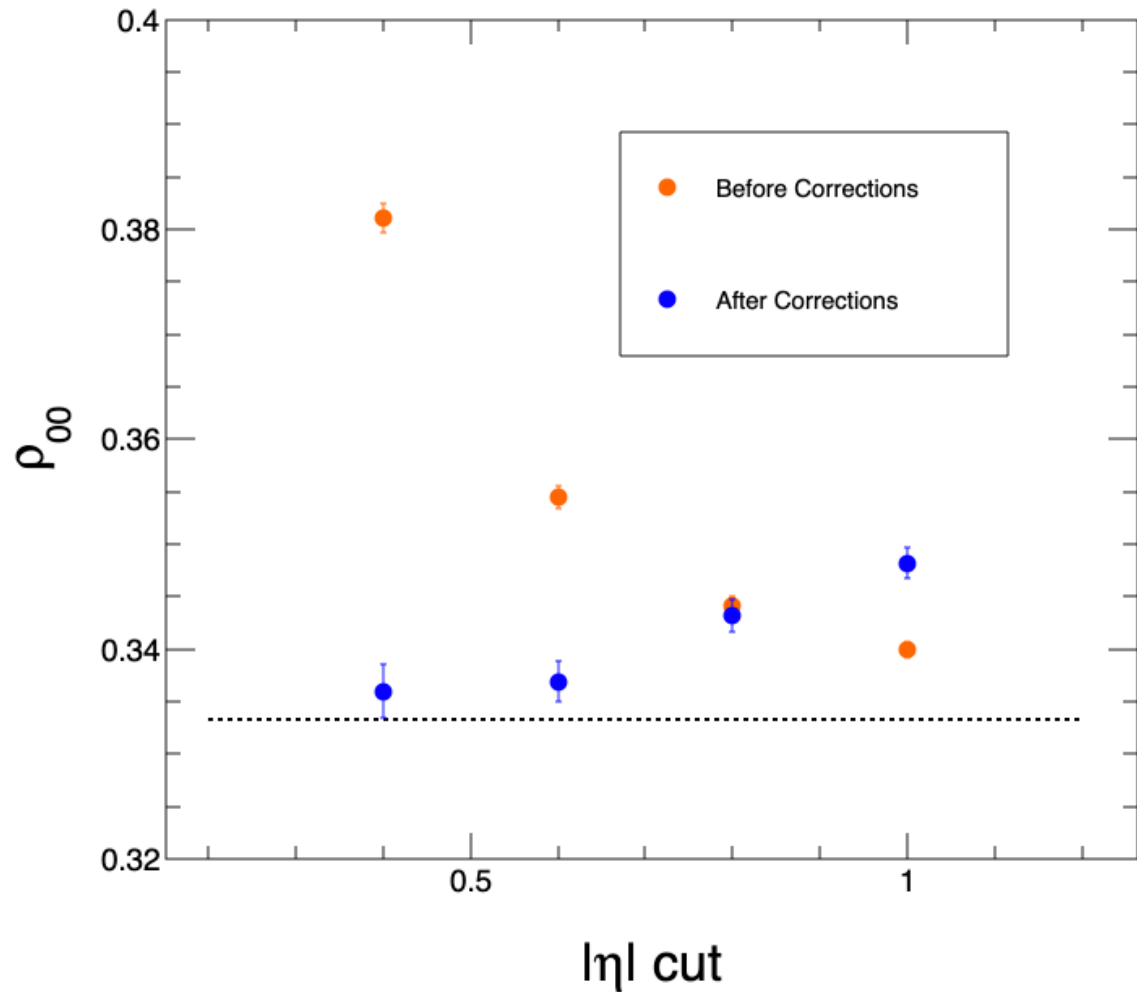


$p_T$  Dependence  
20-60% Centrality  
 $1.2 < p_T < 4.2$  GeV/c





Centrality Dependence  
0-80% Centrality  
 $1.0 < p_T < 5.0$  GeV/c



Rapidity Dependence  
0-80% Centrality  
 $1.0 < p_T < 5.0$  GeV/c

