



STAR Physics Highlights- 2026

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2026 RHIC/AGS Users' Meeting

May 11–15, 2026, BNL

Thanks to everyone
Who commented
And helped

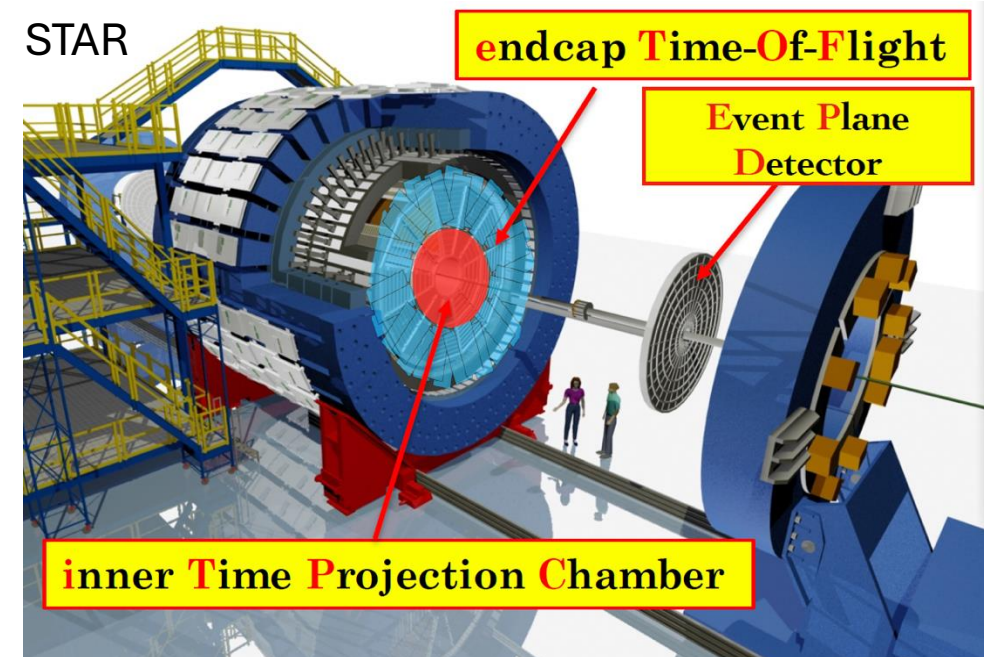
Status

- Data taking is done – Detector is being disassembled
 - ~30 energies, 12 species combinations — incl. BES II
- Rich and varied physics program — 25+ years
- 5 Physics working groups
- Over 50 papers now under “GPC” review
- ~21 publications in past year – Nature:1, Nature Comm:1, Rept. Prog. Phys:1, PRL:6, PRC:6, PRD:2, PLB:4
- FXT energy analysis in high gear (3–7.7 GeV)

• Chosen subset of topics to discuss

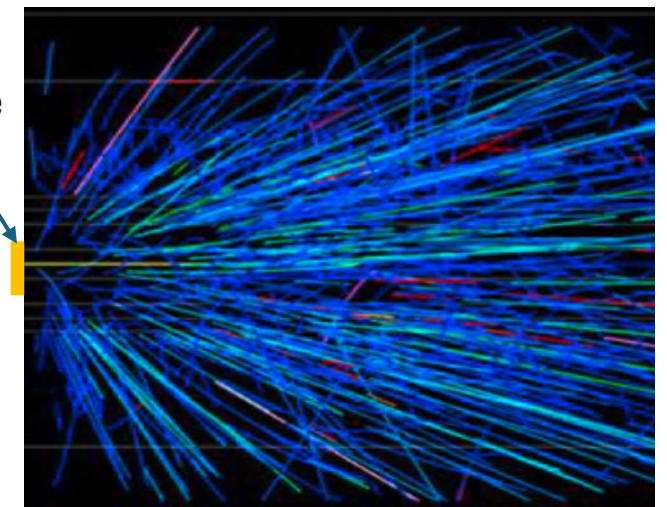
- Small Systems: FF in CNM; Jet quenching in O+O
- Stopping and Baryon Junctions
- (strange) Di-Baryon Bound States
- Measuring c_s as a function of T
- Measuring T – dileptons
- The Critical Point and 1st-Order Transition Line
 - Flow and NCQ scaling: v_2
 - Fluctuations: Net Proton; p_T
- Conclude

High Energy
↓
Low Energy



Target at
End of TPC
In beampipe

FXT Event



Small Systems:

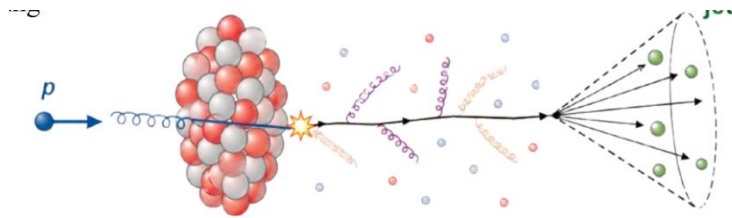
Cold Nuclear Matter: Fragmentation function modifications in p+Al

Hot Nuclear Matter: Jet quenching in O+O

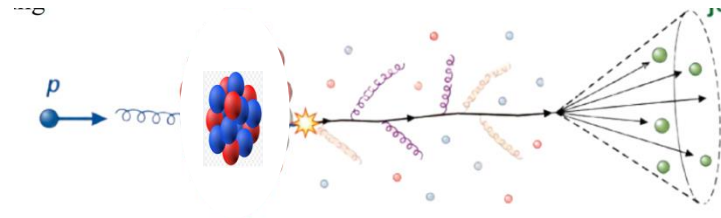
$\sqrt{s} = 200 \text{ GeV}$

Cold Nuclear Matter: QCD Hadronization modified in nuclear environment
Fragmentation functions encode parton \rightarrow hadron transition
Difference between Large and small systems?

Nuclear modification of hadrons in jets in p+Al



A=197
(Au)



A=27
(Al)

Hot Nuclear Matter:

QGP created in Au+Au collisions
Can it be created in small systems?

Jet quenching in O+O



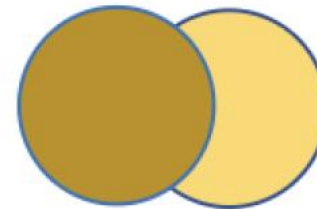
p+p



O+O

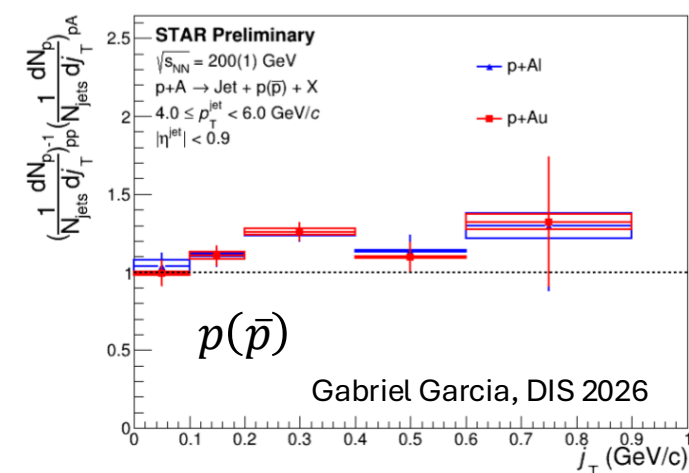
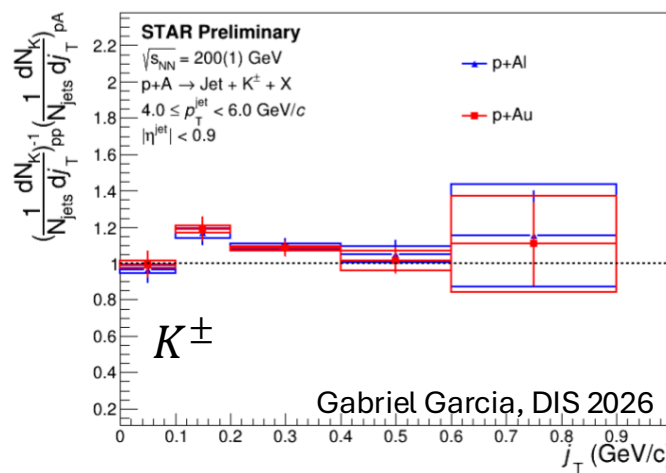
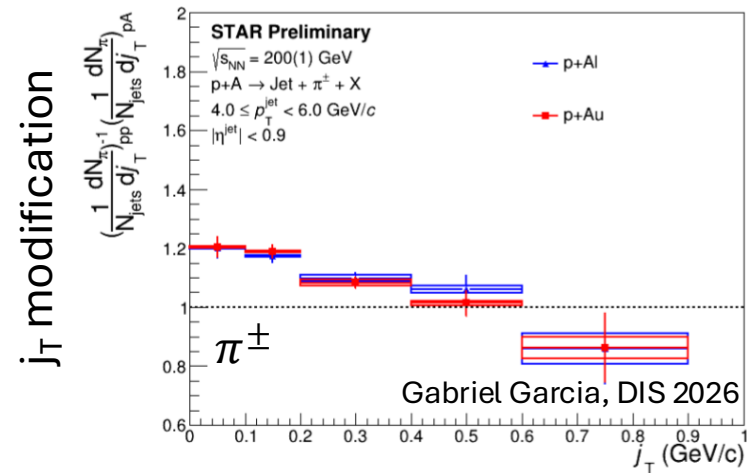
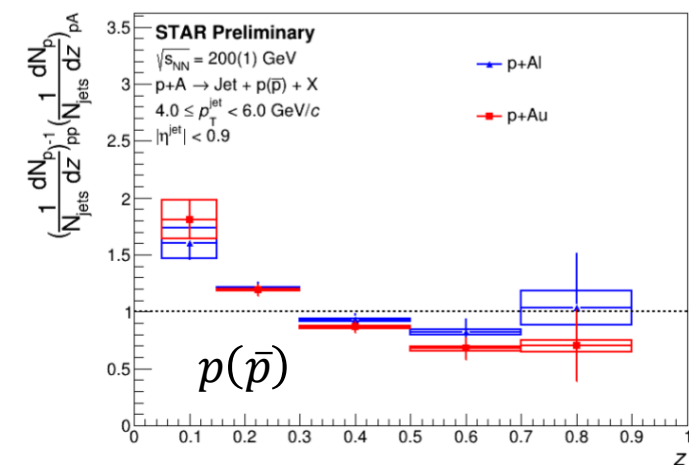
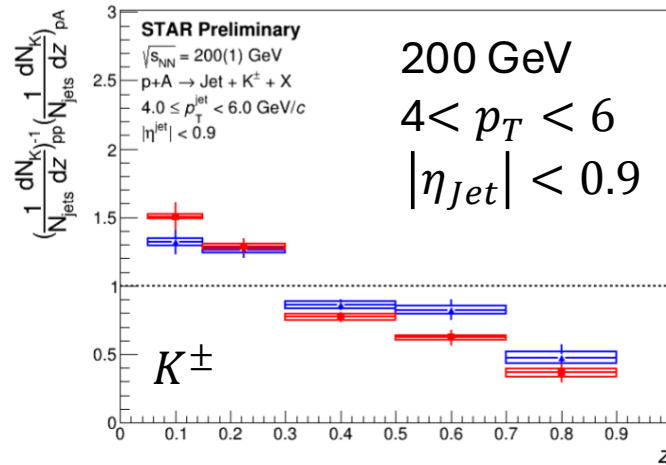
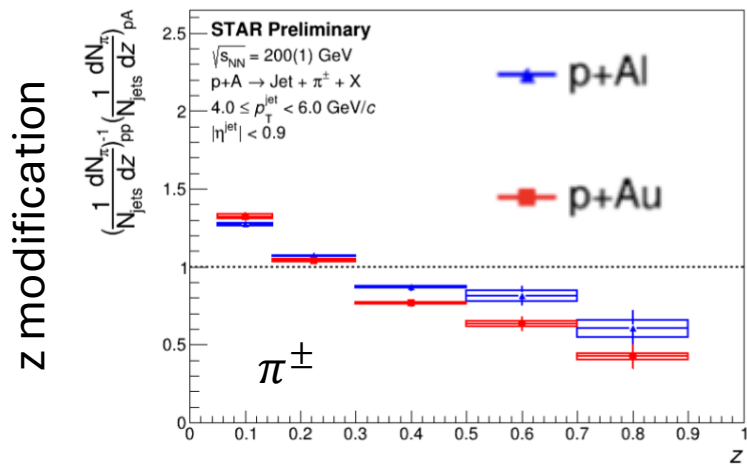


Isobar



Au+Au

Nuclear Modification of Identified Hadrons in Jets in CNM:



$$z = \frac{|\vec{p}^{\text{track}}|}{|\vec{p}^{\text{jet}}|}$$

$$j_T = |\vec{p}^{\text{track}} \times \hat{p}^{\text{jet}}|$$

- ❖ Modification in p+A due to
 - CNM effect – FF modification
 - multiple scattering
 - energy loss

Observe:

Enhancement at low-z, suppression at high-z
 stronger effect in p+Au than p+Al
 enhancement above 1 for j_T

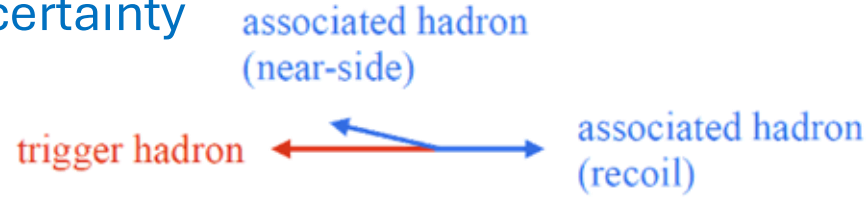
Jet quenching in small systems? O+O (A=16)

STAR, arXiv:2604.13935

- Per-trigger normalization of coincidence measurements removes dependence on N_{coll} present for inclusive measurements

→ significantly reduces uncertainty

$$I_{\text{CP}} = \frac{\frac{1}{N_{\text{trig}}} \cdot \left. \frac{d^2 N_{\text{jet}}}{dp_{T,\text{jet}}^{\text{ch}} d\eta_{\text{jet}}^{\text{ch}}} \right|_{\text{high-EA}}}{\frac{1}{N_{\text{trig}}} \cdot \left. \frac{d^2 N_{\text{jet}}}{dp_{T,\text{jet}}^{\text{ch}} d\eta_{\text{jet}}^{\text{ch}}} \right|_{\text{low-EA}}}$$



hadron-hadron:
suppression in 0-10% EA*
significance: $2.7\sigma - 5.2\sigma$

- Semi-inclusive hadron-jet measurement captures soft fragments from quenching

→ study dependence from energy redistribution

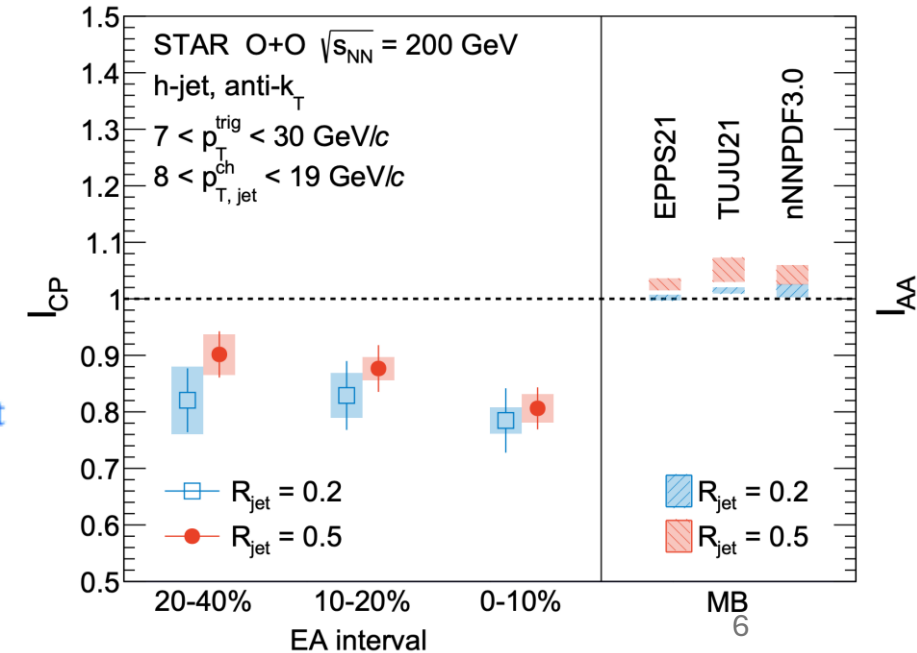
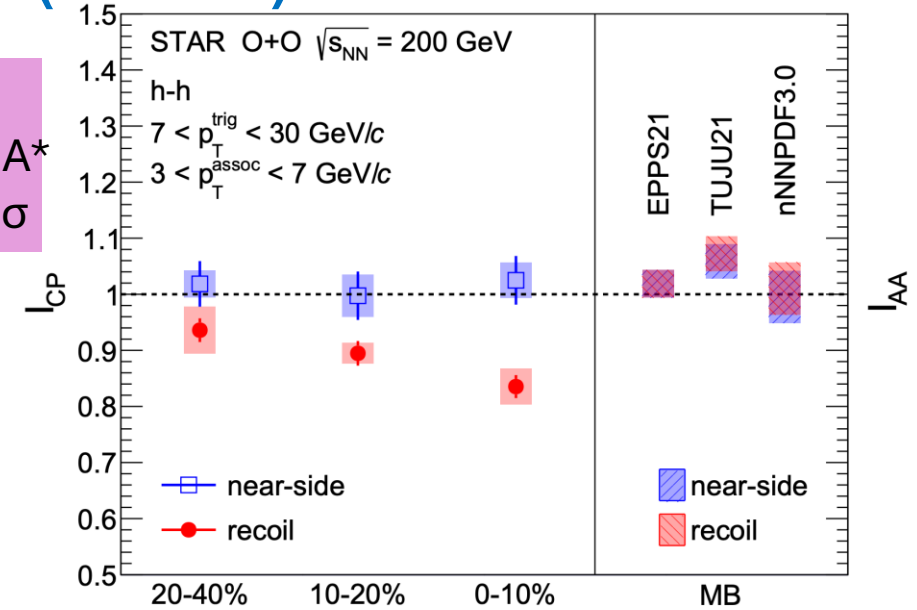
hadron-jet:
suppression in 0-10% EA*
 $3.5\sigma - 5\sigma$

- Models based on nPDFs with no quenching predict O+O/p+p ~ 1

Data suggest jet quenching in central O+O collisions at top RHIC energy



*EA = event activity

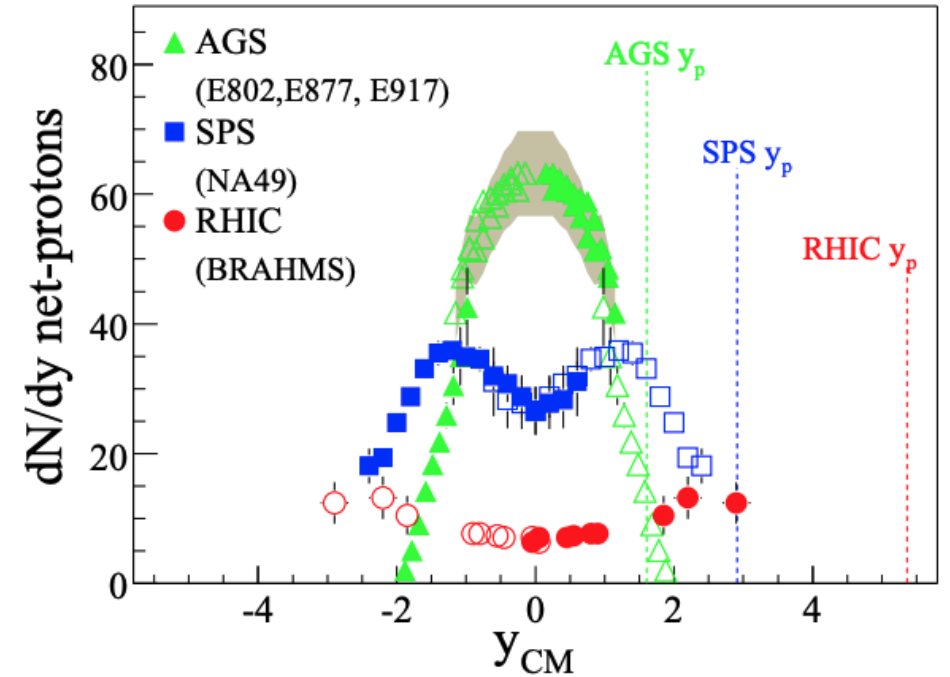
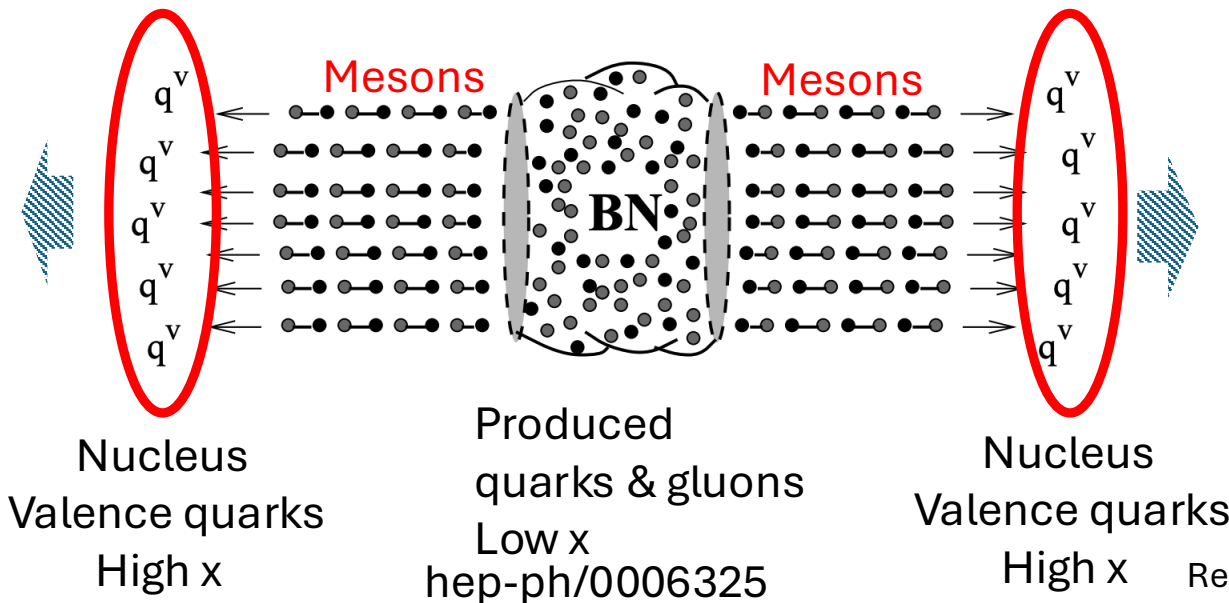
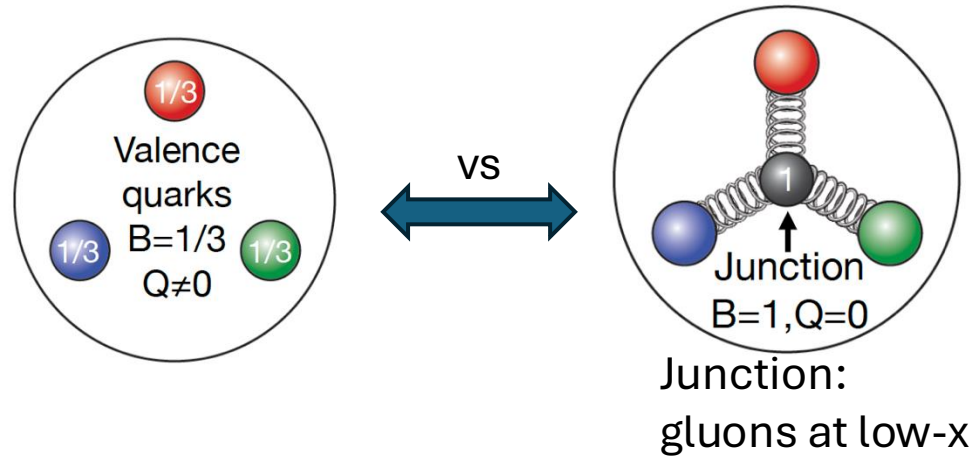


Baryon Junctions

Stopping & Baryon Junctions

Stopping: Baryon transport to midrapidity

Operator: gauge invariant



• 2 tests

- 1) Baryon vs charge transport in Isobar collisions
- 2) Baryon transport in γ +Au (54 GeV, UPC) and Au+Au (7.7–200 GeV) via Net-proton rapidity slope

Rossi, Veneziano, Kharzeev...

Refs: PLB 378, 238 (1996); hep-ph/0006325; PRL 93, 102301 (2004)

1) Charge vs Baryon transport in Isobar collisions

- Look at $\langle B \rangle / \Delta Q$

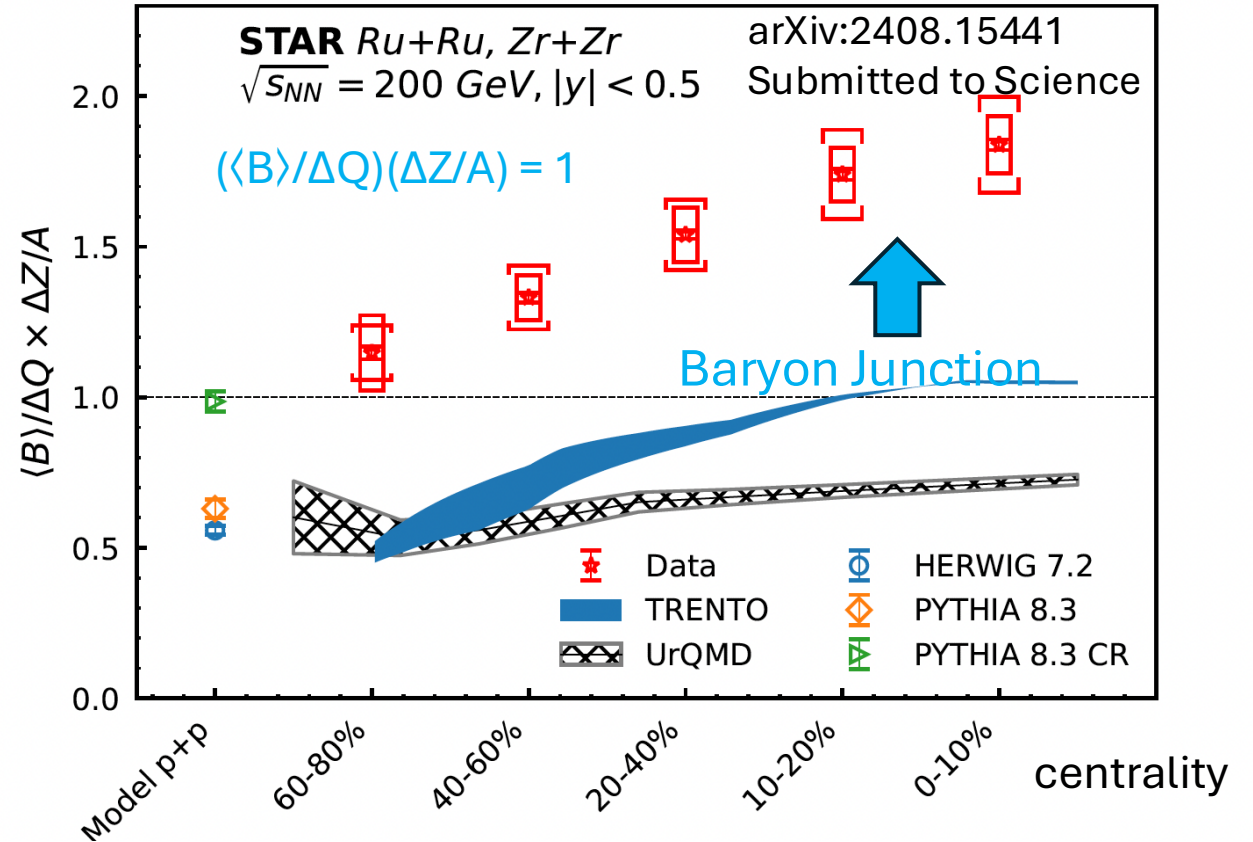
- $\Delta Q = Q_{RuRu} - Q_{ZrZr}$ (${}^{96}_{44}Ru$ ${}^{96}_{40}Zr$)

→ naively $(\langle B \rangle / \Delta Q)(\Delta Z / A) = 1$

2B Ru+Ru and Zr+Zr @ $\sqrt{s} = 200$ GeV

$$\Delta Q = N_{\pi} (R2_{\pi} - 1) + \text{same for K \& p}$$

$$R2_{\pi} (N_{\pi+} / N_{\pi-})_{RuRu} / (N_{\pi+} / N_{\pi-})_{ZrZr}$$



- Larger than 1

$$\langle B \rangle / \Delta Q (\Delta Z / A) = 1.84 \pm 0.02 (stat) \pm 0.09 (sys) \pm 0.16 (feed - down)$$

- Larger than models (neutron skin, UrQMD tuned to reproduce yields, Pythia 8.3 CR has a partial imitation of the baryon junction mechanism)

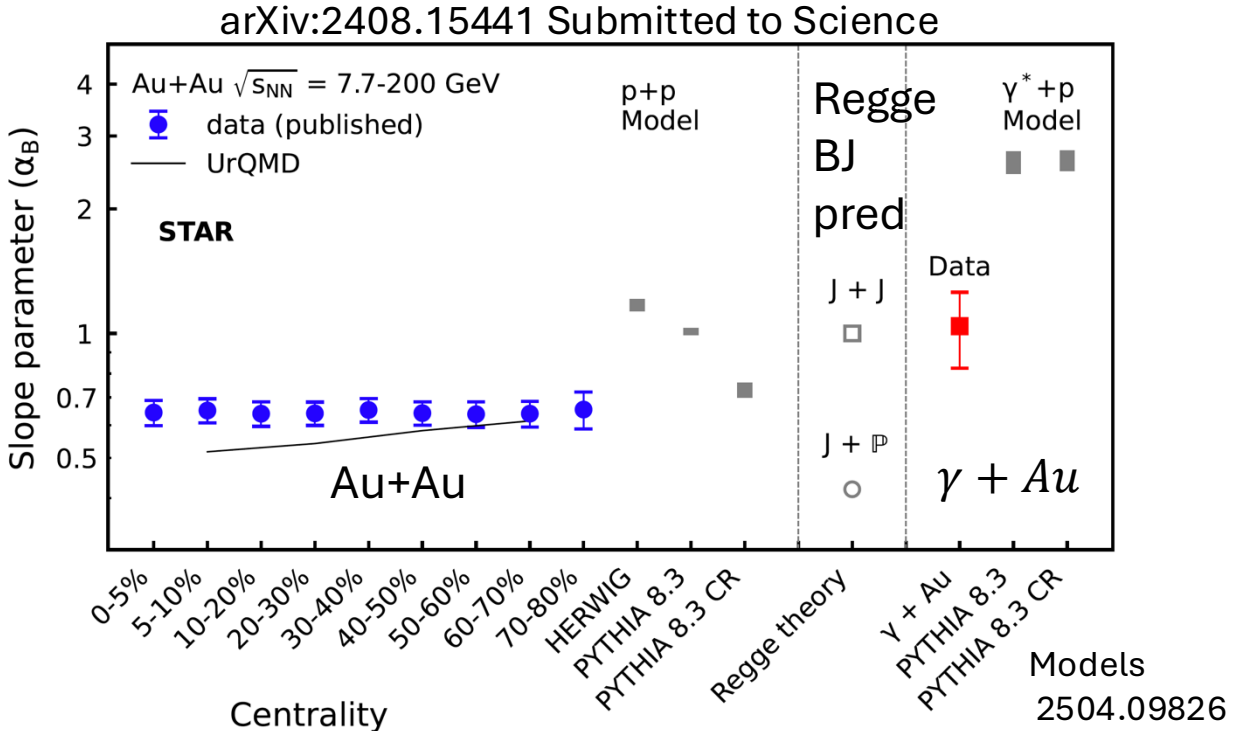
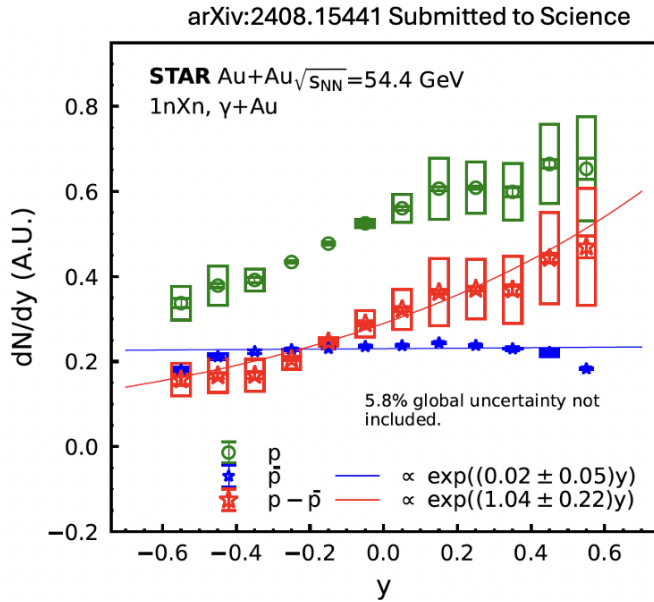
→ charge vs Baryon transport in isobar data favors Baryon Junction hypothesis

2) Baryon transport in γ +Au & Au+Au

Mid-rapidity Slopes vs y

γ +Au

Data: $\alpha_{B_data} \sim 1.04 \pm .22$



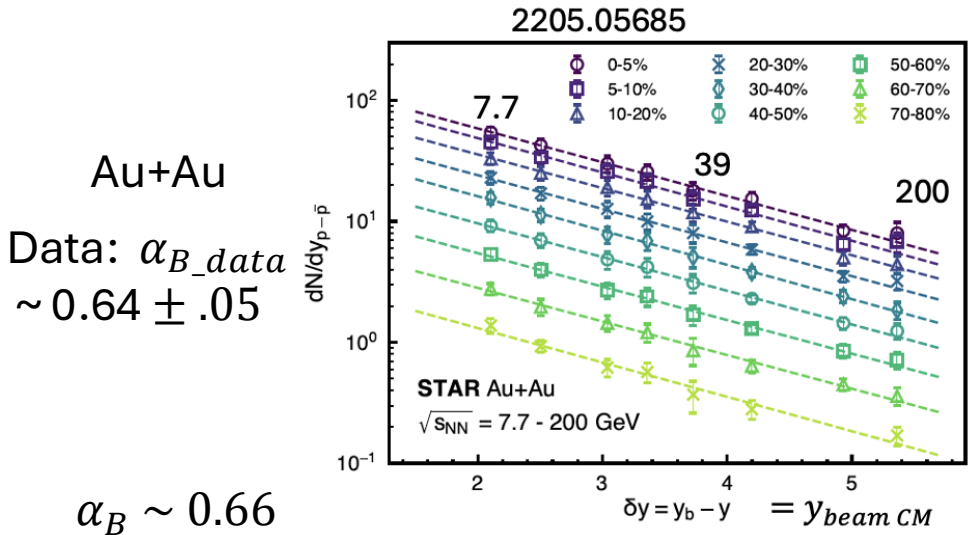
Data
 $\alpha_B \sim 0.64 \pm .05$ (Au + Au)
 $1.04 \pm .22$ (γ + Au)

Bracketed between

in BJ framework
 $f(y) \propto \exp(-\alpha_B \Delta y)$
 $\alpha_B \sim 0.42 - 1.0$

Models (Pythia 8.3 CR) "explain" the Au+Au data, but not γ +Au

→ Both Charge vs Baryon transport and Baryon transport in γ + Au Favor Baryon Junction hypothesis



(Strange) Di-Baryon Bound States

Correlation functions: $p-\Xi$, $p-\Omega$

p-Hyperon Correlations

- Femtoscopic techniques
- Lednicky-Lyuboshitz (L-L) model
- High-statistics isobar data

Source size FSI

$$C(k^*) = \int S(\vec{r}) |\Psi(\vec{k}^*, \vec{r})|^2 d^3\vec{r} = \frac{N_{same}(k^*)}{N_{mixed}(k^*)}$$

$S(\vec{r})$: Source function
 $\Psi(\vec{k}^*, \vec{r})$: Pair wave function
 $k^* = \frac{1}{2} |\vec{p}_a - \vec{p}_b|$, relative momentum
 \vec{r} : relative distance

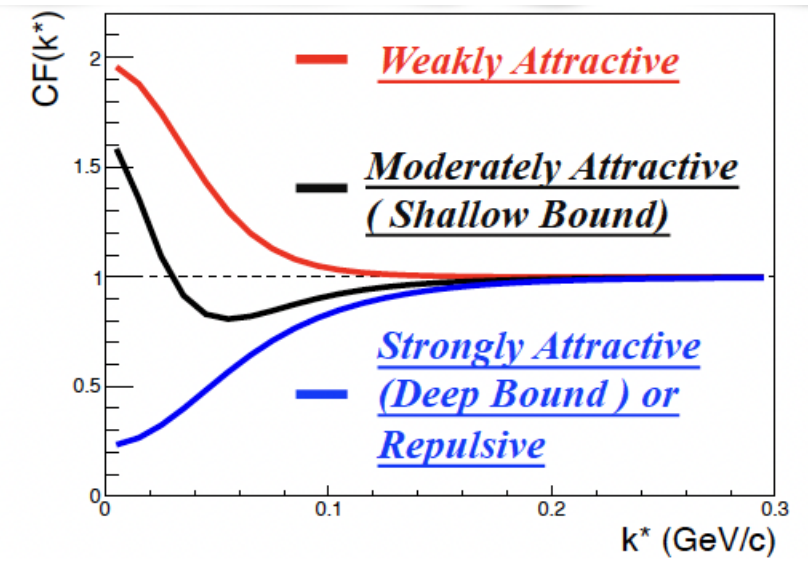
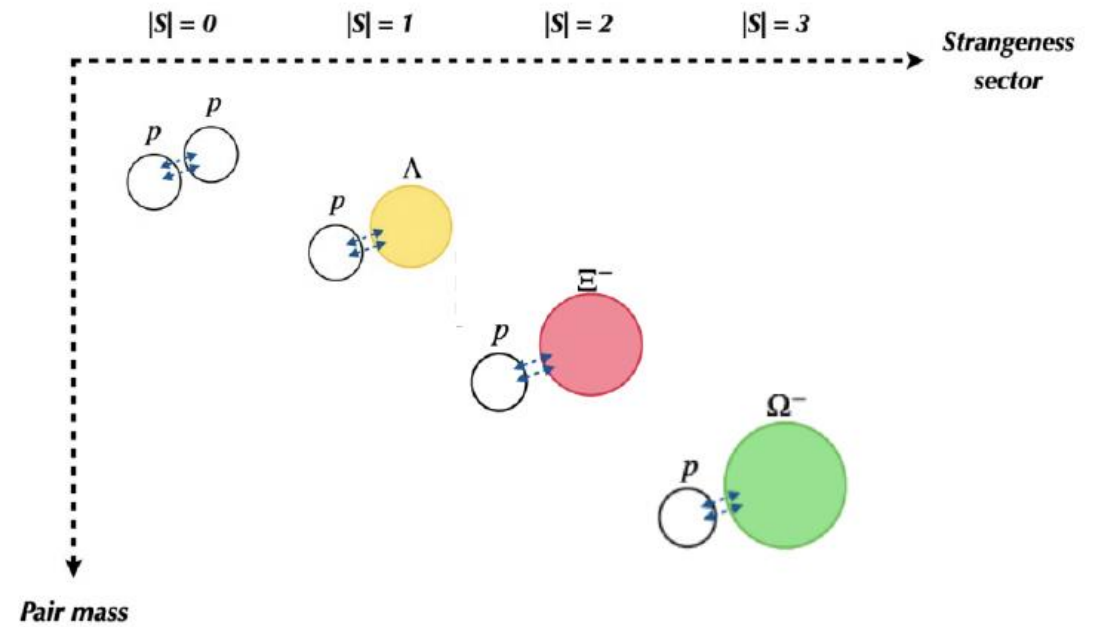
➤ **Wave function:**

□ $\psi(r^*, k^*) = e^{-ik^*r^*} + f(k^*) \frac{e^{-ik^*r^*}}{r^*}$

□ $f(k^*) = [\frac{1}{f_0} + \frac{1}{2} d_0 k^{*2} - \frac{2}{a_c} h(\eta) - ik^* A_c(\eta)]^{-1}$
 a_c : Bohr radius $\eta = (k^* a_c)^{-1}$
 A_c, h : Coulomb interaction factor

➤ **Physics quantity:**

- f_0 : Scattering Length
- d_0 : Effective Range

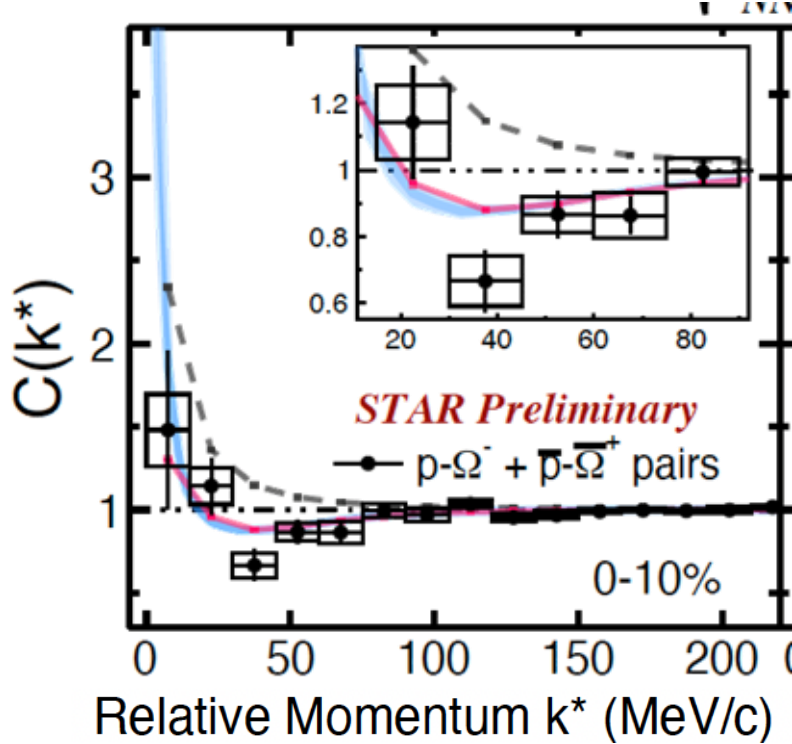


negative f_0 (scattering length) → indicative of a bound state

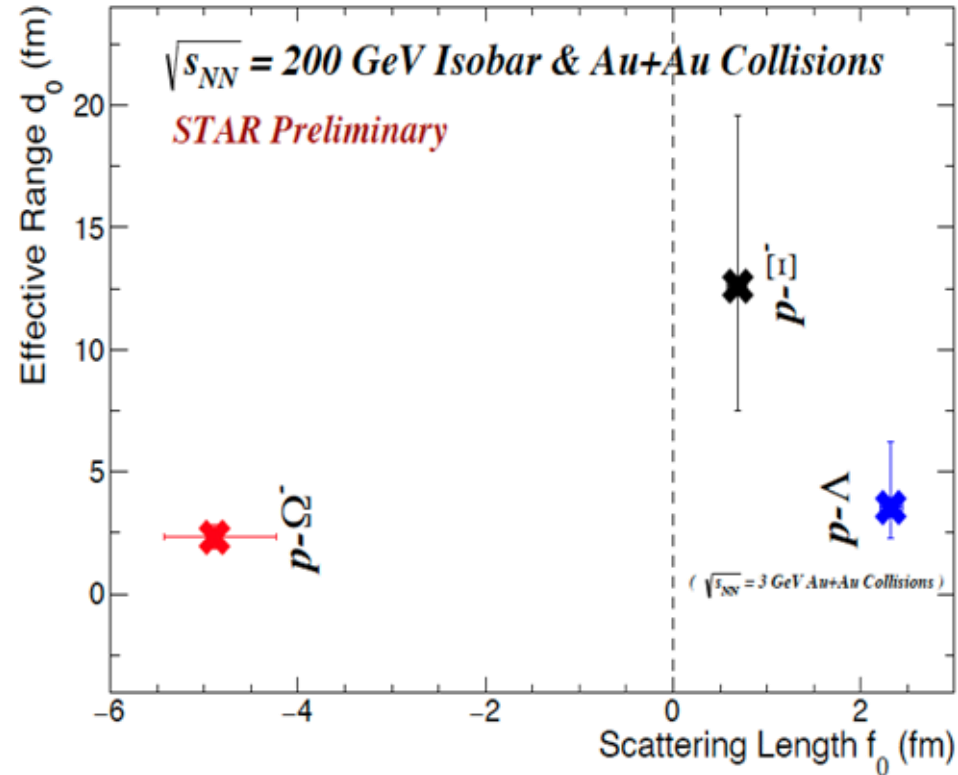
Extracted Parameters

Previous lower-statistics paper:
PLB 790, 490 (2019) – note sign convention

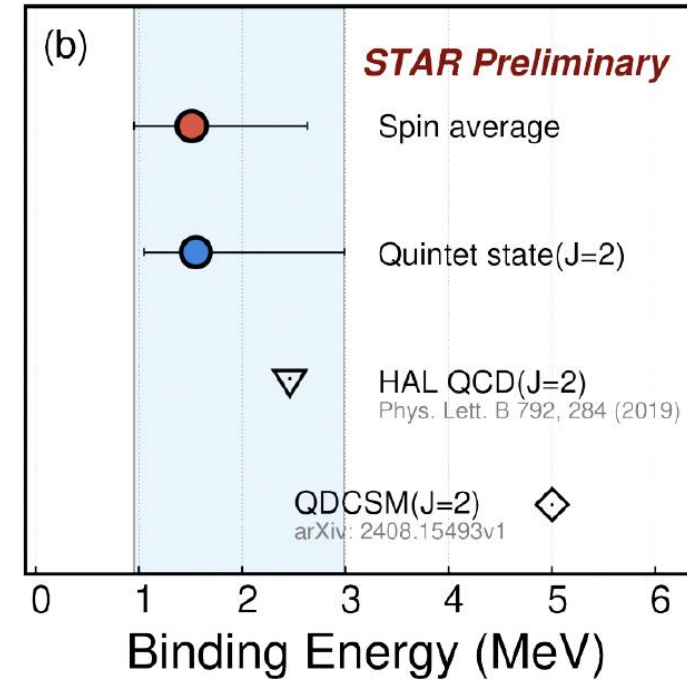
200 GeV Isobar



Kehao Zhang, QM 2025



Kehao Zhang, QM 2025



➤ **Physics quantity:**

- f_0 : Scattering Length
- d_0 : Effective Range

First evidence of a strange dibaryon bound state

Sign convention chosen such that negative f_0 (scattering length) → indicative of a bound state

Thermodynamic Quantities

The speed of sound c_s

T: black-body radiation (dileptons)

Extracting the speed of sound c_s from $\langle p_T \rangle$

Gardim, Giacalone, Luzum, Ollitrault

In ultra-central collisions ($b \sim 0$) $\langle p_T \rangle$ changes with N_{ch}
 Related to temperature fluctuations, so you write

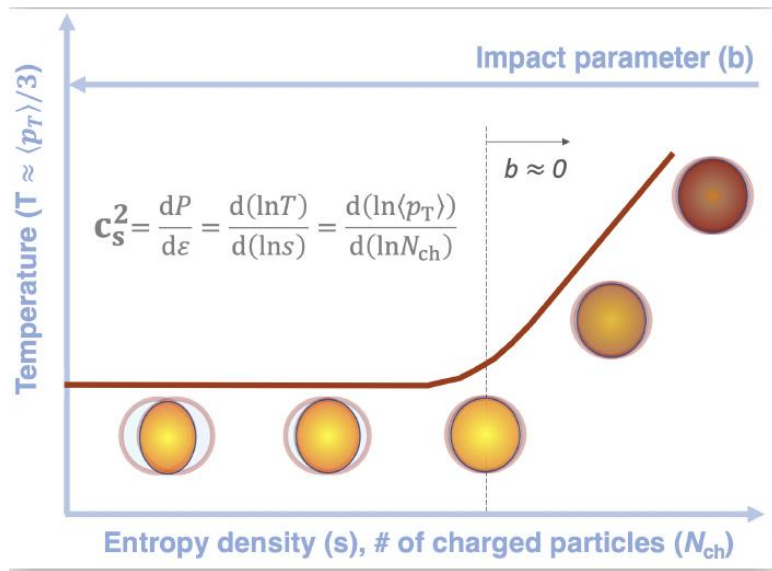
$$c_s^2 = \frac{dP}{d\varepsilon} \approx \frac{d(\ln \langle p_T \rangle)}{d(\ln N_{ch})} \quad (1)$$

1908.09728

iterative bootstrap \longleftrightarrow e-by-e model fluctuations

$$\frac{\Delta_{p_T}}{\langle p_T \rangle} = c_s^2 \frac{\Delta_N + \delta}{N} \quad (2)$$

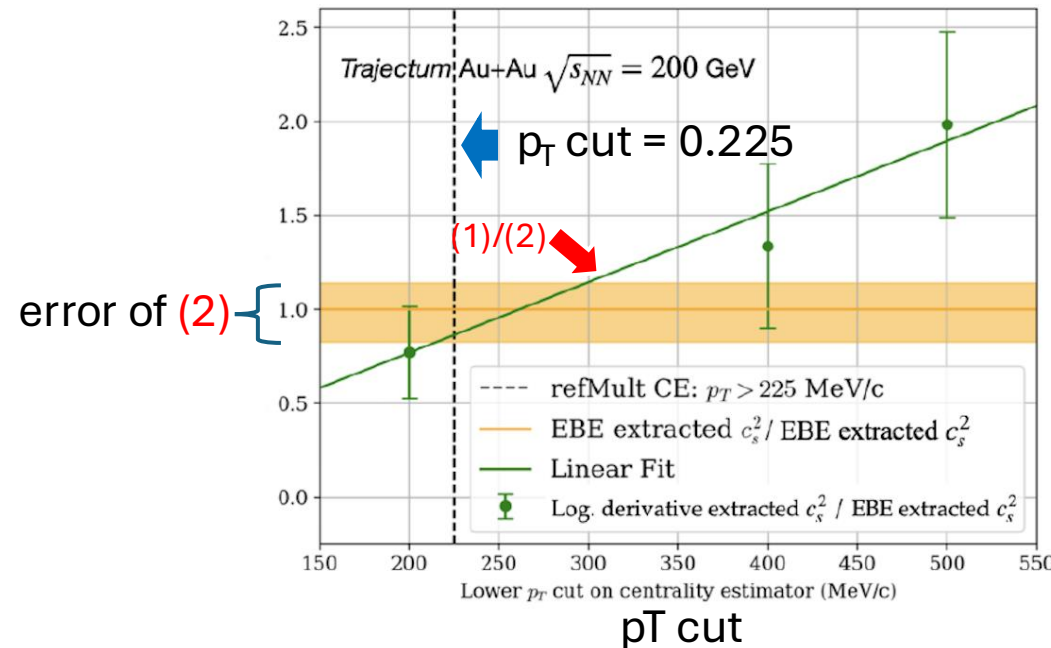
2501.02777
 Mu, Sun, Yan, Huang



Solution: Use a model (Trajectum) and a 2nd method

Iteratively bootstrap, varying the p_T cut, until both methods agree

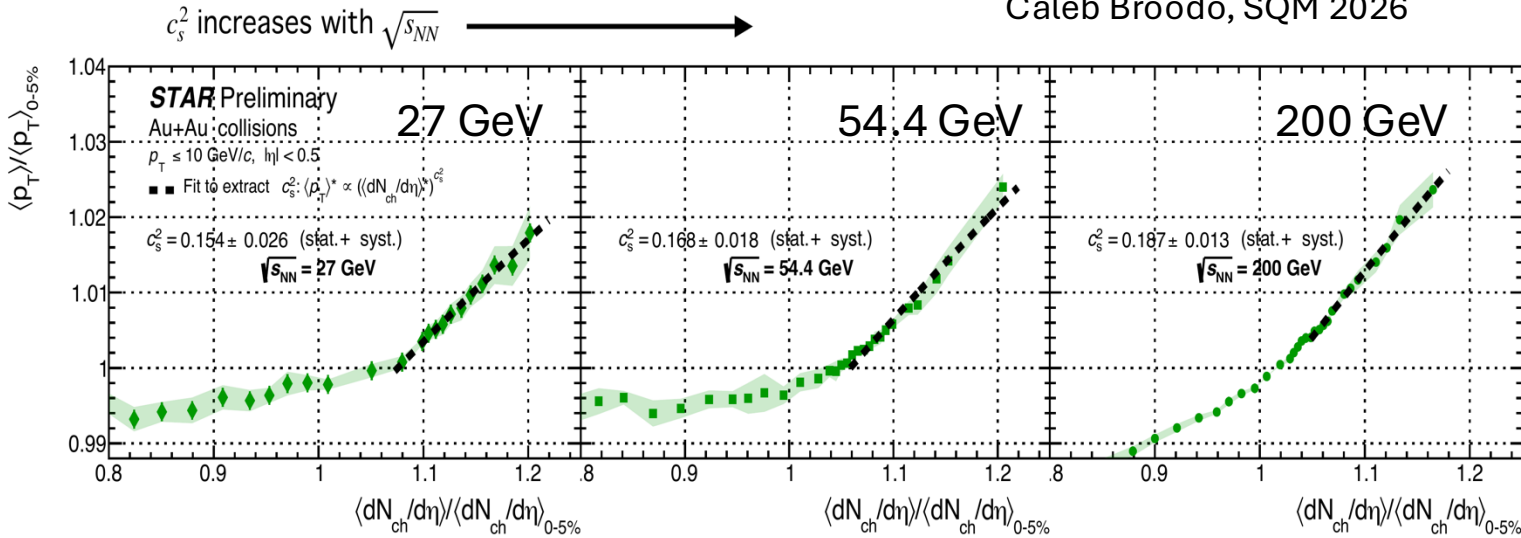
Problem: centrality definition changes the result. Specifically, acceptance effects — namely the p_T cut used to measure N_{ch} (the centrality estimator).



So STAR:
 p_T cut = 0.225 GeV/c

Extracting the speed of sound c_s from $\langle p_T \rangle$

Caleb Broodo, SQM 2026



Estimating T_{eff} arXiv:2403.06052

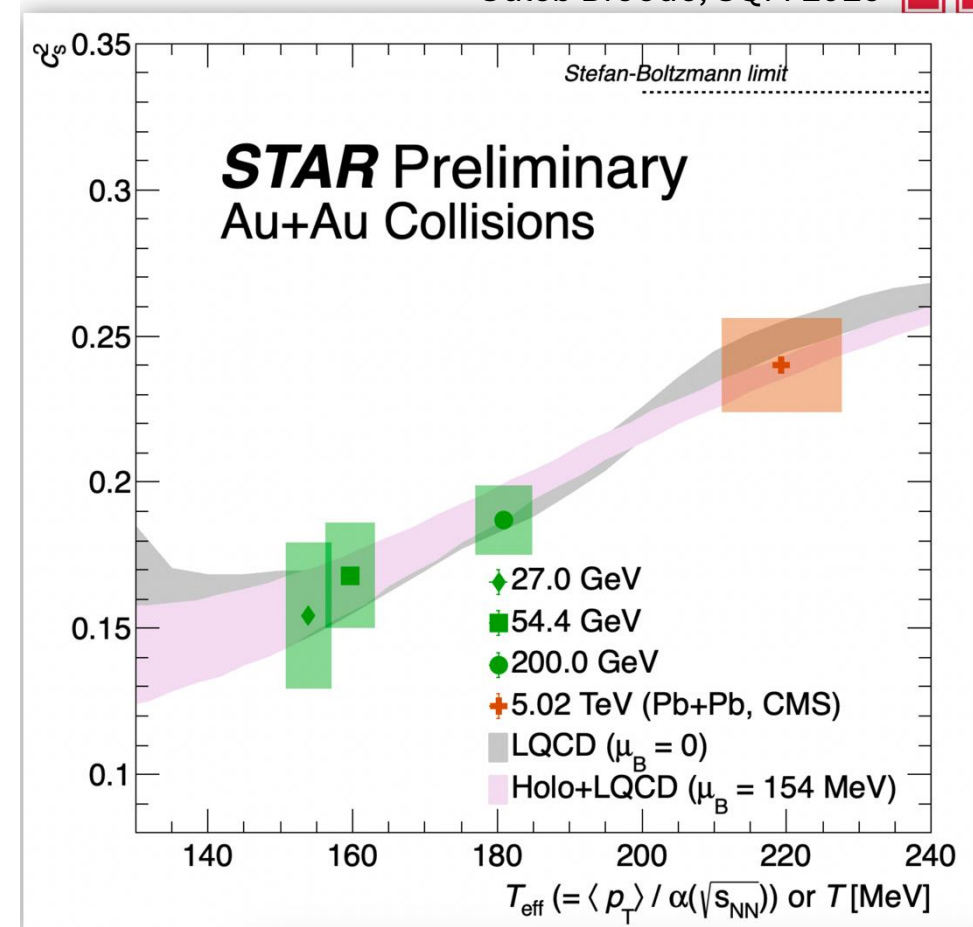
Extrapolate to zero p_T and estimate $\langle p_T \rangle$

$T_{\text{eff}} = \alpha \langle p_T \rangle / 3$ $\alpha \sim 1$, estimated from hydro model

First extraction of temperature dependence of c_s

Results consistent with Lattice QCD

Caleb Broodo, SQM 2026



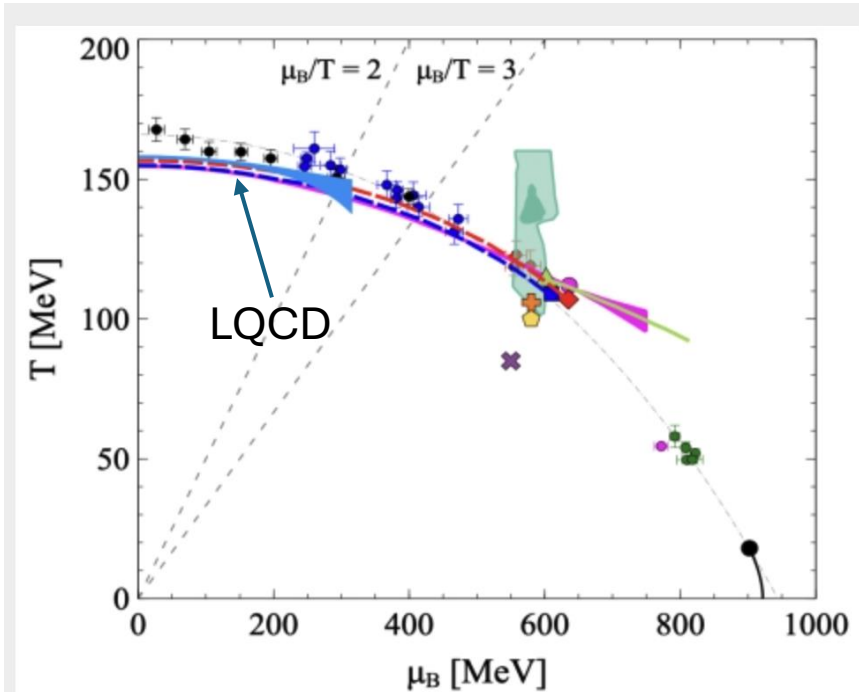
Holo + LQCD - M. Hippert et al., Phys. Rev. D 110, 094006 (2024)

stout - S. Borsanyi et al., Phys. Lett. B 370, 99-104 (2014)

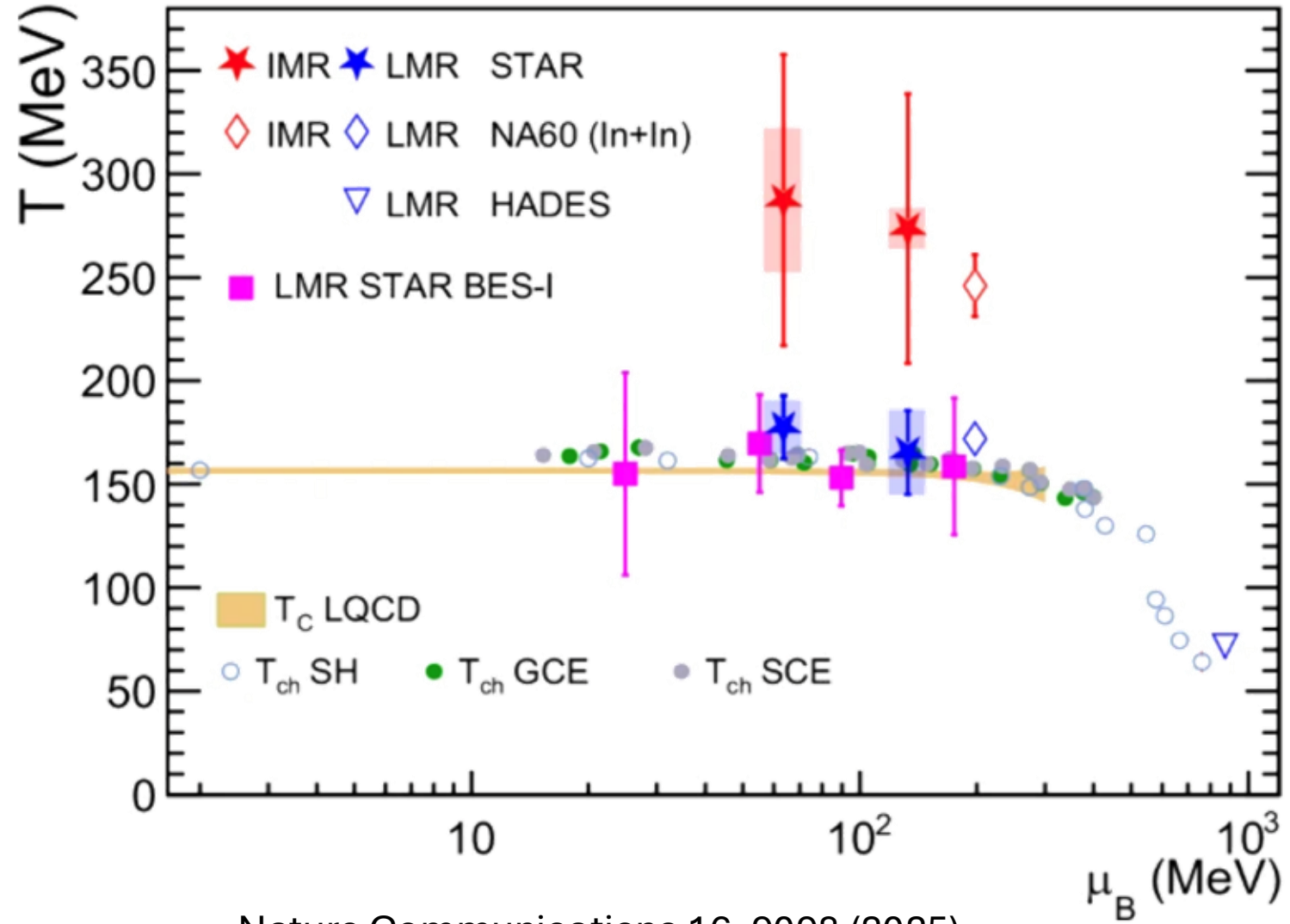
HISQ - A. Bazavov et al., Phys. Rev. D 90, 094503 (2014)

Thermal Dileptons in Au+Au – higher statistics 27, 54.4 GeV

- LMR (ρ region) ~ 150 MeV. Consistent with the phase transition temperature.
- IMR consistent with thermal radiation from QGP medium



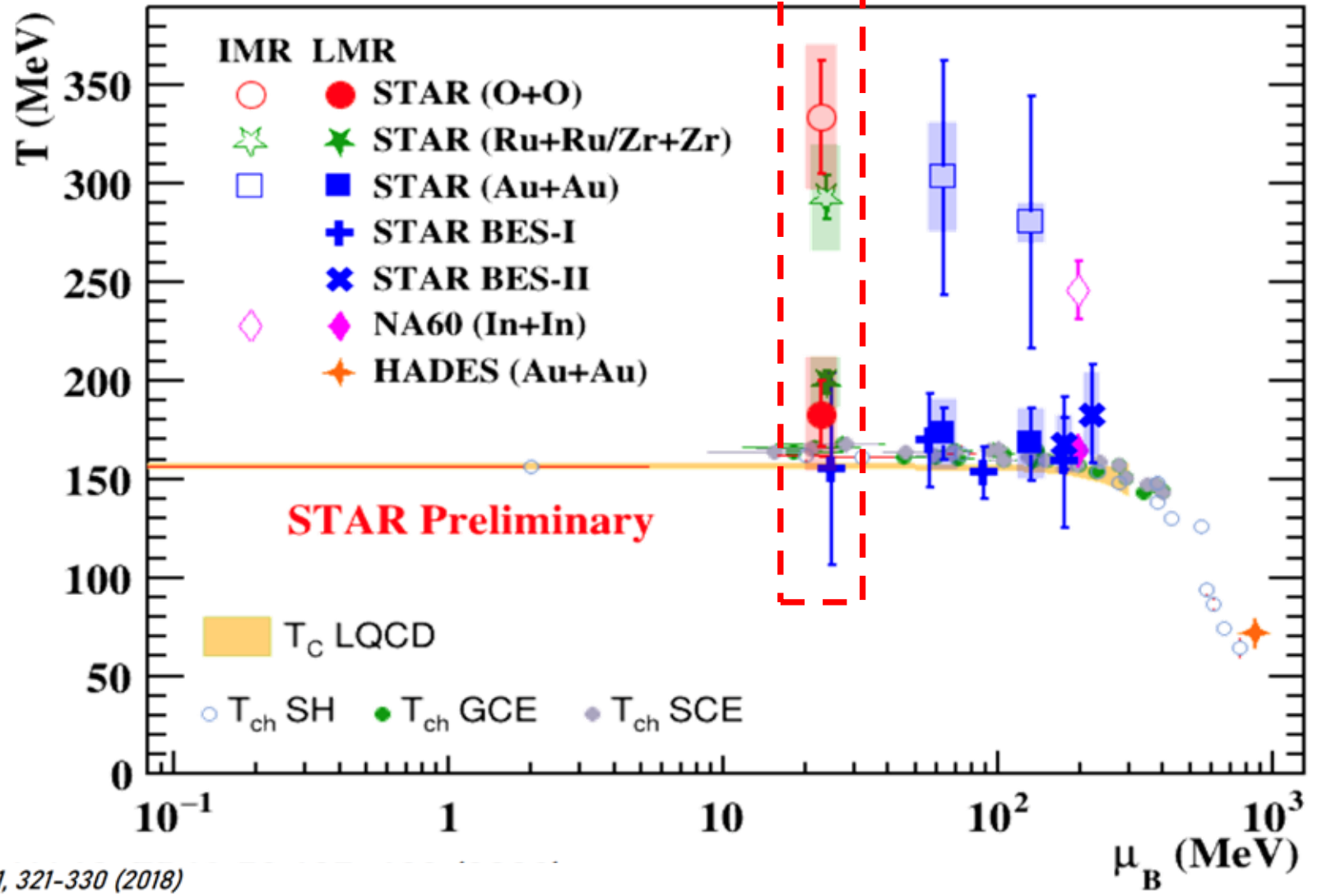
- LQCD [Borsanyi et al., 2010.13705]
- FRG [Fu et al., 1909.02991]
- self-consistent fRG-DSE [Gao, Pawłowski 2010.13705]
- truncated DSE [Gunkel, Fischer 2106.08356]
- ◆ LYE Pade+conformal [Basar 2312.06952]
- ✕ LYE Pade [Clarke et al., 2401.08820]
- ▲ AdS/CFT [Hippert et al., 2309.00579]
- ▲ s=const contours [Shah et al., 2410.16206]
- C₂ finite-size scaling [Sorensen&Sorensen, 2405.10278]
- freeze-outs: RHIC, SPS, AGS, SIS, HADES



Nature Communications 16, 9098 (2025)

Thermal Dileptons in O+O (small system)

New
O+O points
Zihan Liu, SQM 2026



O+O
Consistent
with Au+Au, Ru+Ru, Zr+Zr
→ IMR consistent with
Thermal Radiation from
QGP medium

NA60: EPJC 59,607–623 (2009)
 HADES: Nat. Phys. 15, 1040–1045 (2019)
 HotQCD: Phys. Lett. B 795, 15–21 (2019)
 T_{ch} SH: P. Braun-Munzinger et al. Nat. 561, 321–330 (2018)
 T_{ch} GCE/SCE: STAR Phys. Rev. C 96, 044904 (2017)
 STAR BES-I, 27 & 54.4 GeV: Nat Commun 16, 9098 (2025)

The Critical Point and the 1st-Order Transition Line

What kind of transition?

- Chiral (not deconfinement!) for the lattice
 - What exists above the Phase Transition (order parameter – quark condensate)
 - Is it a fluid of chirally restored resonances and particles (ρ and a_1 , π and σ , ...)

YES

My picture of the QGP has changed (or maybe I'm just confused...)

Over the past decade, next-to-leading order calculations of dynamical processes in, and thermodynamic processes of, the fully developed QGP, away from the chiral/deconfinement crossover transition, have made it plausible that the QGP is, after all, a strongly coupled plasma composed of massive, very short-lived quarks and gluon quasiparticles. The es-

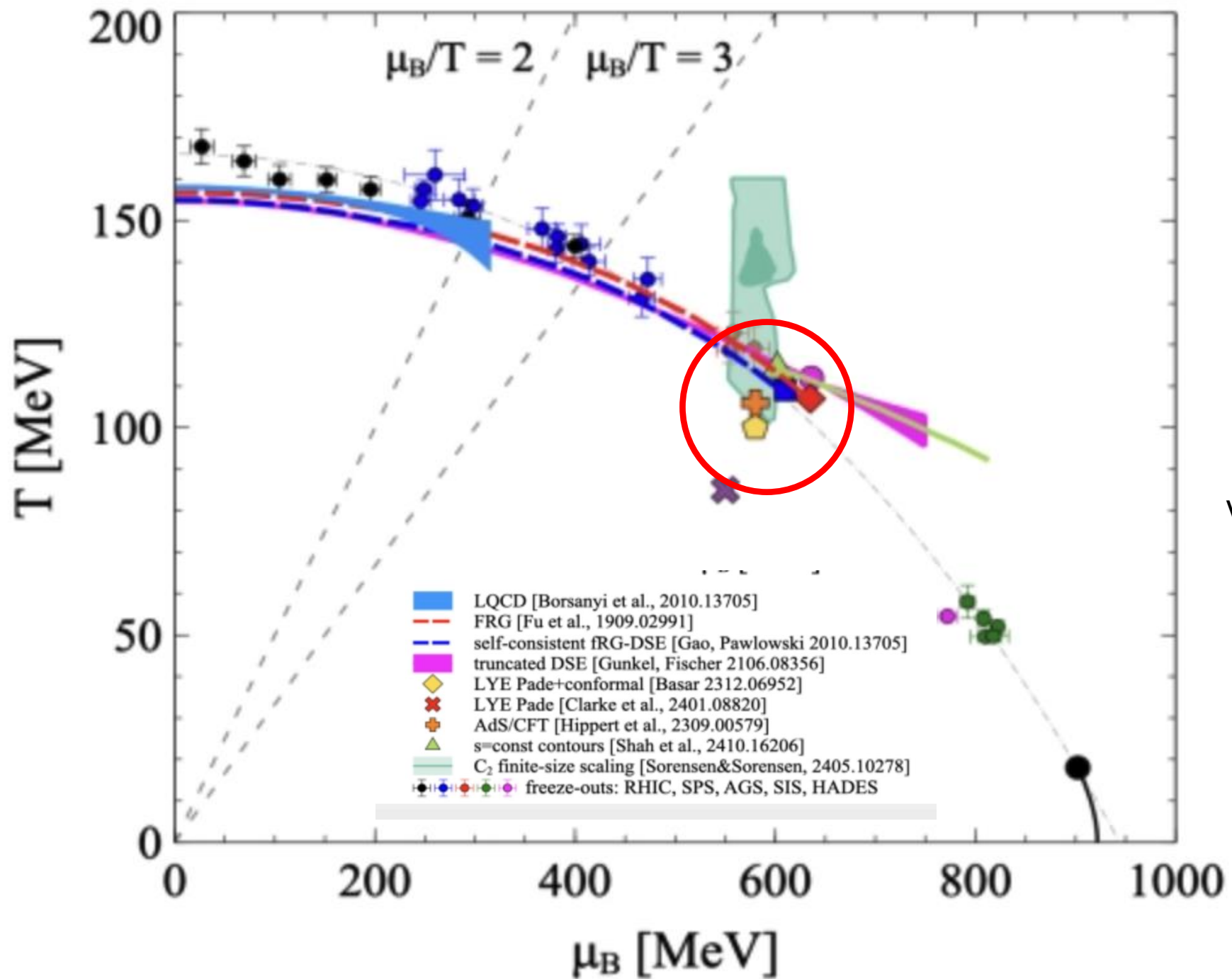
What is the Quark-Gluon Plasma made of?

Berndt Mueller

arXiv:2506.07181v1 [nucl-th] 08 Jun 2025

Note: I may behave as if I am still thinking about deconfinement.

Theory:
Critical
Point
on Phase
Diagram



Where is the
Critical point?

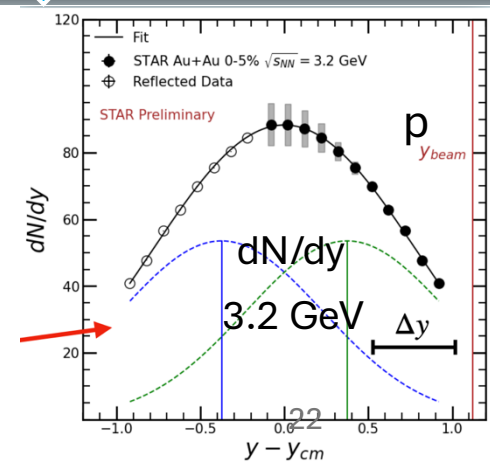
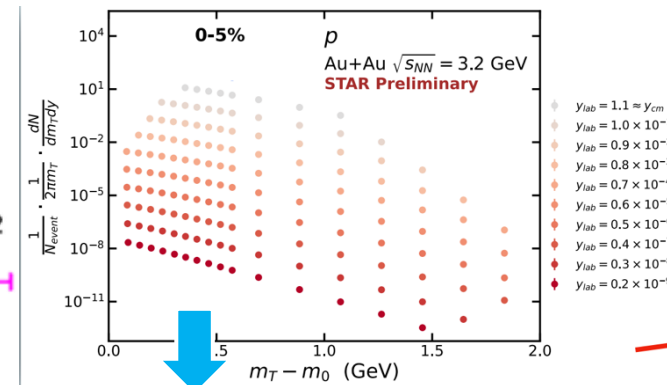
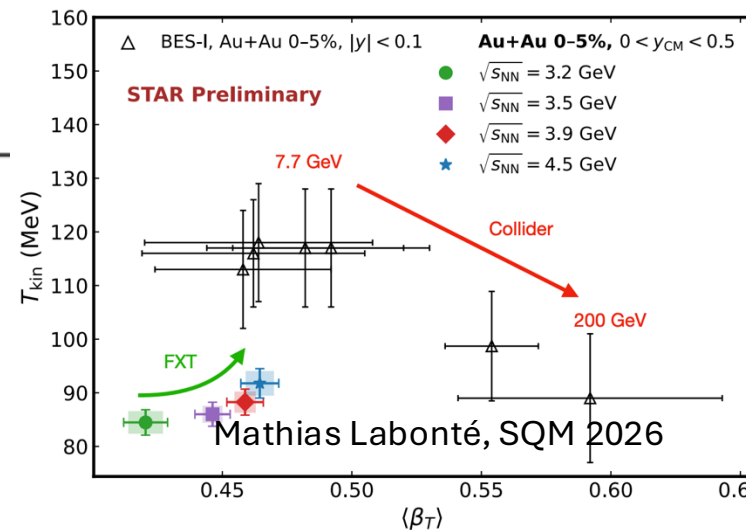
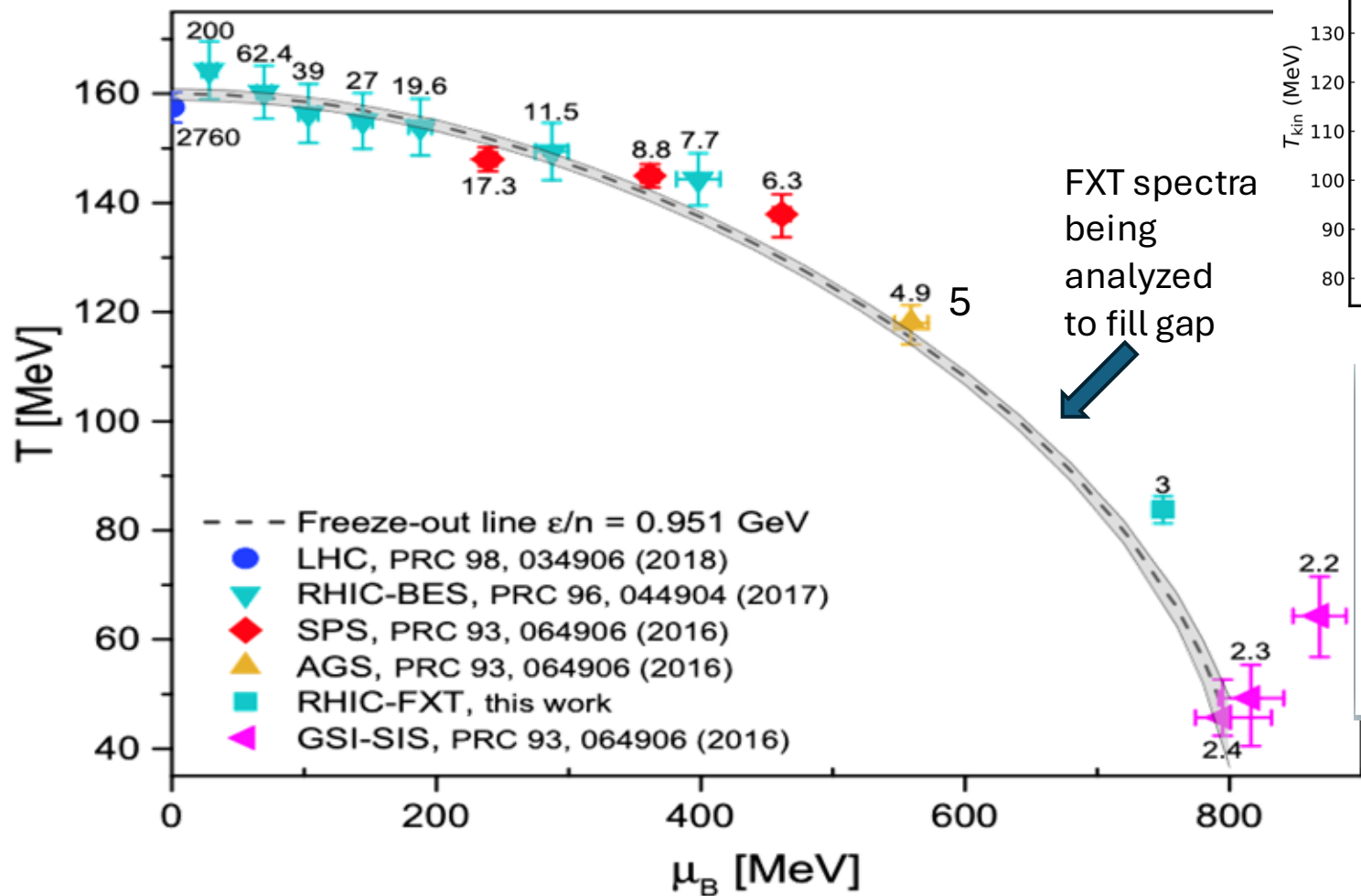
$\mu_B \sim 600$ MeV
 $T_c \sim 100$ MeV

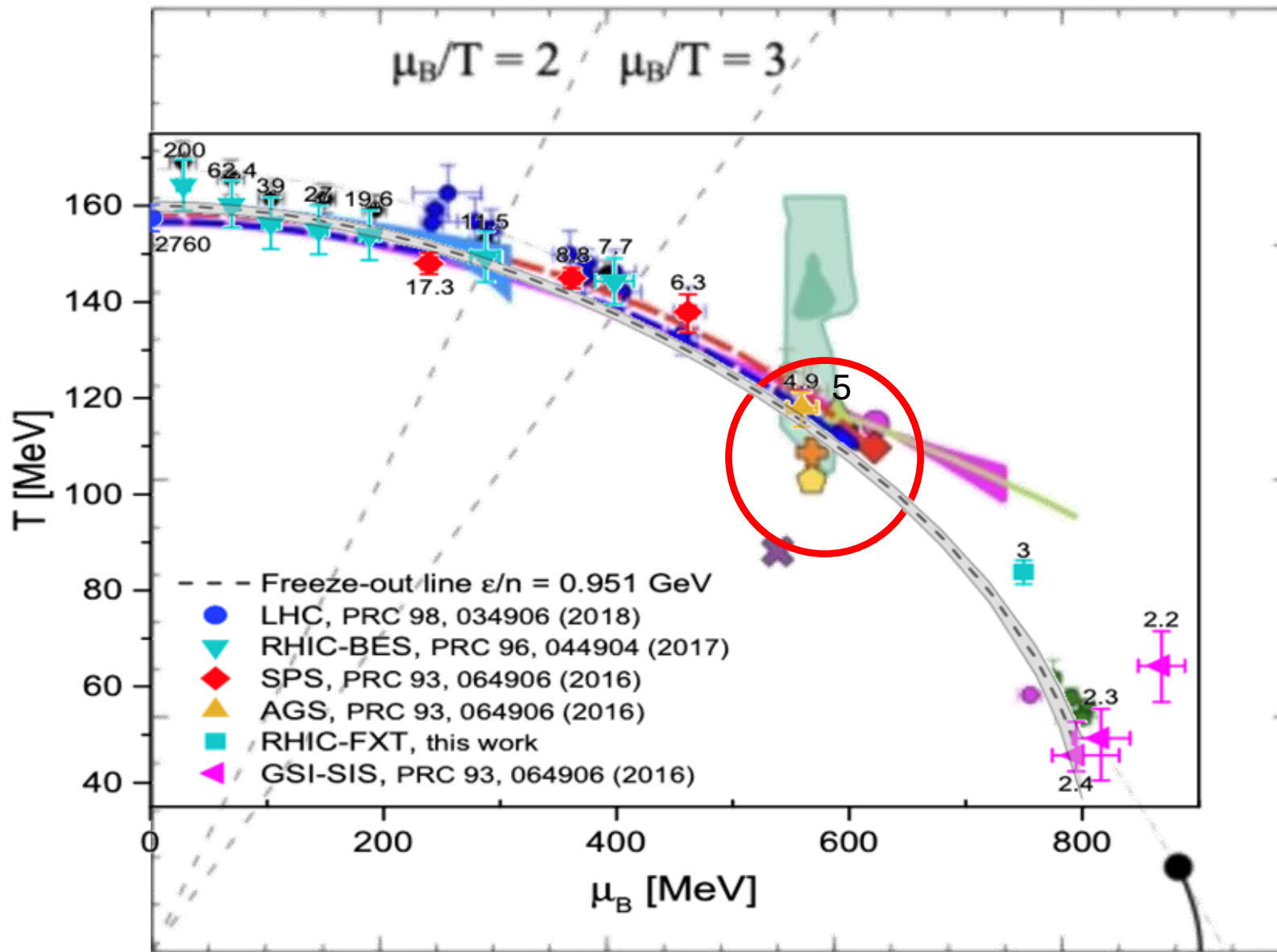
Various techniques

Lattice extrapolation
FRG
Holography

...

Experiment
Freeze Out
Curve With
 $\sim\sqrt{s}$





$\mu_B \sim 600$ MeV
 $T_c \sim 100$ MeV

$\sqrt{s} \sim 5$ GeV
 But there is
 a path through
 μ and T

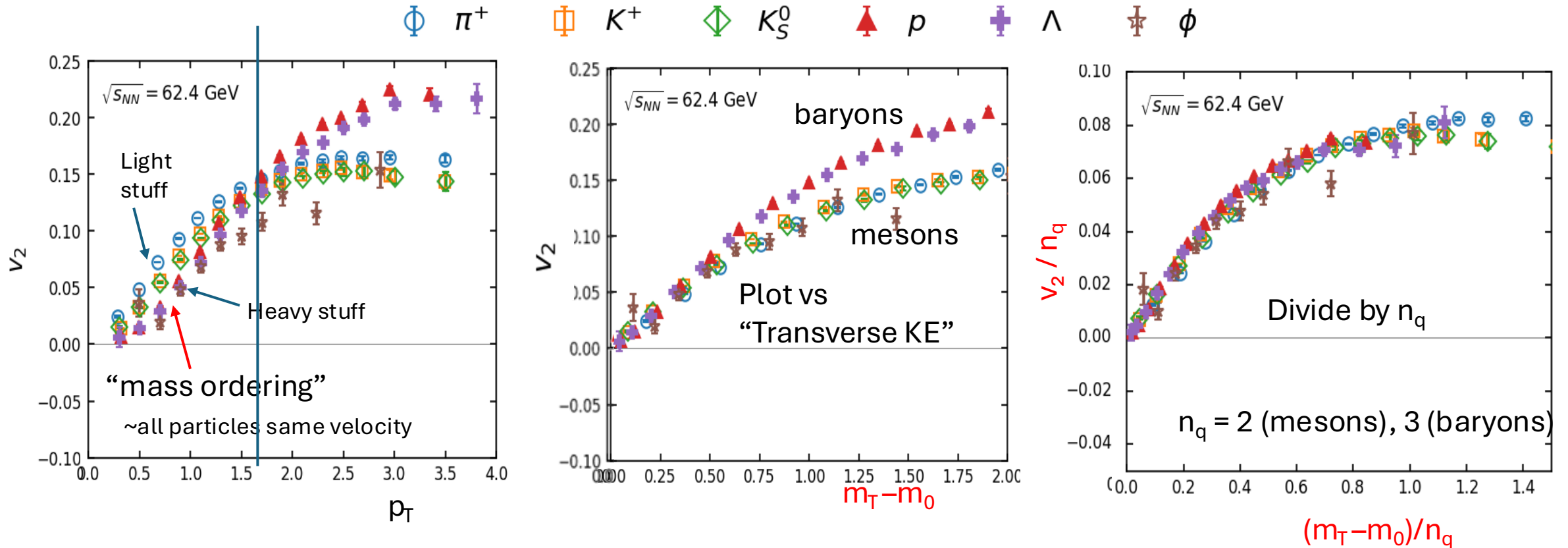
This is a tough regime. MANY effects: passing time of nuclei, shadowing, thresholds of particle production. But if we want to locate the CP and see the 1st-order transition line, we have to master it. 23

Bulk Properties: Flow

Can it teach us anything about the Phase Transition?

- 1) v_2 – NCQ scaling \rightarrow quark coalescence as hadronization mechanism
- 2) v_2 – dividing into produced and transported quarks

1) NCQ Scaling — what is it? What can it tell us? Can it tell us if we are in a partonic system?



To test Nc_q scaling $p_T > 1.5$ GeV
 $(m_T - m_0) / n_q > \sim 0.5$

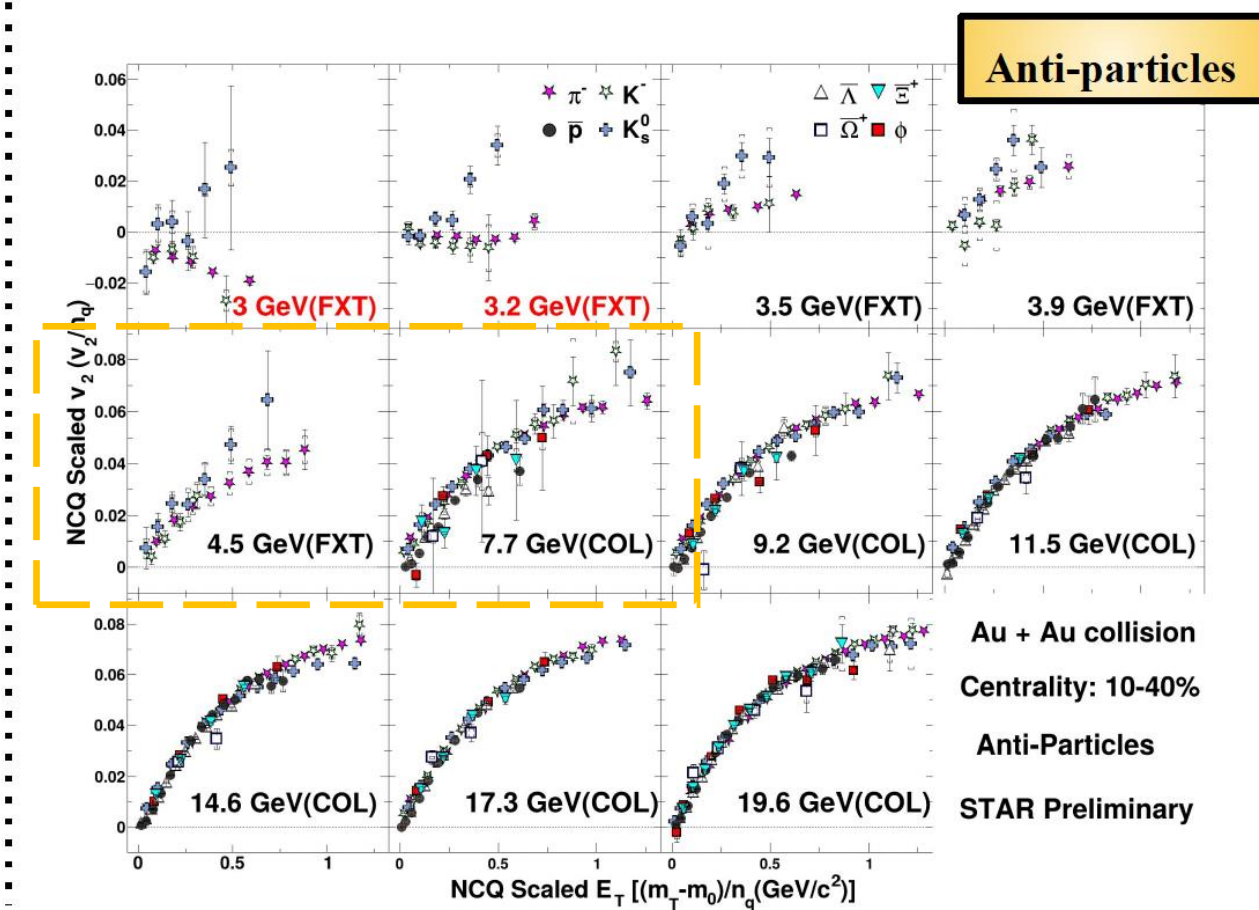
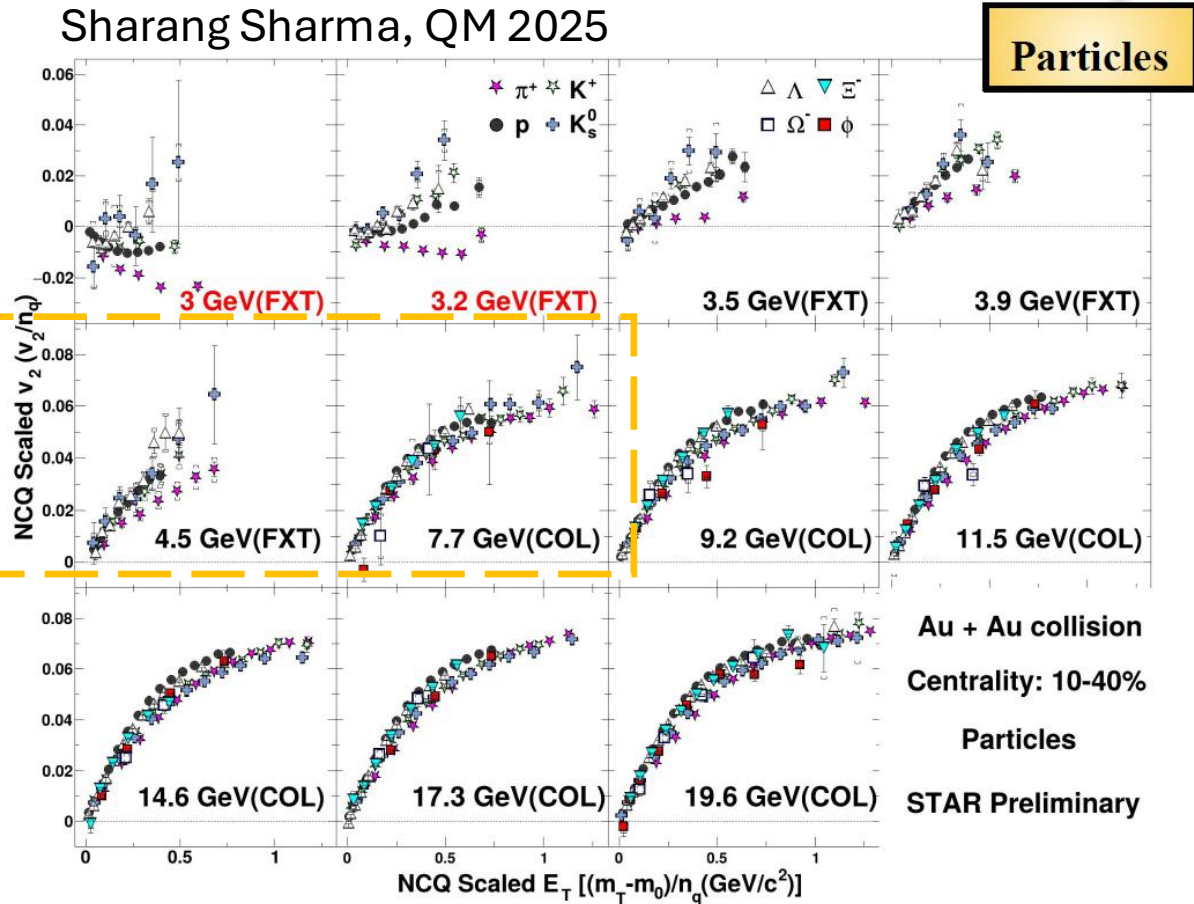
→ need p_T reach

\sim argues for flow from partonic (constituent quark) level

Extended NCQ scaling test down to 3 GeV →

The latest from STAR: Ncq scale v_2 , $3 \rightarrow 19.6 \text{ GeV}$

Sharang Sharma, QM 2025



“Disappearance of partonic collectivity in $\sqrt{s_{NN}} = 3 \text{ GeV}$ Au+Au Collisions at RHIC”

“NCQ scaling is markedly violated at 3.2 GeV consistent with a hadronic-interaction dominated EOS, however as the collision energy increases, a gradual evolution to NCQ scaling is observed. This energy dependence of v_2 for all hadrons studied, provides evidence for the onset of partonic interactions by $\sqrt{s_{NN}} = 4.5 \text{ GeV}$.”

PRL 135, 072301 (2025)
 PLB 827, 137003 (2022)

Comments

- We see approx. NCQ scaling down to ~ 7.7 GeV, then departure at 4.5 and below.
- Studies have been done using models attempting to a) show NCQ scaling at higher energies, b) show the breaking at lower energies, typically due to shadowing
 - UrQMD (2601.02923); JAM AMPT (2508.21577)...
 - In the data the effect is very striking and clear. Difficult for the confluence of several “accidental” effects to mimic this. Occam’s razor would tell you that it was some physics principle. Of course it doesn’t have to be deconfinement.



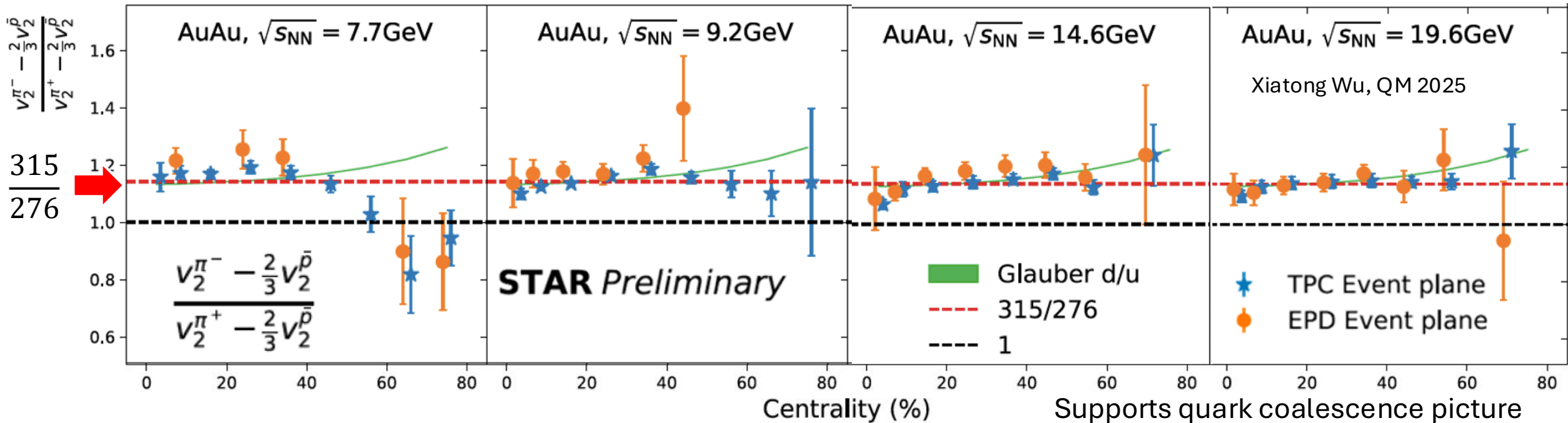
2) Testing Coalescence with pion v_2 : transported-produced / quark-flavors

- NCQ scaling: assume constituent quarks have same p_T and v_n & coalescence as the means of hadronization
 - Further consider
 - Transported and produced quarks
 - Different quark flavors

$$\pi^- : d\bar{u} \quad \pi^+ : u\bar{d} \rightarrow \begin{array}{l} \text{produced } d = \bar{u} \\ \text{produced } u = d \end{array} \rightarrow v_2^{\pi^-} = N_{\text{trans},d}^{\pi^-} \cdot v_2^{\text{trans},d} + (2 - N_{\text{trans},d}^{\pi^-}) v_2^{\bar{u}}$$

$$\rightarrow \frac{v_2^{\pi^-} - \frac{2}{3} v_2^{\bar{p}}}{v_2^{\pi^+} - \frac{2}{3} v_2^{\bar{p}}} \approx \frac{N_{\text{trans},d}^{\pi^-}}{N_{\text{trans},u}^{\pi^+}} = \frac{315}{276} = 1.14 \text{ for Au}$$

$N_{\text{trans},u(d)}^{\pi^{+(-)}}$ is the number of transported $u(d)$ quarks per $\pi^{+(-)}$

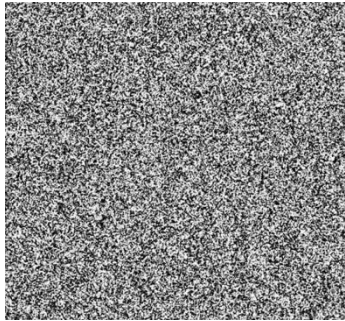


Looking for the CP: Fluctuations

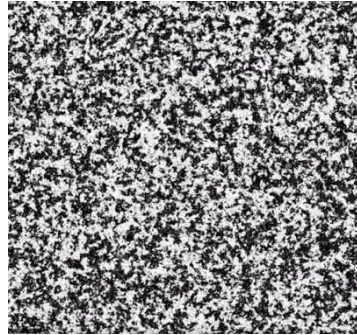
How do you see a CP? Net-proton fluctuations

Classic answer: the correlation length ξ (clumpiness) goes to “infinity”

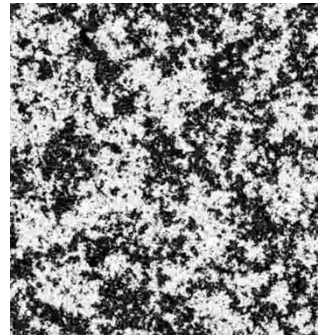
Ising
Model
Same
Universality
Class
As QCD



$\xi = 2.2$



$\xi = 5.0$



$\xi = 11.4$

Net-proton fluctuations

Sensitive to baryon susceptibility χ_B

$$\delta N = N - \langle N \rangle$$

$$C_1 = \langle N \rangle \quad C_n = VT^3 \chi_n^B$$

$$C_2 = \langle (\delta N)^2 \rangle = \sigma^2 \sim \xi^2$$

$$C_3 = \langle (\delta N)^3 \rangle \sim \xi^{4.5}$$

$$C_4 = \langle (\delta N)^4 \rangle - 3 \langle (\delta N)^2 \rangle^2 \sim \xi^7$$

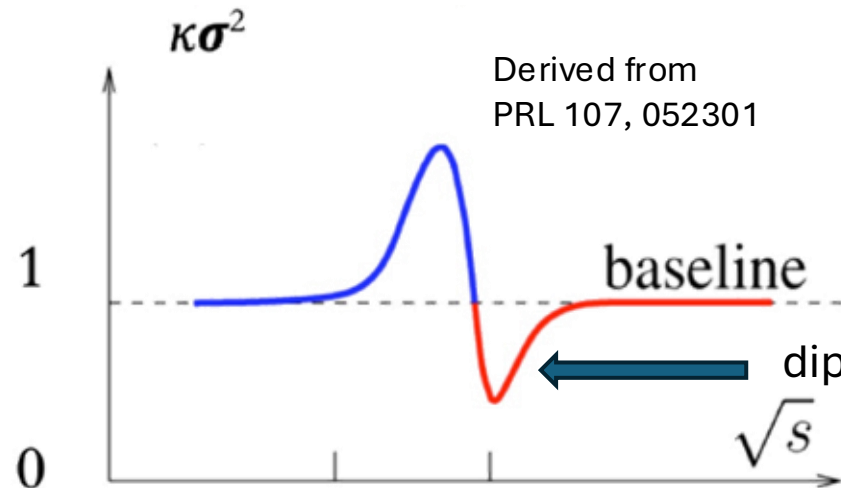
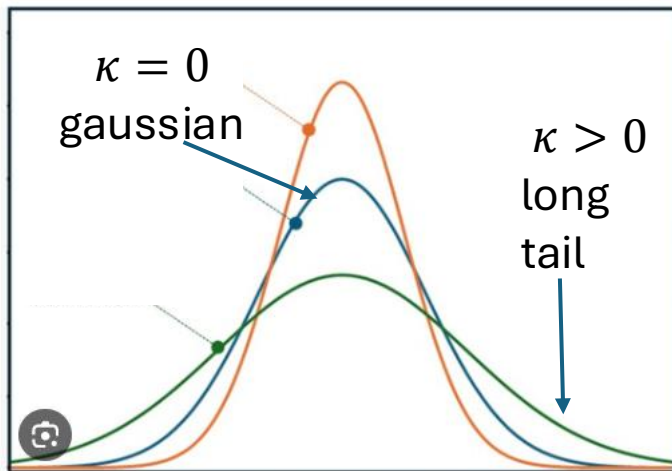
$$S\sigma = \frac{C_3}{C_2}$$

$$\kappa\sigma = \frac{C_4}{C_2} = \frac{\chi_4^B}{\chi_2^B} \sim \xi^5$$

σ^2 is the variance

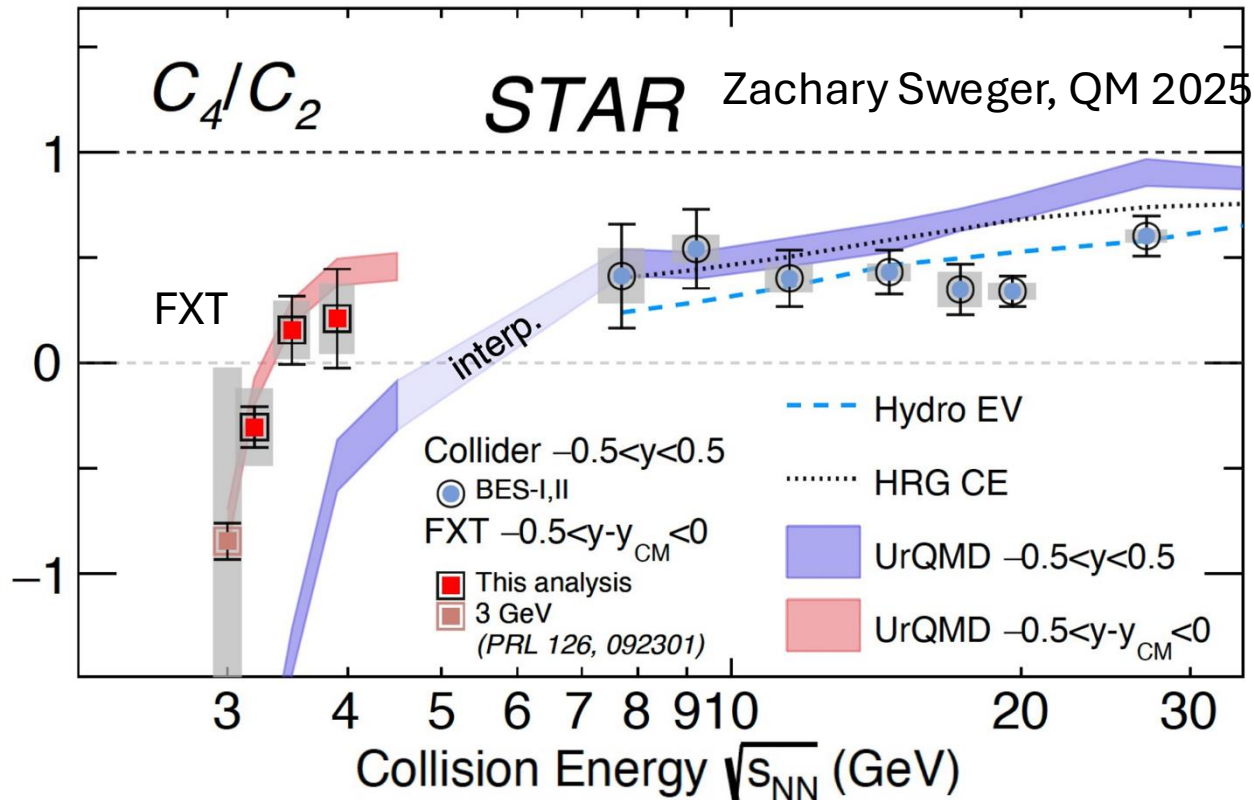
S is the Skewness

κ is the kurtosis

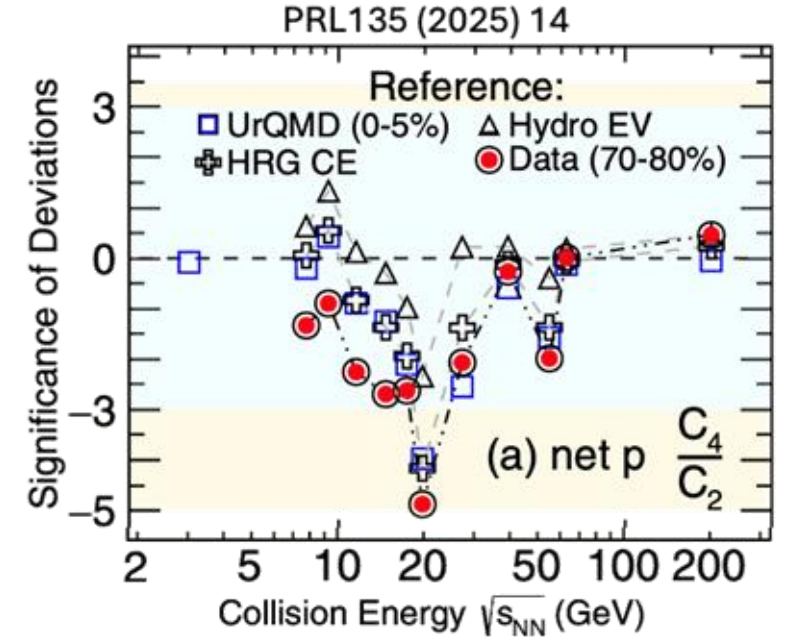
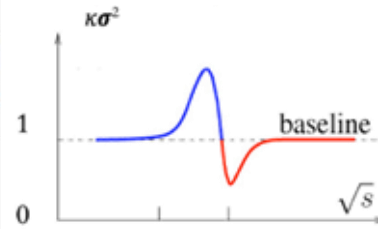


Latest Data: $C_4/C_2 = \kappa\sigma \sim \xi^5$

0-5% Au+Au Collisions at RHIC



3–5 σ deviation below baseline at ~20 GeV



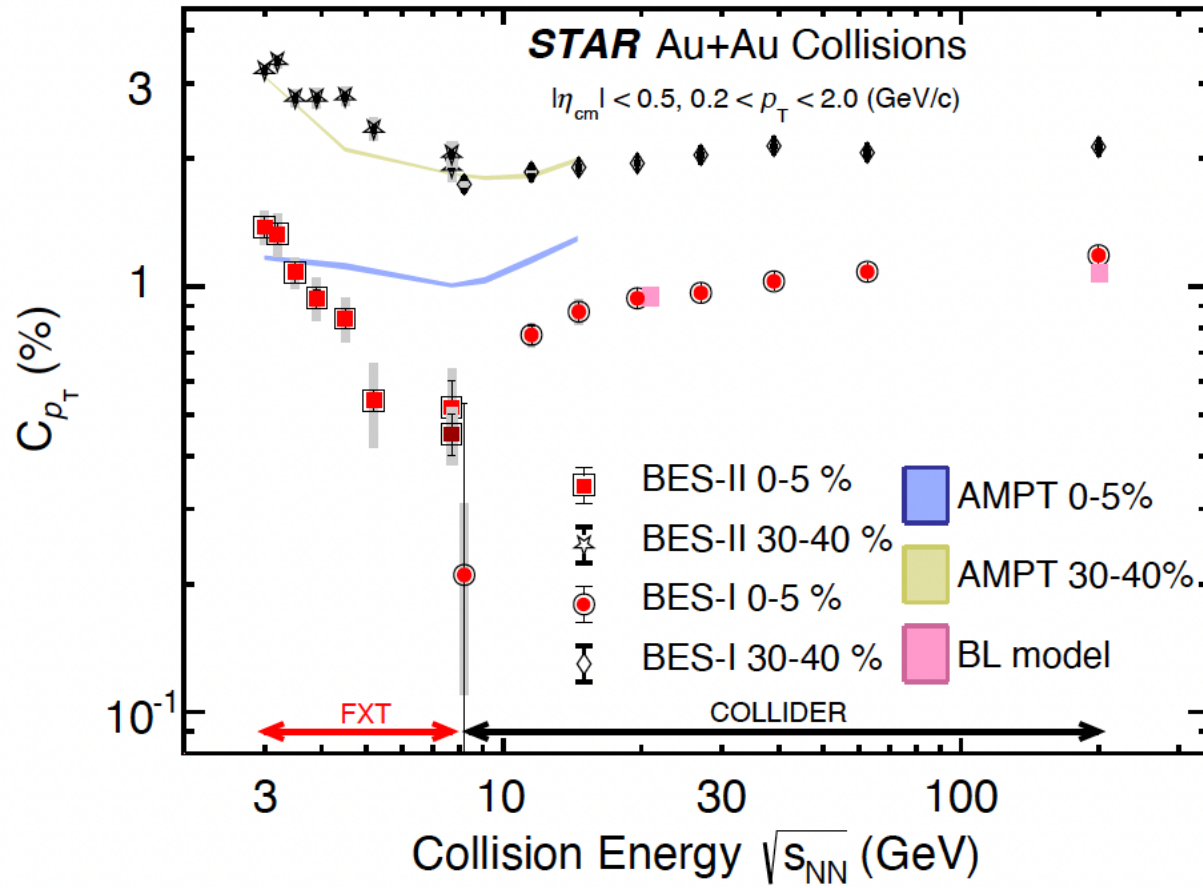
Gap at 5 GeV (note – 4.5 GeV being analyzed)
2026 – Took large data sets at 4.2, 4.5, and 5.2 GeV

Experimentally a challenging energy for STAR
FXT (edge of acceptance) – collider configuration transition

Crucial point: **signatures of CP** will be seen at lower μ_B than the actual CP

Other fluctuations \rightarrow

How do you see a transition? p_T correlations



FXT: [arXiv:2604.06434v1](https://arxiv.org/abs/2604.06434v1)

Relates to temperature fluctuations

At CP heat capacity diverges \rightarrow

Temperature fluctuations suppressed

$$C_{p_T} \equiv \frac{\sqrt{\langle \Delta p_{T,i} \Delta p_{T,j} \rangle}}{\langle \langle p_T \rangle \rangle}$$

$$\Delta p_{T,i} = p_{T,i} - \langle p_T \rangle$$

C_{p_T} shows 5σ suppression at ~ 7.7 GeV

Conclusions – What have we learned?

- Jets modified in CNM, less so in small systems
- Partons lose energy in “small” A=16 systems (cf with 197)
- Data favor the Baryon Junctions as the carrier of Baryon number
- First indication of a strange di-baryon bound state
- c_s vs T ~ lattice (modulo – arguments in the community)
- Dilepton measurements: continue to show T ~ 150 MeV for the cross over transition at $\mu_B < 400$ MeV. Temperature in IMR O+O similar to Ru+Ru/Zr+Zr → consistent with thermal radiation from QGP medium
- Ncq scaling and similar signatures seem to hold, not only for v_2 but e.g. for $v_0(p_T)$ – Other combinations should be explored, but the key is interpretation. We see NCQ scaling down to 7.7, but a departure from NCQ scaling below.
- Net-proton fluctuations show a dip at ~ 20 GeV. The key is now the analysis at ~4.5 GeV. New high-statistics data now available
 - p_T are also showing a dip: at ~ 10 GeVImportant to remember that signatures of the CP will show up at lower μ_B than the CP



There is an enormous amount and variety of data available to answer many questions. RHIC data taking may be over, but our task is to do the analysis and to find answers...

Thanks to all who worked on the RHIC program for the past 25–30 years (or more) to make it such a success.

And thanks to those who worked on the RHIC experiments: STAR, PHENIX, PHOBOS, BRAHMS, and sPHENIX (and a few others).

RHIC operations may be over, but we users still have a lot of science to do.

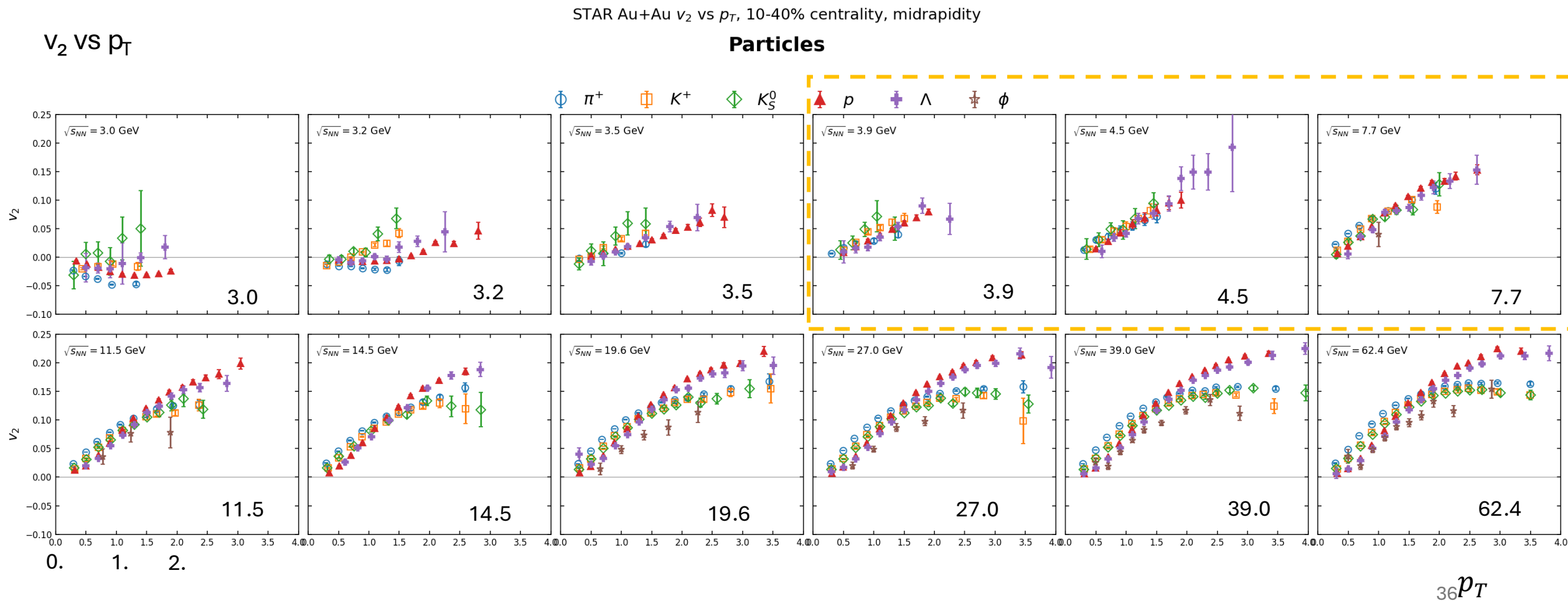
To our bosses: do not forget us. To make the investment in the machine and running time — not to mention the time and effort of the RHIC support staff — pay off, we need to produce the science. And to do that, we need support. You are our partners.

backups

To make my point, just use published data.

Compiled from:
PRL 135, 072301 (2025)
PRC 93, 014907 (2016)
PLB 827, 137003 (2022)

Are we getting high enough in p_T ? Marginal in FXT region (3–7 GeV). Data sets $\sim 100M$
Much larger data sets at 3 GeV. New sets at 4.2, 4.5, 5.2 $\sim 1B$ each.

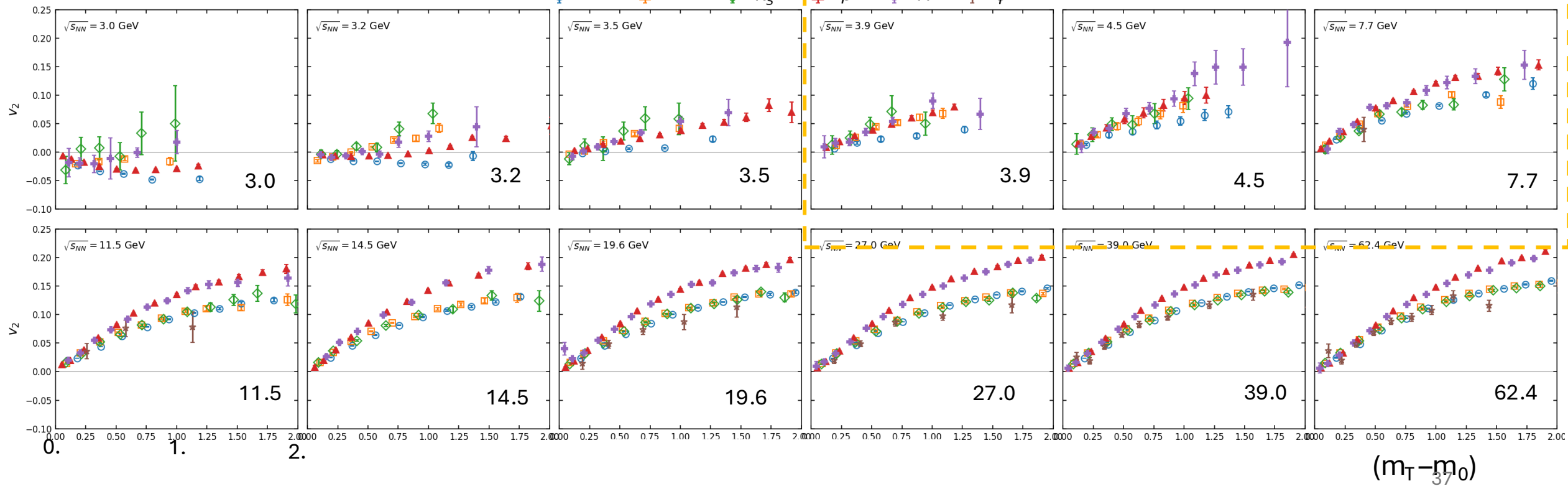


STAR Au+Au v_2 vs $m_T - m_0$, 10-40% centrality, midrapidity

v_2 vs $m_T - m_0$

Particles

π^+ K^+ K_S^0 p Λ ϕ

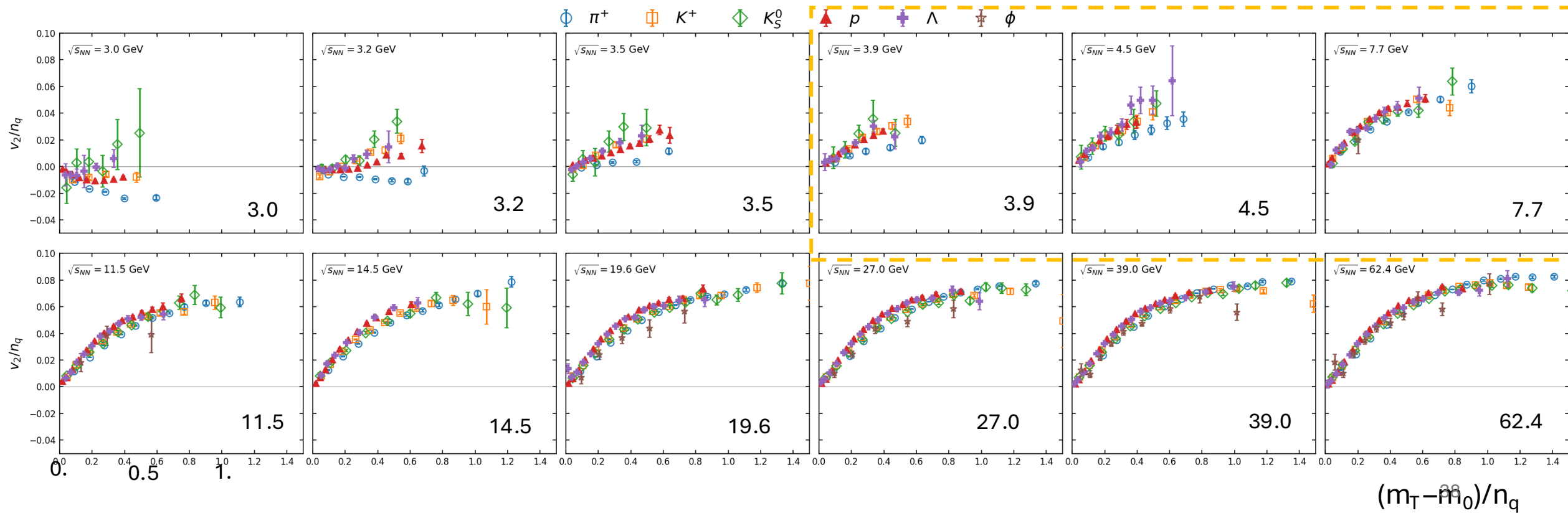


STAR Au+Au v_2/n_q vs $(m_T - m_0)/n_q$, 10-40% centrality, midrapidity ($n_q = 2$ mesons, $n_q = 3$ baryons)

NCQ Scaled

Particles (NCQ-scaled)

Refs:

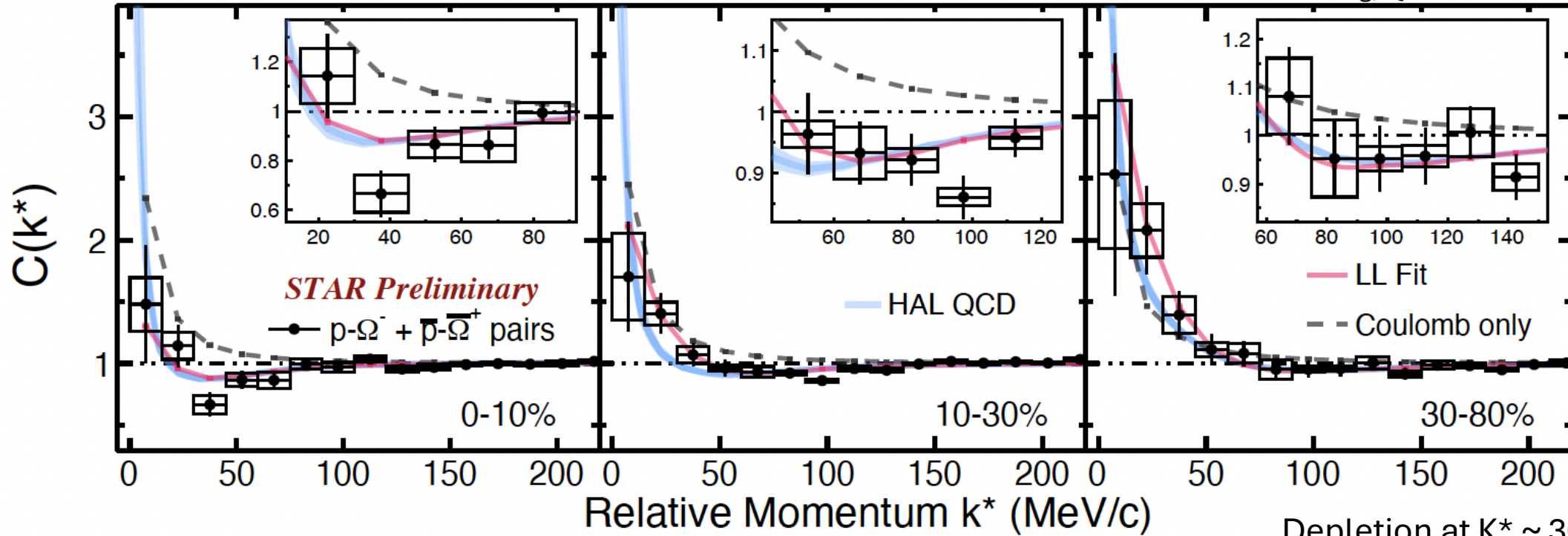


$(m_T - m_0)/n_q$

One example: p- Ω CF

$\sqrt{s_{NN}} = 200 \text{ GeV Isobar Collisions}$

Kehao Zhang, QM 2025



➤ **Wave function:**

□ $\psi(r^*, k^*) = e^{-ik^*r^*} + f(k^*) \frac{e^{-ik^*r^*}}{r^*}$

➤ **Scattering amplitude:**

□ $f(k^*) = [\frac{1}{f_0} + \frac{1}{2}d_0k^{*2} - ik^*]^{-1}$ (No Coulomb)

□ $f(k^*) = [\frac{1}{f_0} + \frac{1}{2}d_0k^{*2} - \frac{2}{a_c}h(\eta) - ik^*A_c(\eta)]^{-1}$ (Include Coulomb)

a_c : Bohr radius $\eta = (k^*a_c)^{-1}$
 A_c, h : Coulomb interaction factor

➤ **Physics quantity:**

□ f_0 : Scattering Length

□ d_0 : Effective Range

□ R_G : Spherical Gaussian Source Size

$f_0 > 0$: Attractive Interaction

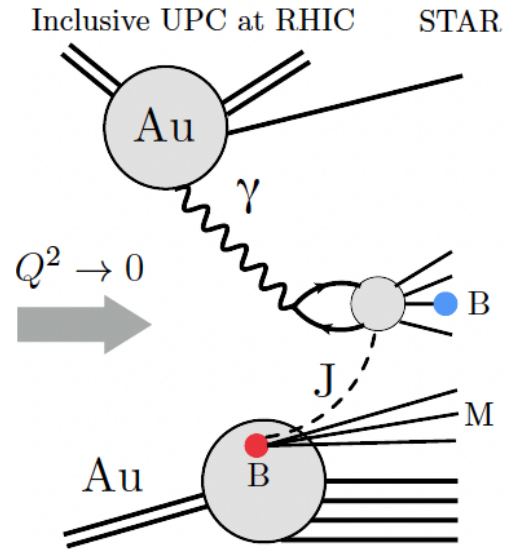
$f_0 < 0$: Repulsive Interaction or Bound State

Depletion at $K^* \sim 30-100$ MeV \rightarrow indication of a bound state

Sign convention chosen such that negative f_0 (scattering length) \rightarrow indicative of a bound state

2) Baryon transport in UPC — Net-proton rapidity slope in γ +Au collisions

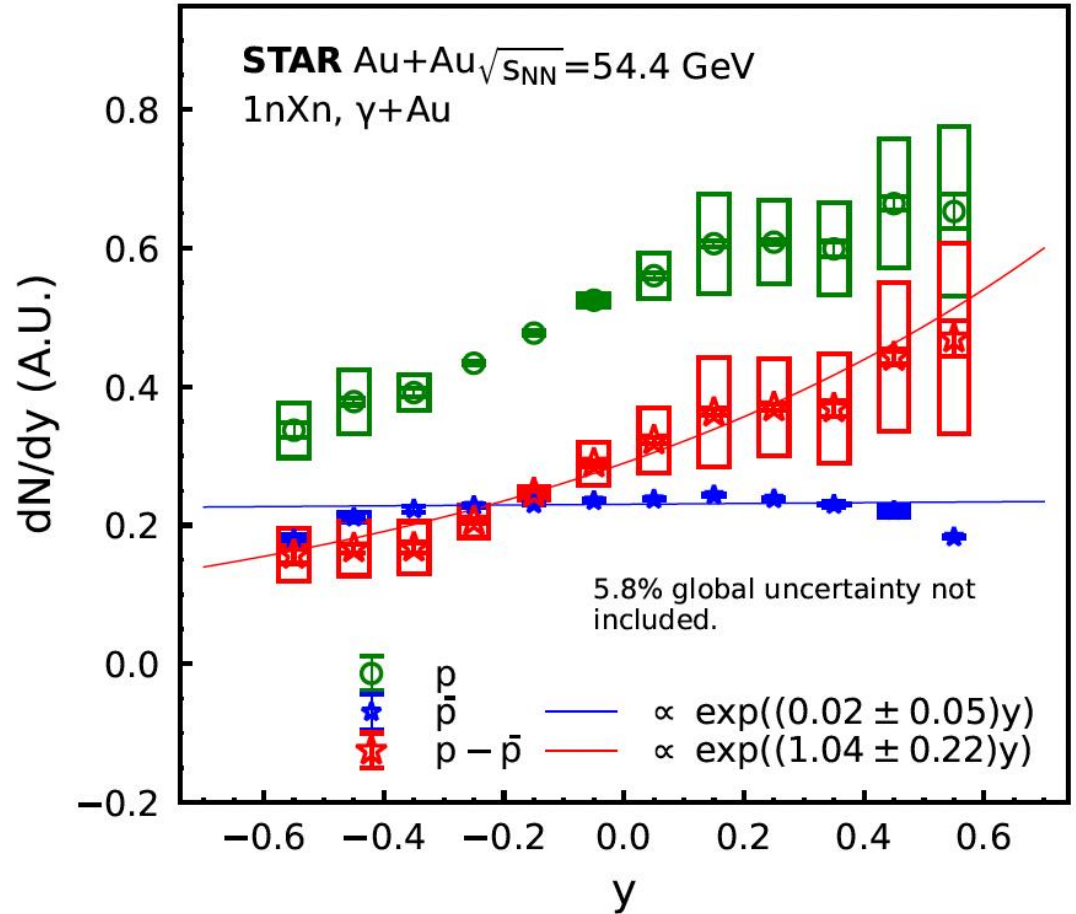
Clean since $B=0$ for incoming photon



in BJ framework $f(y) \propto \exp(-\alpha_B \Delta y)$
 $\alpha_B \sim 0.42 (JJ) - 1.0 (JP)$

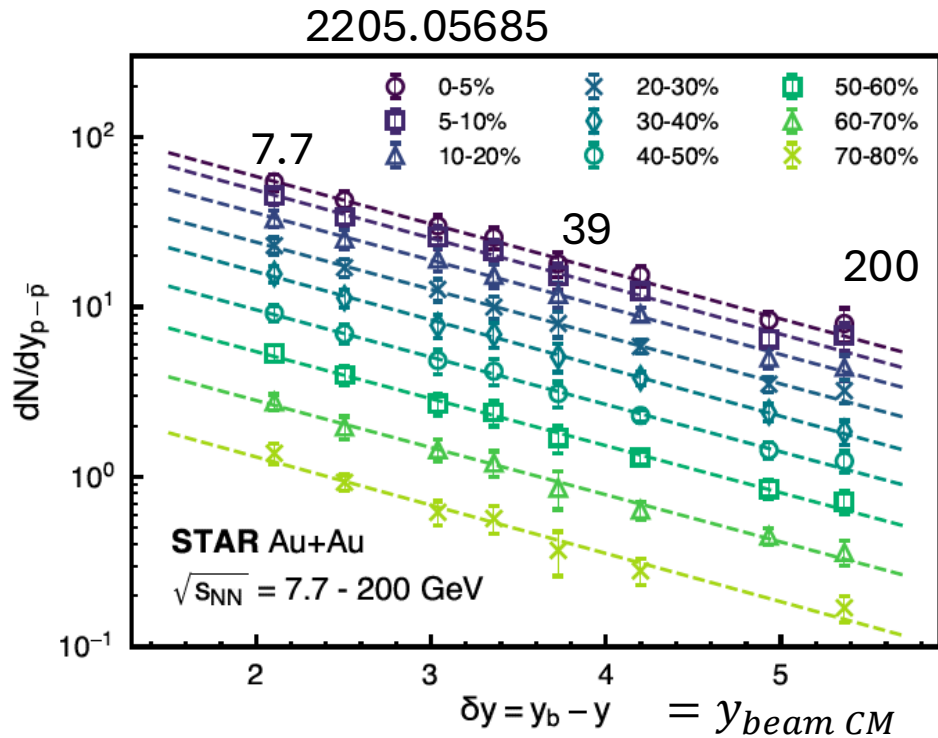
arXiv:2205.05685

arXiv:2408.15441 Submitted to Science



Data: $\alpha_{B_data} \sim 1.04 \pm .22$

2 (cont.) Baryon transport in Au+Au

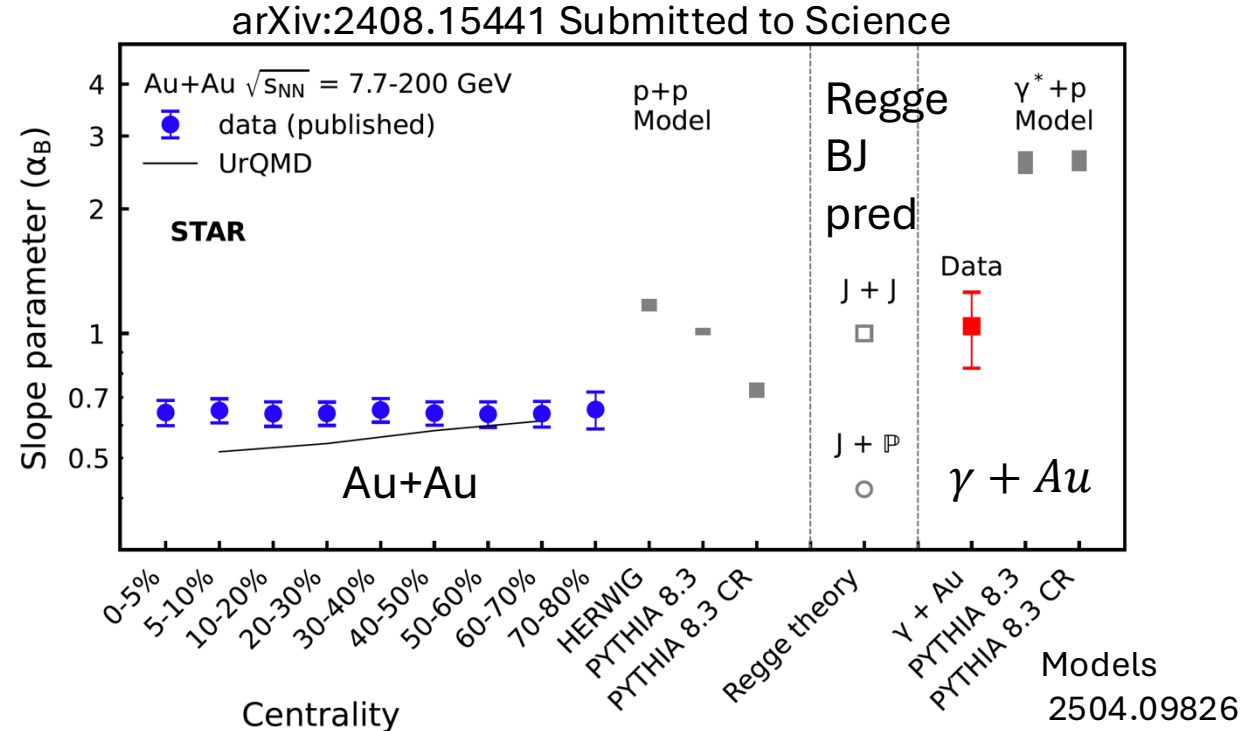


Data: $\alpha_{B_data} \sim 0.64 \pm .05$

in BJ framework $f(y) \propto \exp(-\alpha_B \Delta y)$
 $\alpha_B \sim 0.42 - 1.0$

Latest value Kharzeev et al

$\alpha_{B,theory} \sim 0.66$ (JHEP 07 *2024) 262



Data
 $\alpha_B \sim 0.64 \pm .05 (Au + Au)$
 $1.04 \pm .22 (\gamma + Au)$

Bracketed
between

BJ Regge theory
 $\alpha_B \sim 0.42 (Au + Au)$
 $1.04 (\gamma + Au)$

Models (Pythia 8.3 CR) "explain" the Au+Au data, but not $\gamma+Au$

→ Both Charge vs Baryon transport and Baryon transport in $\gamma + Au$
Favor Baryon Junction hypothesis

Where is the Critical Point?

- Theoretically: $\mu_B \sim 600$ MeV, $T_c \sim 100$ MeV
 - Various techniques come to these numbers
 - Lattice extrapolations (to $\mu_B \sim 200$ – 400 MeV via “Taylor series”) – no CP
 - Extensions (e.g. constant s) $\mu_B \sim 602 \pm 62$ MeV, $T_c \sim 114 \pm 7$ MeV
 - FRG (Functional Renormalization Group)
 - Holography: $\mu_B \sim 560$ – 625 MeV, $T_c \sim 101$ – 108 MeV (not QCD – but CFT)

Theorists are getting pretty confident about the location of the CP because of the confluence of predictions