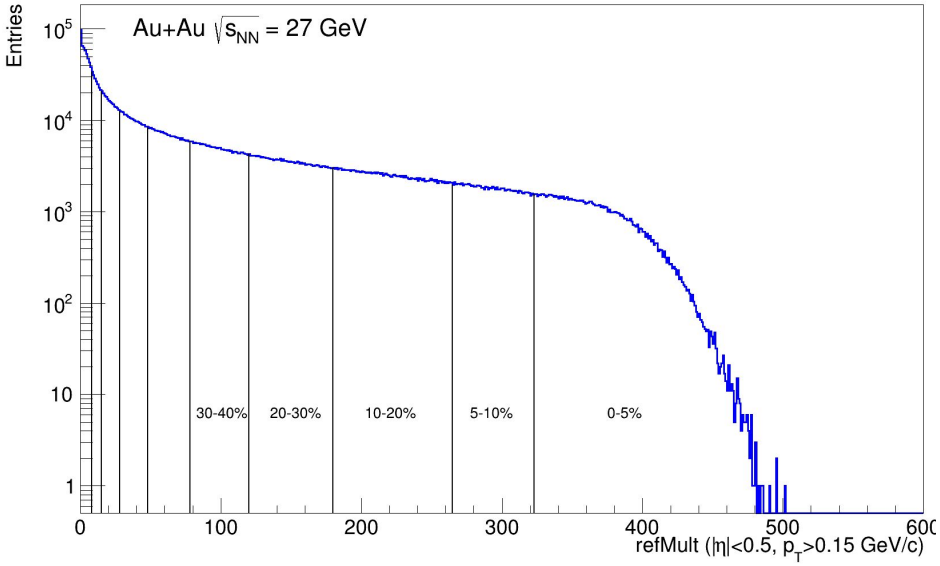
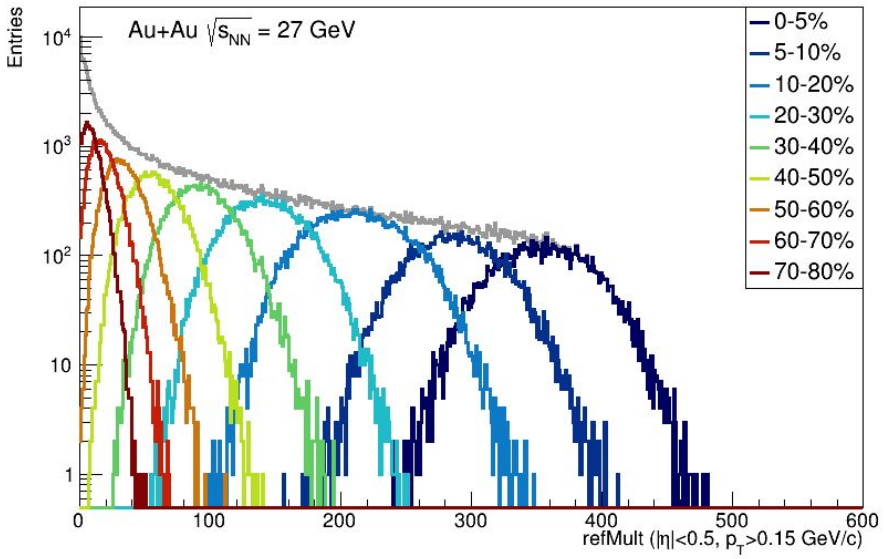
$\pi/\mathrm{K}/\mathrm{p}$ spectra, $\mathrm{Au}+\mathrm{Au}$, $\sqrt{s_{\mathrm{NN}}} = 27$ GeV

UrQMD

Cuts for centrality calculation:

- $\pi^{\pm}$, $K^{\pm}$, p (p-bar)
- $p_T > 0.15$ GeV/c
- $|\eta| < 0.5$





Au+Au, 27 GeV			
Centrality, %	Multiplicity	Percent in this bin	Cumulative percent
0-5	$322 \leq \text{mult} < 502$	0.0500505	0.0500505
5-10	$264 \leq \text{mult} < 322$	0.0495357	0.0995862
10-20	$179 \leq \text{mult} < 264$	0.100235	0.199822
20-30	$119 \leq \text{mult} < 179$	0.100627	0.300448
30-40	$77 \leq \text{mult} < 119$	0.0987935	0.399242
40-50	$47 \leq \text{mult} < 77$	0.100271	0.499513
50-60	$27 \leq \text{mult} < 47$	0.0990788	0.598592
60-70	$14 \leq \text{mult} < 27$	0.103341	0.701933
70-80	$7 \leq \text{mult} < 14$	0.0972113	0.799144

Statistics: ~2M

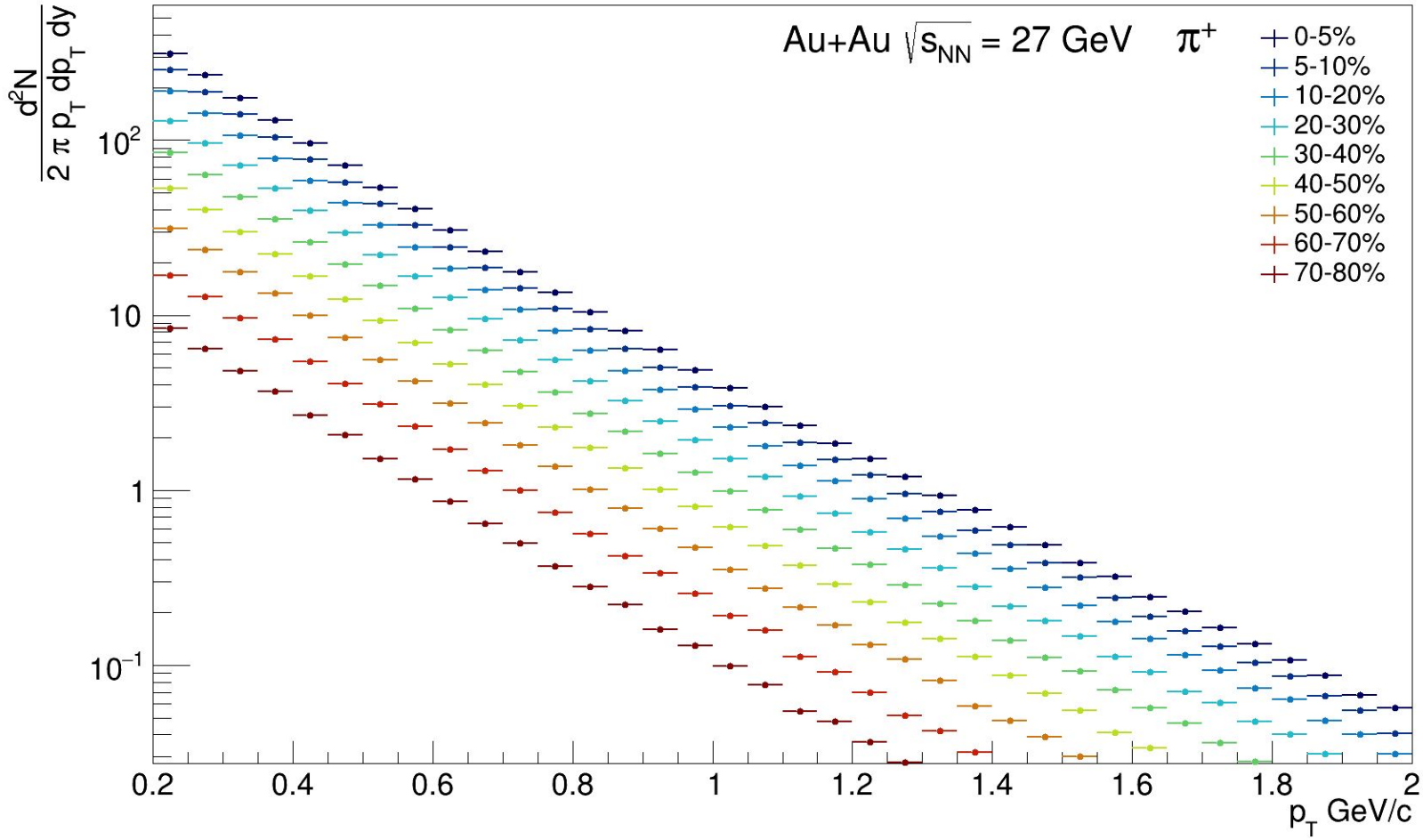
Track cuts:

- PDG ($\pi^{\pm} = \pm 211$, $K^{\pm} = \pm 321$, p (p-bar) $= \pm 2212$)
- $|y| < 0.1$,
- $|\eta| < 0.5$
- $p_T > 0.2$ GeV/c

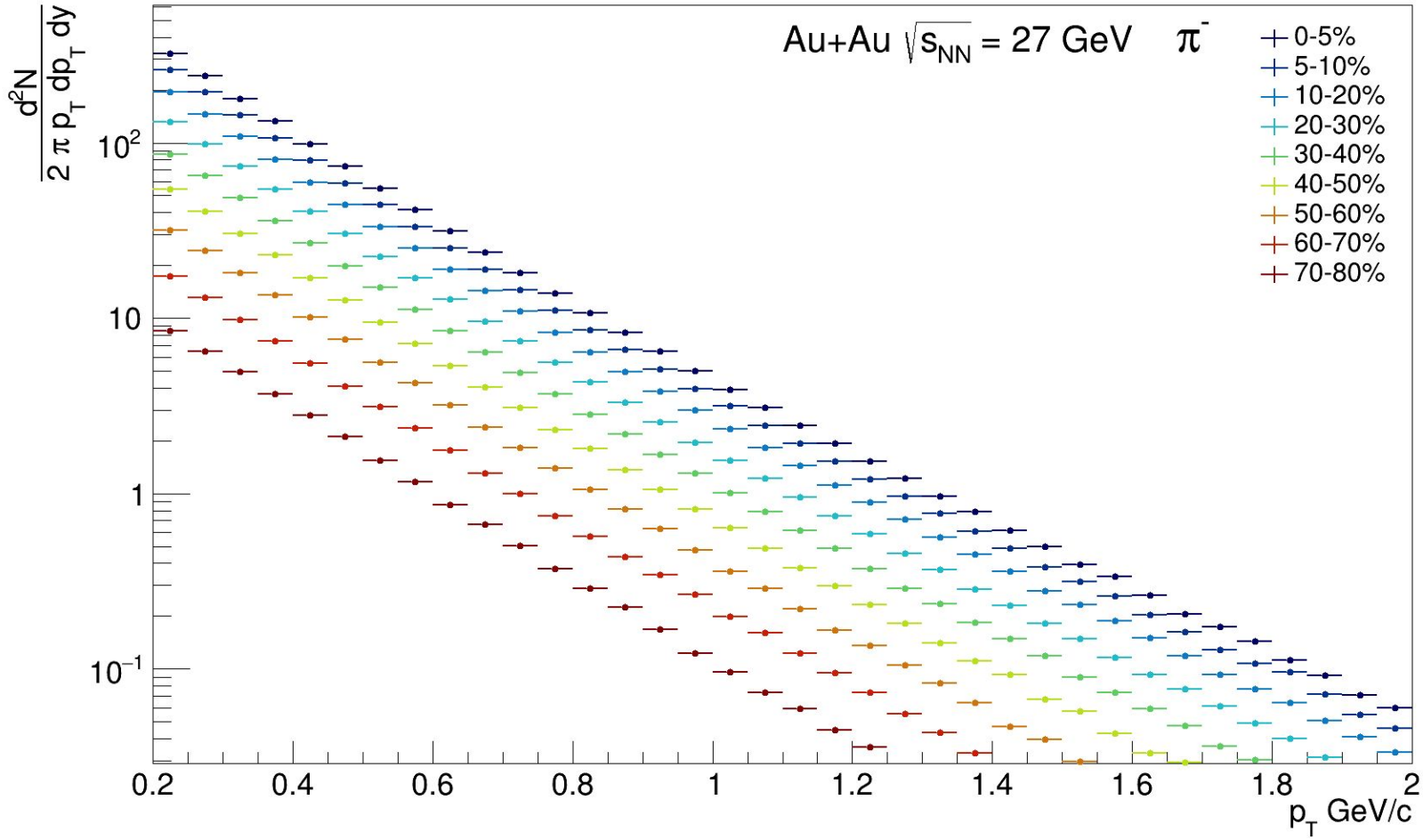
Bin width for spectra: 50 MeV/c

Centrality was calculated using multiplicity.

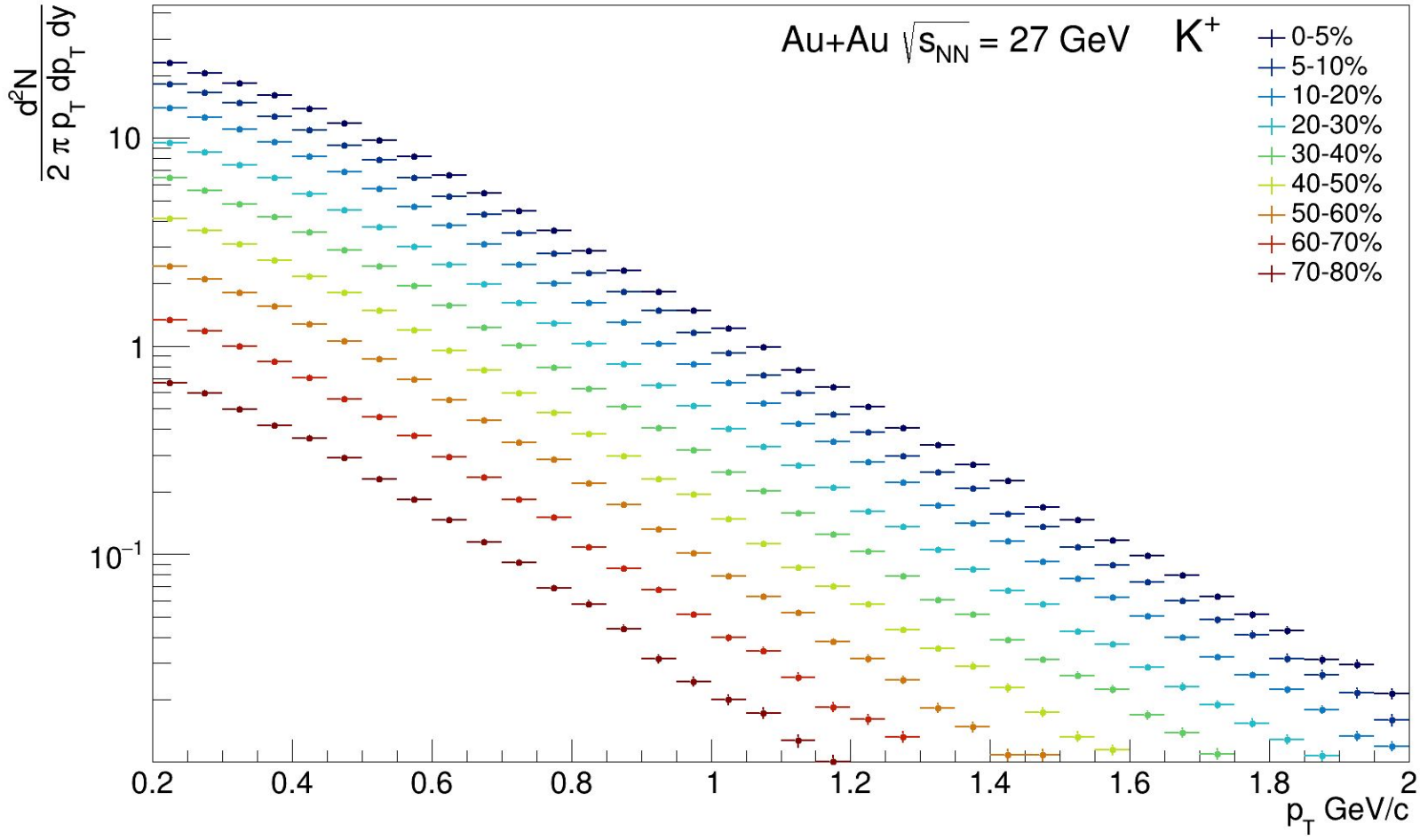
Centrality dependence of π^+ spectra at $\sqrt{s_{NN}} = 27$ GeV



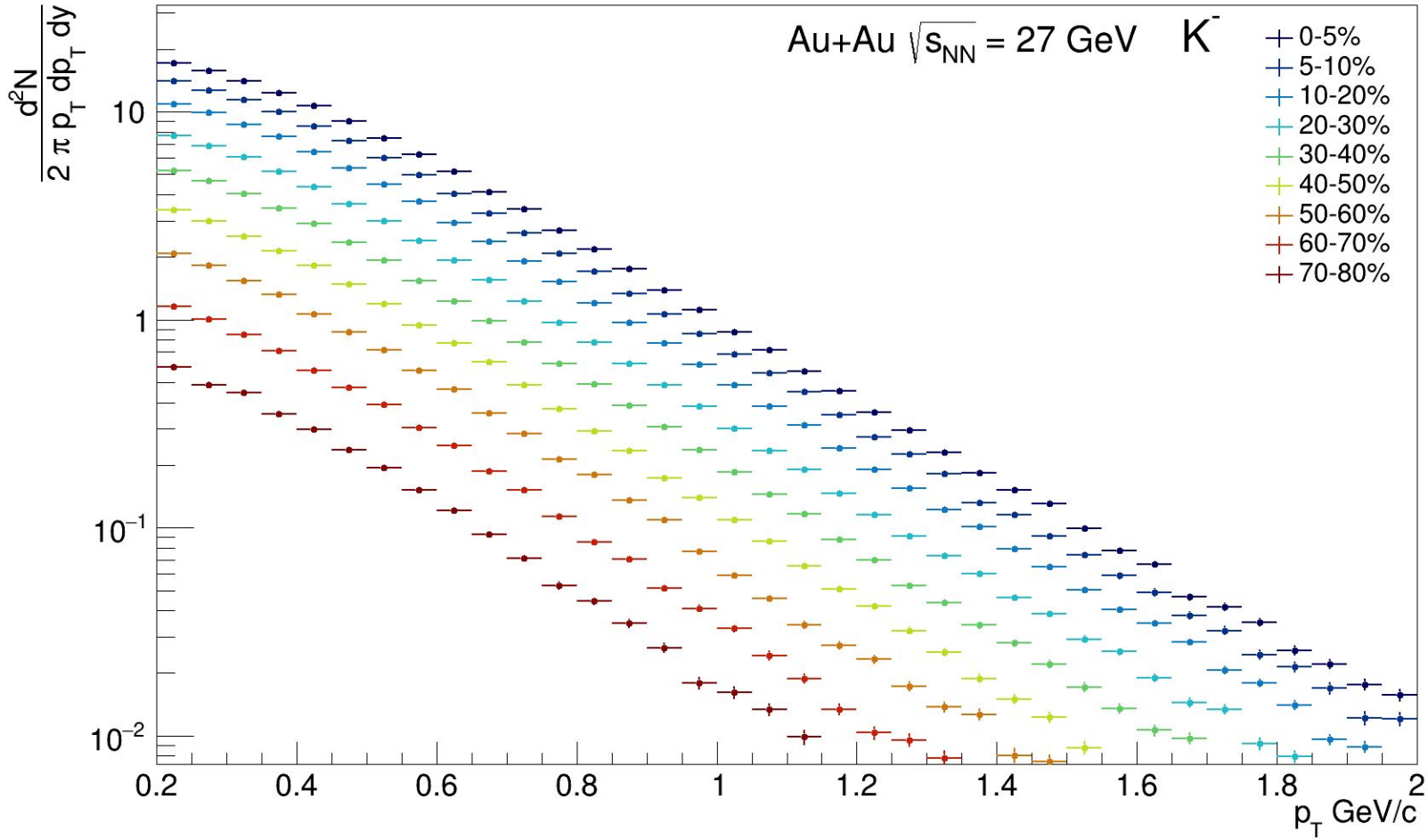
Centrality dependence of π^- spectra at $\sqrt{s_{NN}} = 27$ GeV



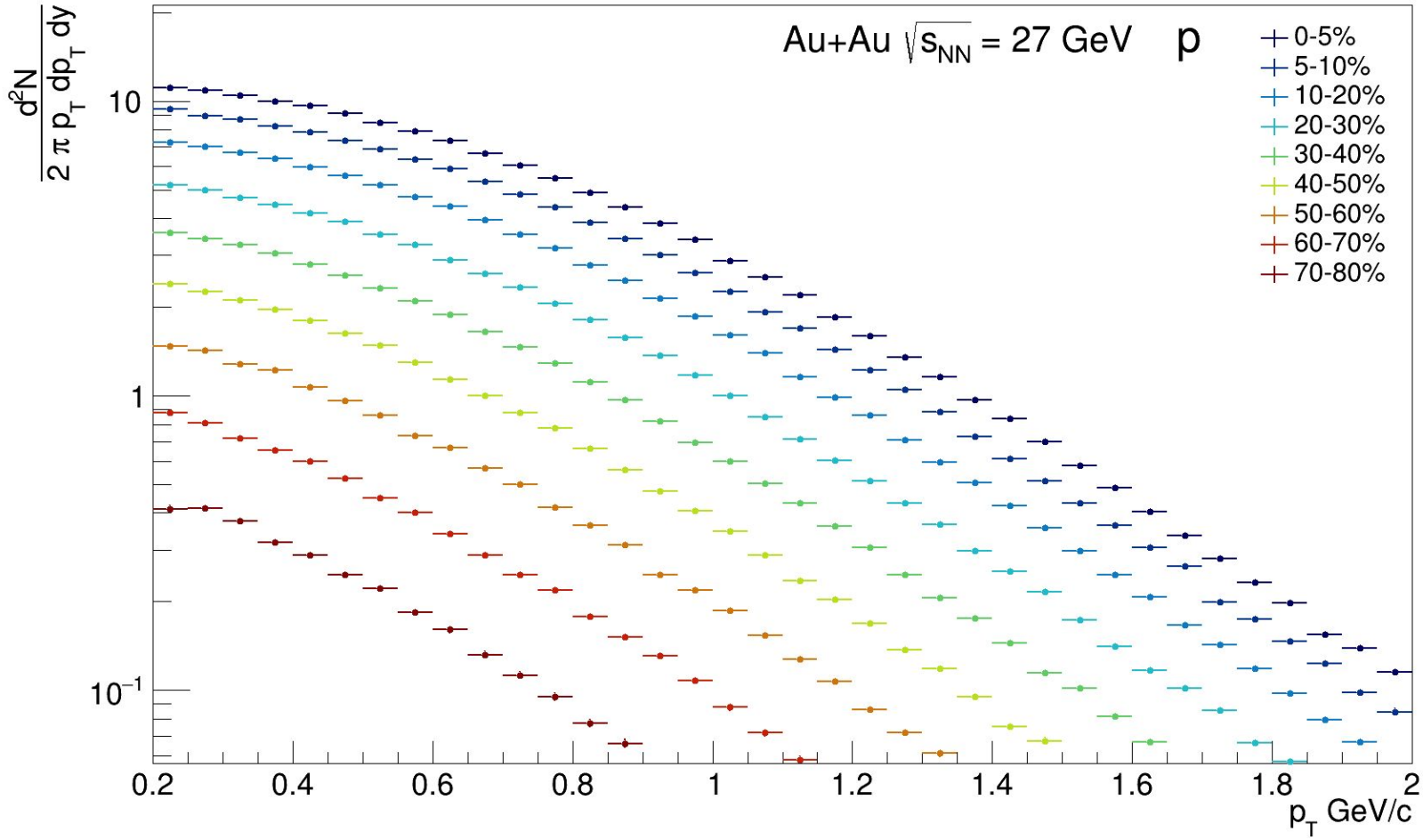
Centrality dependence of K^+ spectra at $\sqrt{s_{NN}} = 27$ GeV



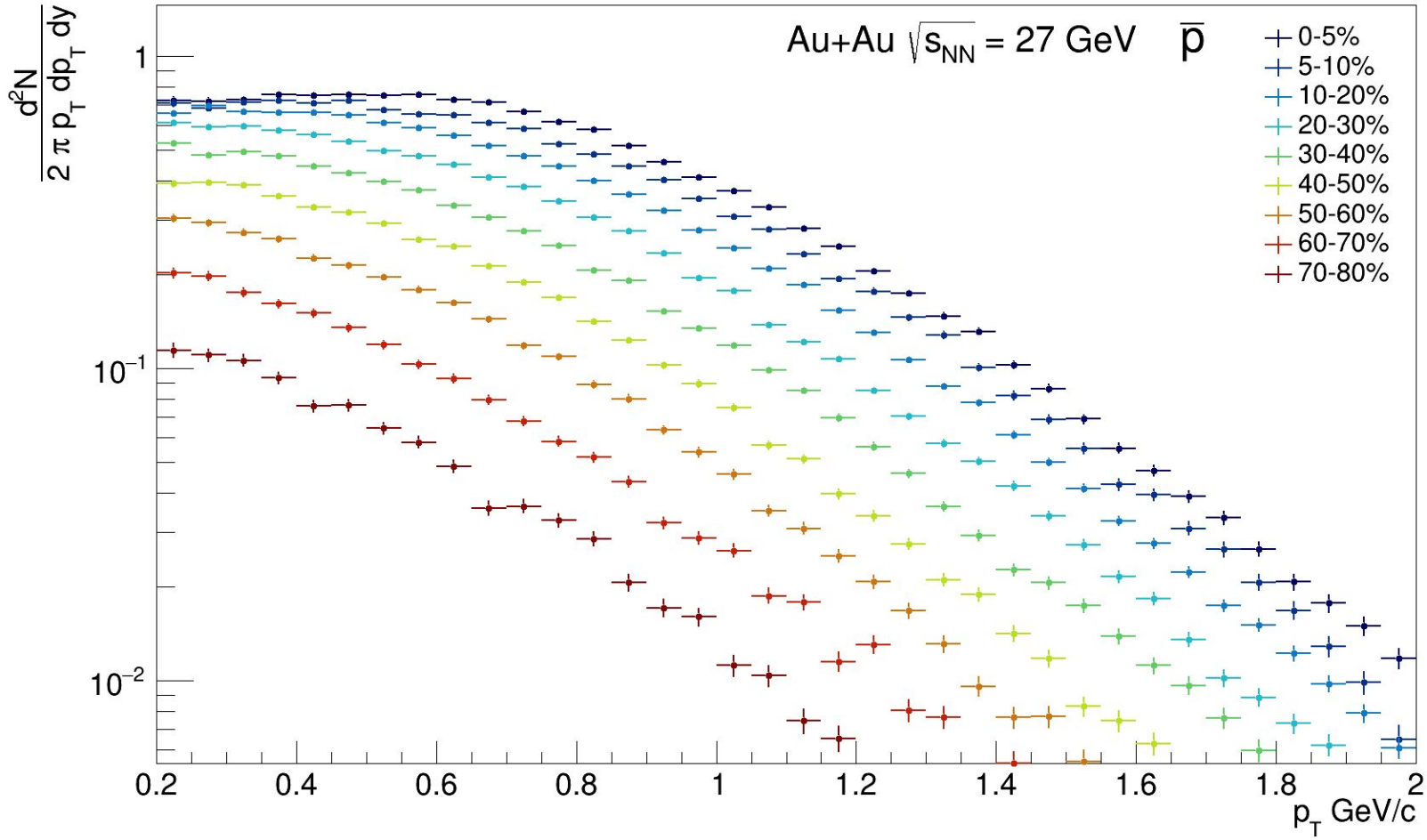
Centrality dependence of K^- spectra at $\sqrt{s_{NN}} = 27$ GeV



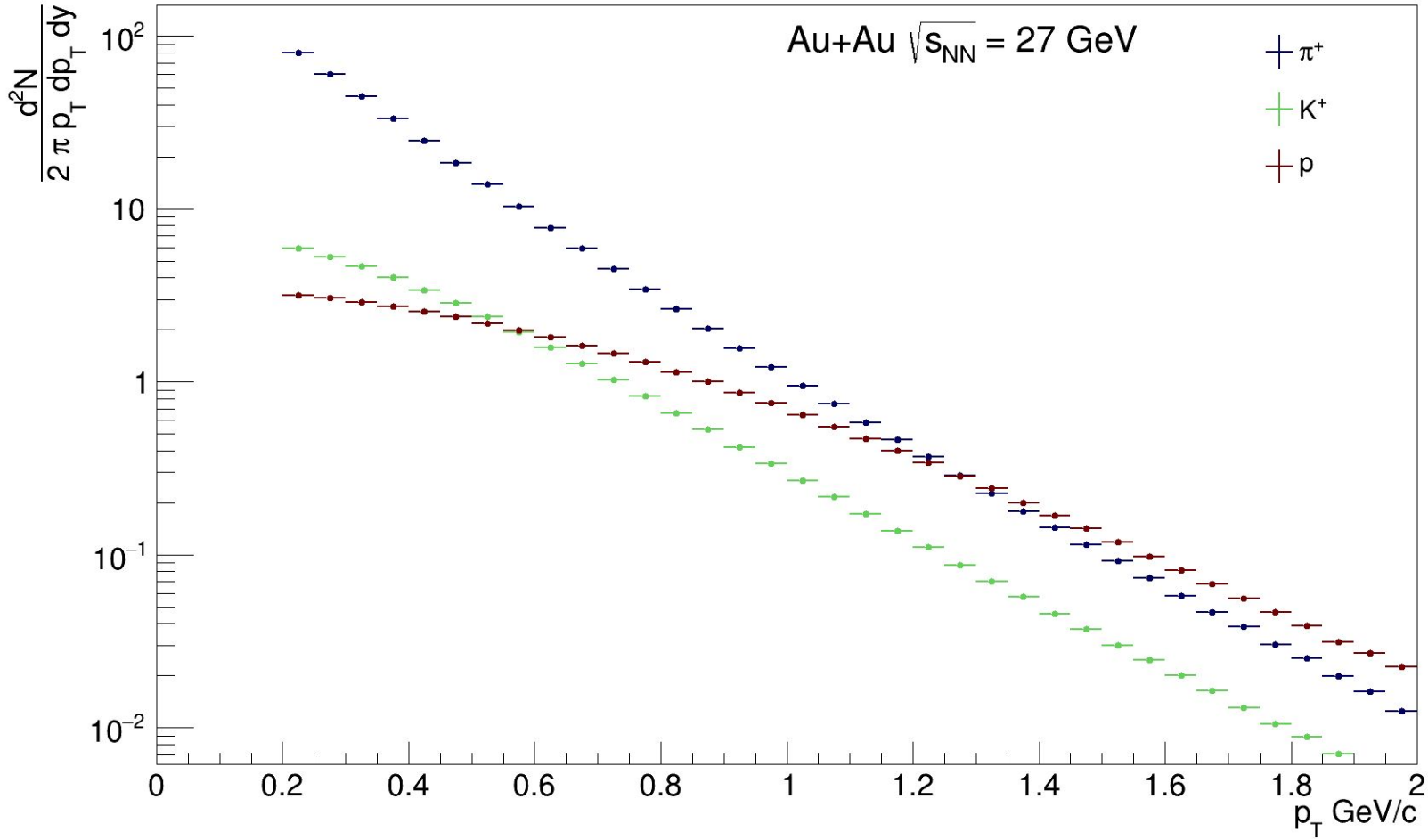
Centrality dependence of p spectra at $\sqrt{s_{NN}} = 27$ GeV



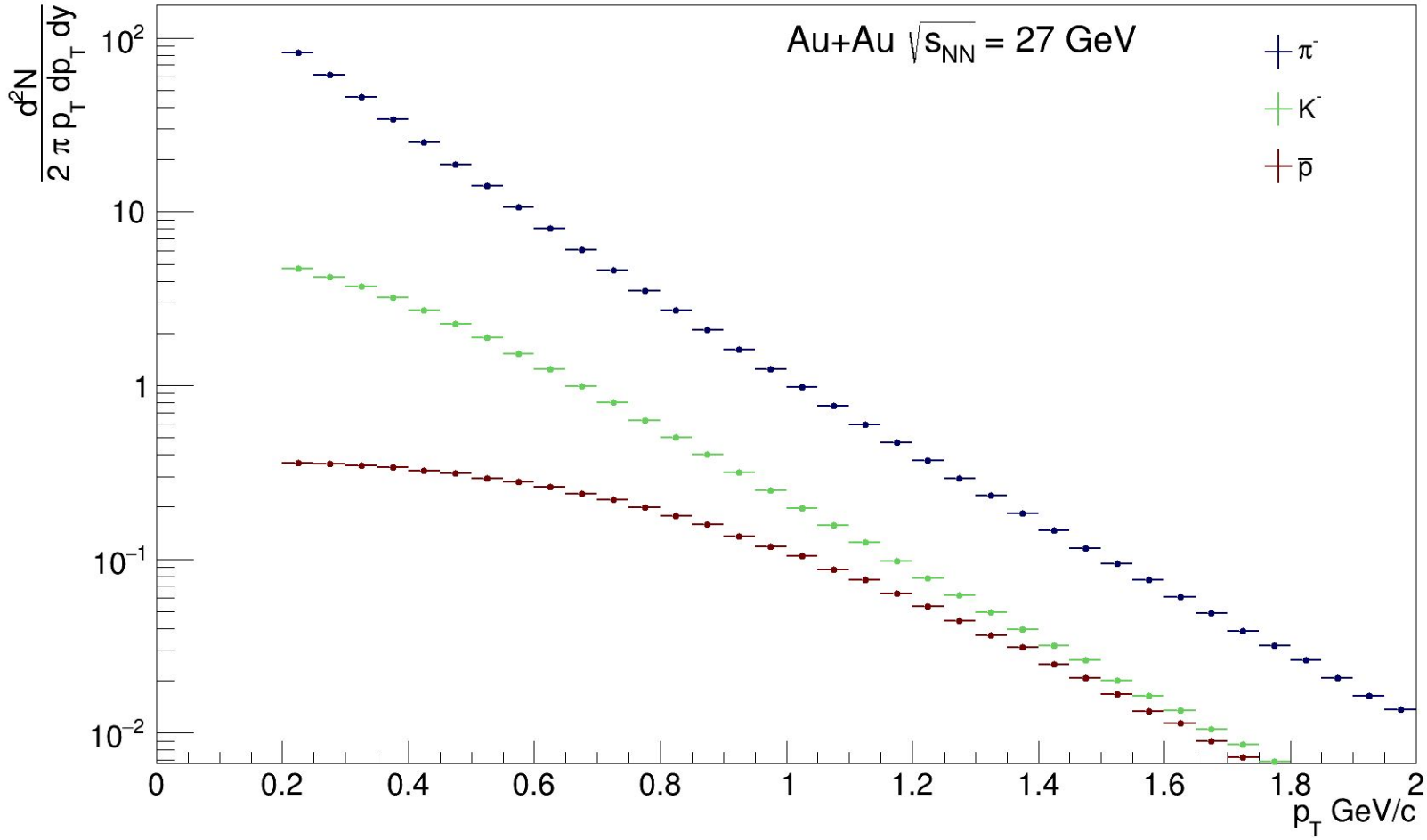
Centrality dependence of p-bar spectra at $\sqrt{s_{NN}} = 27$ GeV



$\pi^+/K^+/p$ spectra at $\sqrt{s_{NN}} = 27$ GeV in integrated centrality range



$\pi^-/K^-/p\text{-bar}$ spectra at $\sqrt{s_{NN}} = 27$ GeV in integrated centrality range



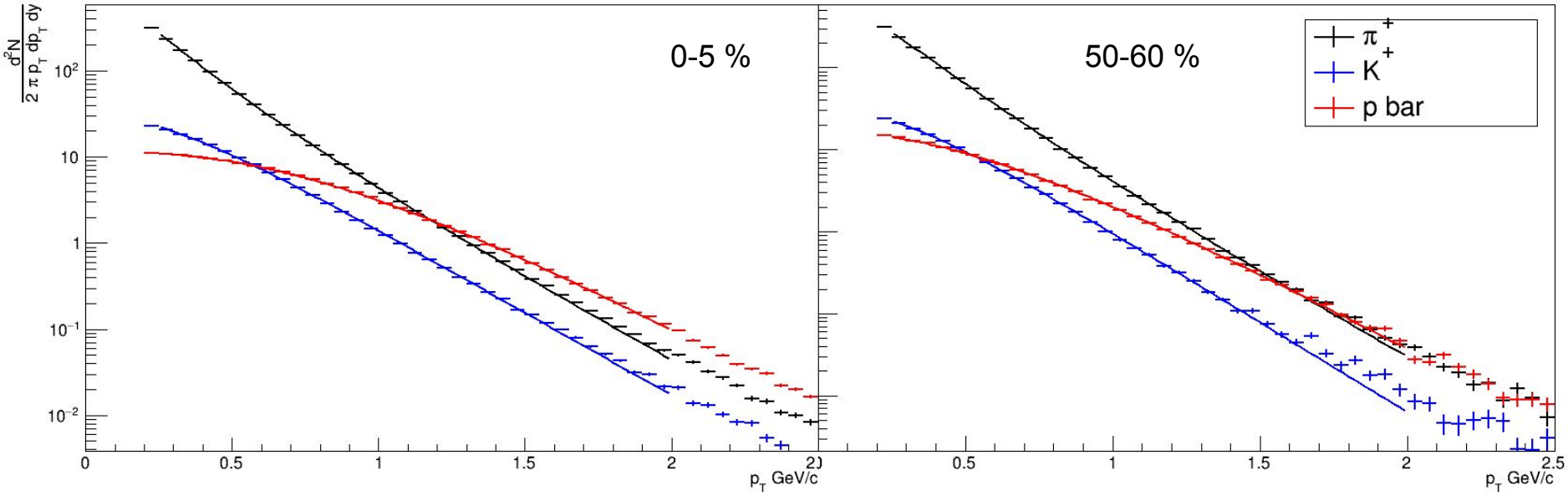
blast wave fit

$$\frac{dN}{p_T\,dp_T} \propto \int_0^R r\,dr\,m_T I_0\left(\frac{p_T \sinh\rho(r)}{T_{\rm kin}}\right) \times K_1\left(\frac{m_T \cosh\rho(r)}{T_{\rm kin}}\right),$$

where m_T is the transverse mass of a hadron, $\rho(r) = \tanh^{-1}\beta$, and I_0 and K_1 are the modified Bessel functions. We use a radial flow velocity profile of the form

$$\beta = \beta_S (r/R)^n, \qquad (14)$$

where β_S is the surface velocity, r/R is the relative radial position in the thermal source, and n is the exponent of flow velocity profile. Average transverse radial flow velocity $\langle\beta\rangle$ can then be obtained from $\langle\beta\rangle = \frac{2}{2+n}\beta_S$.



blast wave fit

$$\frac{dN}{p_T\,dp_T} \propto \int_0^R r\,dr\,m_T I_0\left(\frac{p_T \sinh\rho(r)}{T_{\rm kin}}\right) \times K_1\left(\frac{m_T \cosh\rho(r)}{T_{\rm kin}}\right),$$

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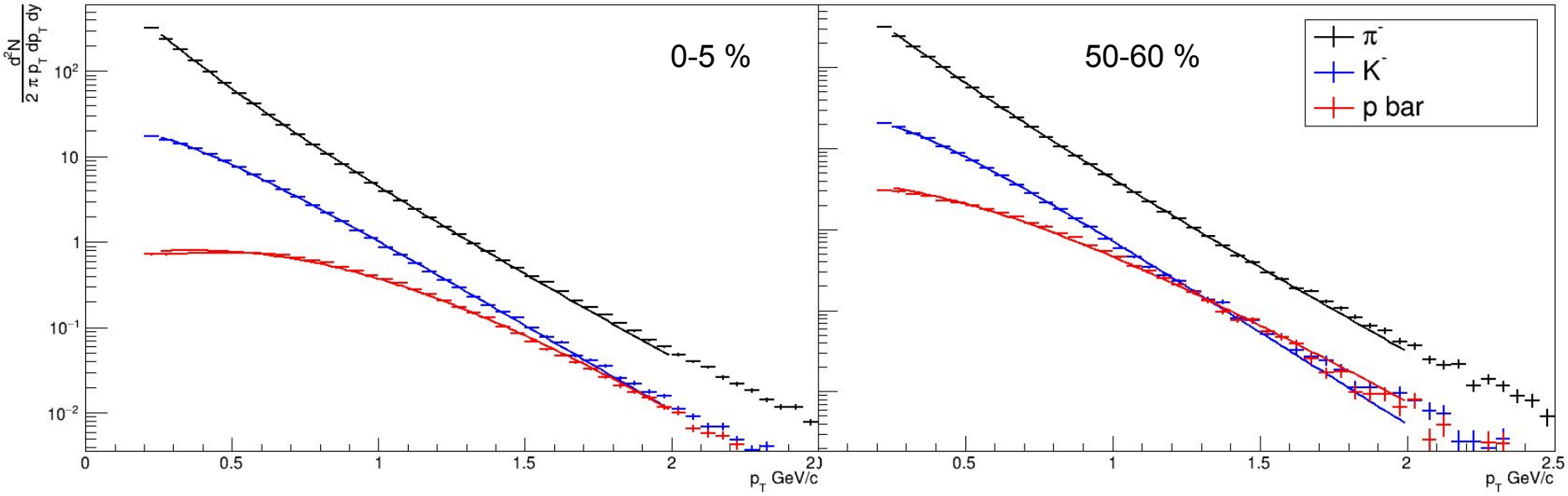

	Centr	<beta>	Tkin, MeV
Pion +	0-5 %	0.53	75.3
K +		0.32	140.6
p		0.45	111.8
Pion –		0.53	73.8
K –		0.24	156.6
p Bar		0.53	72.5
Pion +	50-60%	0.42	102.1
K +		0.31	119.9
p		0.26	153.7
Pion –		0.44	98.5
K –		0.31	116.7
p Bar		0.10	184.5

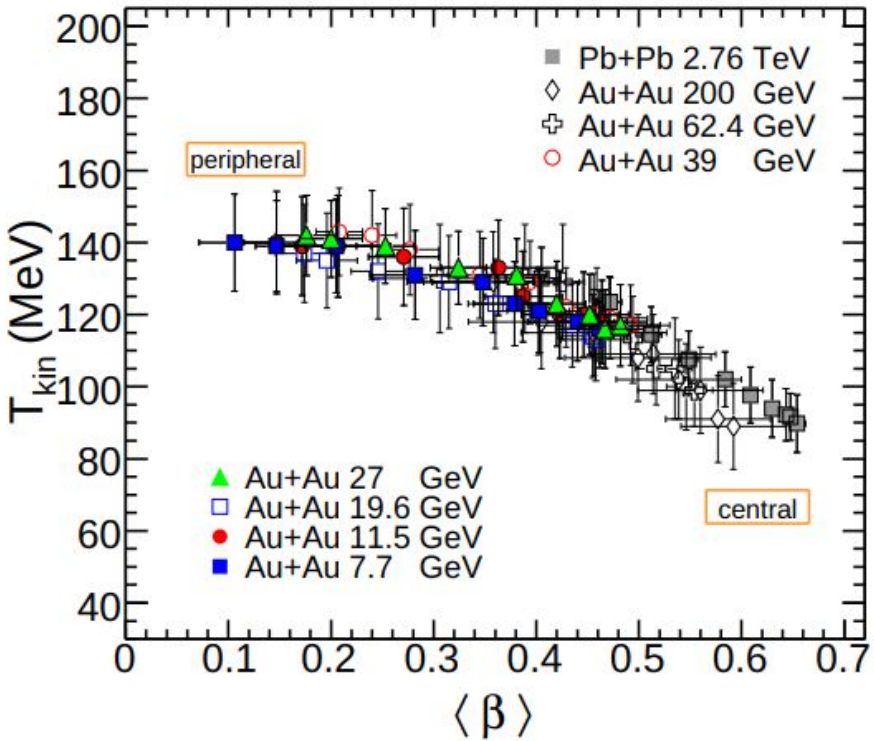

FIG. 37: (Color online) Variation of $T_{\rm kin}$ with $\langle\beta\rangle$ for different energies and centralities. The centrality increases from left to right for a given energy. The data points other than BES energies are taken from Refs. [43, 66]. Uncertainties represent systematic uncertainties.