

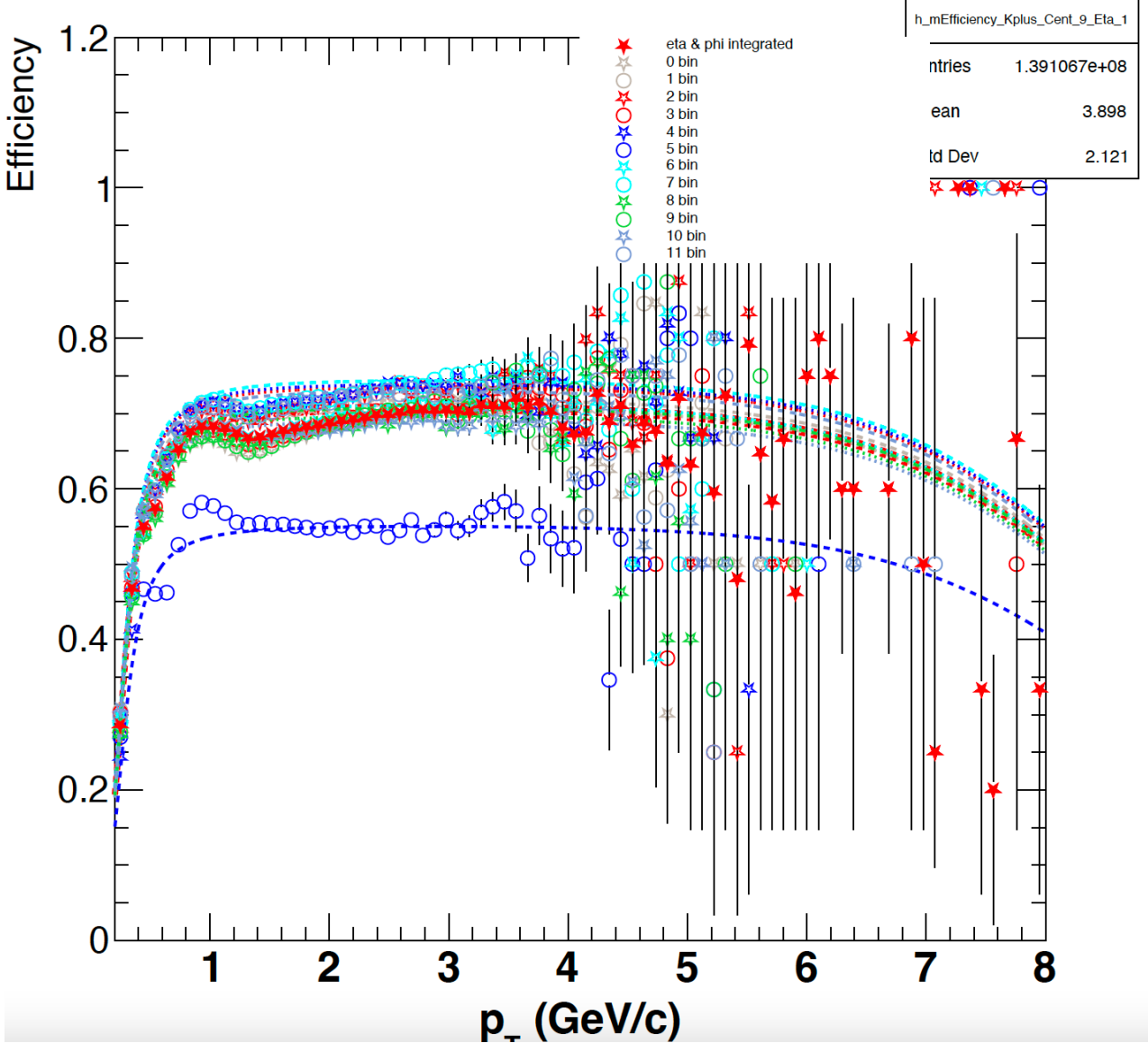
Global Spin Alignment Update

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Efficiency methods for systematic error



- “Fit to eta” fit efficiency integrated over all phi.
 - Sets the shape of the function.
- “Fit to plateau” → scale the “fit to eta” for each phi bin by fitting the tail of the distribution ($\sim 2.5 < p_T < 5.0$).
- Fit to plateau is treated as the default efficiency.

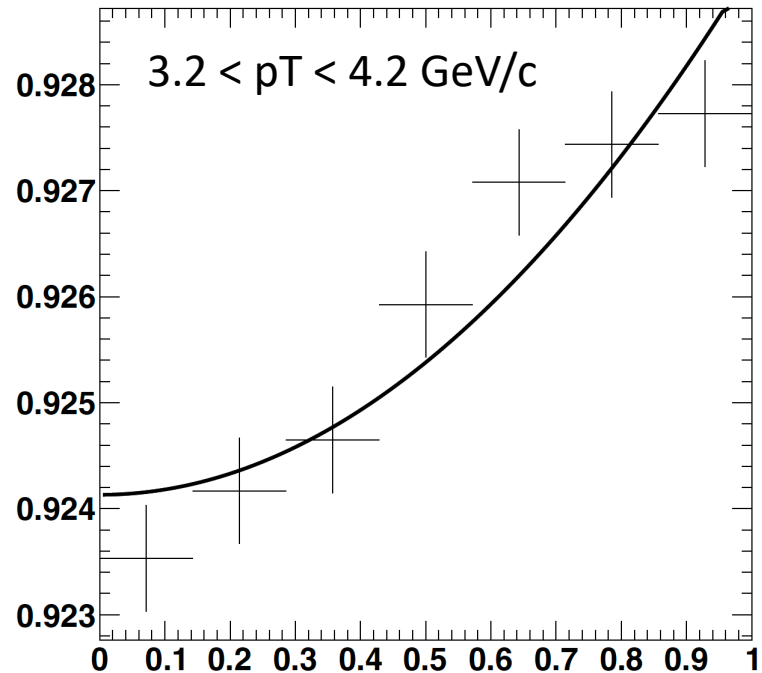
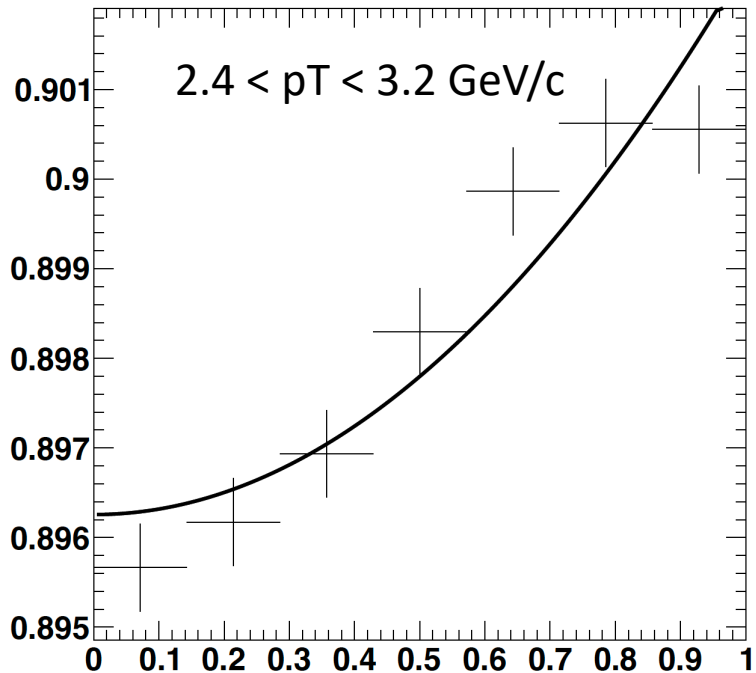
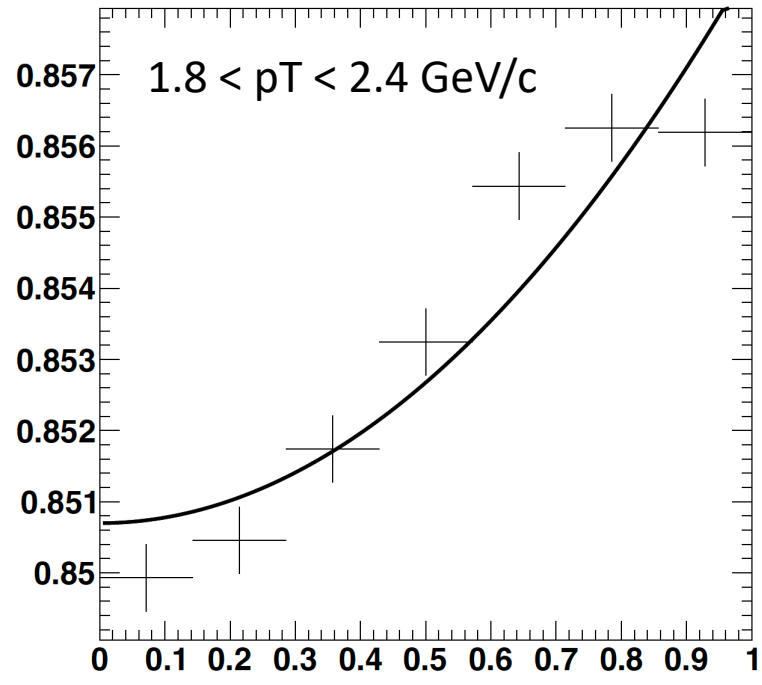
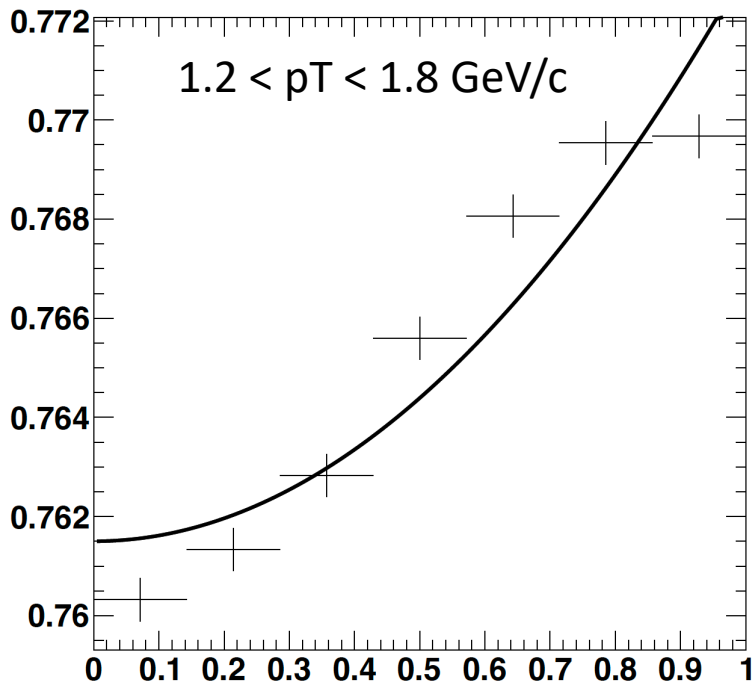
Global Spin Alignment (ϕ) Acceptance Par.

pT bin (GeV/c)	BESI F (Jinhui)	BESII F (Gavin)
1.2-1.8	0.0155811	0.0151739 ± 0.0007378
1.8-2.4	0.00968584	0.0092919 ± 0.0007136
2.4-3.2	0.00738826	0.0068791 ± 0.0007020
3.2-4.2	0.00498759	0.0054043 ± 0.0006965

BESI Kaon Daughter Cuts
 $|\eta| < 1.0$

BESII Kaon Daughter Cuts
 $|\eta| < 1.0$

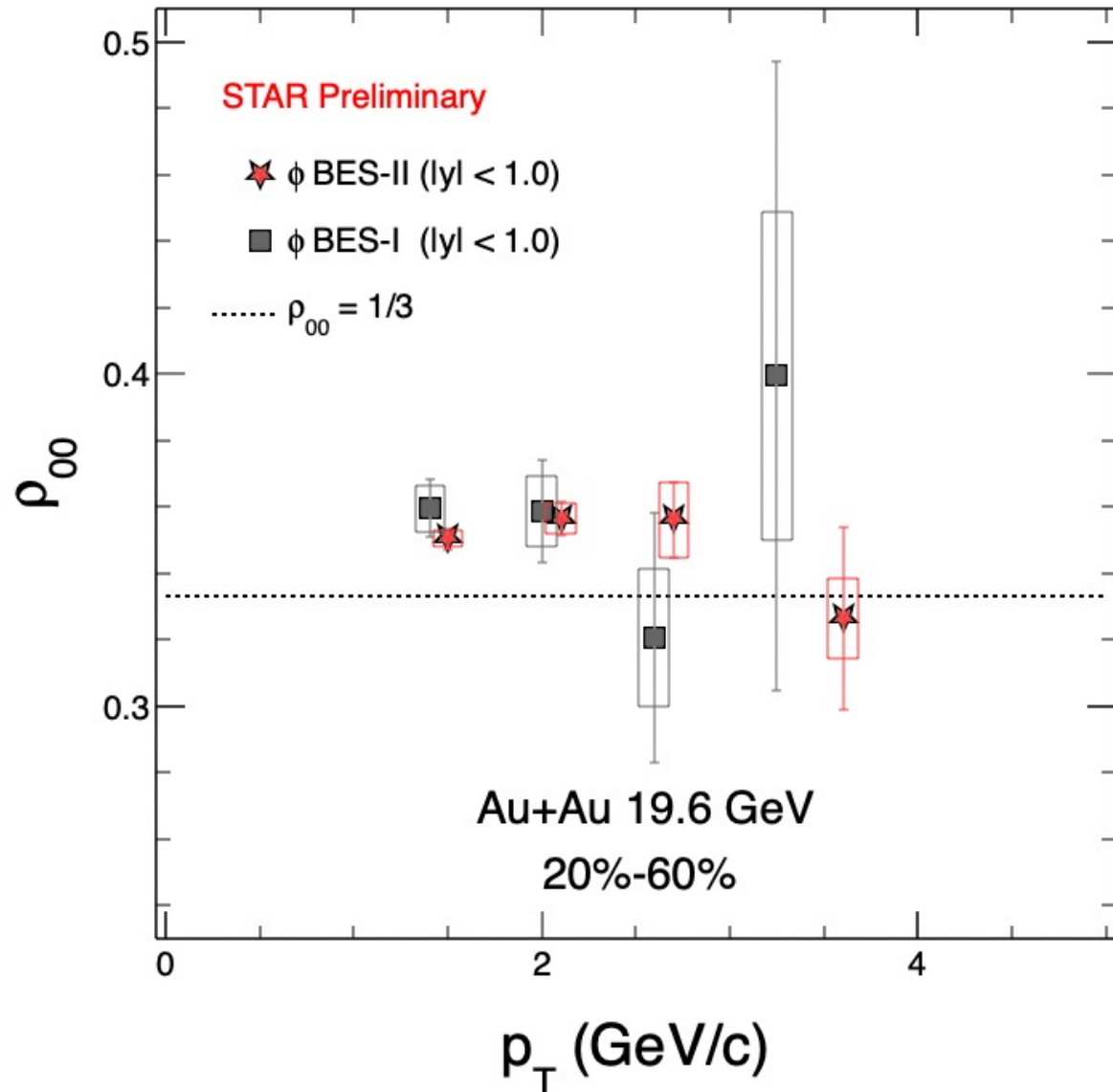
Both use 50M MC ϕ meson events in each pT bin.
Each bin is consistent within uncertainties.



Fits for F

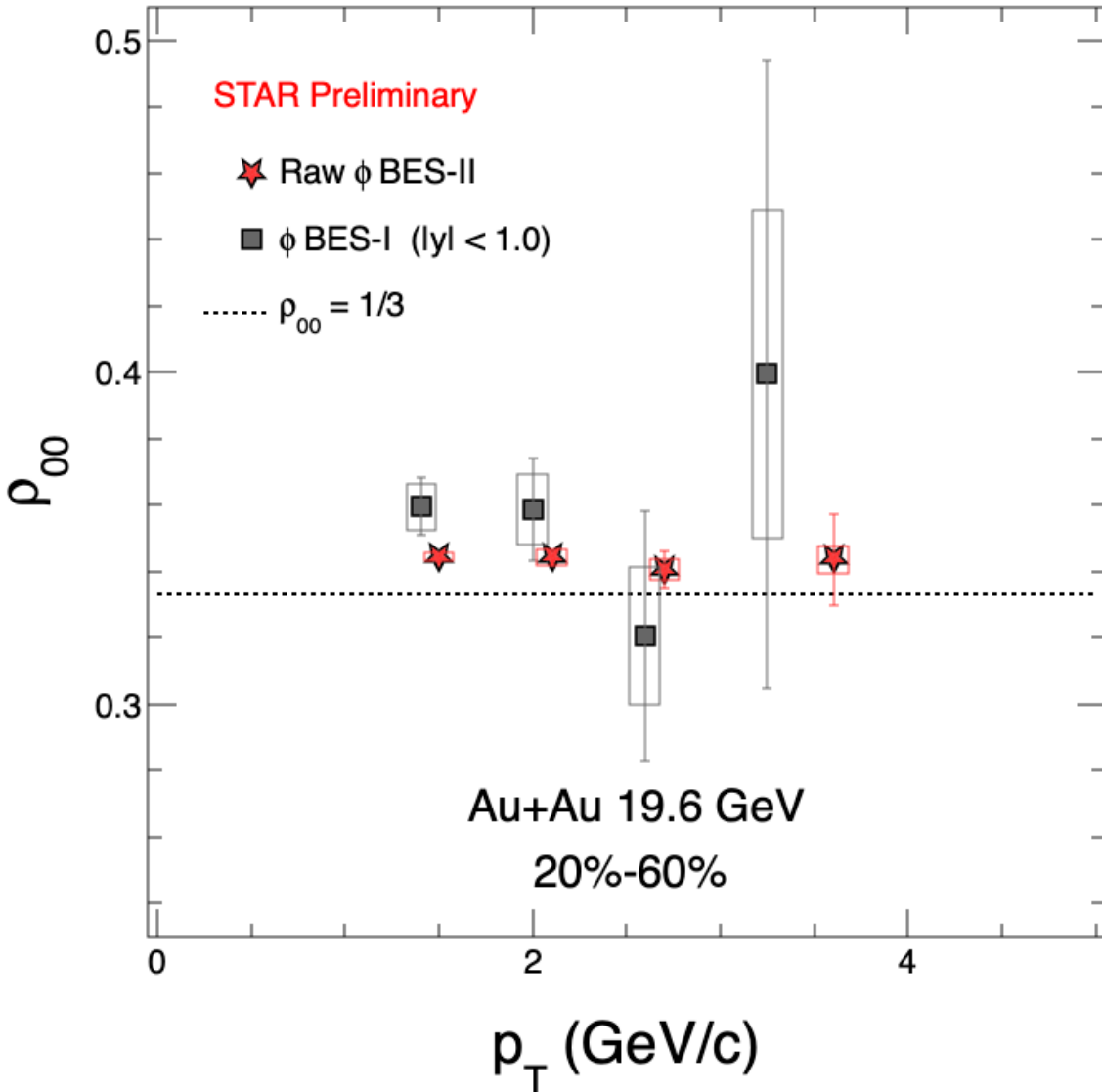
- $1 + \cos^2(\theta^*)$ dependence does not seem to properly describe the shape.
- Perhaps I should include the fit uncertainty in F as a systematic error source.
 - F (default), F- δF , F+ δF
 - OR use F from BESI analysis as a source of systematic error as before.

ϕ meson $\rho_{00}(p_T)$ w.r.t 2nd EP



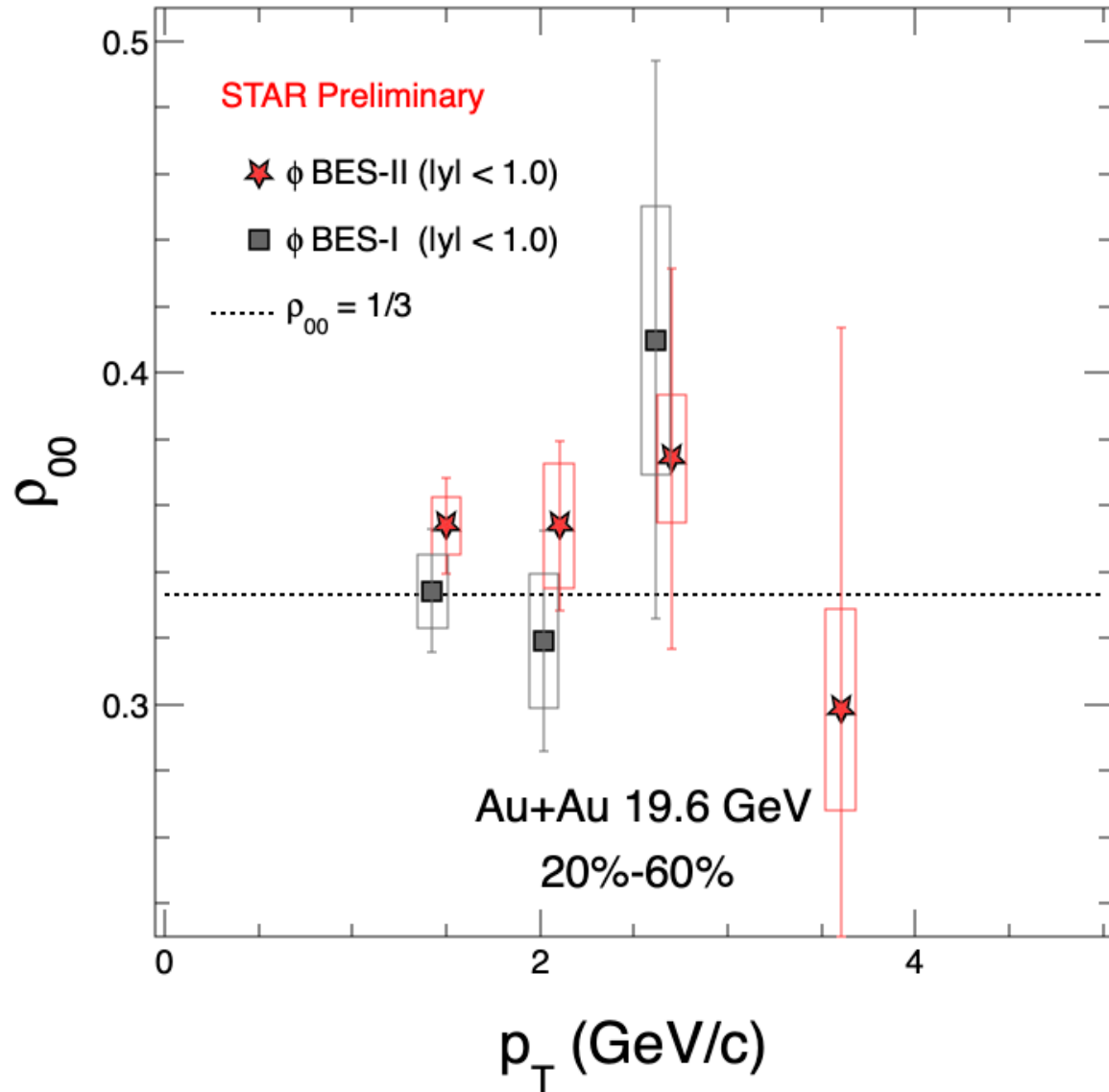
- Full Statistics.
- TOF and TPC for PID
- $|\eta| < 1.0$ cut for kaon daughters.
- 20-60% Centrality.
- Added ToF efficiency fit method as source of systematics.
- 0.3516 ± 0.0026 (stat) ± 0.0028 (sys)
- Need updated 19.6 GeV integrated value from Xu for comparison.

First look at ϕ meson $\rho_{00}(p_T)$ w.r.t 2nd EP

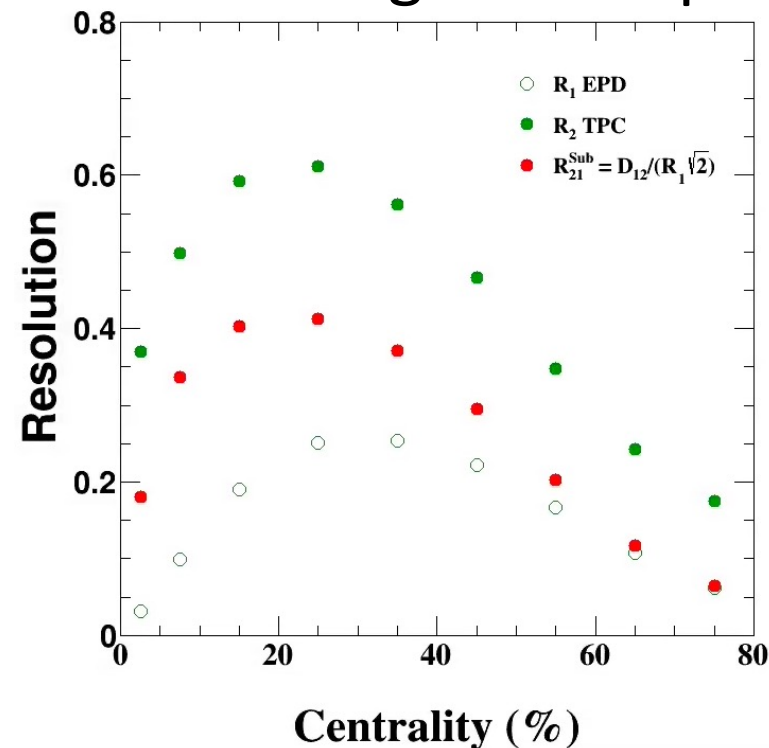


- Full Statistics.
- TOF and TPC for PID
- $|\eta| < 1.5$ cut for kaon daughters.
- $|y| < 1.5$ for ϕ meson (BES-II).
- 20-60% Centrality.
- I expect the values to increase with the efficiency, acceptance and resolution corrections.

First look at BESII ϕ meson $\rho_{00}(p_T)$ w.r.t 1st EP

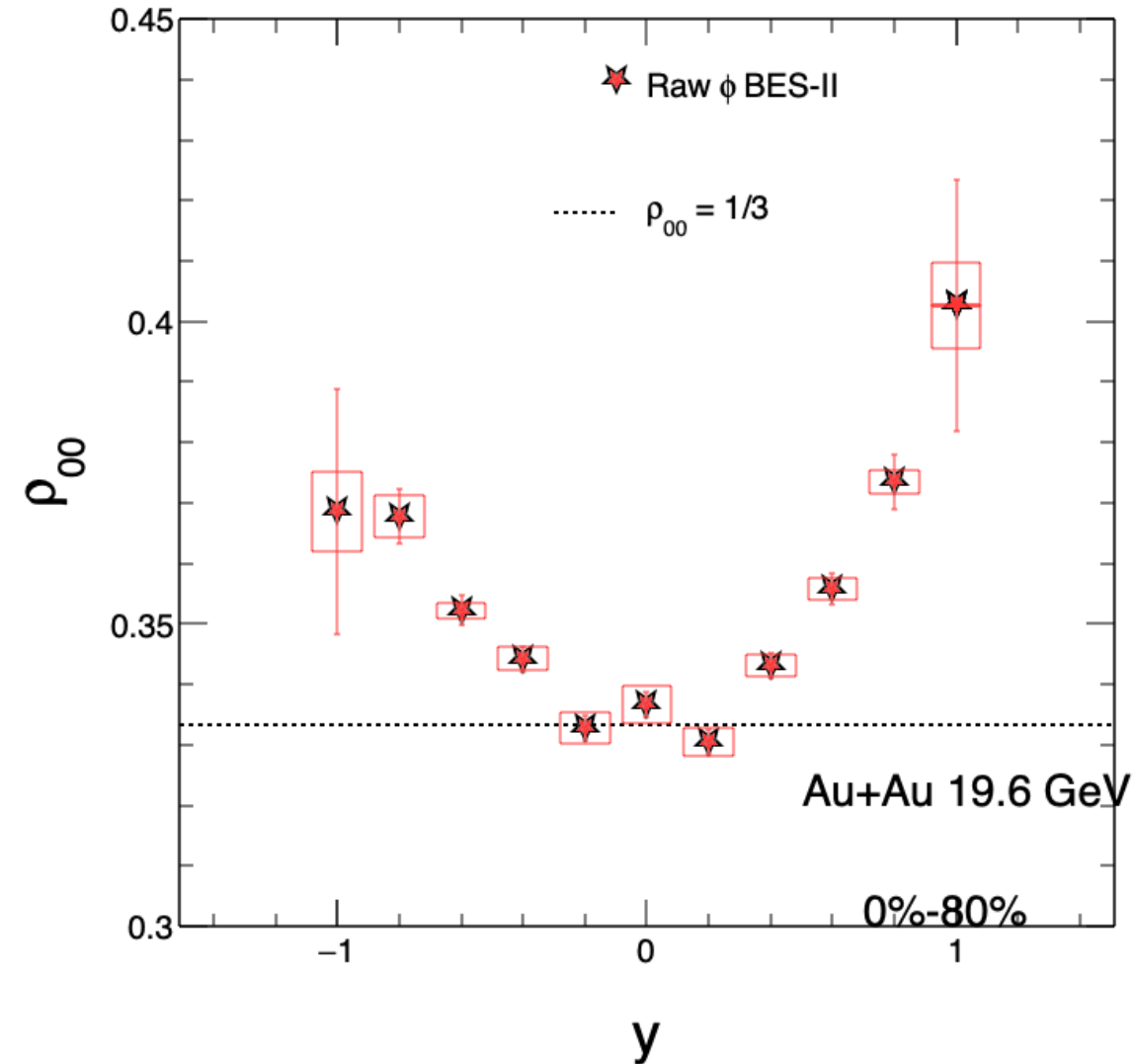


- $\sim 1/10$ of picoDst files.
- $|\eta| < 1.0$ cut for kaon daughters.
- $|y| < 1.0$ for ϕ meson.
- 20-60% Centrality.
- Producing full sample now.



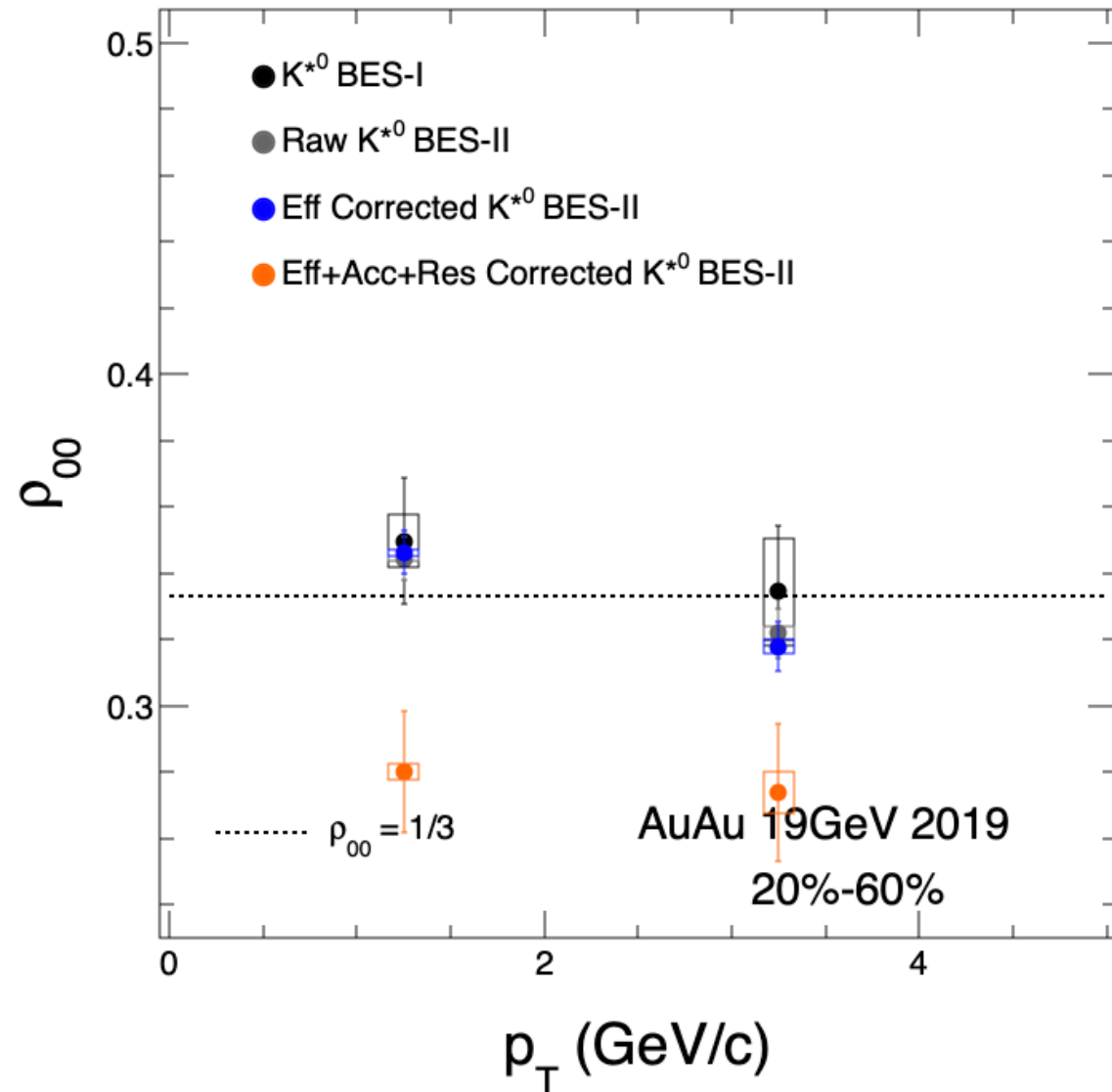
Integrated R1 used for resolution correction.
 $R1 = \langle \cos 2(\Psi_1 - \Psi_{r,1}) \rangle$

First look at ϕ meson $\rho_{00}(y)$



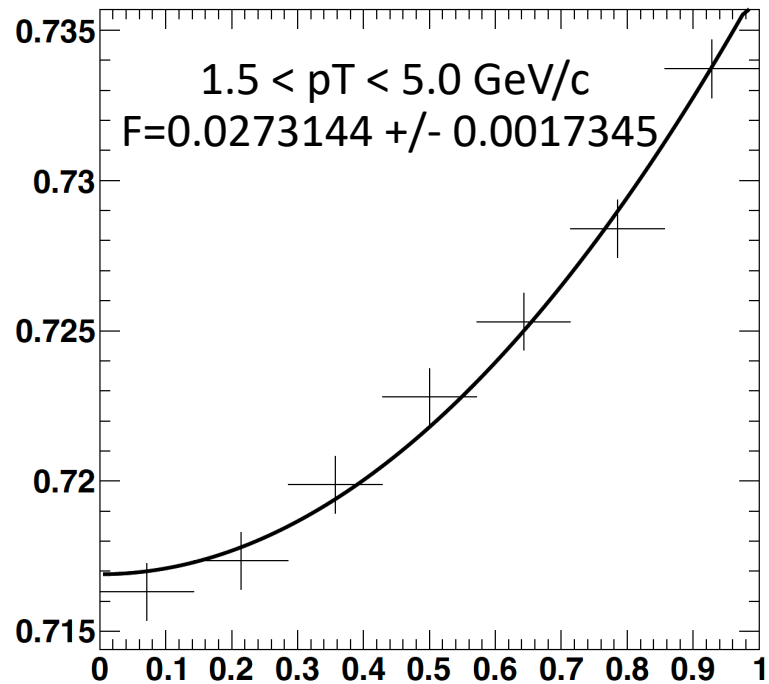
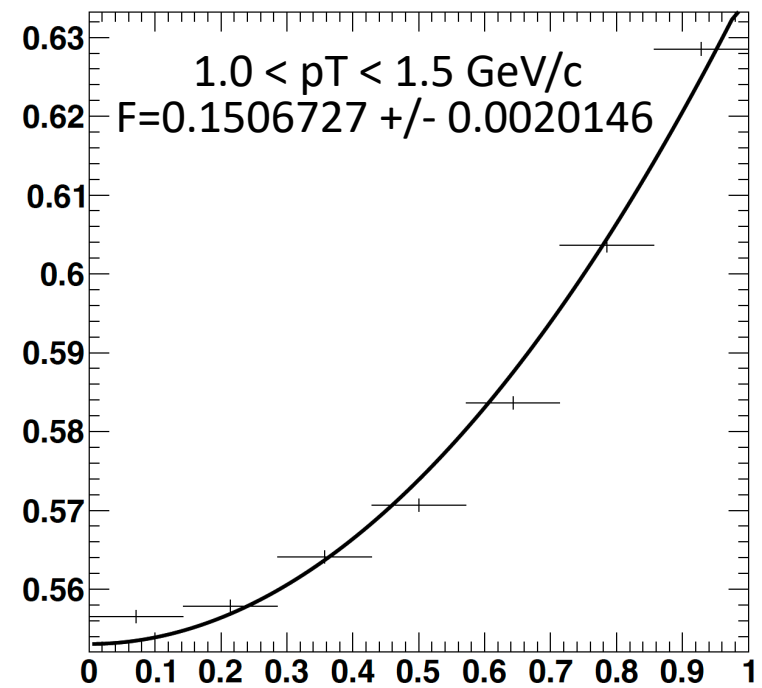
- Full Statistics.
- Only TOF and TPC for PID (add EToF later).
- $|\eta| < 1.5$ cut for kaon daughters.
- $|y| < 1.5$ for ϕ meson.
- ϕ meson: $1.0 < p_T < 5.0$ GeV/c.
- 0-80% Centrality.
- Limited rapidity coverage due to requirement of track matching with TOF ($|\eta| < 0.9$).

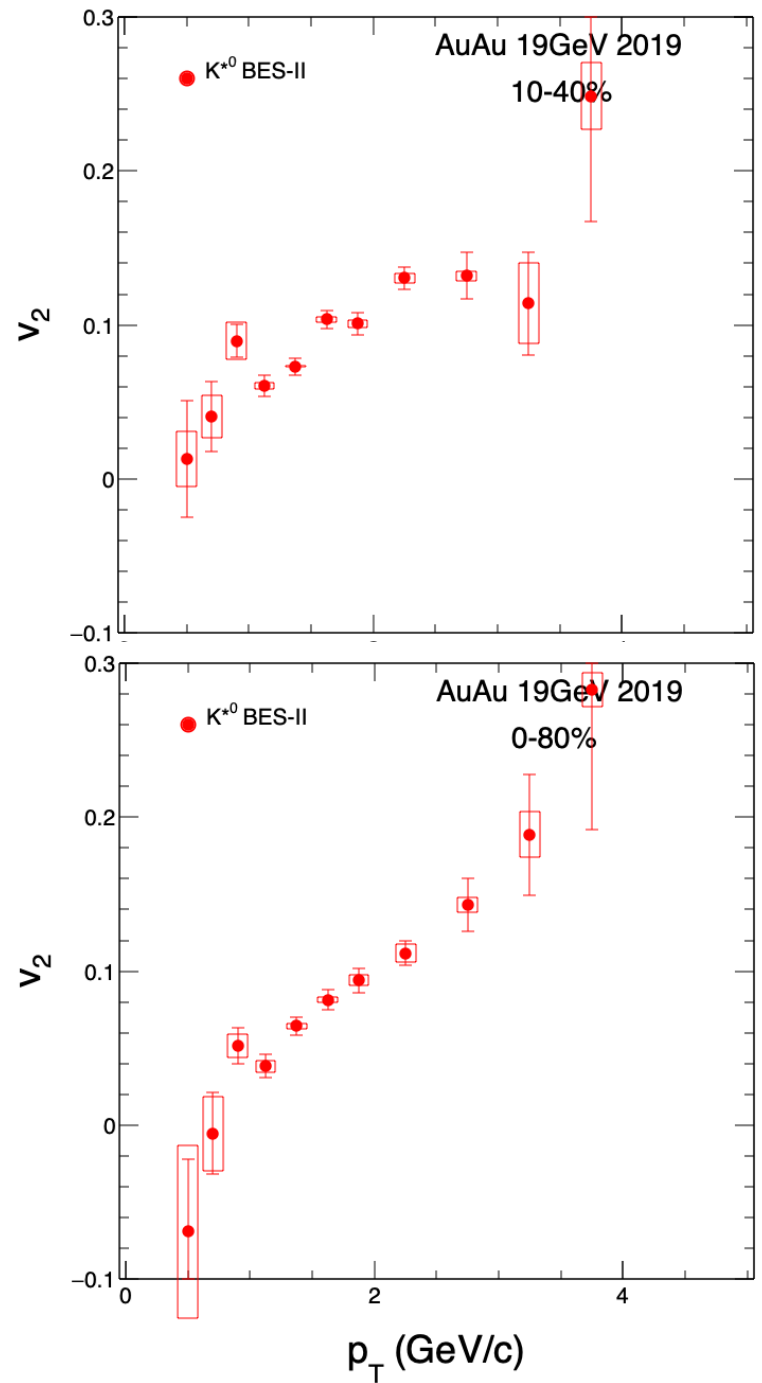
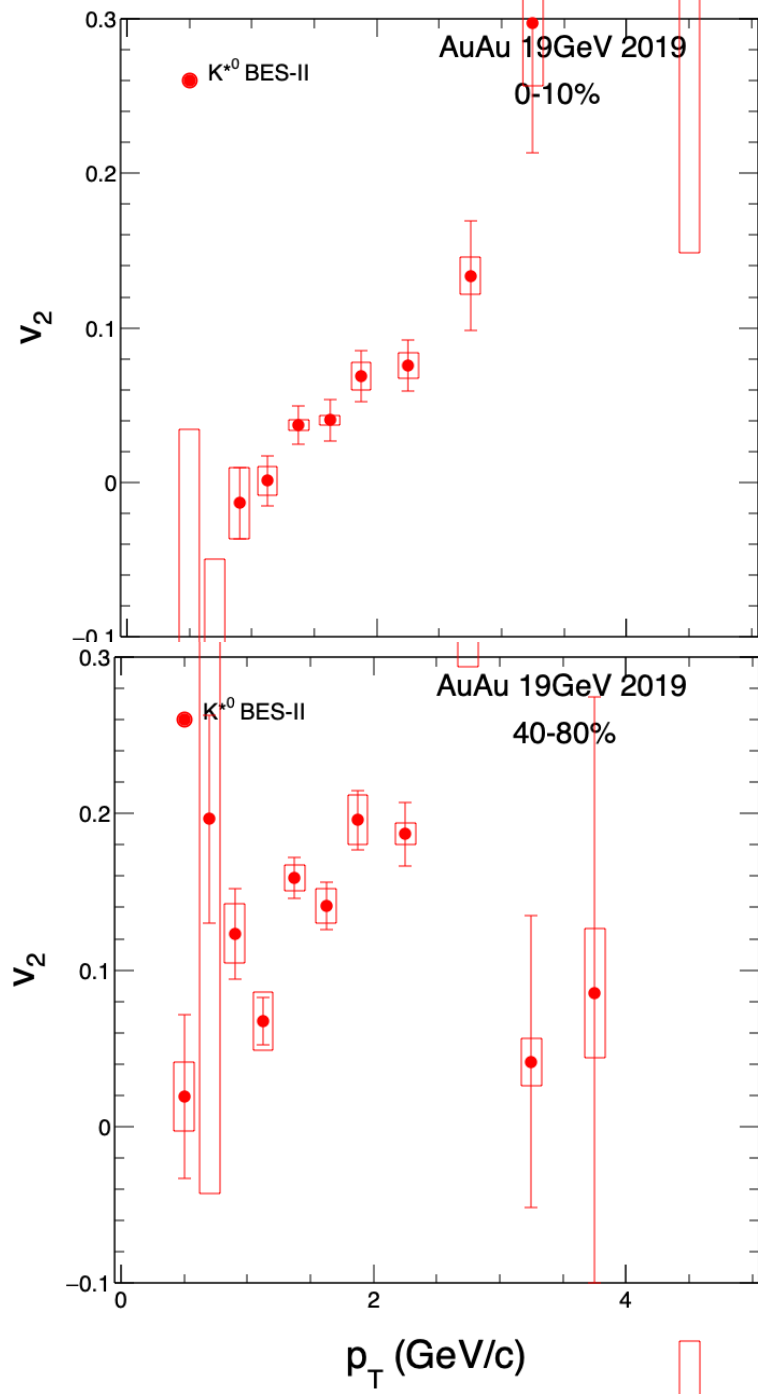
$K^*0 \rho_{00}(p_T)$



- Full Statistics.
- TOF or TPC for PID
- $|\eta| < 1.0$ cut for kaon daughters.
- 20-60% Centrality.
- Acceptance + Resolution correction significantly shifts the points down.
 - Very high acceptance parameter values.

K^*0 acceptance parameters



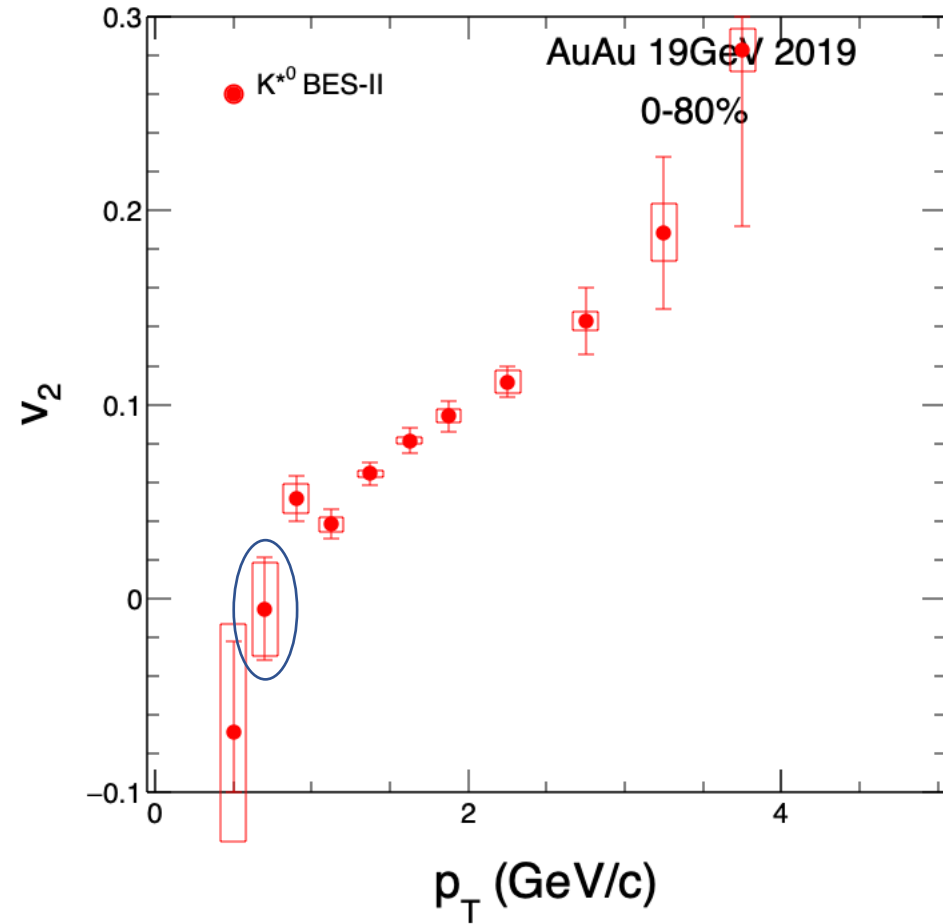
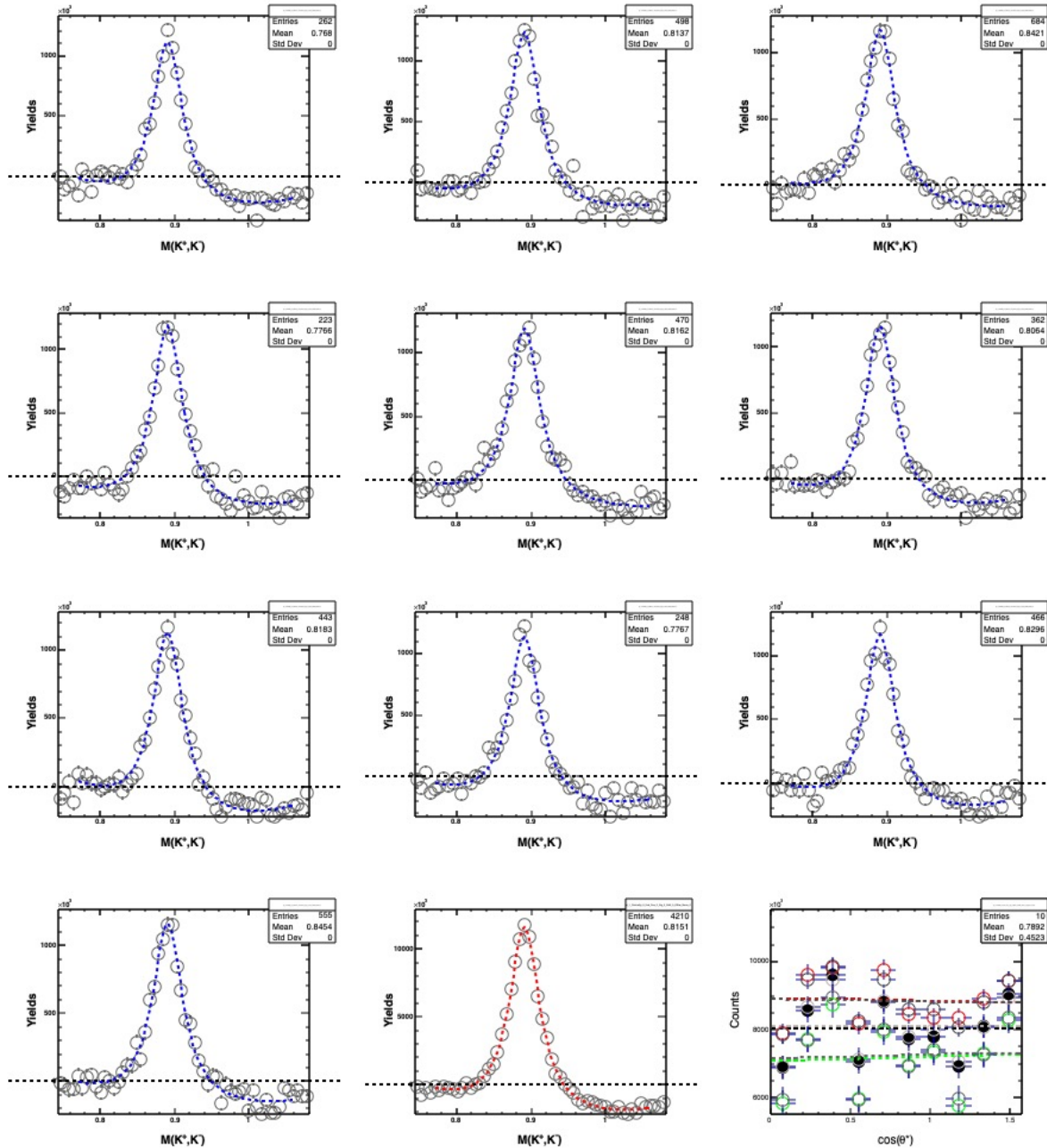


K^*0 v_2

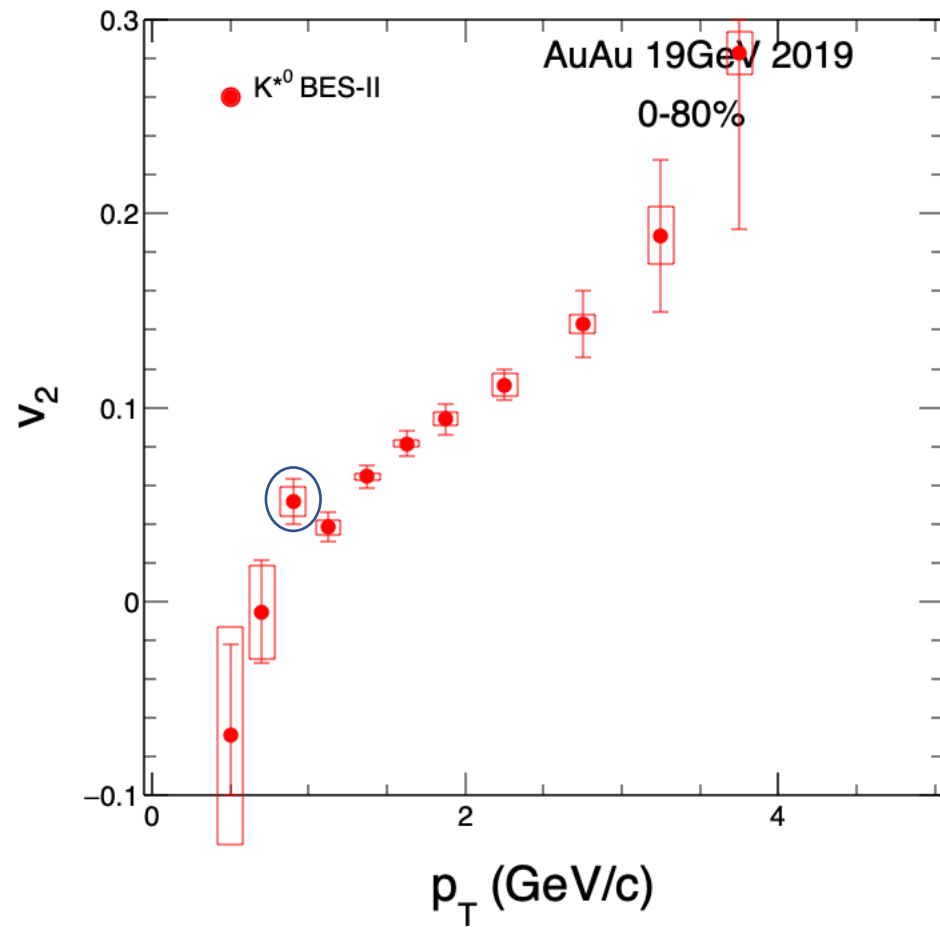
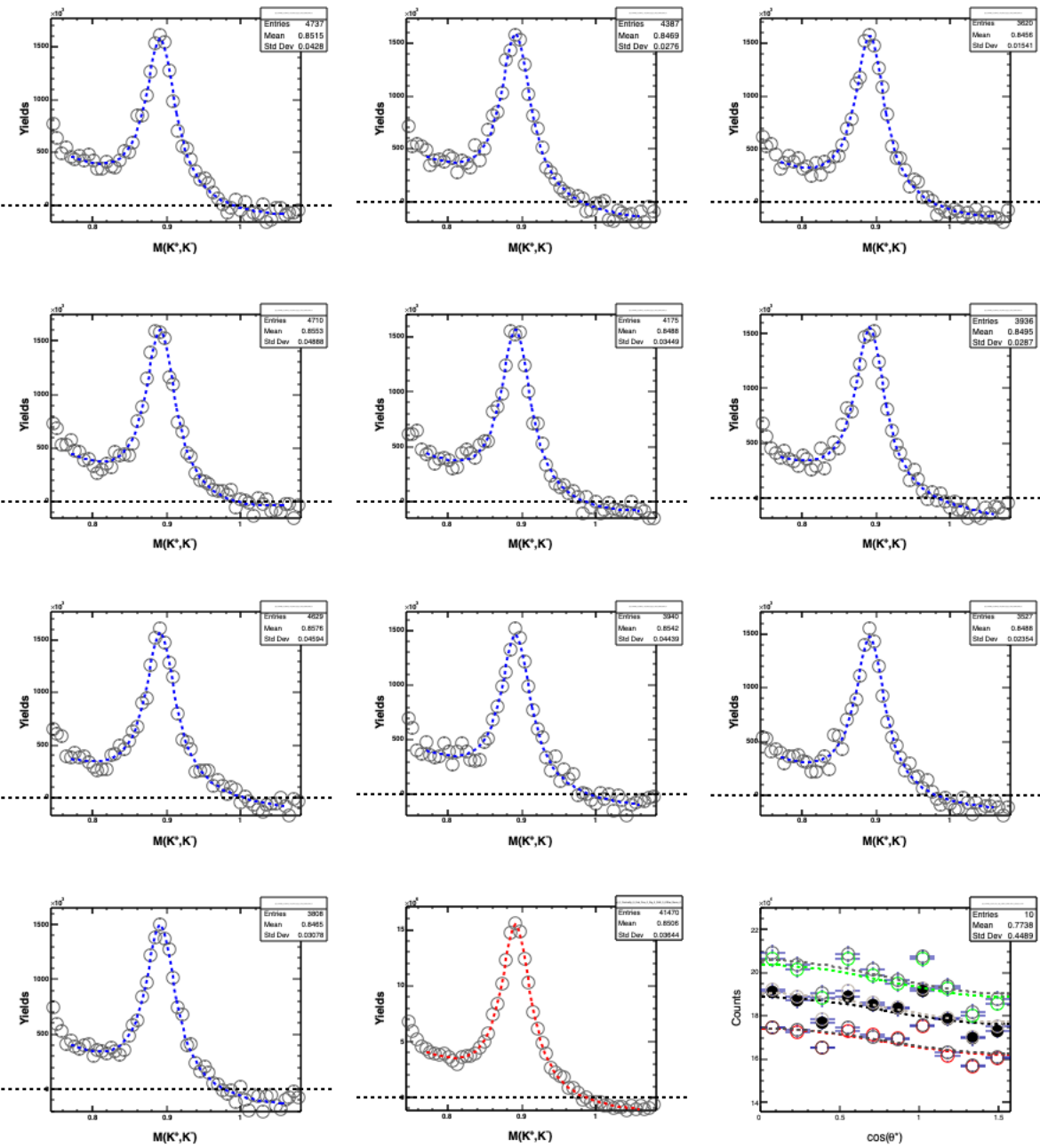
Strange behavior in tails of distributions.

Major issue with 40-80% centrality results

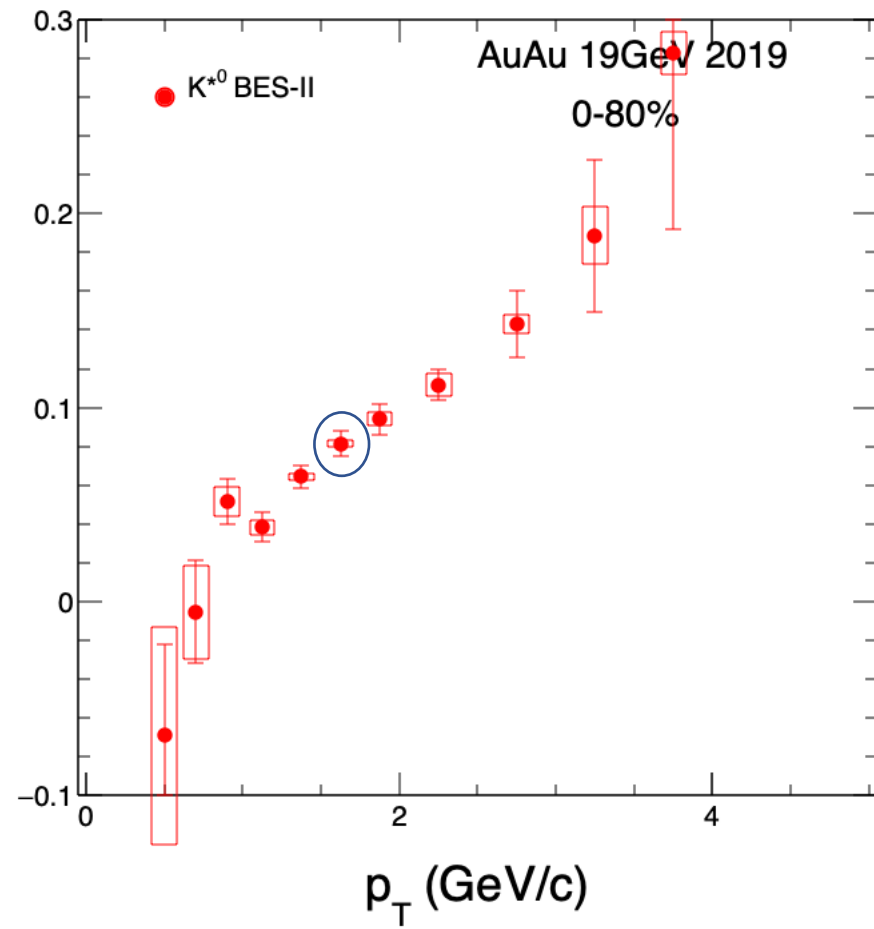
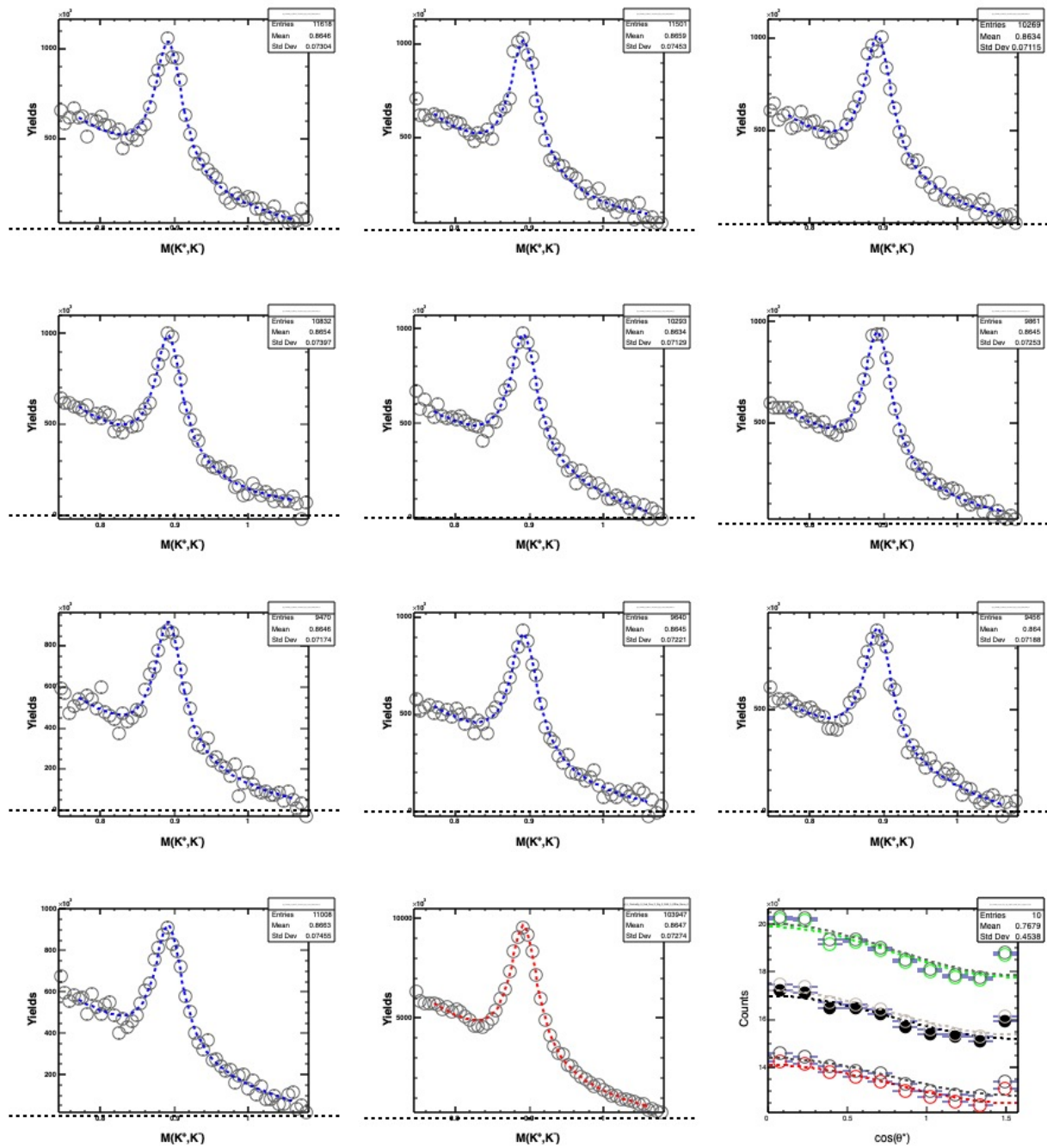
pT1



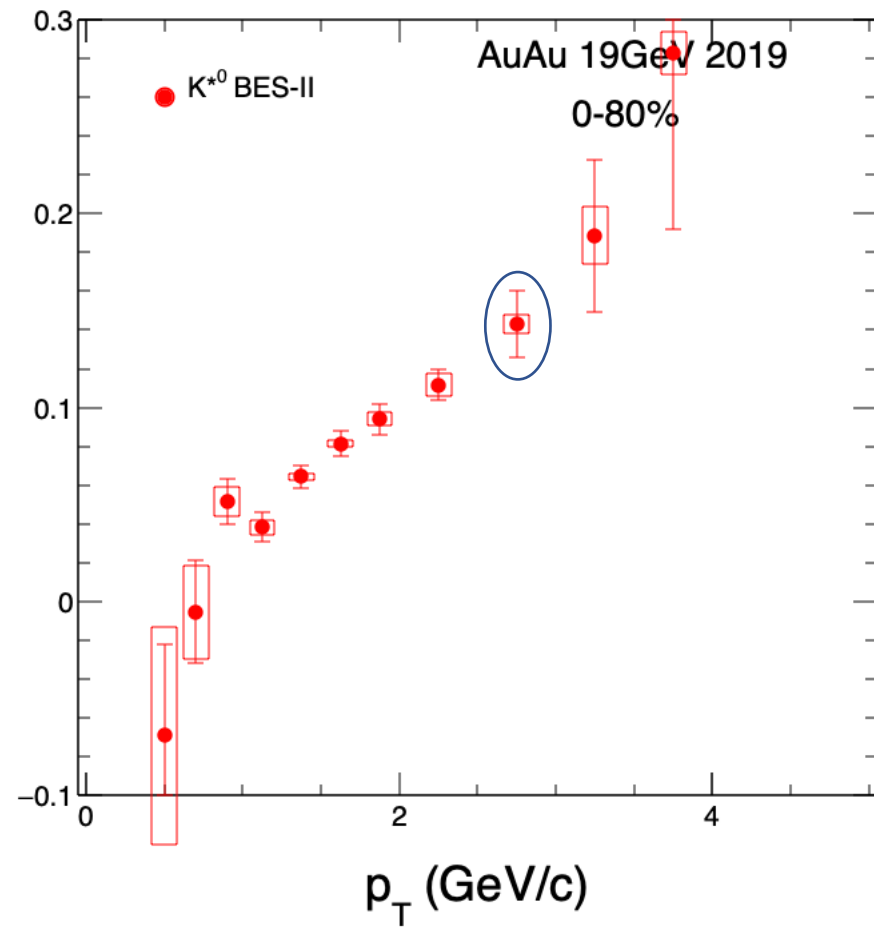
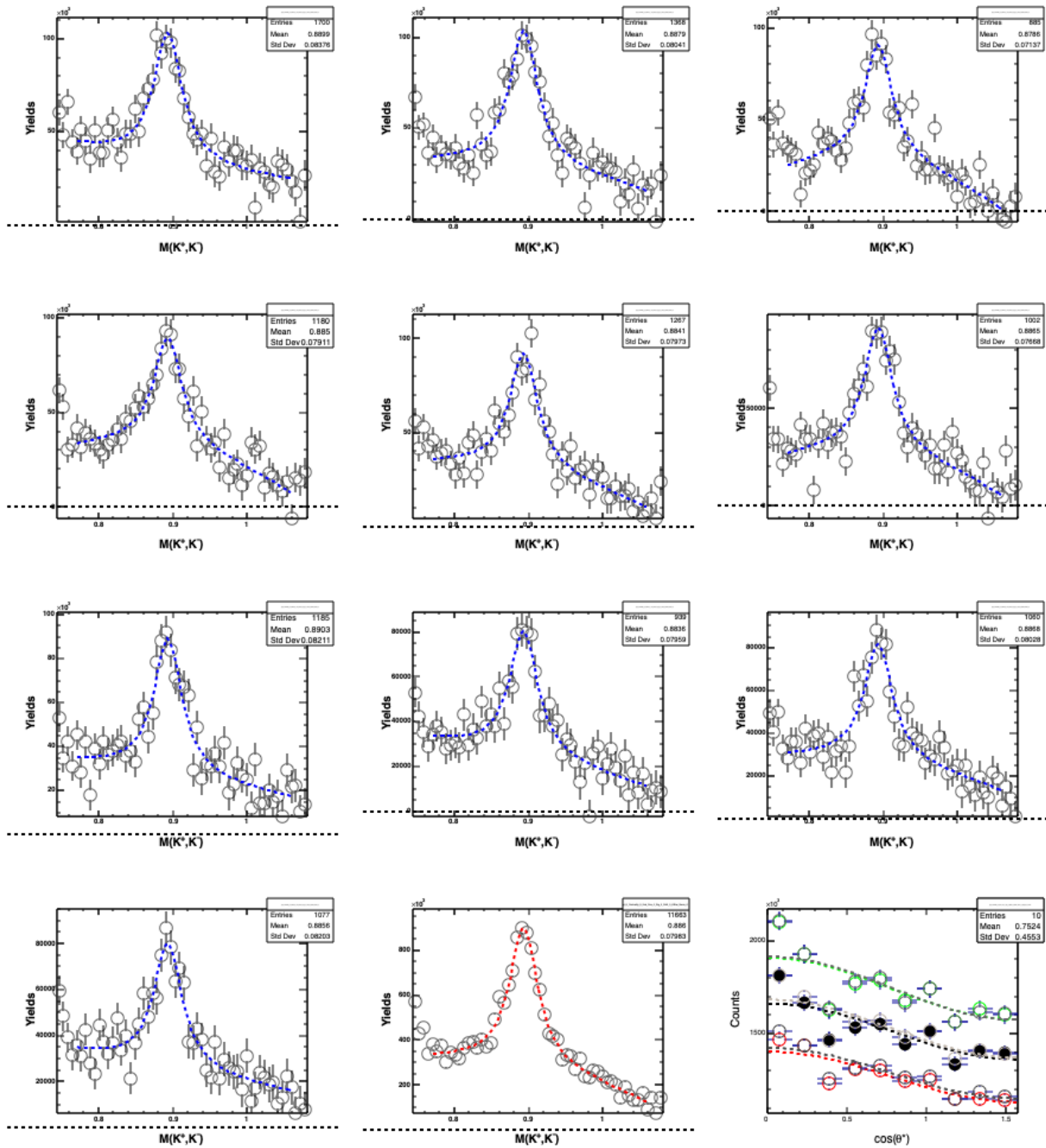
pT2



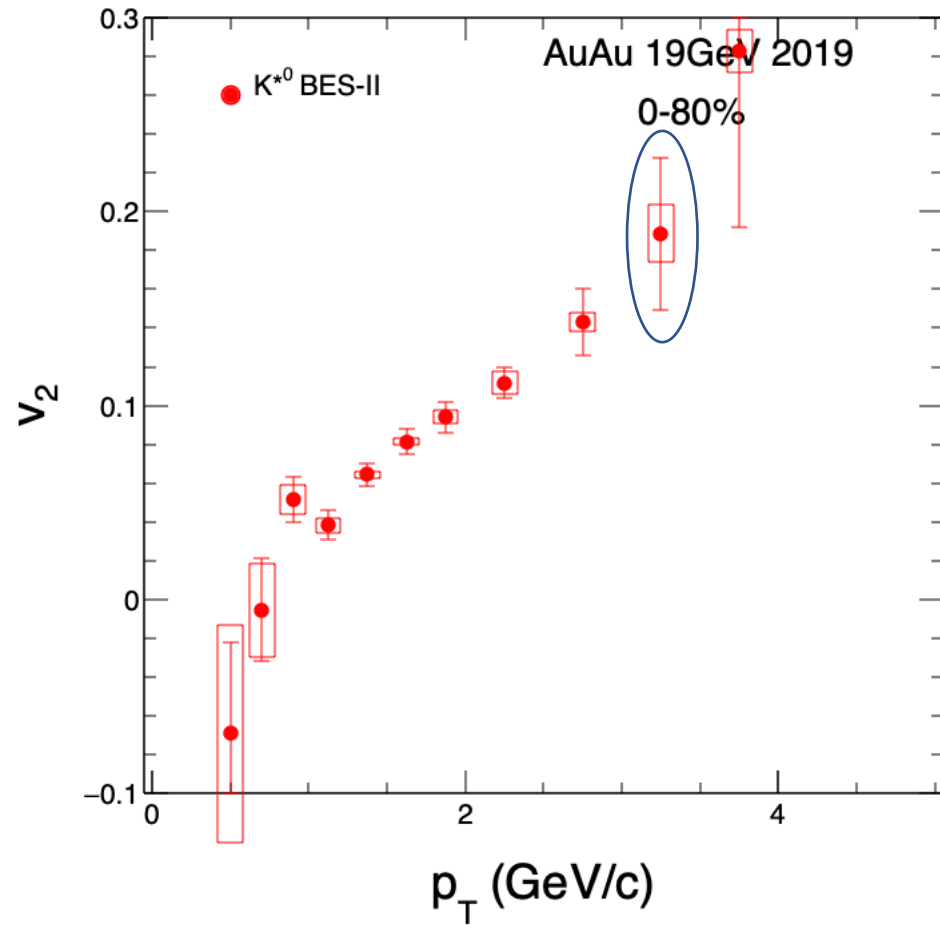
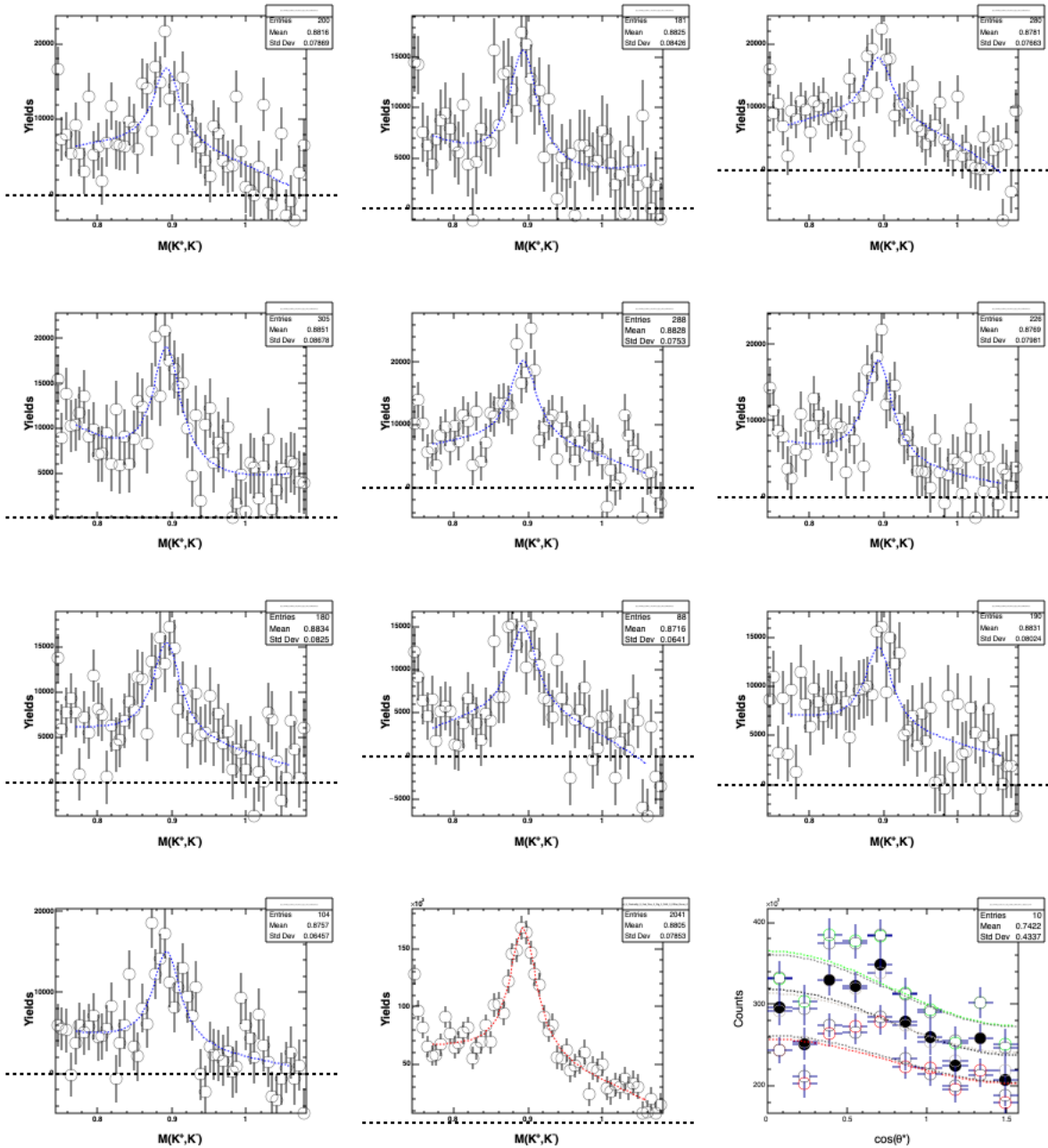
pT5



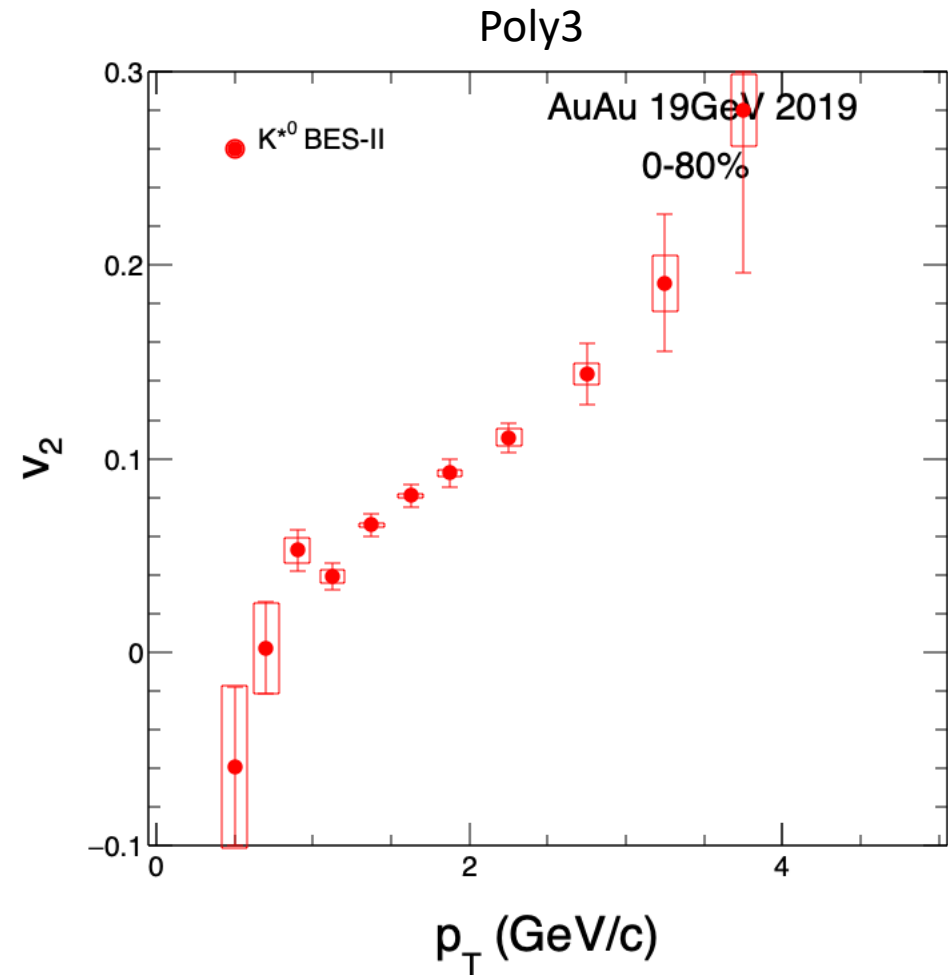
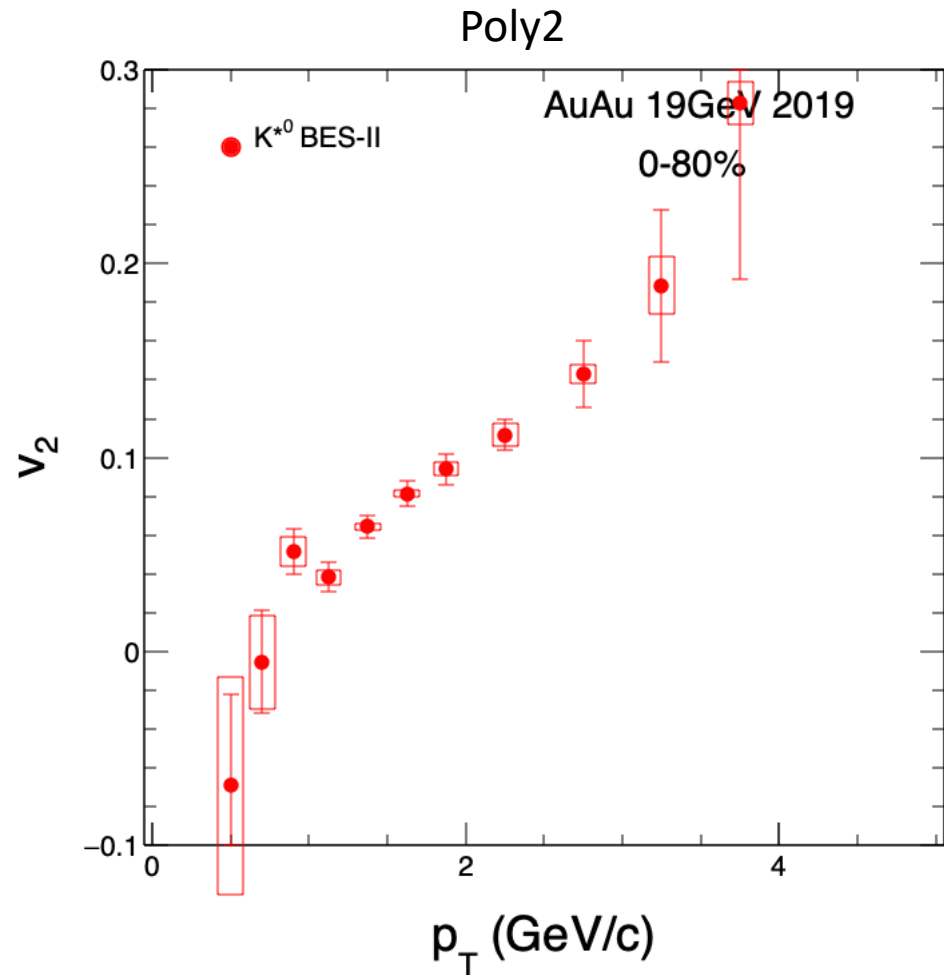
pT8



pT9



Attempt Poly 3 residual background



Other updates

ϕ meson elliptic flow:

- I have contacted Priyanshi Sinha and received the v_2 vs p_T distributions as well as the p_T bin edges.
- Need to fill histograms from Ttrees with proper p_T binning. Use $|y| < 1.0$ to keep consistent with this analysis.

ETOF status: waiting for reply from Yannick and/or Philip who are working on the calibration for ETOF.

Outlook

ϕ meson

- Produce full sample for p_{00} w.r.t. $\Psi 1$.
- Produce TOF Matching fits and TPC tracking efficiency distributions for wider $|\eta|$ cut (p_{00} w.r.t. $\Psi 2$).
 - For p_T , y , and centrality dependence.

K^*0 meson

- v_2 needs work

