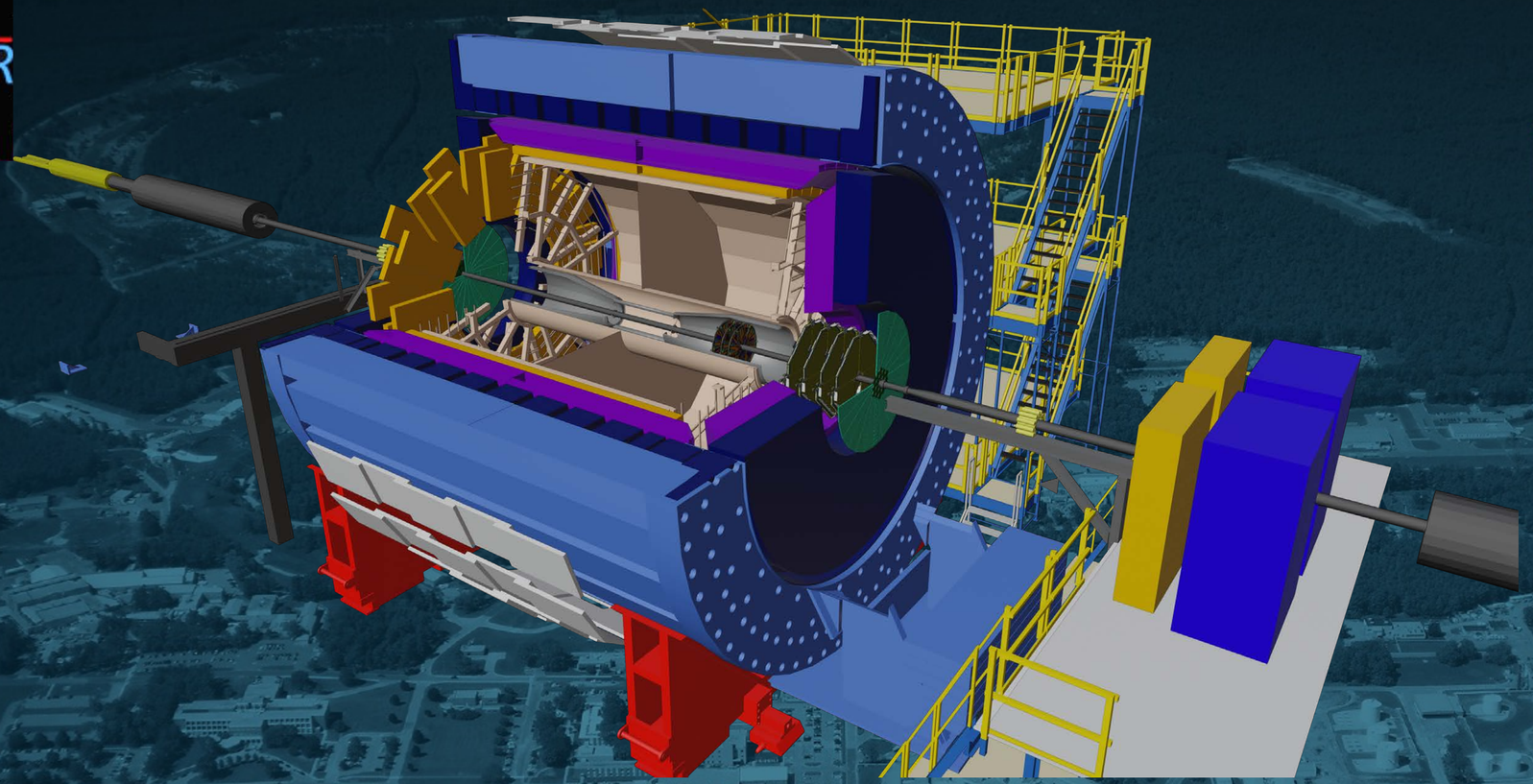


Highlights from the STAR experiment

Prithwish Tribedy (for the STAR collaboration)
(Brookhaven National Laboratory)
ptribedy@bnl.gov

Supported in part by the U.S. DEPARTMENT OF ENERGY | Office of Science

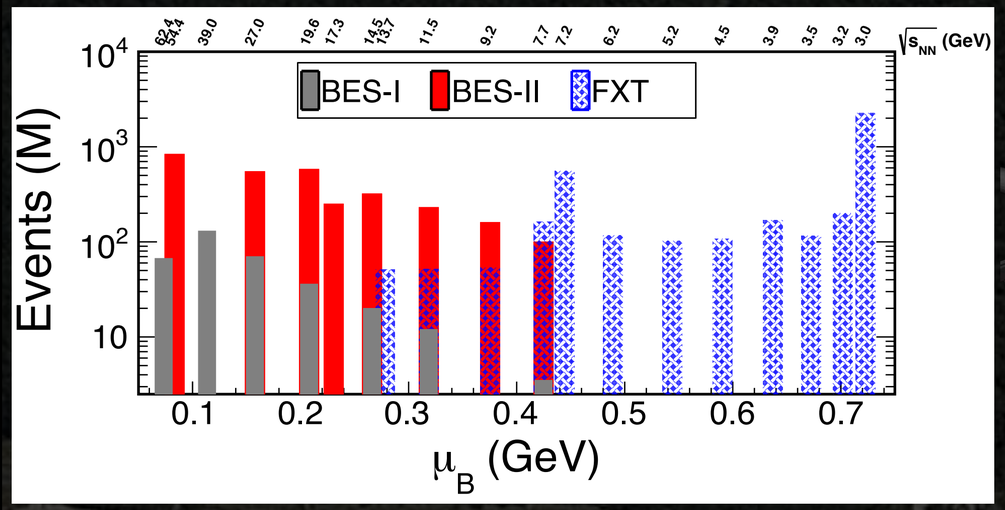
QUARK MATTER KRAKÓW 2022

29TH INTERNATIONAL
CONFERENCE ON ULTRARELATIVISTIC
NUCLEUS - NUCLEUS COLLISIONS
APRIL 4-10, 2022
KRAKÓW, POLAND

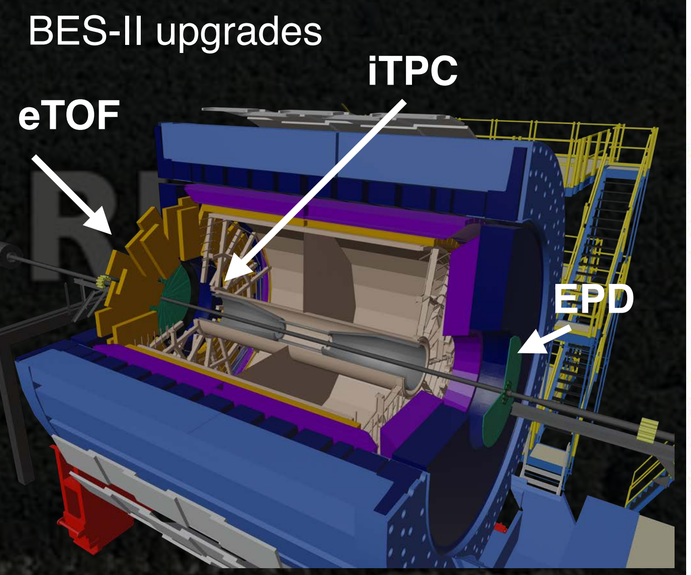
Successful Operation of STAR in Years 2020-21

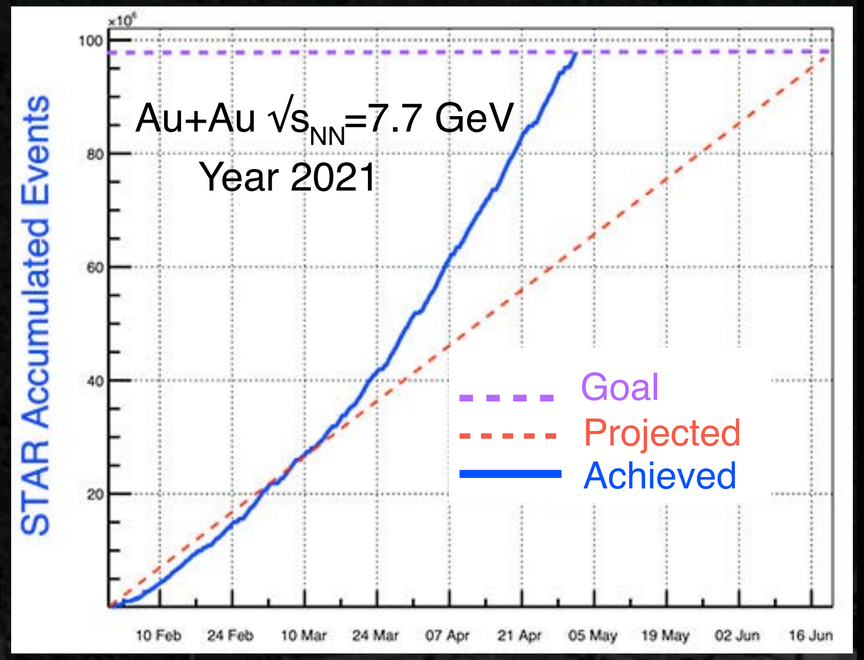
Watch Live Collisions At STAR:
https://online.star.bnl.gov/aggregator/livedisplay/

Run 20 and 21 completed successfully: enhanced collision rates due to Low Energy RHIC Electron Cooling (LEReC) system, smooth & desired performance of BES-II upgrades (iTPC, eTOF, EPD)



7 energies between 7.7 - 27 GeV (collider mode)
12 energies between 3.0 - 13.7 GeV (FXT mode)





Early completion of BES-II data taking allowed O+O & d+Au runs in 2021

RHIC Beam Energy Scan II completed, p+p 510 run with fully installed forward upgrade is ongoing

Outline of STAR highlights

STAR results are being presented in 21 parallel talks and 47 posters at this Quark Matter

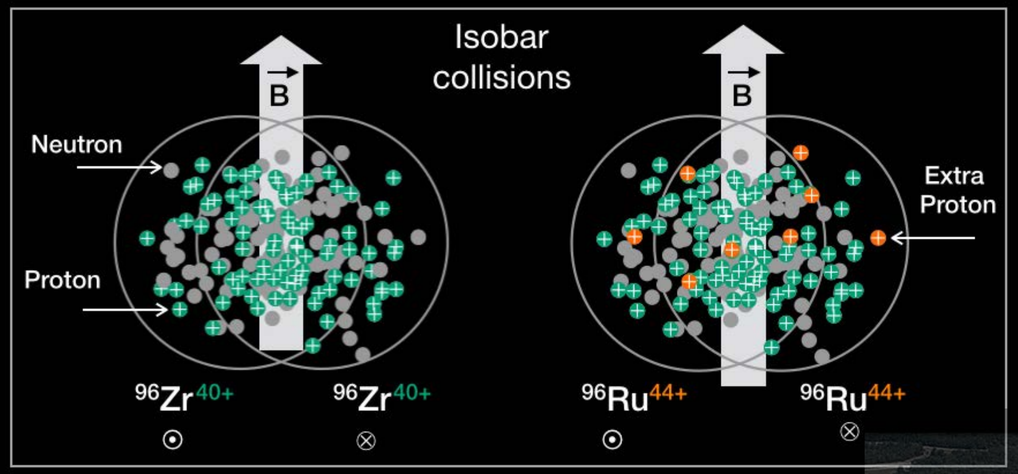
Isobar collisions & strong field effects

- Chiral magnetic effect
- Directed flow splitting
- Global polarization
- Spin alignment
- Photoproduction

Chiral magnetic effect search in isobar collisions

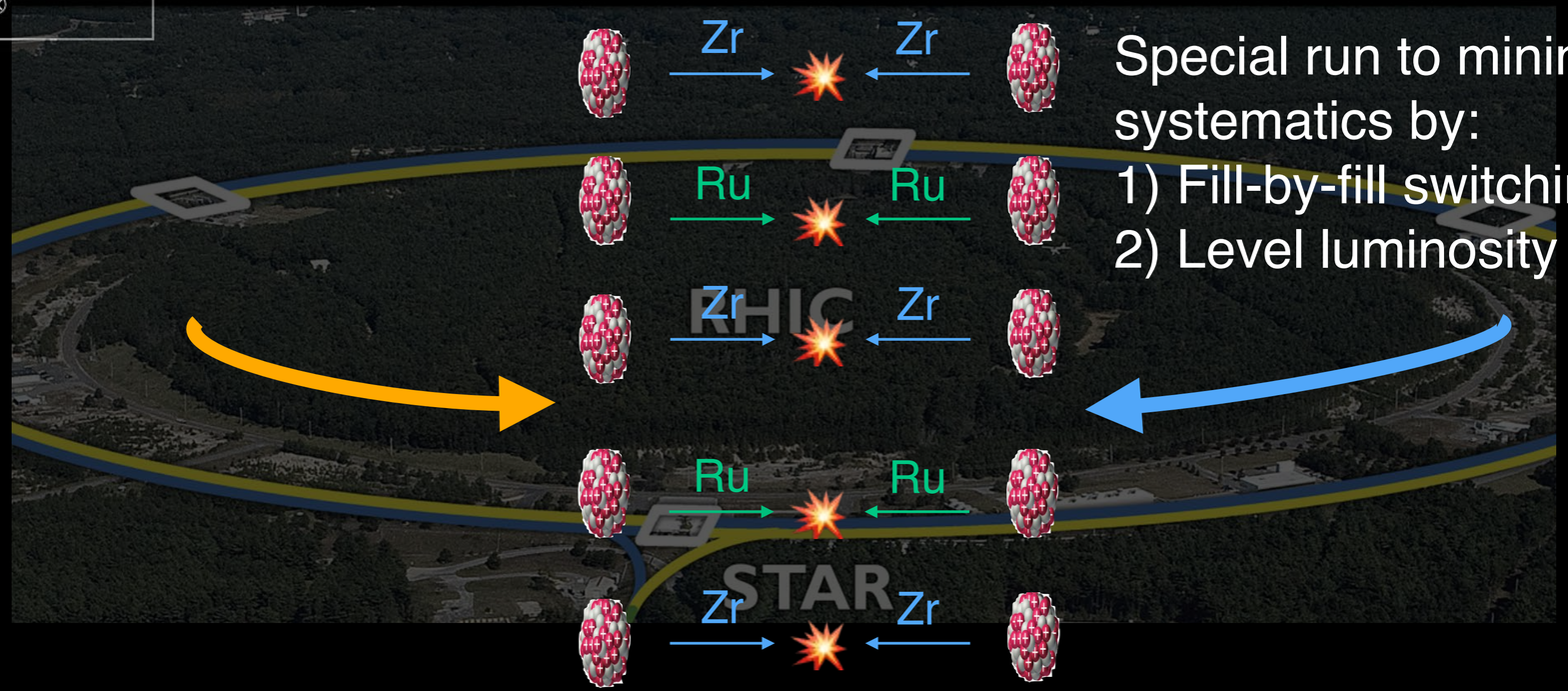
Talk by Yu Hu (Thu T02-III)

Poster by Yicheng Feng (Wed T02)



B-field square is 10-15% larger in Ru+Ru than Zr+Zr

$$\frac{\langle \text{Observable} \rangle_{\text{Ru+Ru}}}{\langle \text{Observable} \rangle_{\text{Zr+Zr}}} > 1$$



Special run to minimize systematics by:
1) Fill-by-fill switching
2) Level luminosity

Best possible control of signal and background compared to all previous experiments for CME search

Chiral magnetic effect search in isobar collisions

Talk by Yu Hu (Thu T02-III)
Poster by Yicheng Feng (Wed T02)

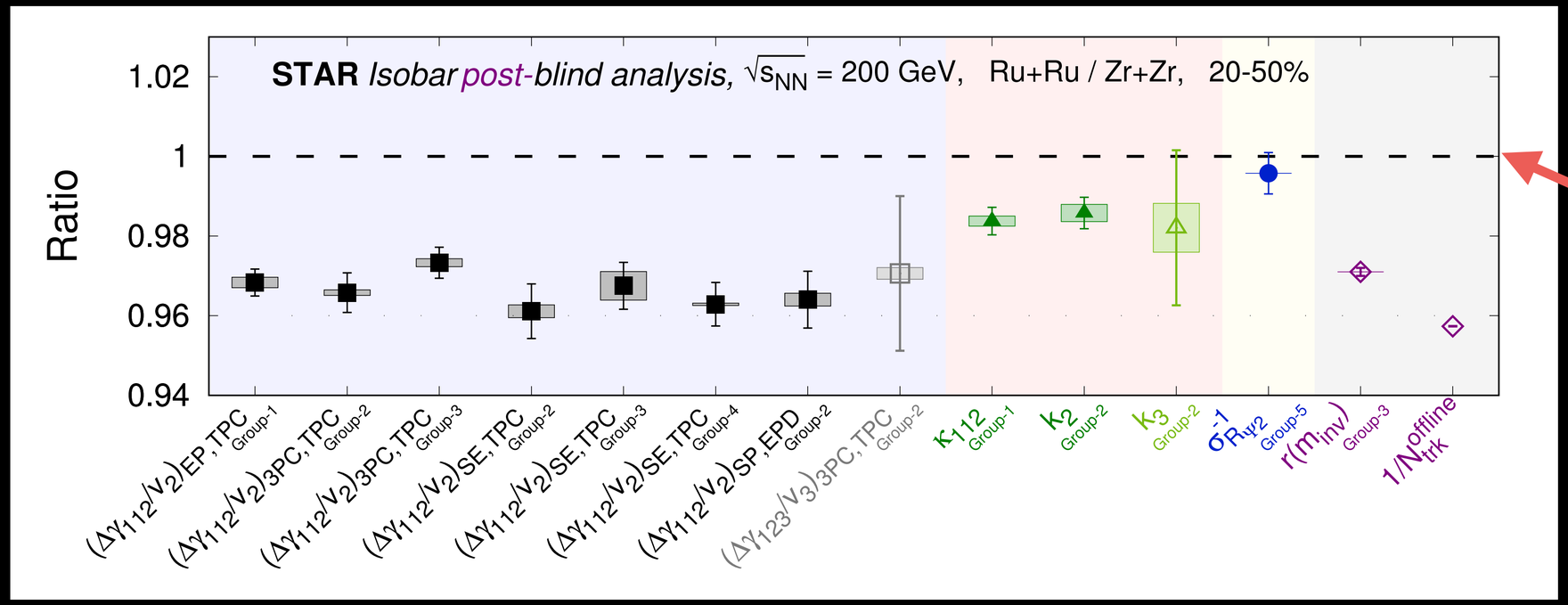
Blind analysis performed with pre-defined criteria for primary CME sensitive observable:

$$\frac{(\Delta\gamma/v_2)_{\mathrm{Ru+Ru}}}{(\Delta\gamma/v_2)_{\mathrm{Zr+Zr}}} \approx 1 + f_{\mathrm{CME}}^{\mathrm{Zr+Zr}}[\underbrace{(B_{\mathrm{Ru+Ru}}/B_{\mathrm{Zr+Zr}})^2 - 1}_{0.1\text{-}0.15}] > 1 \ (\text{for CME})$$

$f_{\mathrm{CME}}^{\mathrm{Zr+Zr}}$: Unknown

Precision of 0.4% achieved

M. Abdallah et al. (STAR Collaboration), Phys. Rev. C 105 (2022) 1, 014901



Blind analysis baseline

No pre-defined signature of CME is observed in isobar collisions, possible residual signal due to change of baseline & non-flow effects are under study

Chiral magnetic effect search in isobar collisions

Talk by Yu Hu (Thu T02-III)
Poster by Yicheng Feng (Wed T02)

Blind analysis performed with pre-defined criteria for primary CME sensitive observable:

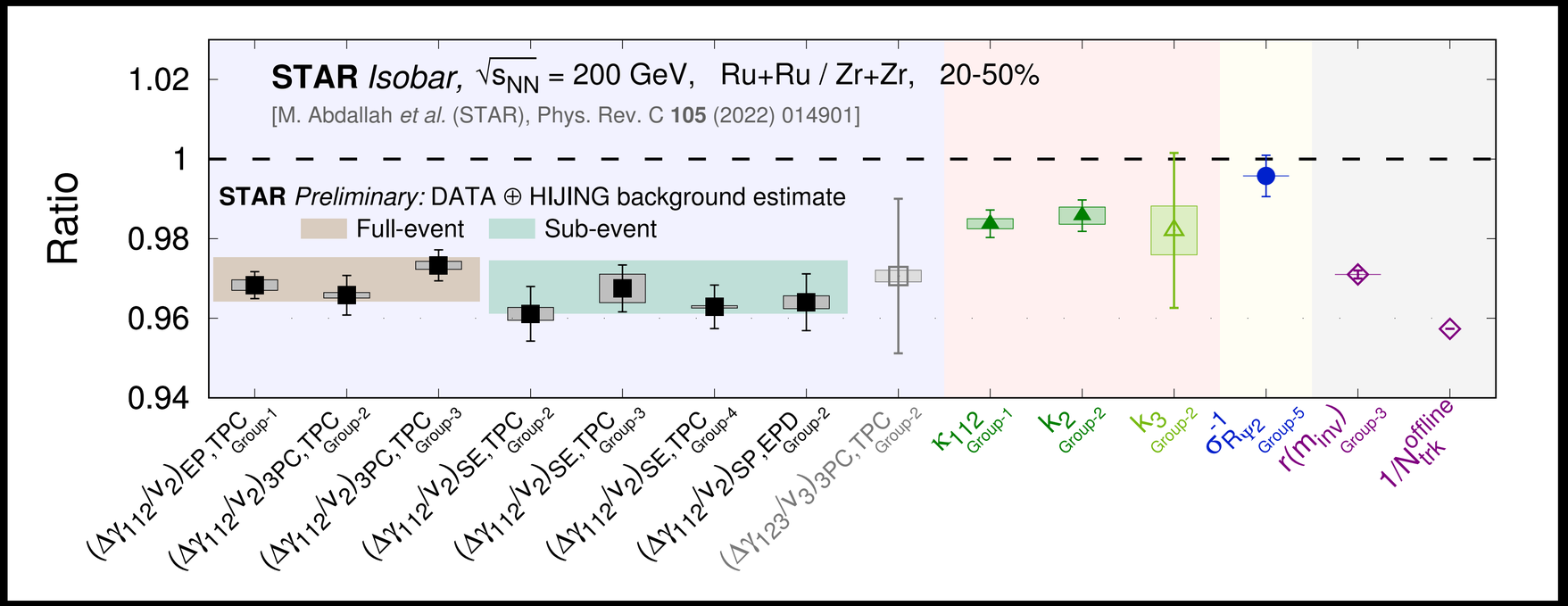
$$\frac{(\Delta\gamma/v_2)_{\mathrm{Ru+Ru}}}{(\Delta\gamma/v_2)_{\mathrm{Zr+Zr}}} \approx 1 + f_{\mathrm{CME}}^{\mathrm{Zr+Zr}}[(B_{\mathrm{Ru+Ru}}/B_{\mathrm{Zr+Zr}})^2 - 1] > 1 \ (\mathrm{for\ CME})$$

$f_{\mathrm{CME}}^{\mathrm{Zr+Zr}}$: Unknown

$(B_{\mathrm{Ru+Ru}}/B_{\mathrm{Zr+Zr}})^2 - 1$: 0.1-0.15

Precision of 0.4% achieved

M. Abdallah et al. (STAR Collaboration), Phys. Rev. C 105 (2022) 1, 014901

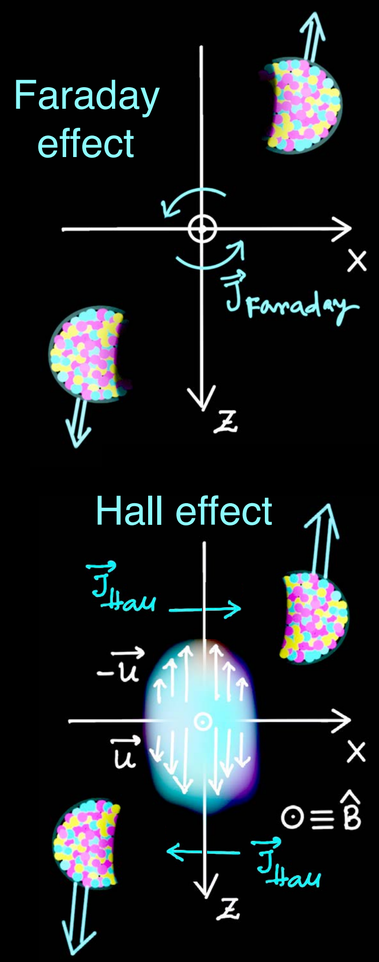


No pre-defined signature of CME is observed in isobar collisions, possible residual signal due to change of baseline & non-flow effects are under study

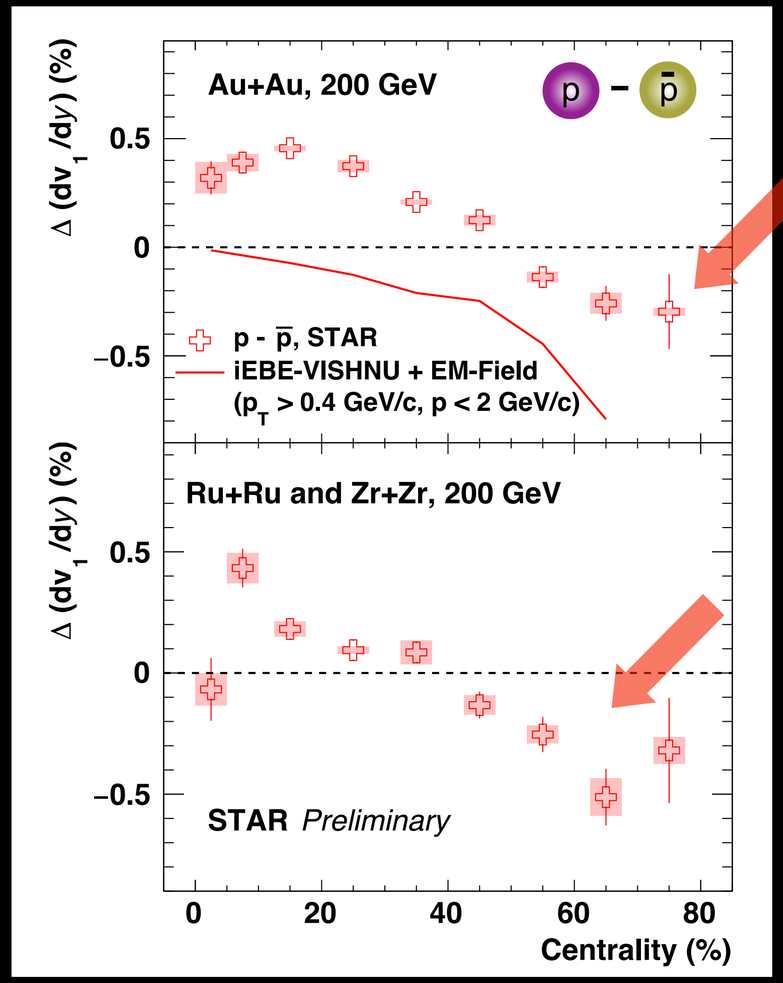
Splitting of charge dependent directed flow

Talk by Ashik Ikbal (Wed T08-I)
Poster by Diyu Shen (Wed T01)

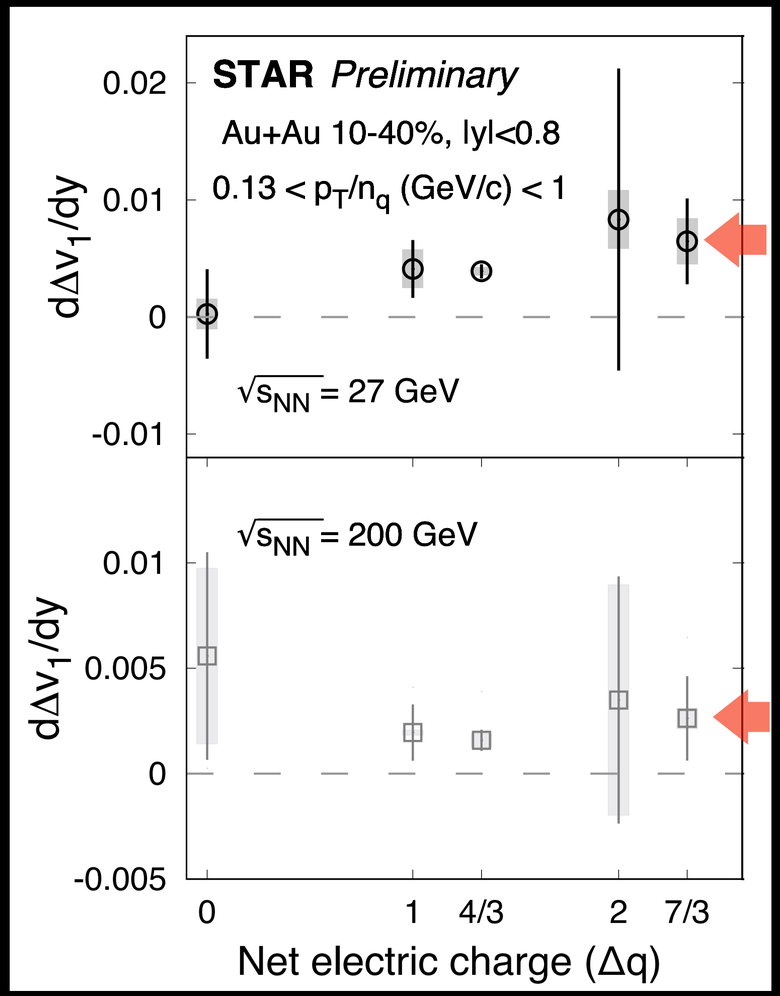
EM-field driven v_1 splitting

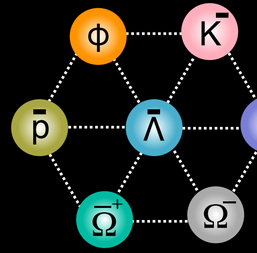


v1 slope difference for p & $\bar{p}$ shows sign change in peripheral events

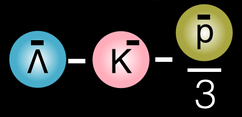


Combination of transport-free hadrons show splitting at various electric charge differences





$\Delta m^{quark} \approx 0$
$\Delta Q = \frac{4}{3}$



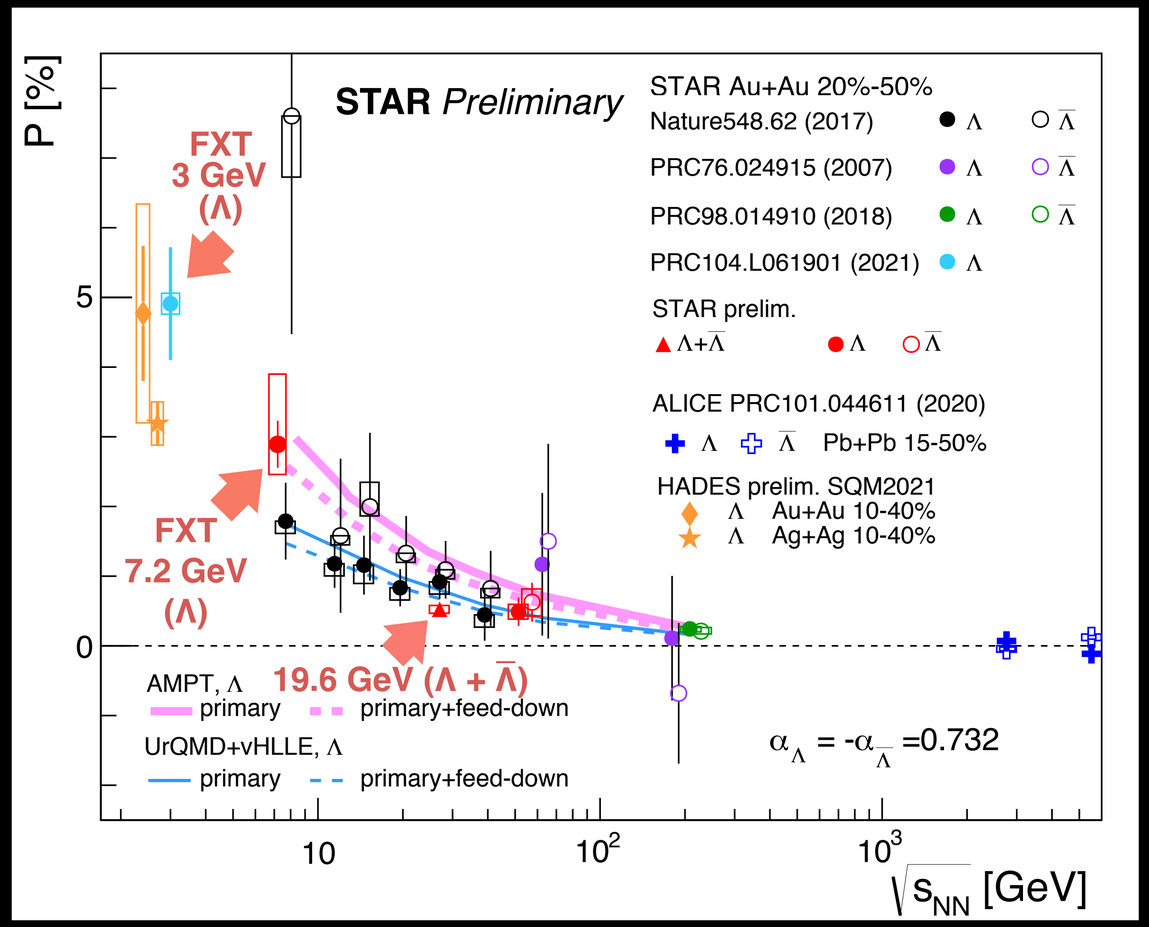
$\Delta m^{quark} = 0$
$\Delta Q = 2$

Splitting of charge dependent v_1 slope observed that cannot be explained by baryon transport

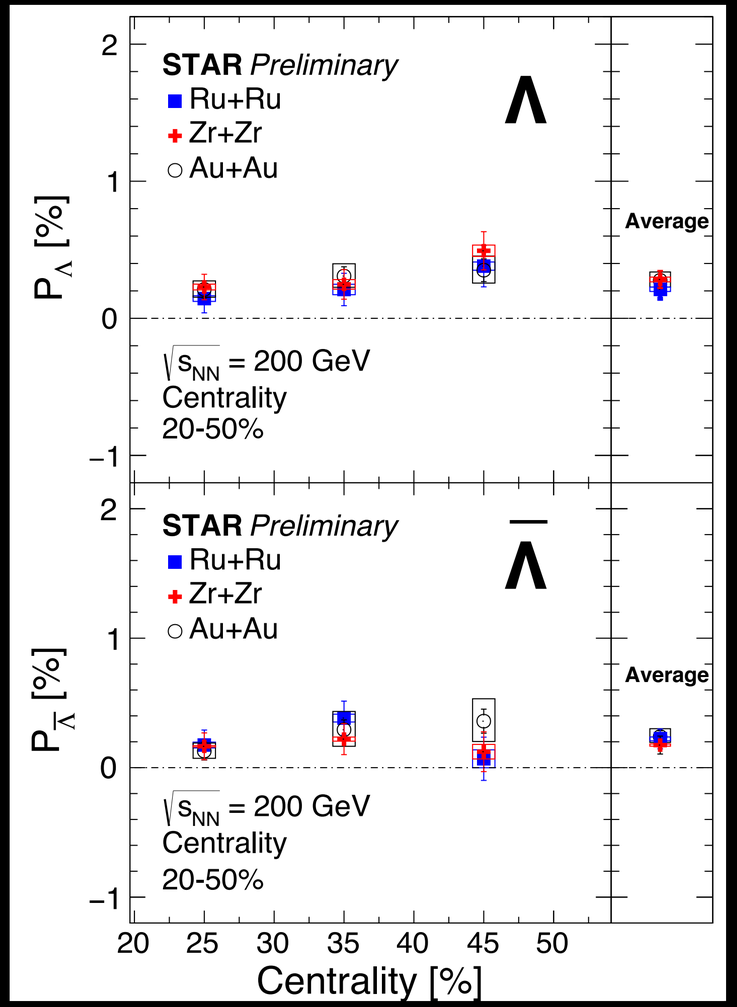
Global lambda polarization

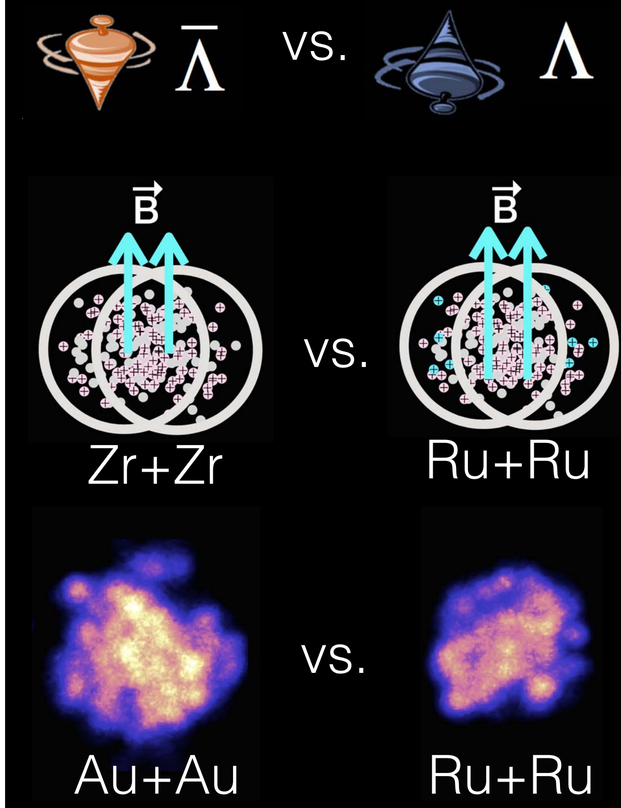
Talk by Joey Adams (Thu T02-II)
Posters by Kosuke Okubo (Wed T02) & Xingrui Gou (Wed T02)

Precision new FXT (3 GeV) and BES-II (19.6 GeV) results follow the global trend



Various predictions tested with high statistics isobar & Au+Au data at $\sqrt{s_{NN}}$ = 200 GeV

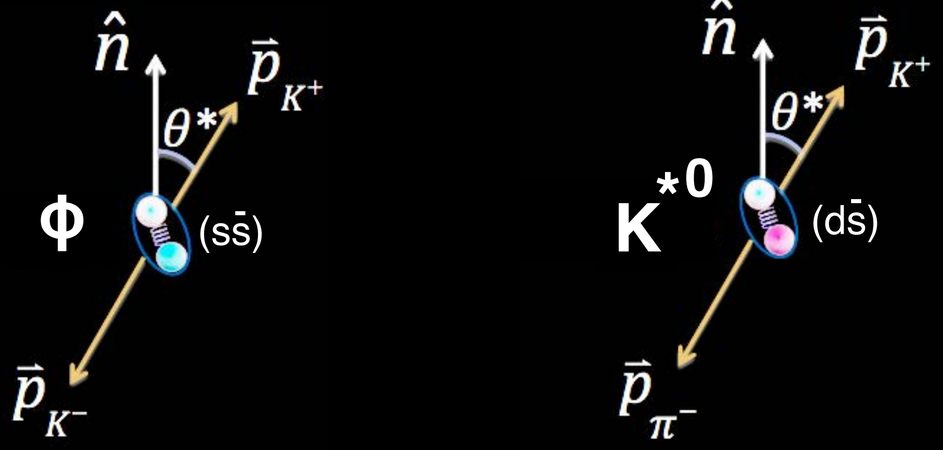




No system dependence at fixed centrality or B-field driven splitting seen in 200 GeV collisions

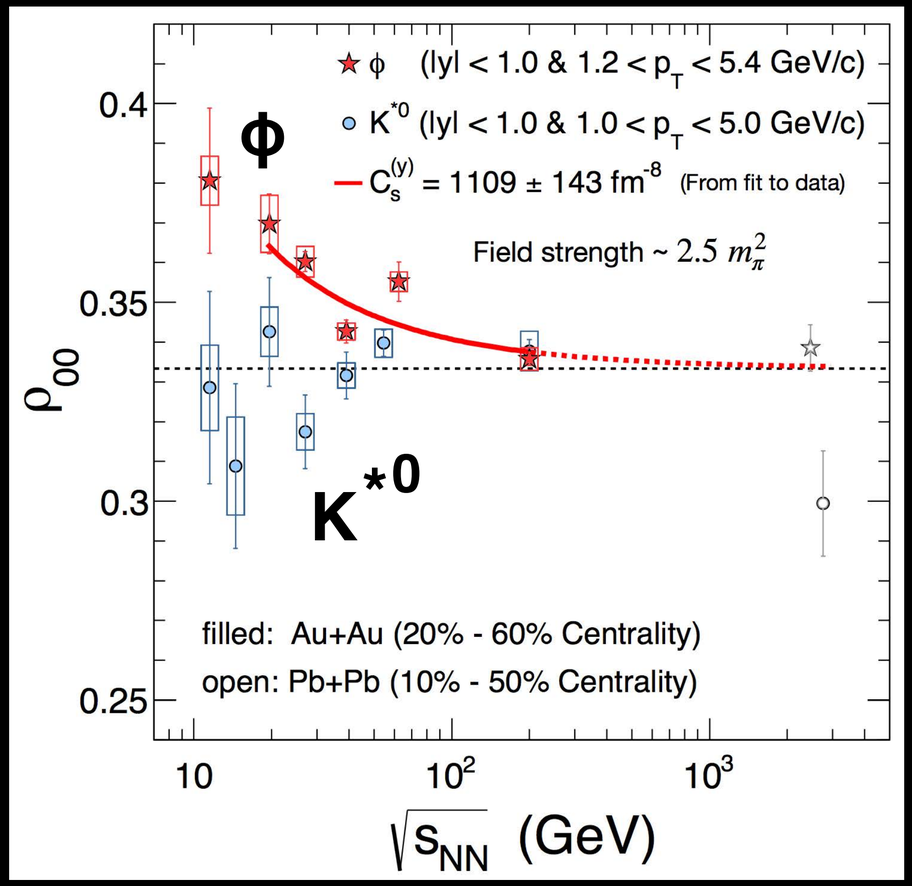
Global spin alignment of vector mesons

Talk by Subhash Singha (Tue T02-I)



K^{*0} meson consistent with 1/3
8.4σ positive deviation from 1/3 for ϕ meson

M. Abdallah et al (STAR Collaboration), arXiv: 2204:XXYY



What causes vector meson spin alignment? Strong force field?

Like Λ polarization (-10^{-5}) Electric field (-10^{-4})

$$\rho_{00}^{\phi} \approx \frac{1}{3} + c_{\Lambda} + c_{\varepsilon} + c_{E} + c_{\phi}$$

Vorticity tensor (-10^{-4}) Vector meson field

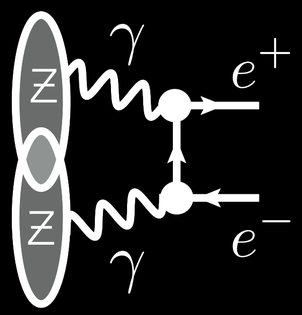
Sheng et al, Phys. Rev. D 101 096005 (2020), Phys. Rev. D 102, 056013 (2020)

Charged $K^{*\pm}$ measurements in will provide more insights

Model with strong vector meson force field (~2.5 m_π^2) provides a possible explanation

Photon-induced processes in isobars

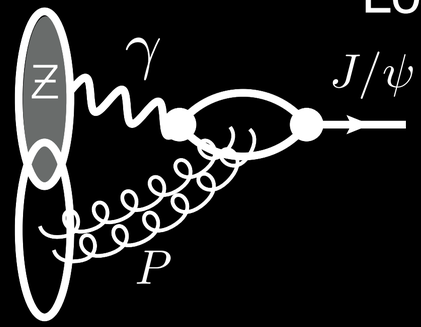
Talk by Xiaofeng Wang (Thu T09-I)
Poster by Kaifeng Shen (Wed T08 / T09)



Low p_T di-electron (Breit-Wheeler)

$$\sigma(\gamma\gamma \to e^+e^-) \sim Z^4$$

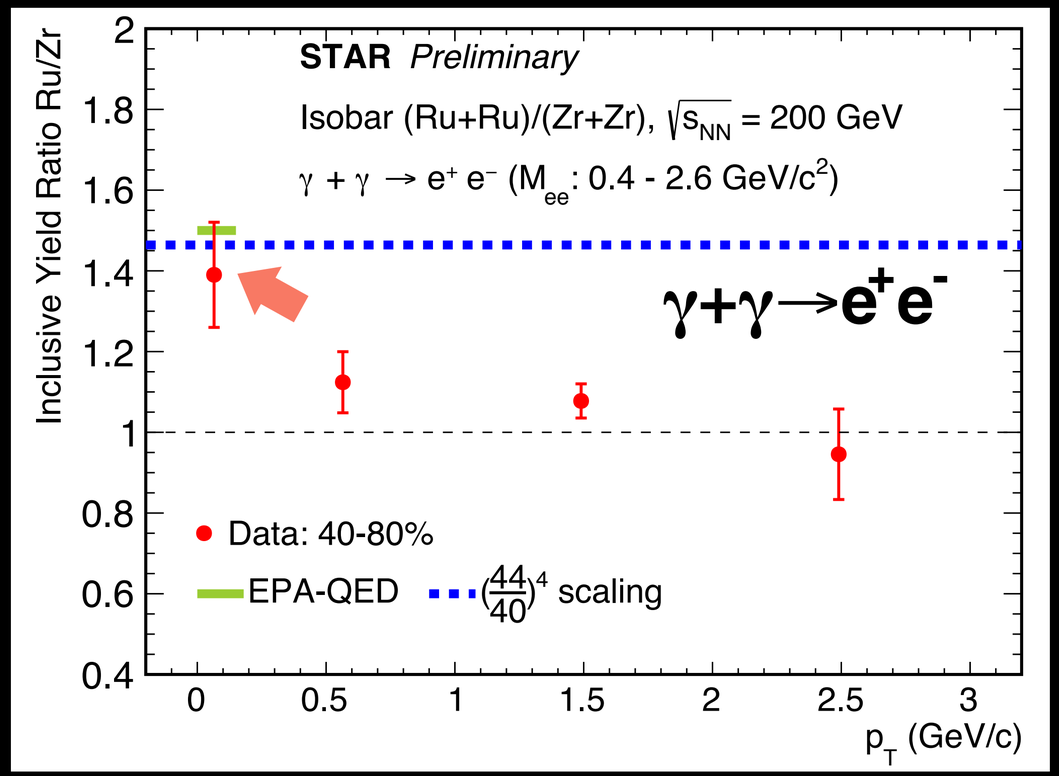
$$\frac{\sigma_{\mathrm{Ru+Ru}}(\gamma\gamma \to e^+e^-)}{\sigma_{\mathrm{Zr+Zr}}(\gamma\gamma \to e^+e^-)} \sim \left(\frac{44}{40}\right)^4$$

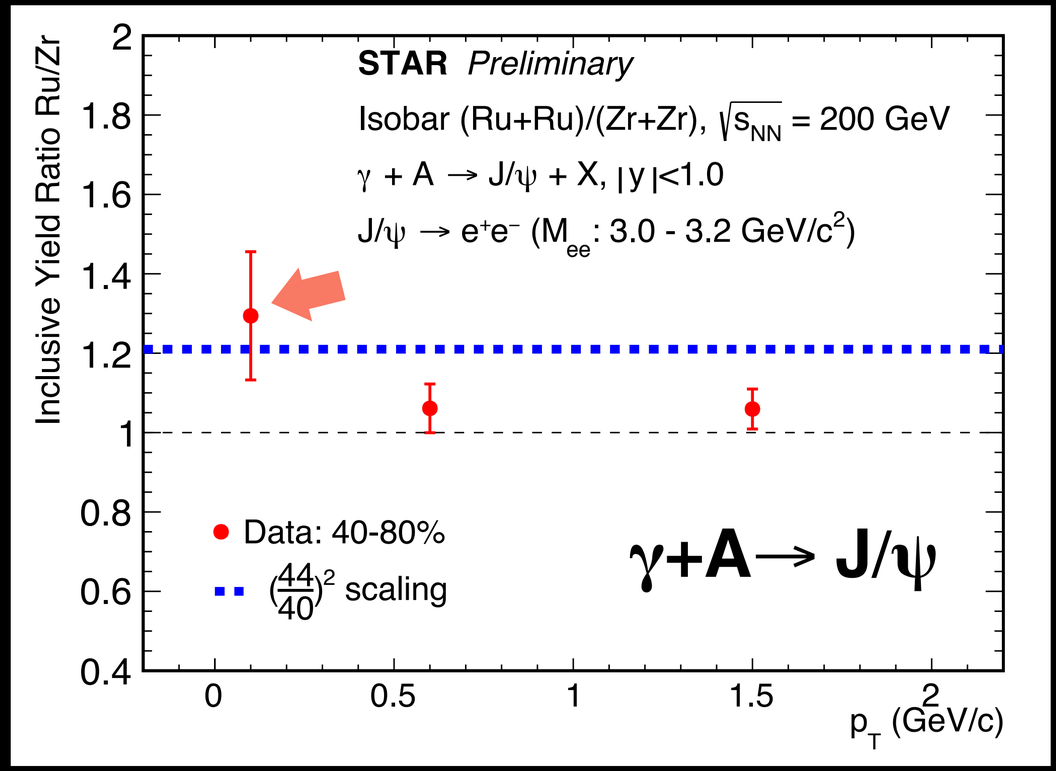


Low p_T J/ψ photoproduction

$$\sigma(\gamma A \to J/\psi) \sim Z^2$$

$$\frac{\sigma_{\mathrm{Ru+Ru}}(\gamma A \to J/\psi)}{\sigma_{\mathrm{Zr+Zr}}(\gamma A \to J/\psi)} \sim \left(\frac{44}{40}\right)^2$$





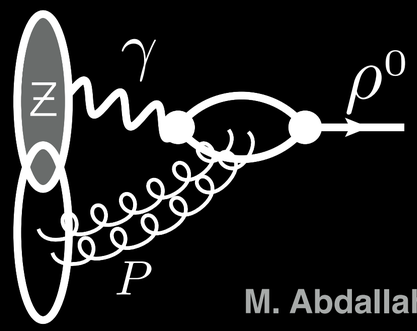
Data suggest low p_T photon induced processes follow "Z" scaling of EM-fields for isobars

Nuclear radii using photon-induced processes

Talk by Xiaofeng Wang (Thu T09-I)

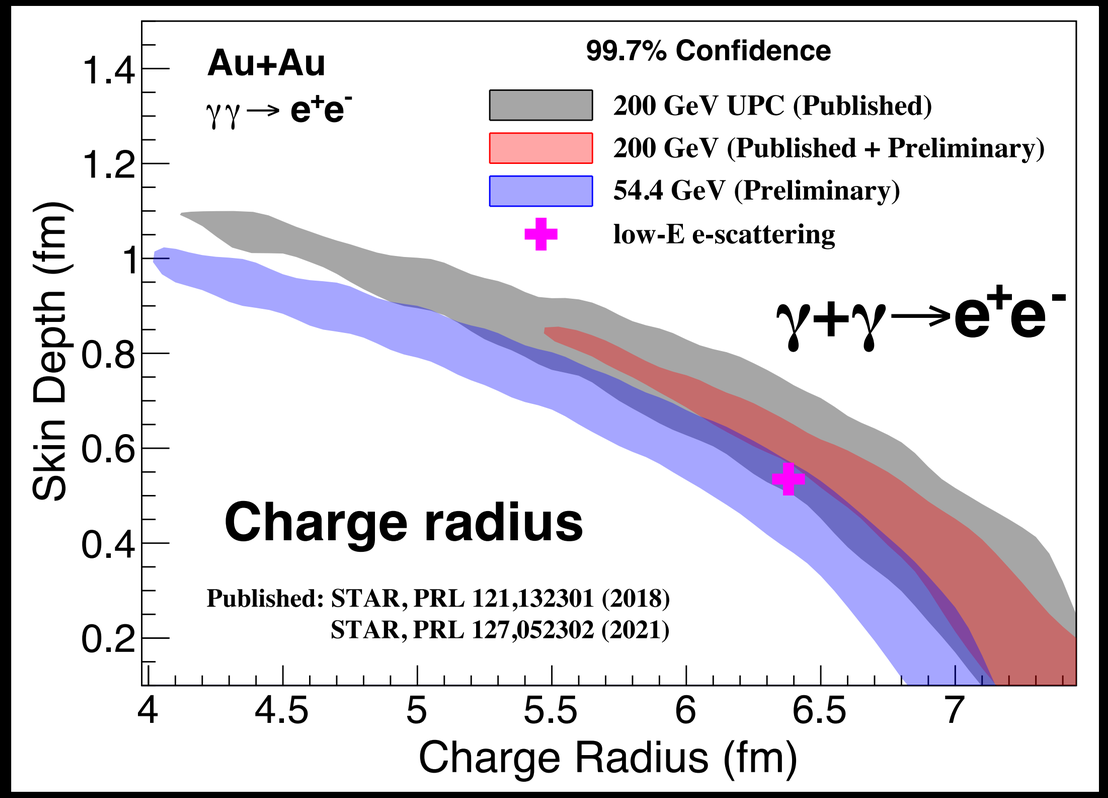
$$\rho = \frac{\rho_0}{1 + \exp\left[(r - R)/a\right]}$$

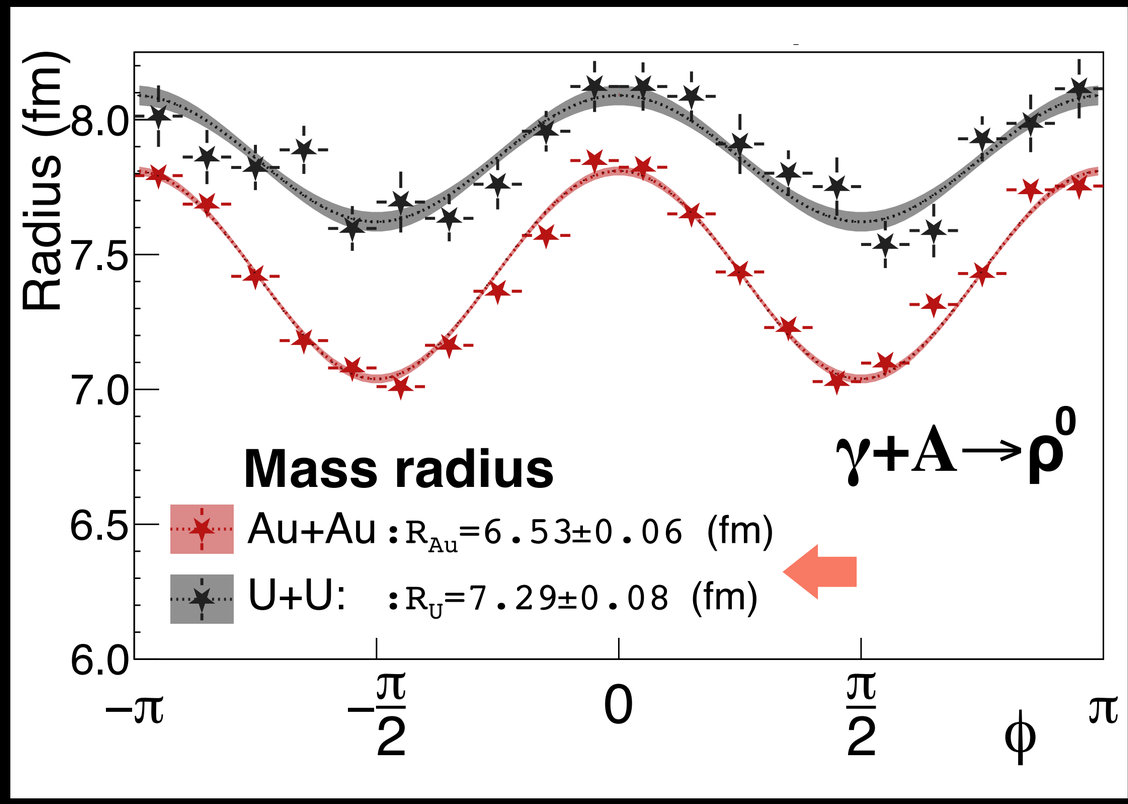
Charge radius R & skin depth a constrained using $\gamma\gamma \rightarrow e^+e^-$ process, compared with e-scattering data



Precision extraction of mass (strong-interaction) radius for Au & U in diffractive $\gamma A \rightarrow \rho^0$

M. Abdallah et al. (STAR Collaboration), arXiv:2204.01625





Novel ways of extracting nuclear charge radius, and strong-interaction (gluon) radius at RHIC energies

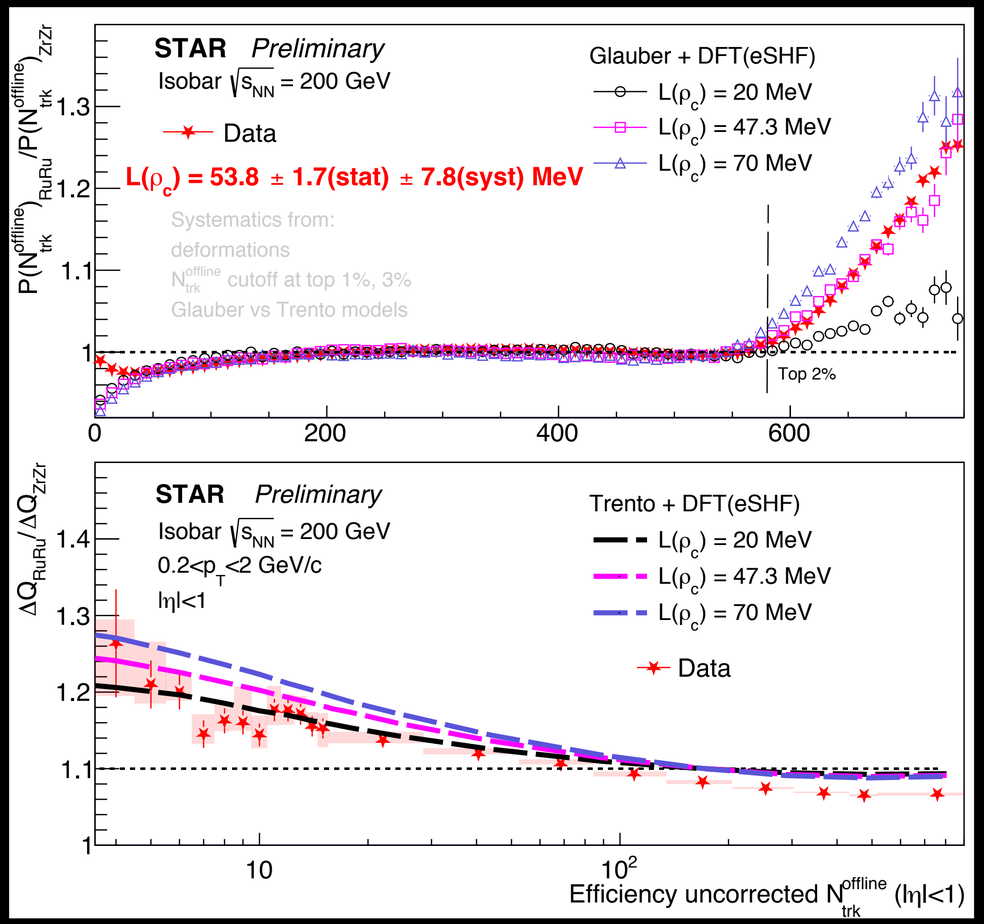
New insights on collective effects

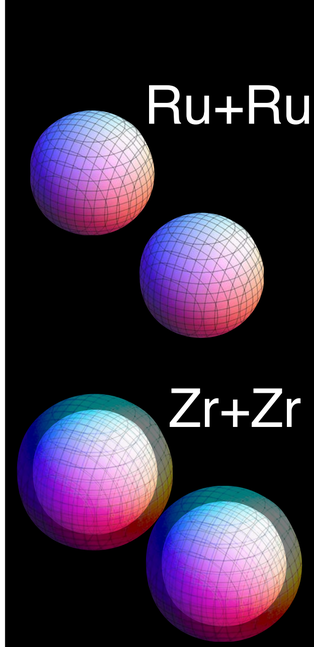
- Nuclear shape & structure
- Transverse & longitudinal dynamics
- Collectivity driven hyperon polarization

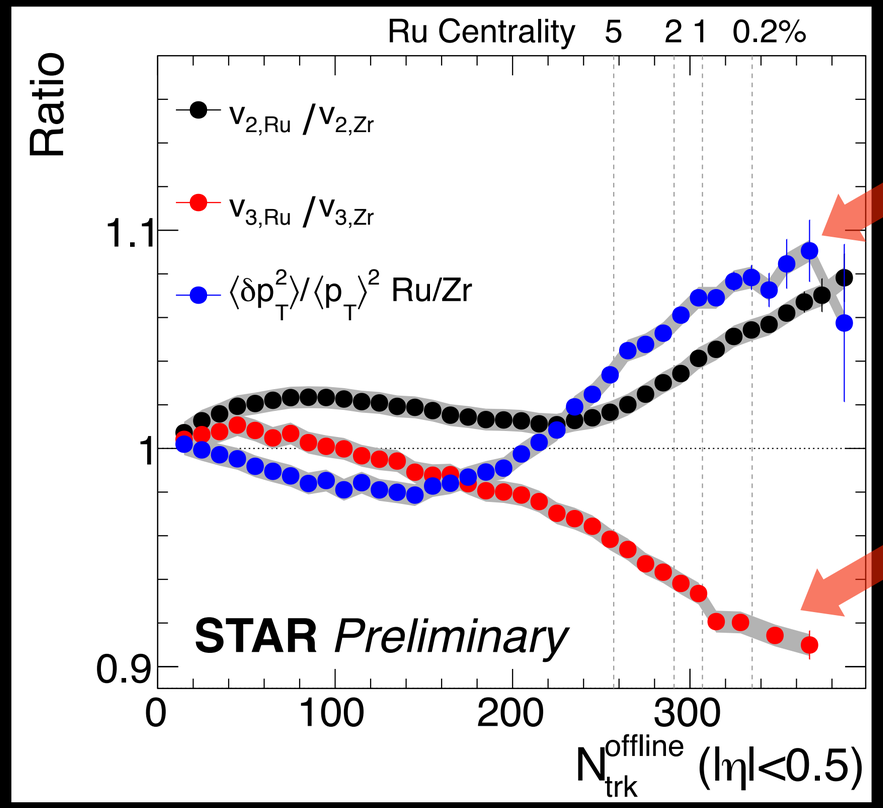
Neutron skin & nuclear deformation of isobars

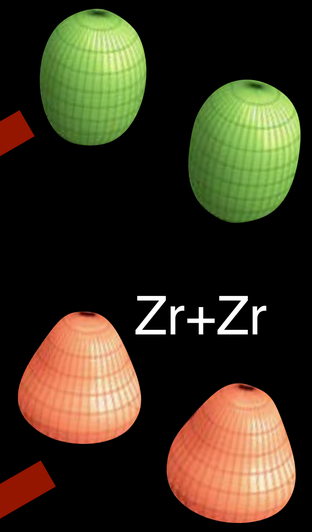
Talk by Haojie Xu (Wed T01-II)
Posters by Chunjian Zhang (Wed T14_2), Jiangyong Jia (Wed T01)

Precision ratios of flow harmonics (v_2, v_3), asymmetric cumulants (ac{3}), $\langle p_T \rangle$, moments of $\langle p_T \rangle$ fluctuation, multiplicity distribution $P(N_{ch})$ and net-charge multiplicity (ΔQ) measured in isobars









β_2 (Ru) > β_2 (Zr)
β_3 (Zr) > β_3 (Ru)

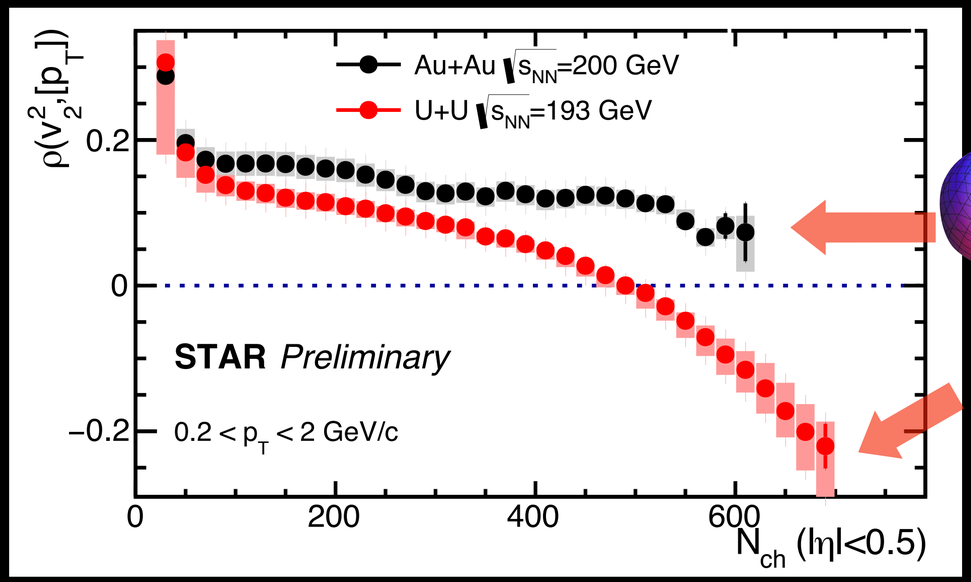
Neutron skin:
$\Delta r_{np}(Zr) > \Delta r_{np}(Ru)$

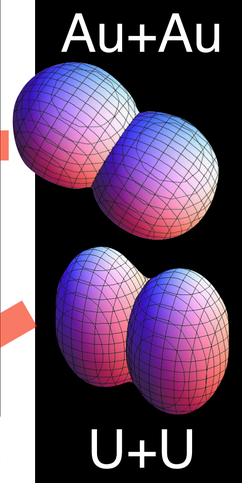
Pioneering new ways to constrain neutron skin & nuclear deformation with heavy ion collisions

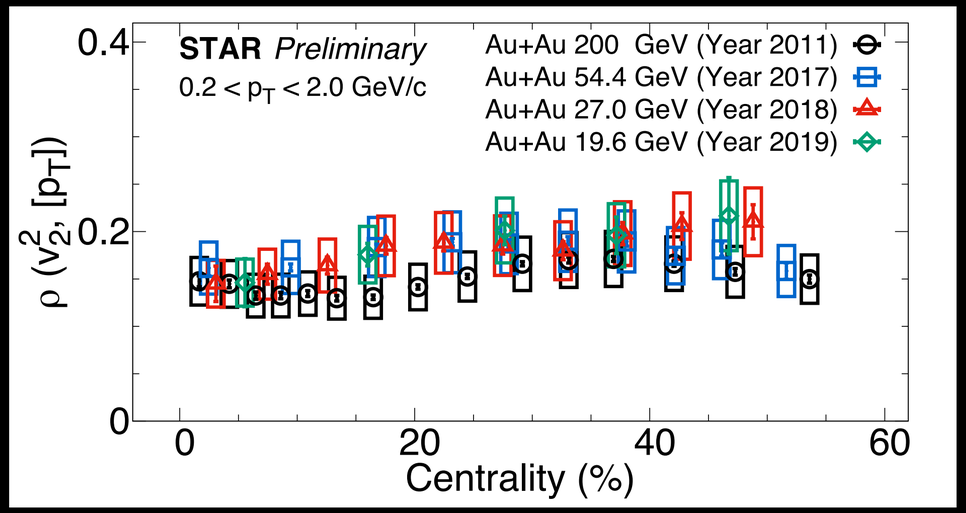
Transverse & longitudinal dynamics

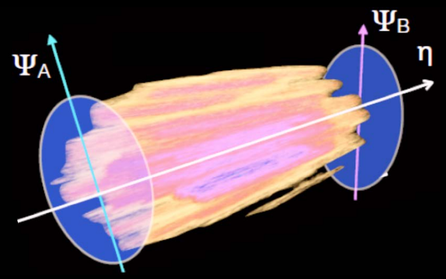
Talk by Gaoguo Yan (Thu T14-II)
Poster by Niseem Magdy (Wed T14-I)
Jiangyong Jia (Wed T01)

Pearson co-efficient $\rho(v_n^2, [p_T]) = \frac{\mathrm{cov}(v_n^2, [p_T])}{\sqrt{\mathrm{Var}(v_n^2)_{\mathrm{dyn}} \langle \delta p_T \delta p_T \rangle}}$



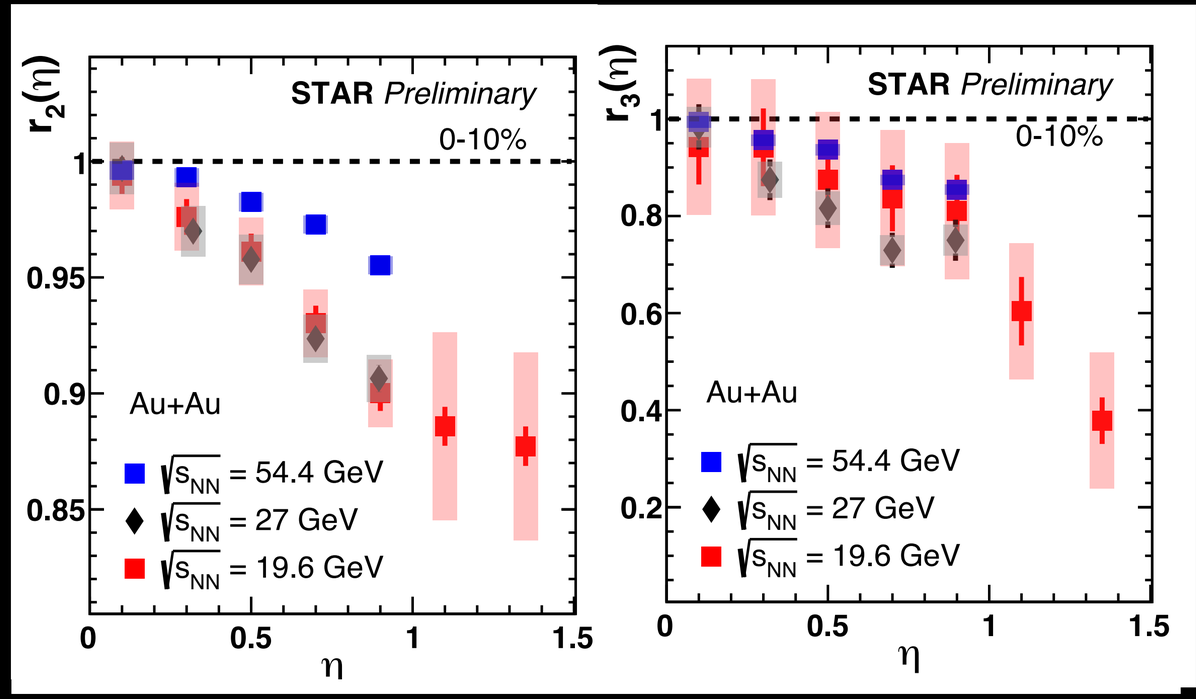






Flow de-correlation with BES-II data

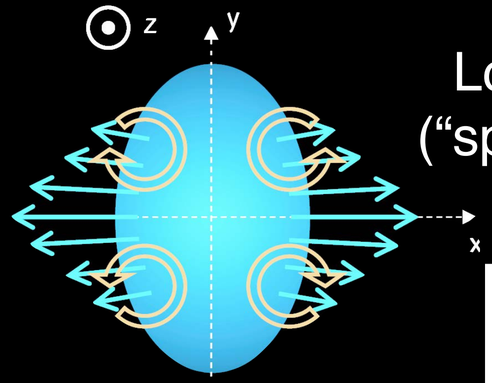
$r_n(\eta^a, \eta^b) = \frac{V_{n\Delta}(-\eta^a, \eta^b)}{V_{n\Delta}(\eta^a, \eta^b)}$



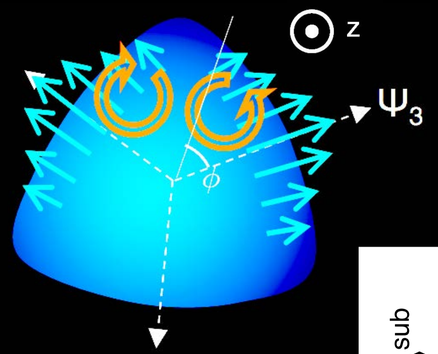
Strong constraints on the transverse & longitudinal dynamics of heavy ion collisions

Triangular flow driven local polarization

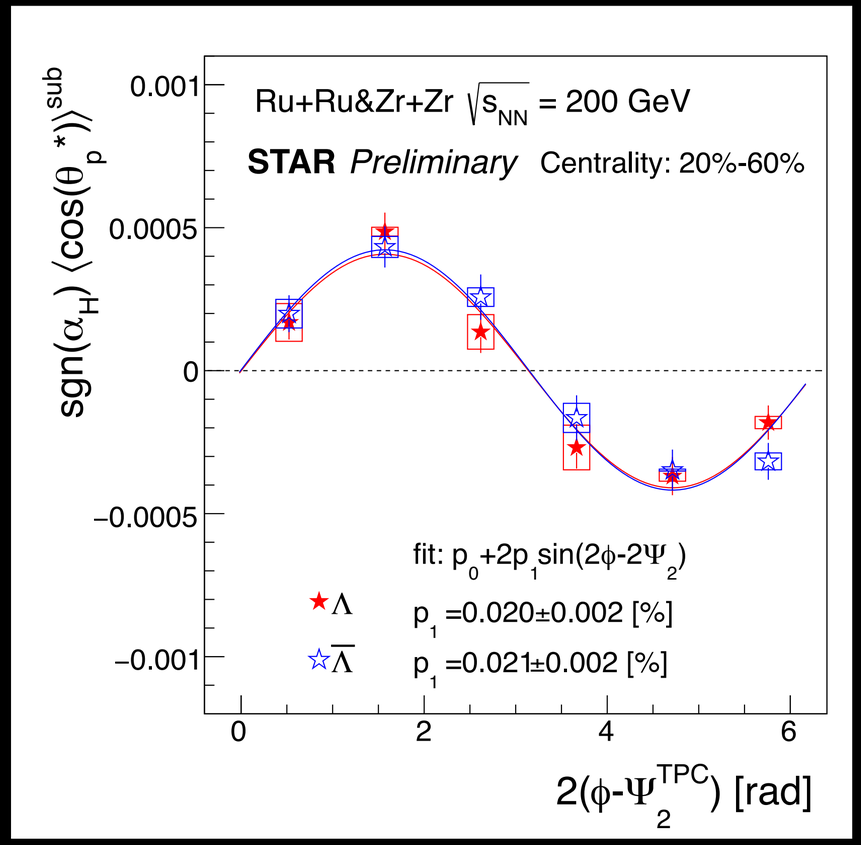
Talk by Joey Adams (Thu T02-III)
Poster by Takafumi Niida (Wed T02)

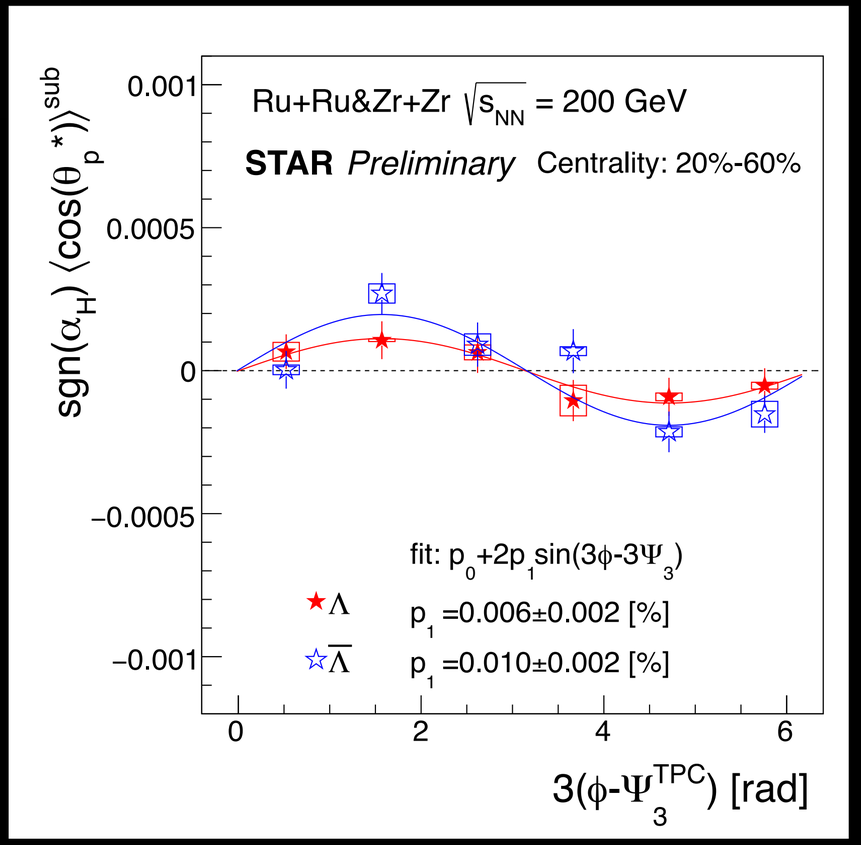


Longitudinal polarization due to v_2 ("spin puzzle" in heavy-ion collisions)



v_3 -driven polarization observed in isobar collisions





The first observation of v_3 driven longitudinal polarization will bring new insights on thermal vorticity

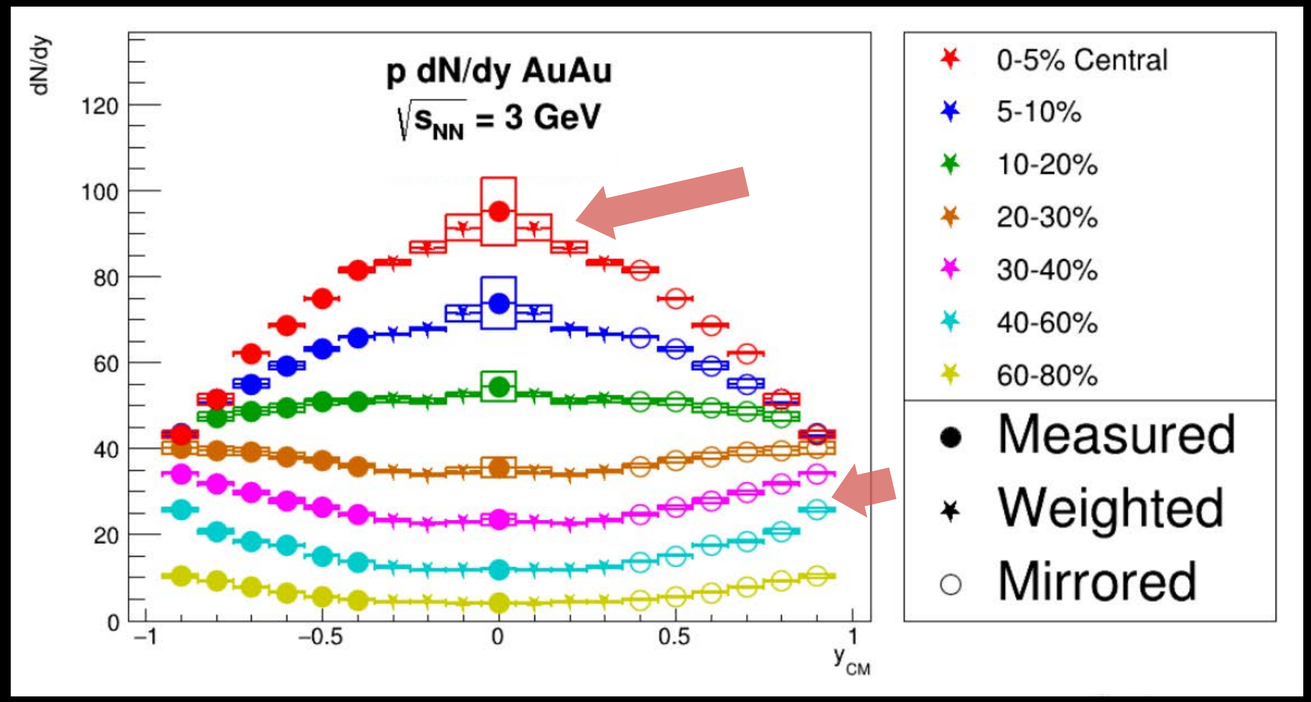
Prerequisites for phase transition & freezeout

- Baryon stopping
- Strangeness production
- Hyper-nuclei formation
- Nuclei formation
- Hadron & nuclei femtoscopy

New insights on baryon stopping

Talk by Benjamin Kimelman (Tue T03-I)
Poster by Nicole Lewis (Wed T08 / T09)

Measurement of proton density with Au+Au $\sqrt{s_{NN}}$= 3 GeV
FXT data: centrality dependence of rapidity distribution



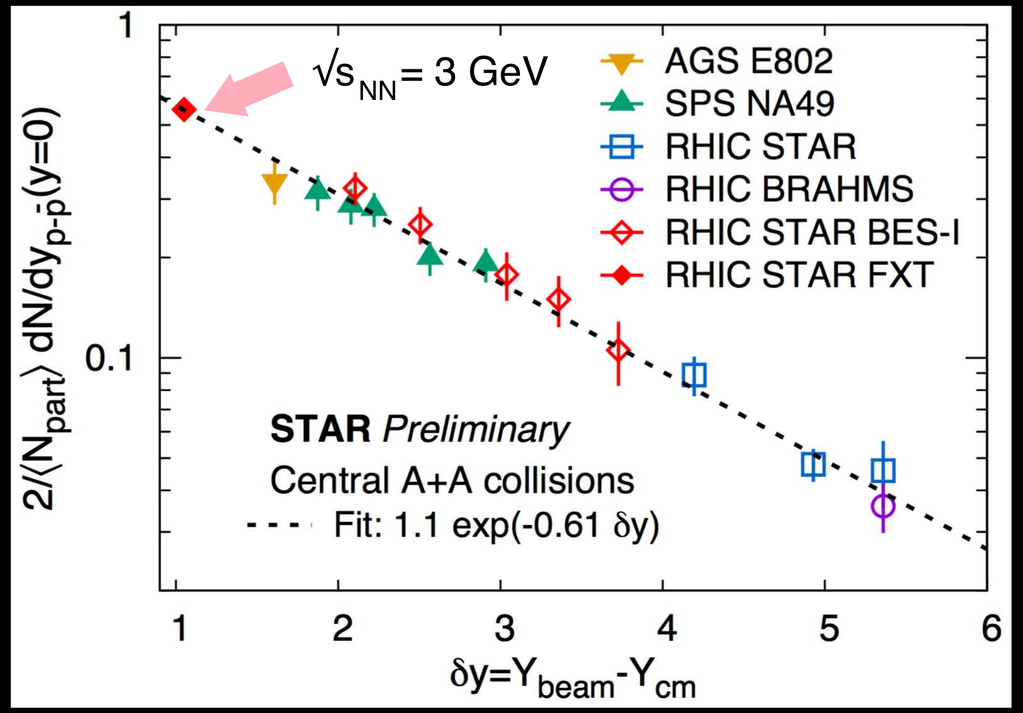
Rapidity loss per collision extracted & indicates a strong centrality dependence

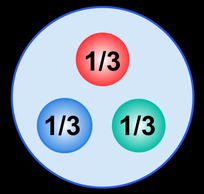
New insights on baryon stopping

Talk by Benjamin Kimelman (Tue T03-I)
Poster by Nicole Lewis (Wed T08 / T09)

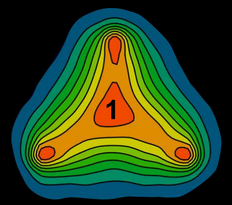
Measurements of proton & net-proton density in central heavy ion collisions

B. Abelev et al. (STAR Collaboration) Phys. Rev. C 79 (2009) 034909





Quarks as baryon carriers

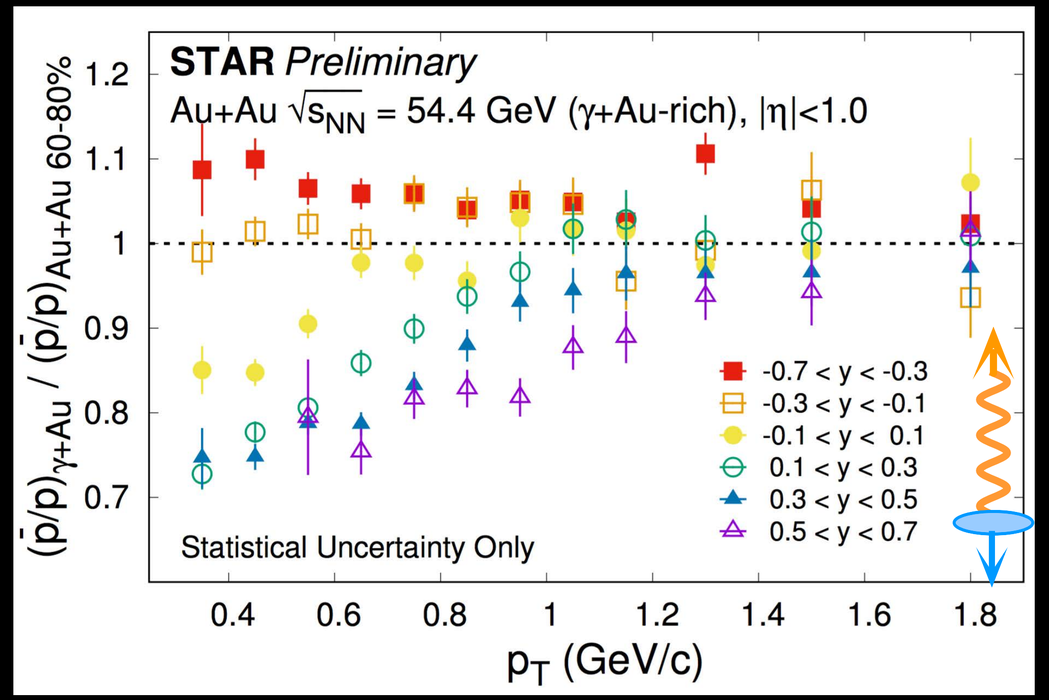


Baryon-junction as baryon carrier

fig: Suganuma et al. AIP Conf.Proc. 756 (2005) 1, 123

Global data show exponential dependence of baryon density with rapidity shift

First look at photonuclear events: stronger rapidity dependent stopping in γ+Au » Au+Au



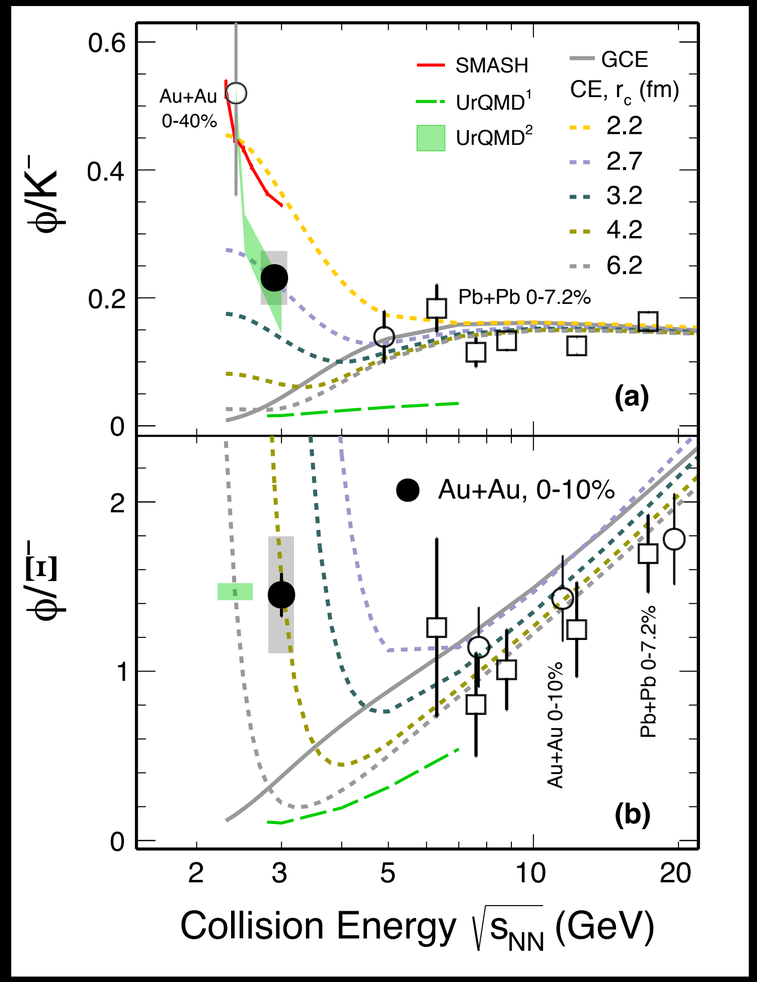
Path towards a microscopic understanding of what carries baryon number & how it is stopped

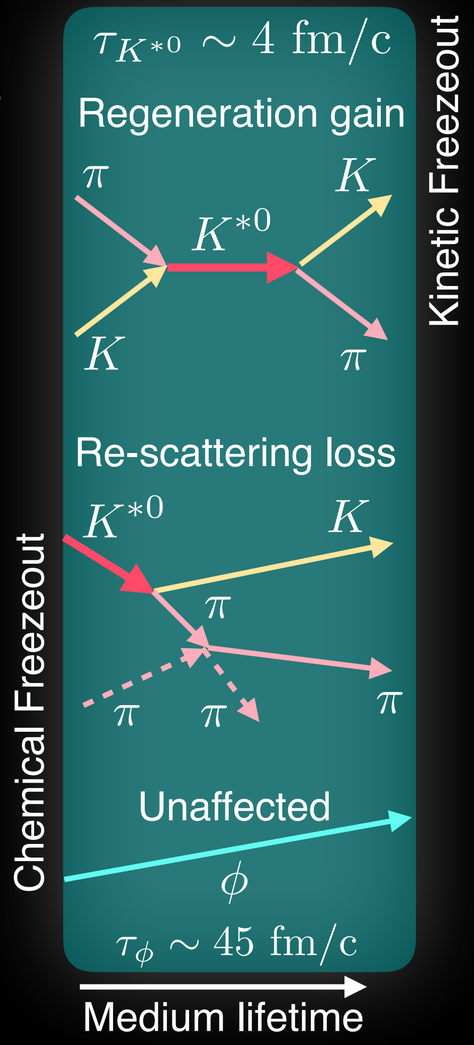
Insights on strangeness production

Talk by Aswini K Sahoo (Thu T14-I)
Poster by Yingjie Zhou (Fri T11_2)

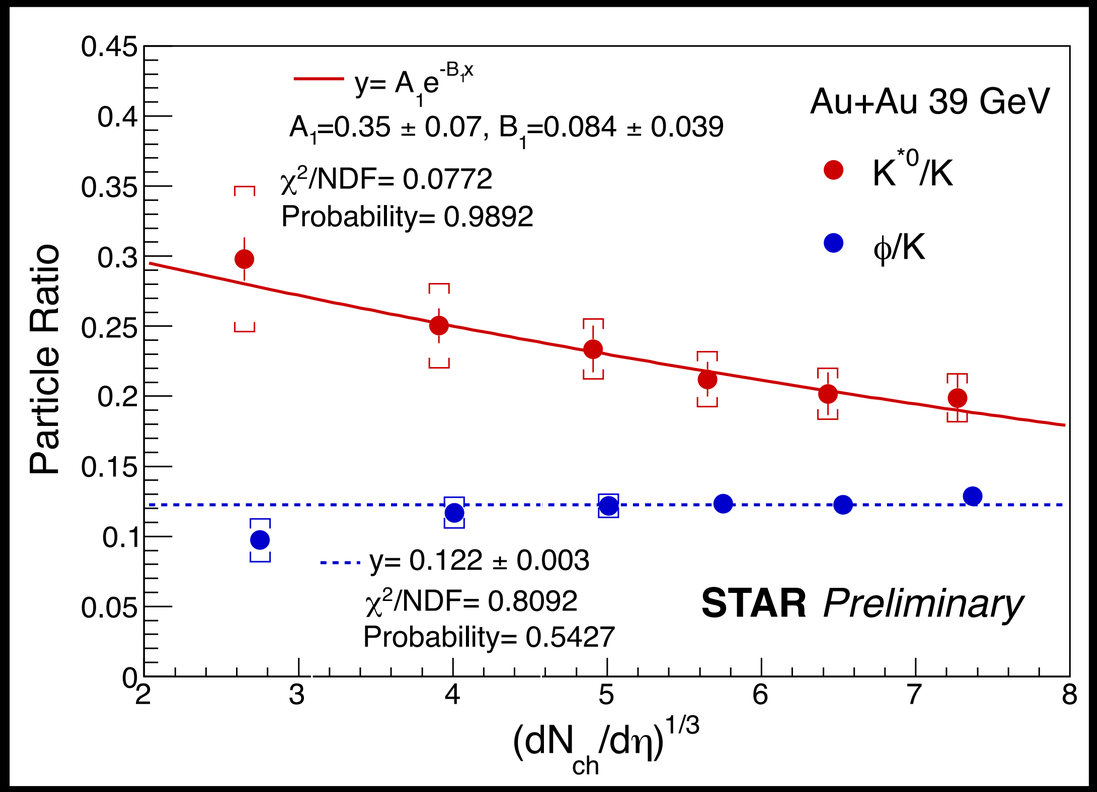
ϕ to strange hadron (K^-, Ξ) yield ratio measured at $\sqrt{s_{NN}}$ = 3 GeV

M. Abdallah et al. (STAR Collaboration), arXiv:2108.00924





K^{*0} to K ratio with BES data indicate re-scattering loss due to shorter lifetime of K^{*0}



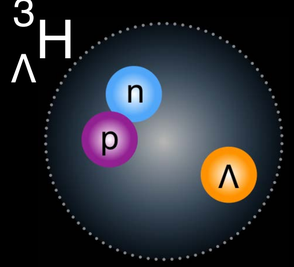
Can be used to estimate medium lifetime

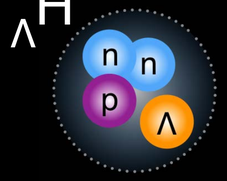
Resonance/non-resonance ratio constrain strangeness correlation length & hadronic phase lifetime

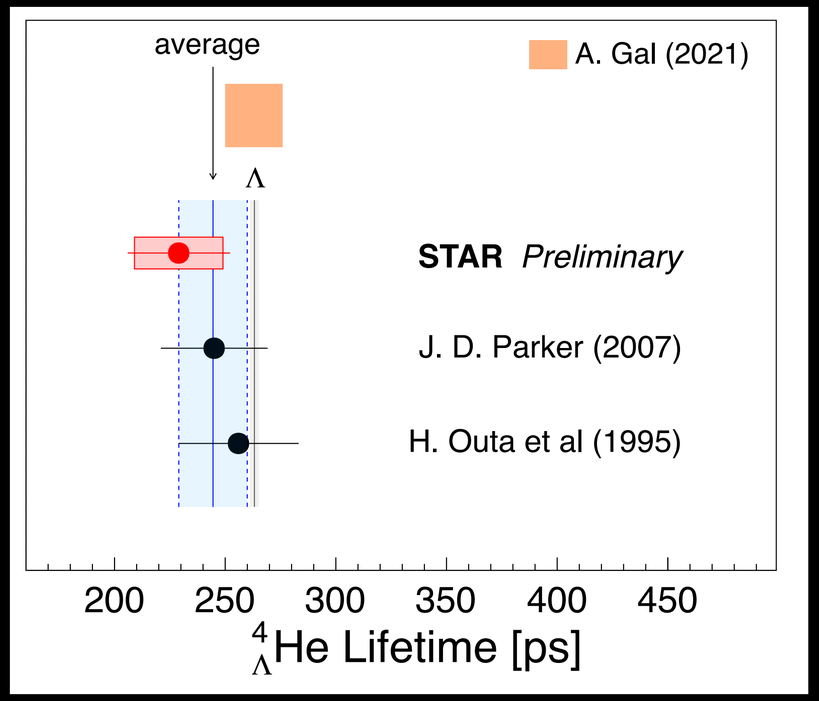
Precision hypernuclei measurements

Talk by Yue-Hang Leung (Thu T16)
Posters by Xiujun Li (Fri T16) & Tan Lu (Fri T16)

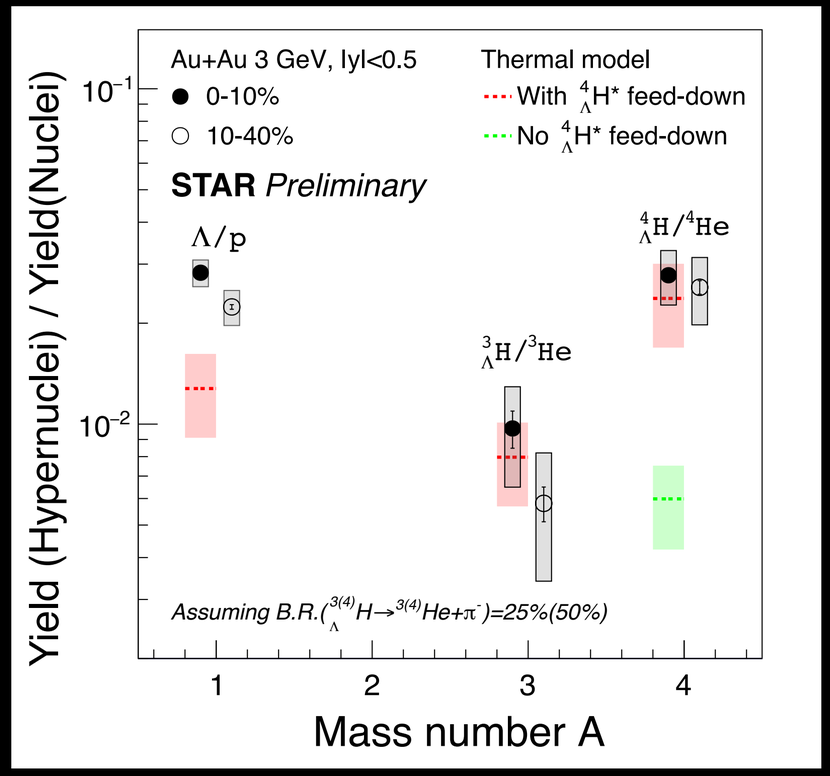
Precision hypernuclei measurements at BES-II (19.6, 27, FXT 3.0, 7.2 GeV) and top RHIC energy data



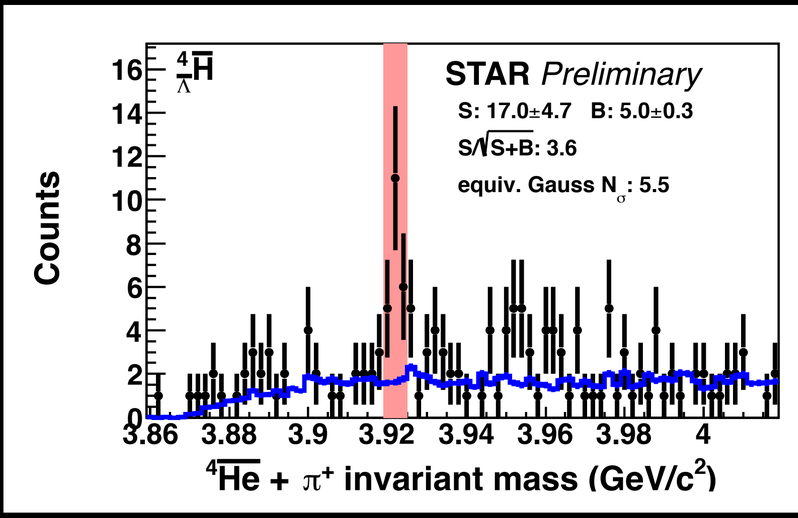




The first Hyper-Helium-4 lifetime measurement in heavy ion collisions



Formation of excited hypernuclei states in heavy ion collisions



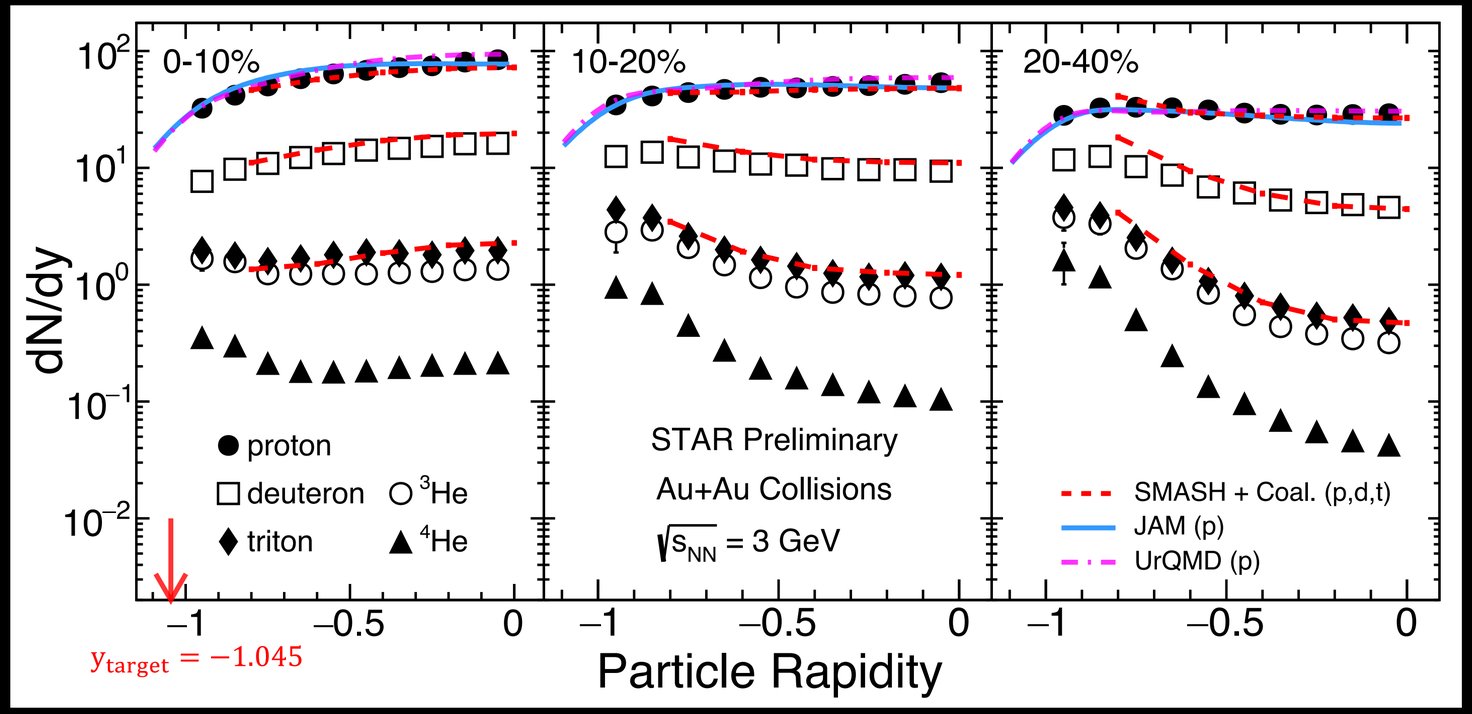
$^{4}_{\bar{\Lambda}}\bar{H} \longrightarrow {}^{4}\bar{He} + \pi^{+}$

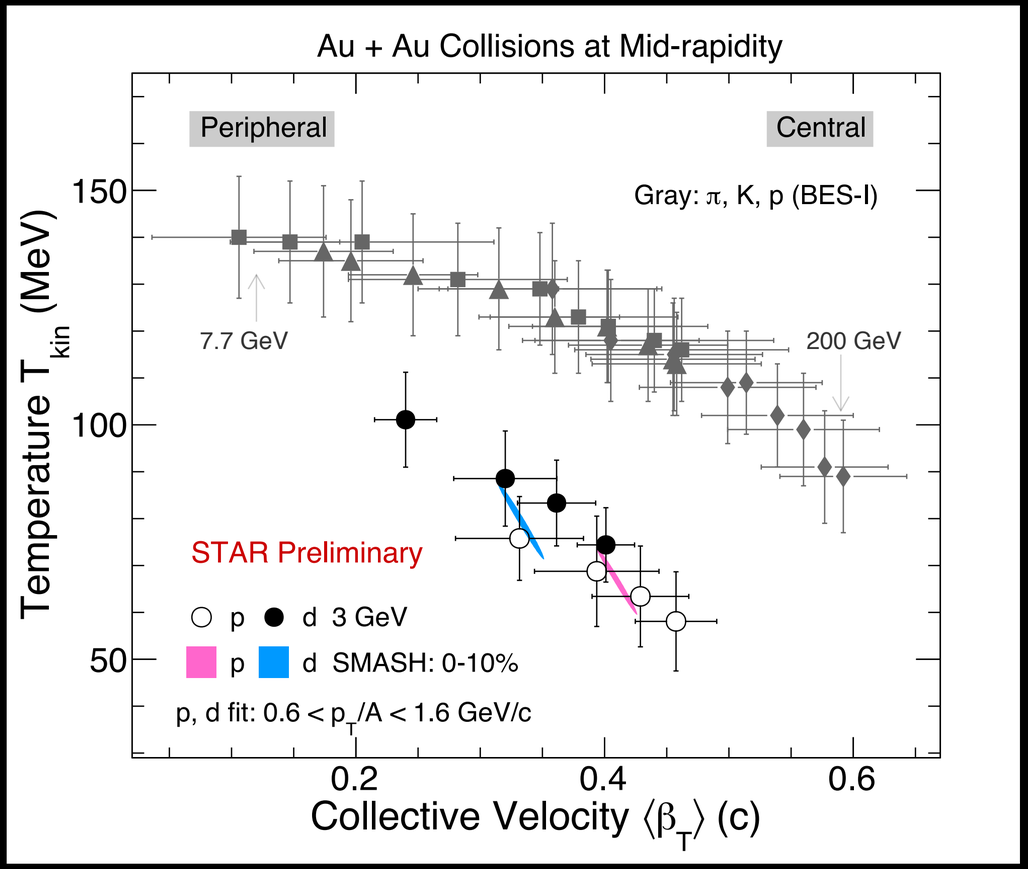
The first observation of Anti-Hyper-Hydrogen-4

Kinetic freeze out of light nuclei

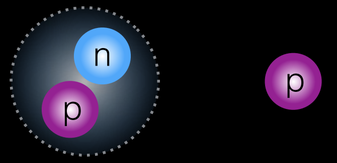
Talk by Hui Liu (Thu T16)

Yields of proton & light nuclei measured at 3 GeV, well described by models, effective average kinetic freeze out parameters extracted using cylindrical blast wave fits





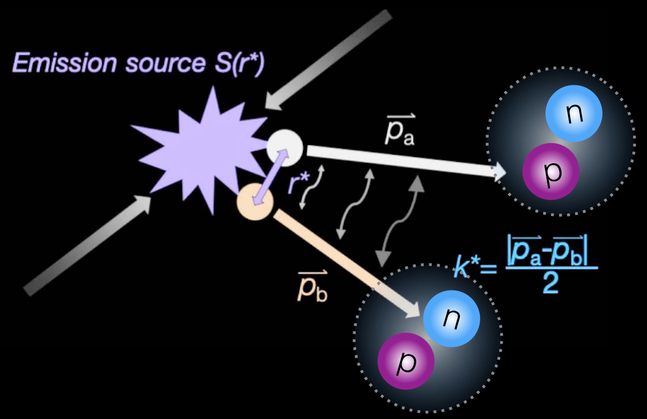
Deuteron freeze out at higher effective temperatures and smaller velocities compared to that of protons at $\sqrt{s_{NN}}$ = 3 GeV



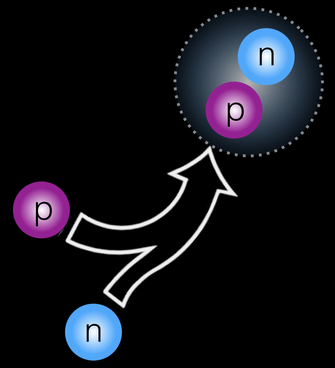
Effective T_{kin}(d) > T_{kin}(p)

Femtoscopy & correlation of nuclei

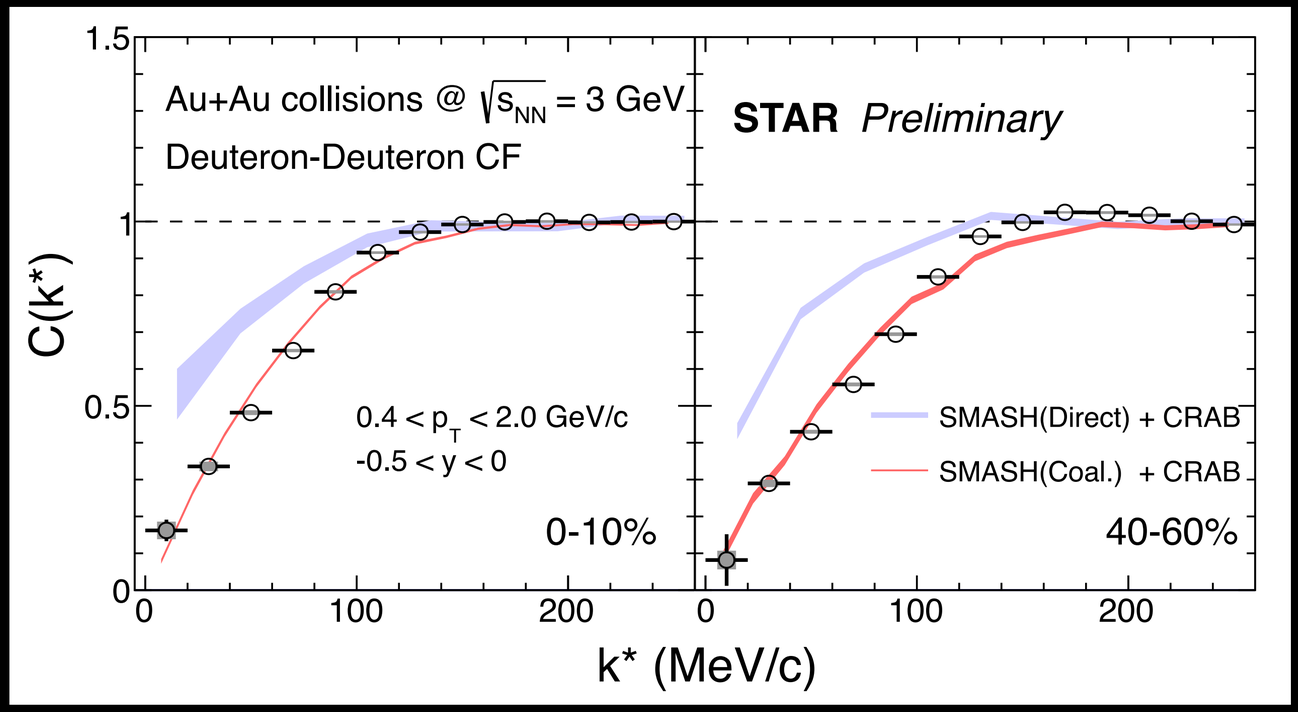
Talk by Ke Mi (Thu T07-III)
Talk by Debasish Mallick (Wed T07-I)

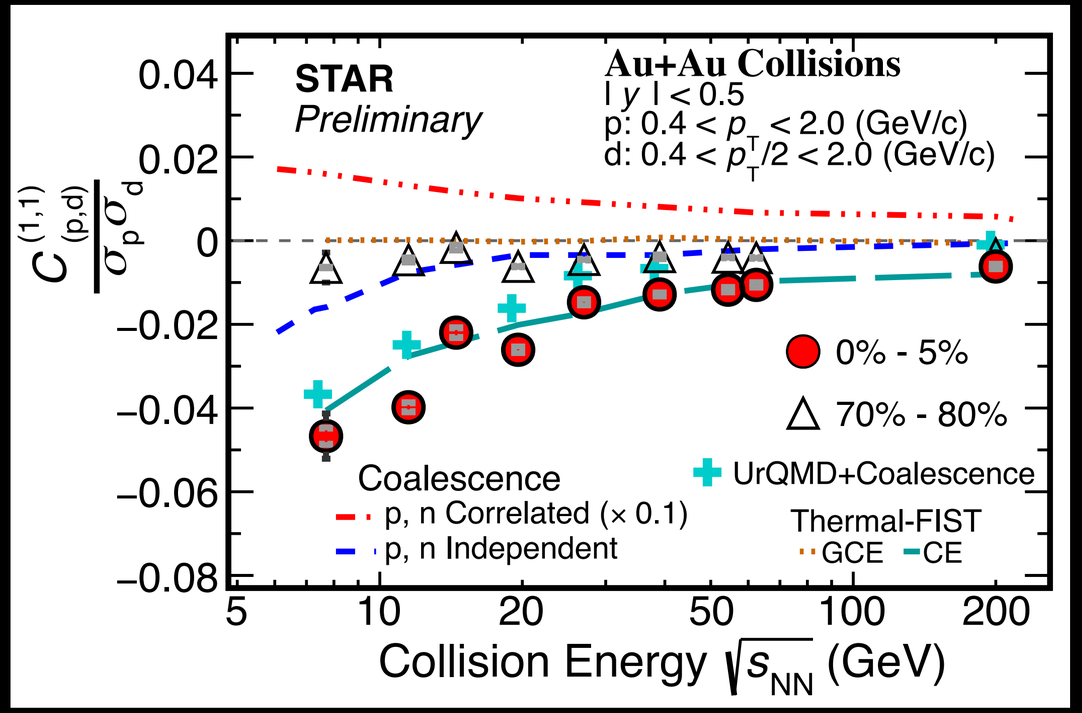


First measurements of d-d femtoscopic correlation function at RHIC



Pearson coefficient of p-d with BES-I data indicates anti-correlation, discriminates models





Models incorporating coalescence provide a consistent explanation of deuteron formation at RHIC

Critical phenomena & mapping phase diagram

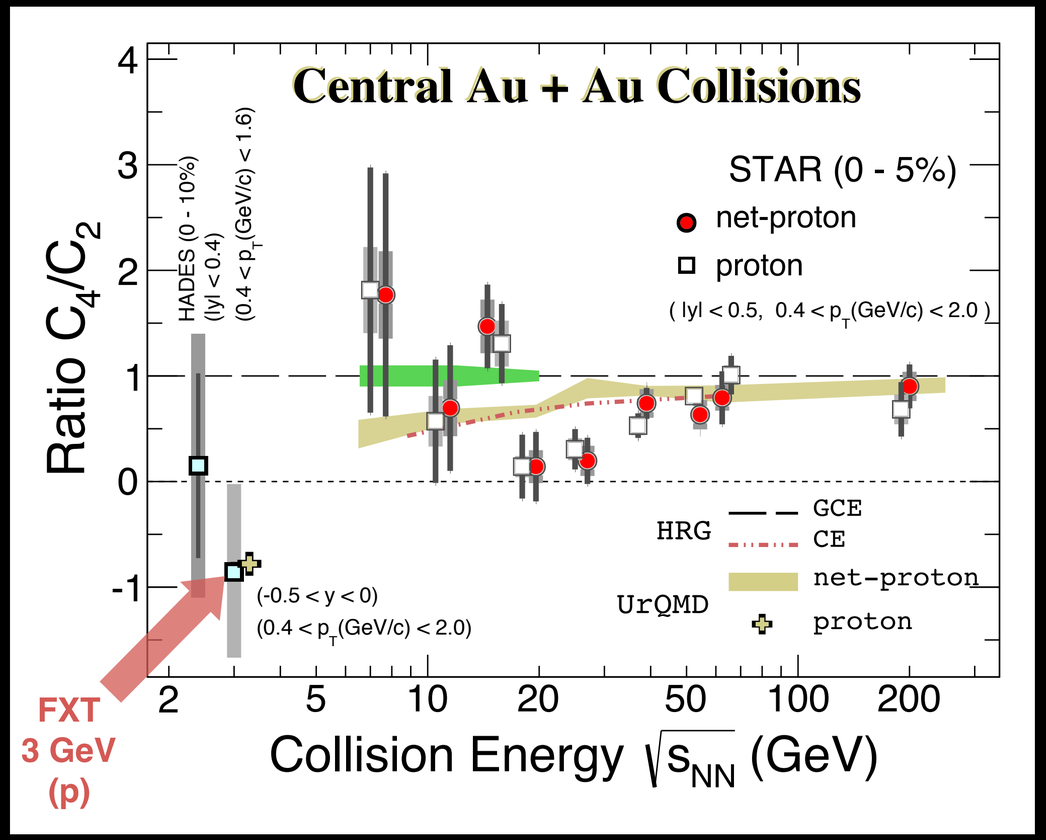
- Net-proton fluctuations
- Deuteron fluctuations
- Search for chiral crossover
- Di-lepton as QGP thermometer

Search for the QCD critical point

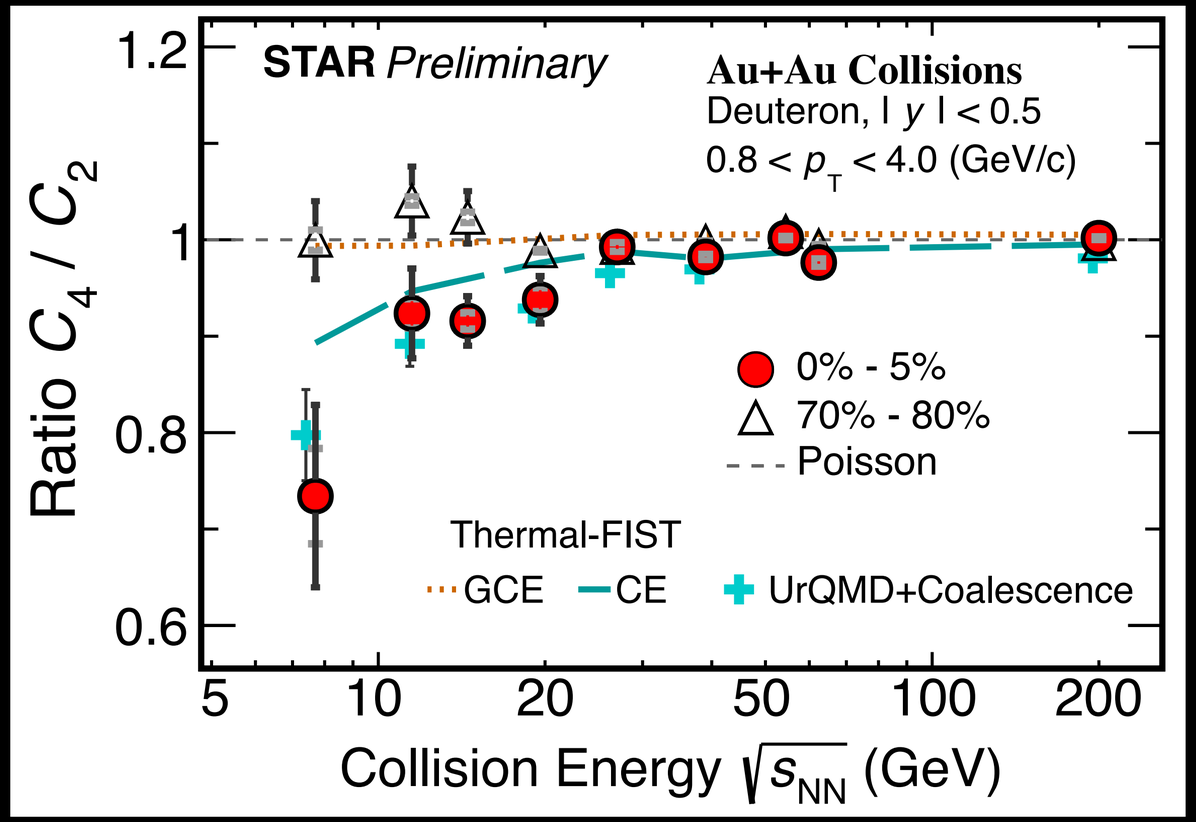
Talk by Yu Zhang (Tue T03-I)
Talk by Debasish Mallick (Wed T07-I)

Proton fluctuations ($k\sigma^2 \equiv C_4/C_2$) measured with Au+Au $\sqrt{s_{NN}}$ = 3 GeV FXT data: consistent with UrQMD

M. Abdallah et al. (STAR collaboration) arXiv:2112.00240



Deuteron fluctuations ($k\sigma^2 \equiv C_4/C_2$) measured with BES-I data: smooth energy dependence



Baryon conservation leads to negative kurtosis at the highest μ_B accessible through RHIC collisions

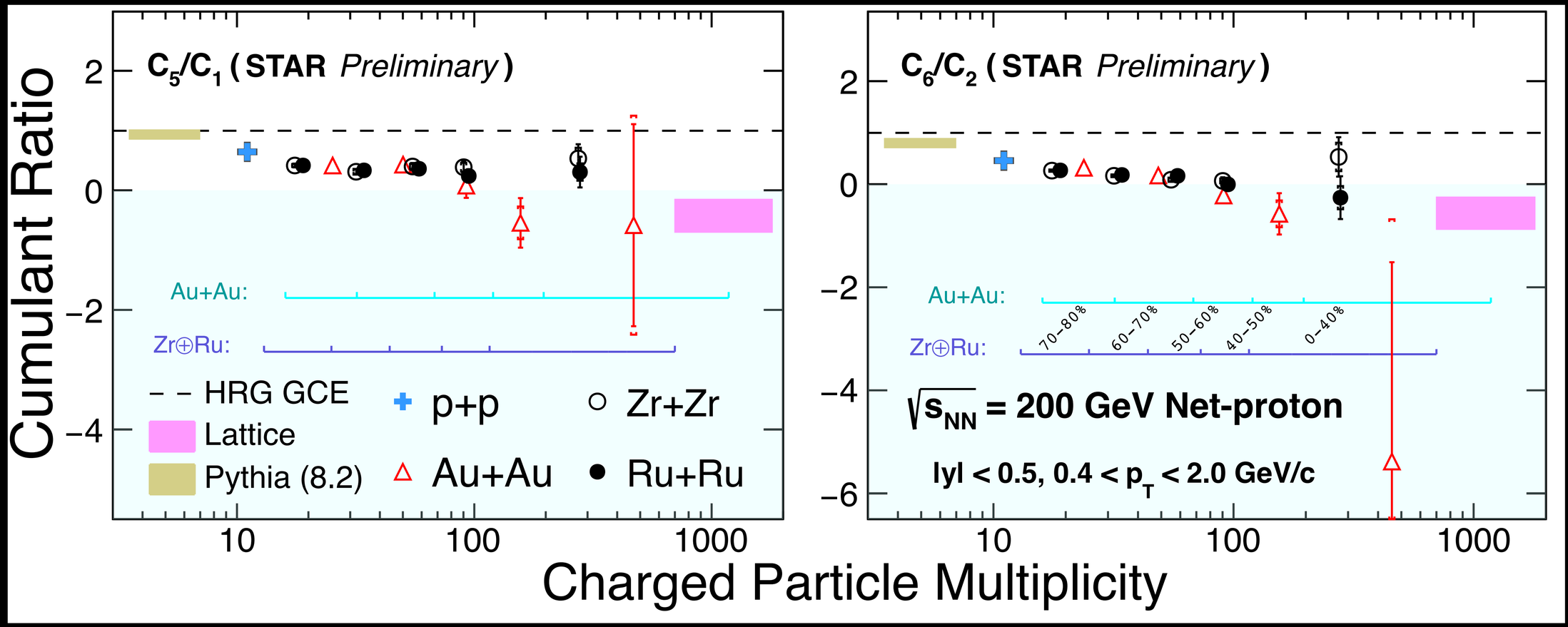
Difference with net-proton: role of different freeze out & smaller yield of deuterons are being investigated

Search for the chiral crossover transition

Talk by Ho-San Ko (Thu T07-II)

Cumulant ratios C_5/C_1 and C_6/C_2 of net-proton measured with p+p, Au+Au and high statistics isobar data at $\sqrt{s_{NN}}$ = 200 GeV show decreasing trend with multiplicity, approaching LQCD predictions

M. Abdallah et al. (STAR Collaboration) Phys. Rev. Lett. 127, 262301

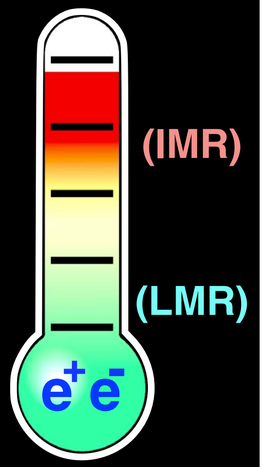


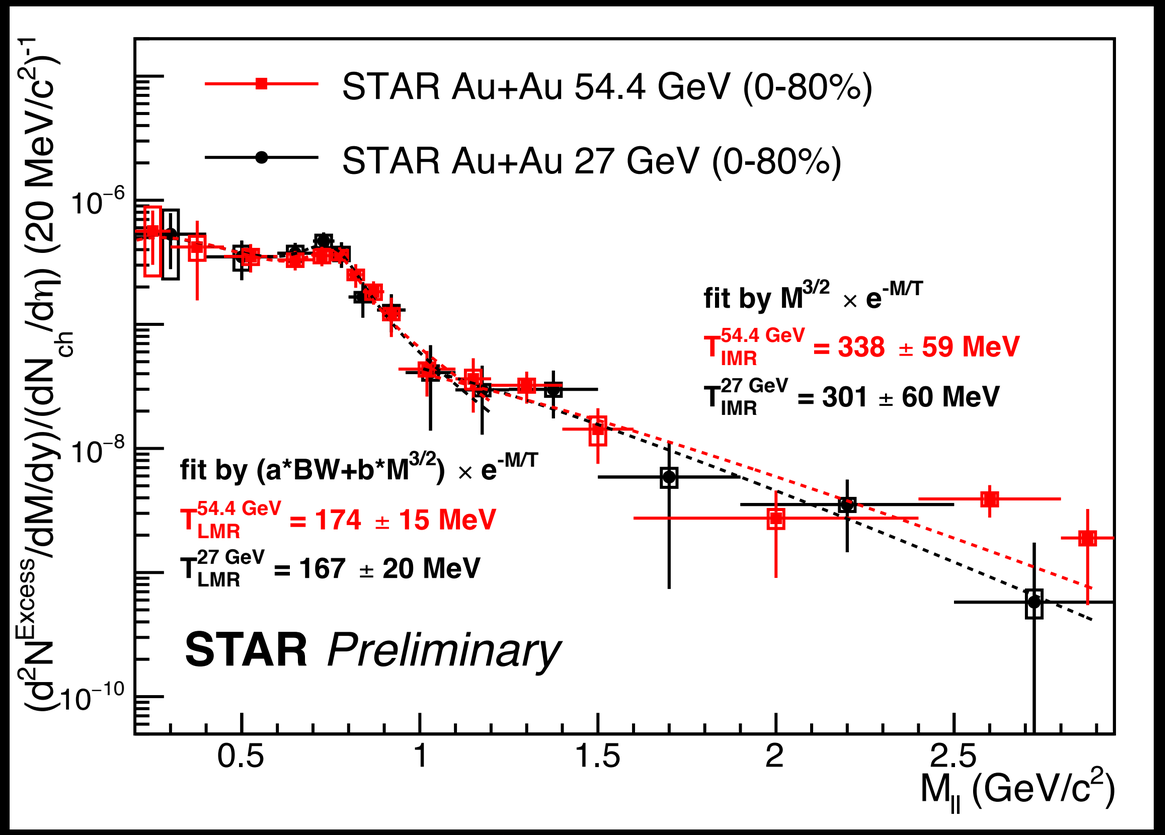
High multiplicity measurements are consistent with results from lattice QCD that predicts crossover at μ_B=0

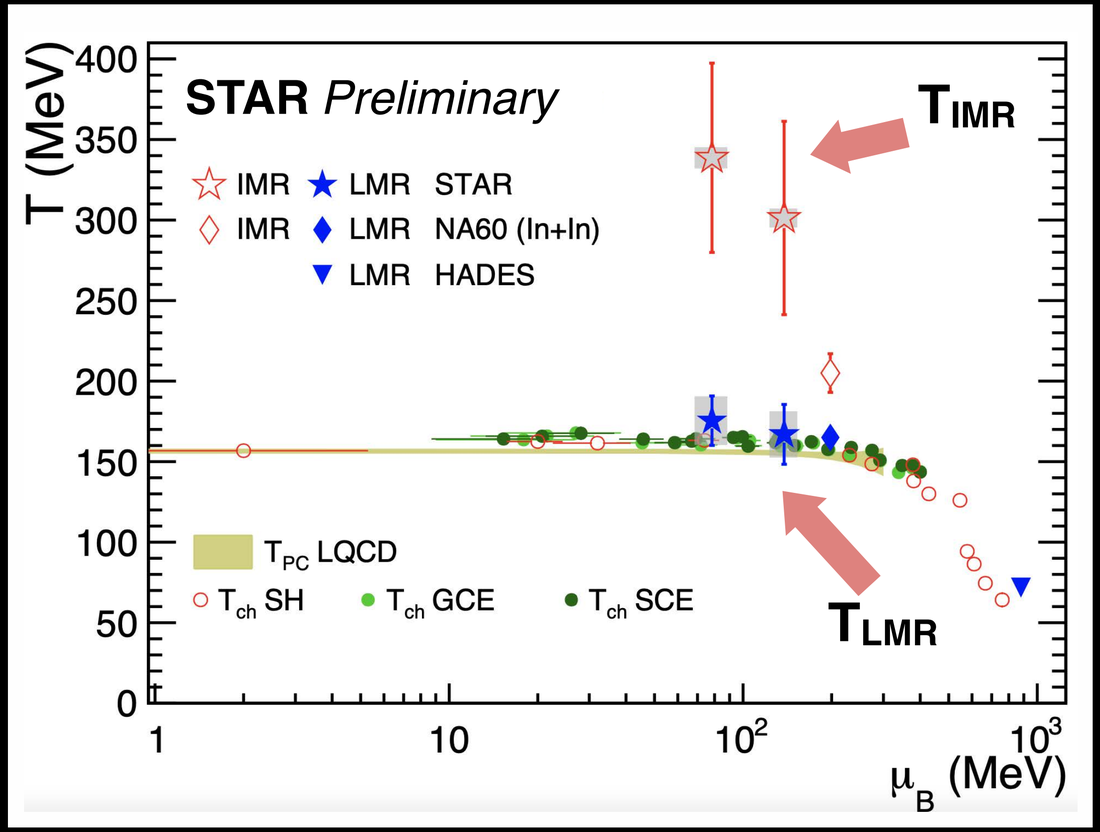
Medium temperature with di-leptons

Talk by Zaochen Ye (Thu T13-I)

Precision di-lepton spectra measured with Au+Au 27 GeV (2018) and 54.4 GeV data (2017)
blue-shift free average temperatures extracted: IMR systematically above LMR temperature







LMR IMR

$T_{LMR} \sim T_{PC,LQCD}$ $T_{IMR} > T_{LMR}$

QGP temperature of ~300 MeV at 27 & 54.4 GeV extracted, ρ mediated di-leptons dominate near T_{PC}

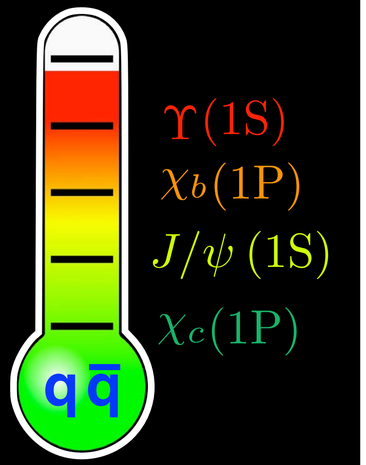
Hard probes in the medium

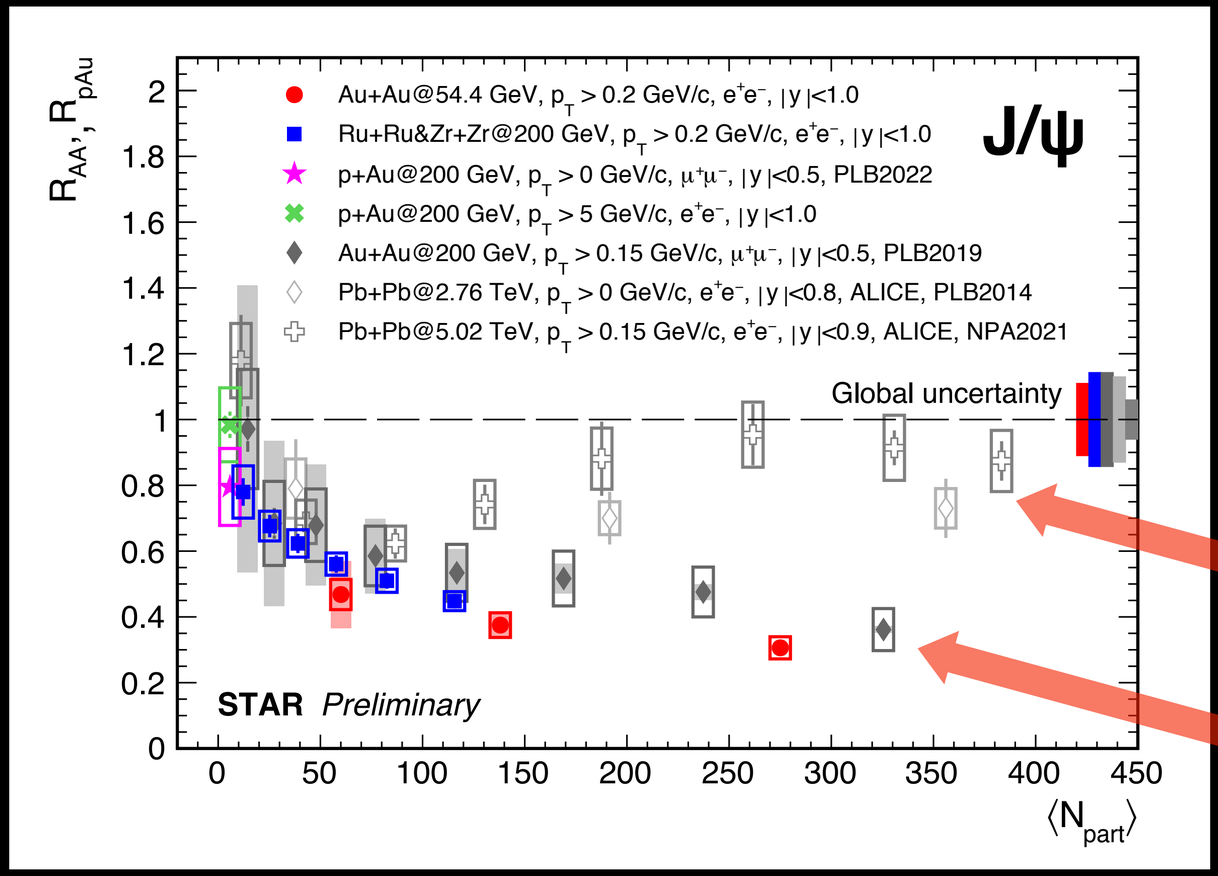
- J/ψ suppression
- High p_T hadron R_{AA}
- Heavy flavor jet shape
- Broadening of γ/π^0 +jets

J/ψ in medium at RHIC energies

Talk by Ziyue Zhang (Thu T11-IV)
Posters by Yan Wang (Fri T11_2), Yu-Ming Liu (Fri T11_3)

Medium modification of J/ψ studied via R_{AA} in isobar and Au+Au 54.4 GeV, new baseline measurement of R_{pA}





LHC

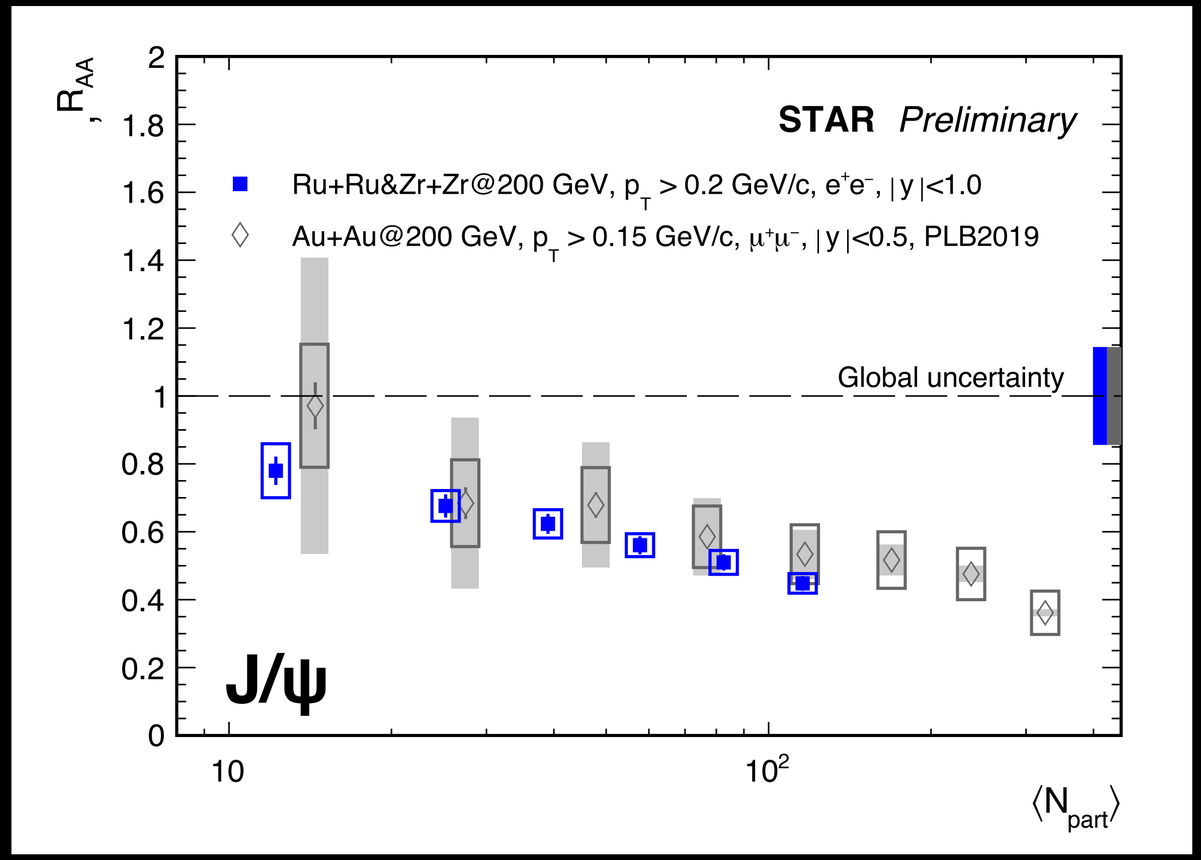
RHIC

Clear indications of J/ψ suppression at RHIC that scales with N_{part}

Charged hadron R_{AA} at high p_T

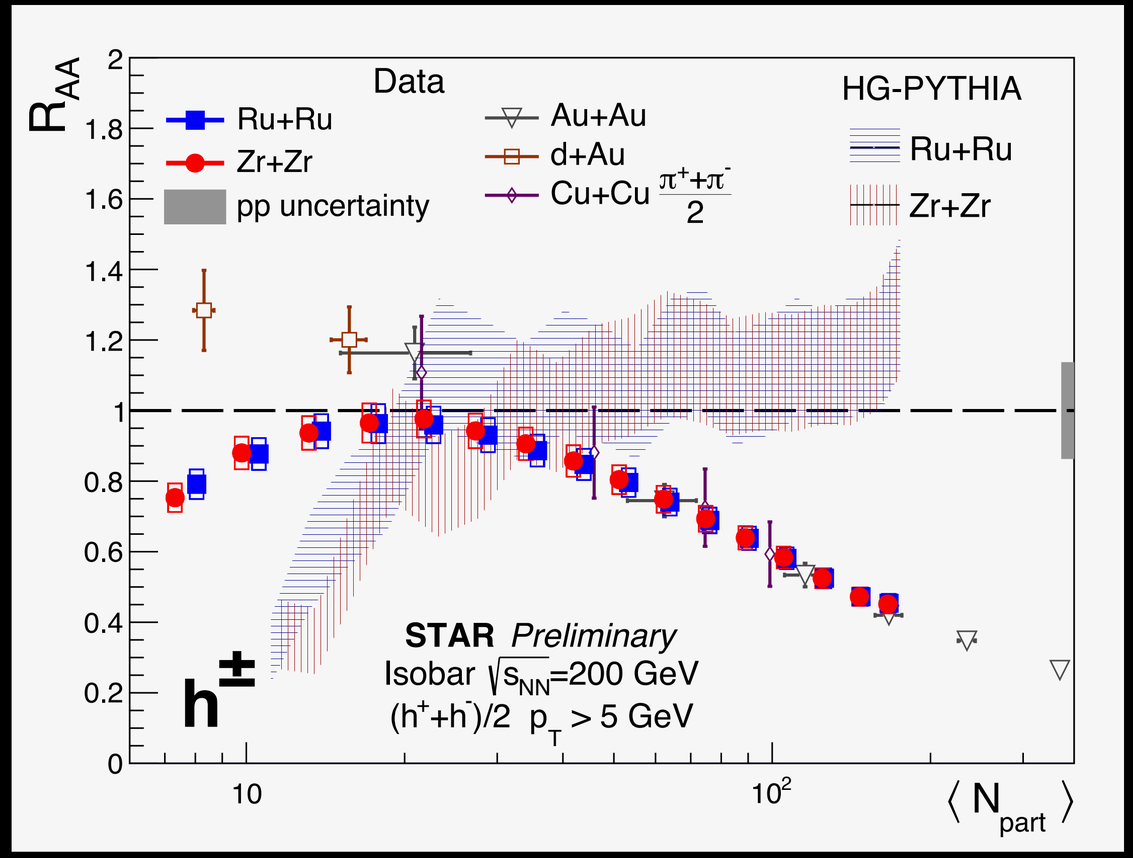
Talk by Ziyue Zhang (Thu T11-IV)
Talk by Tong Liu (Wed T05-II)

Medium modification of J/ψ studied via R_{AA} in various systems at RHIC, new baseline measurement of R_{pA}



Clear indications of J/ψ suppression at RHIC that scales with N_{part}

Medium modification of high $p_T > 5$ GeV/c hadrons studied via R_{AA} in isobars

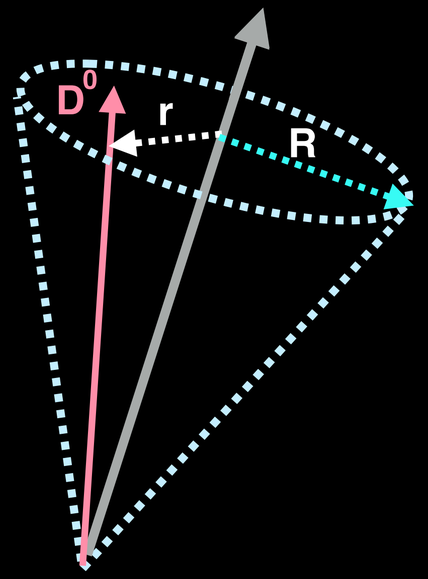


Suppression of charged hadrons at high p_T possible centrality bias in peripheral events

Open heavy flavor tagged jets

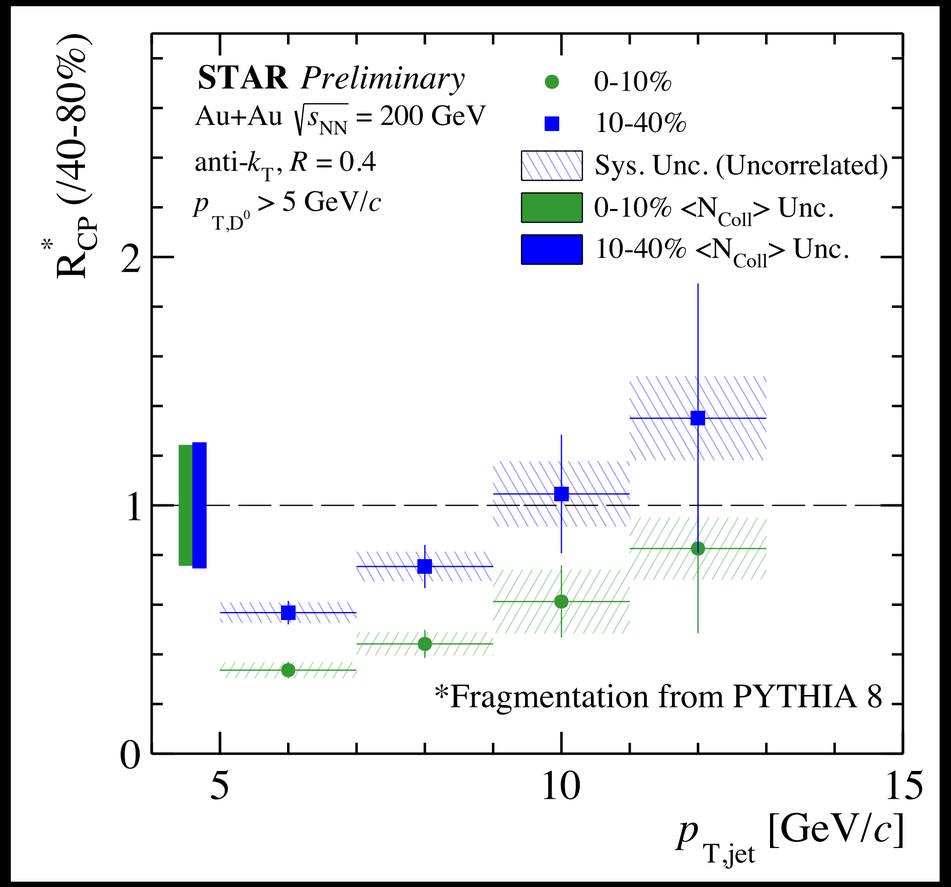
Talk by Diptanil Roy (Thu T11-III)
Poster by Matthew Kelsey (Fri T11_2)

First measurement of D^0-tagged jets@RHIC using STAR HFT

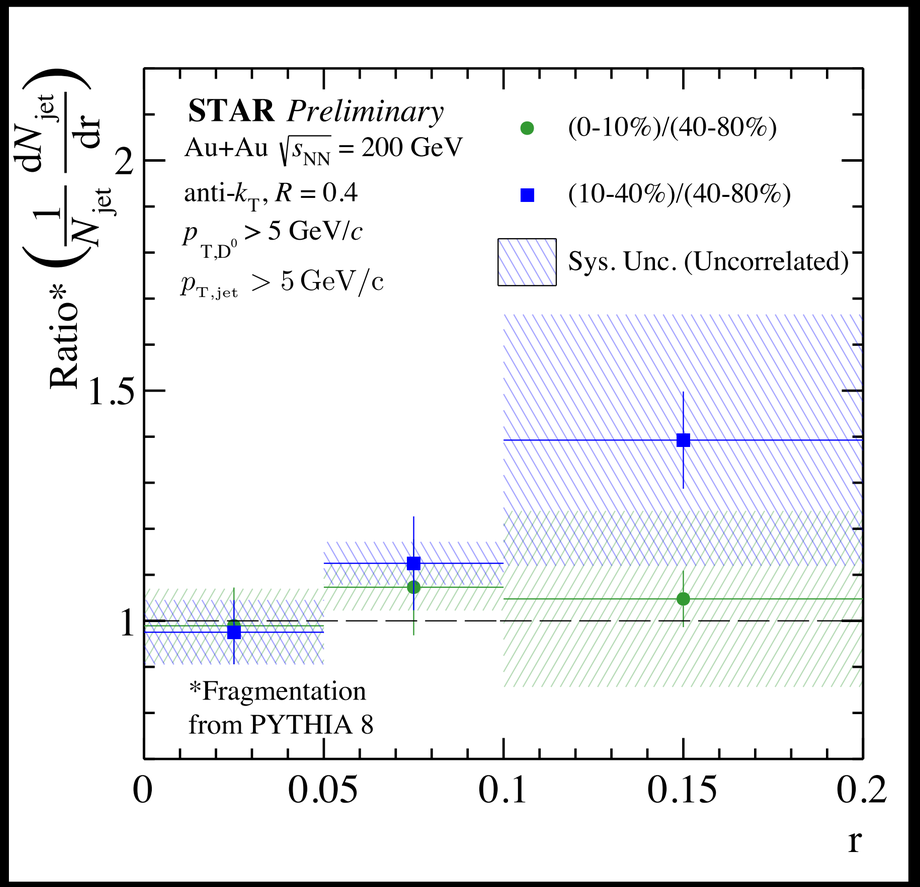


PYTHIA fragmentation is used for unfolding

R^*_{CP} in mid-central & central events indicate suppression at low jet-p_T



No jet substructure modification seen in central & mid-central events within uncertainties

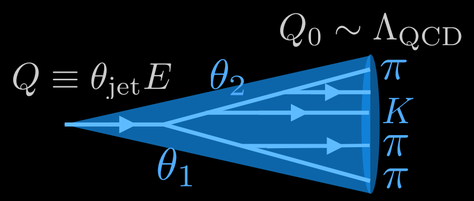


Access to mechanisms of heavy quark diffusion & energy loss in the medium produced at RHIC

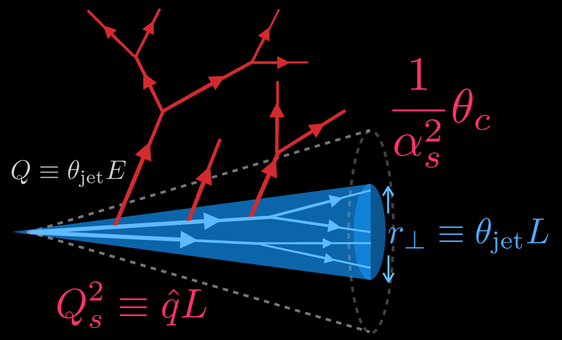
Medium-induced broadening of jets

Talk by Derek Anderson (Tue T04-I)
Poster by Nihar Sahoo (Wed T04_1)

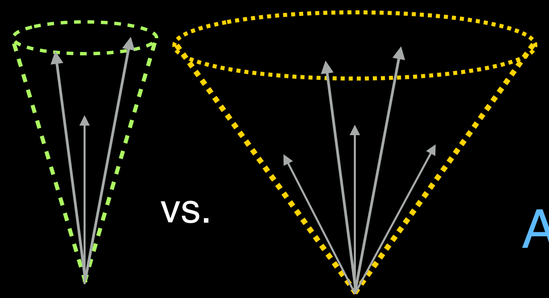
Fig: Mehtar-Tani



Vacuum shower (p+p)

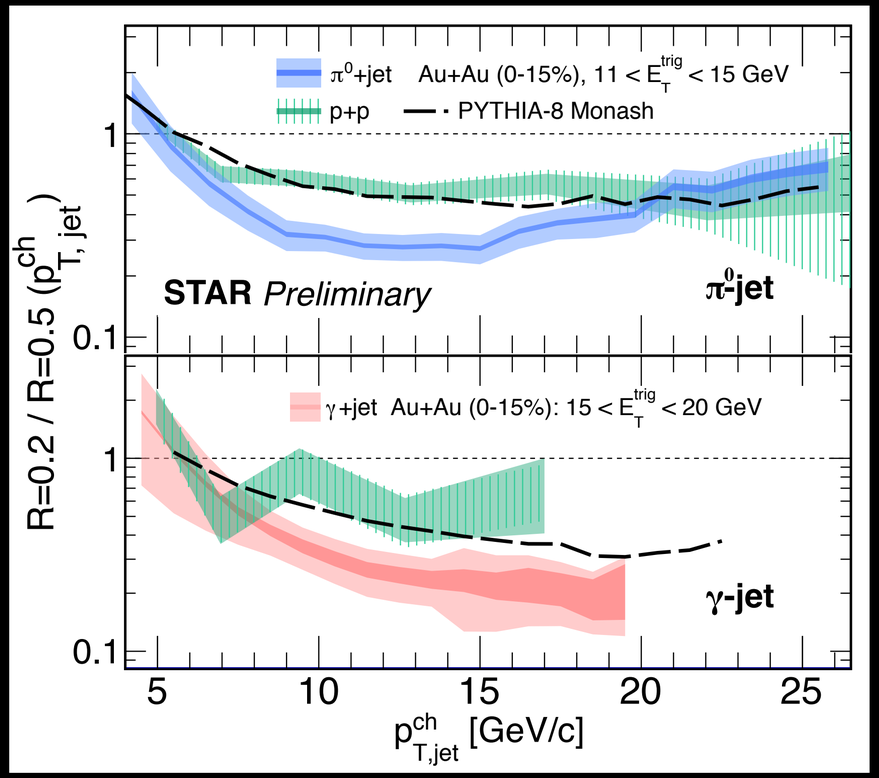


Medium induced gluon radiation (Au+Au)



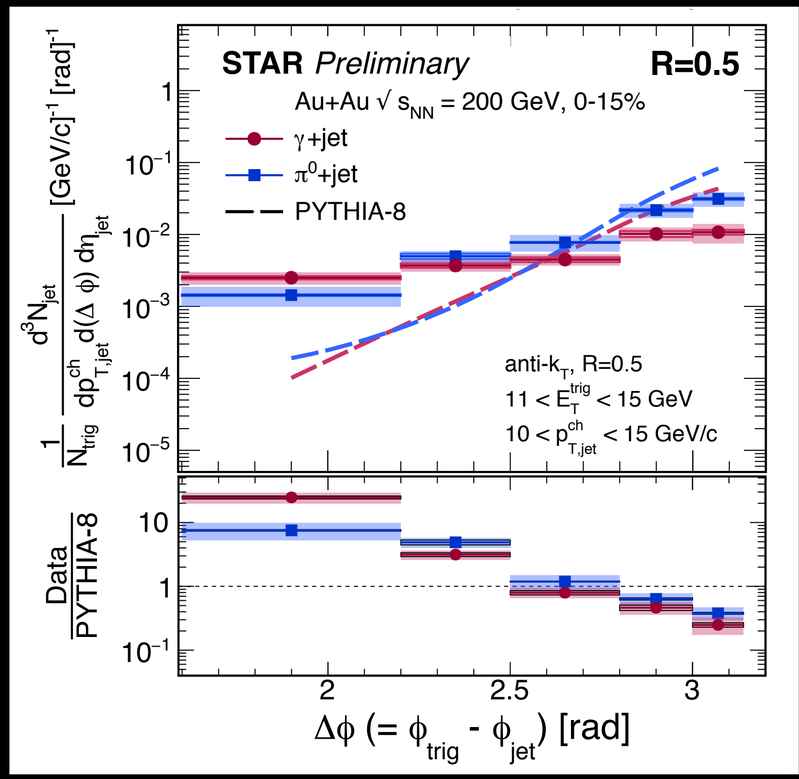
R=0.2 / R=0.5

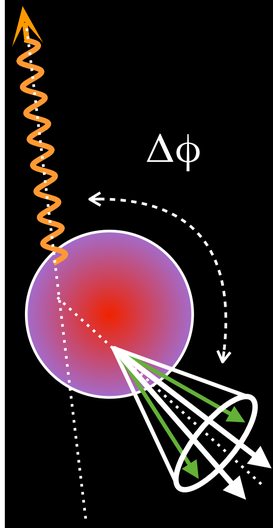
Ratio of spectra by varying cone sizes for semi-inclusive π^0/γ+jets is lower in Au+Au than p+p measurements



A clear observation of medium-induced broadening of jet-shower at RHIC

Excess yield at large angle for π^0/γ+jet in Au+Au observed compared to p+p PYTHIA baseline





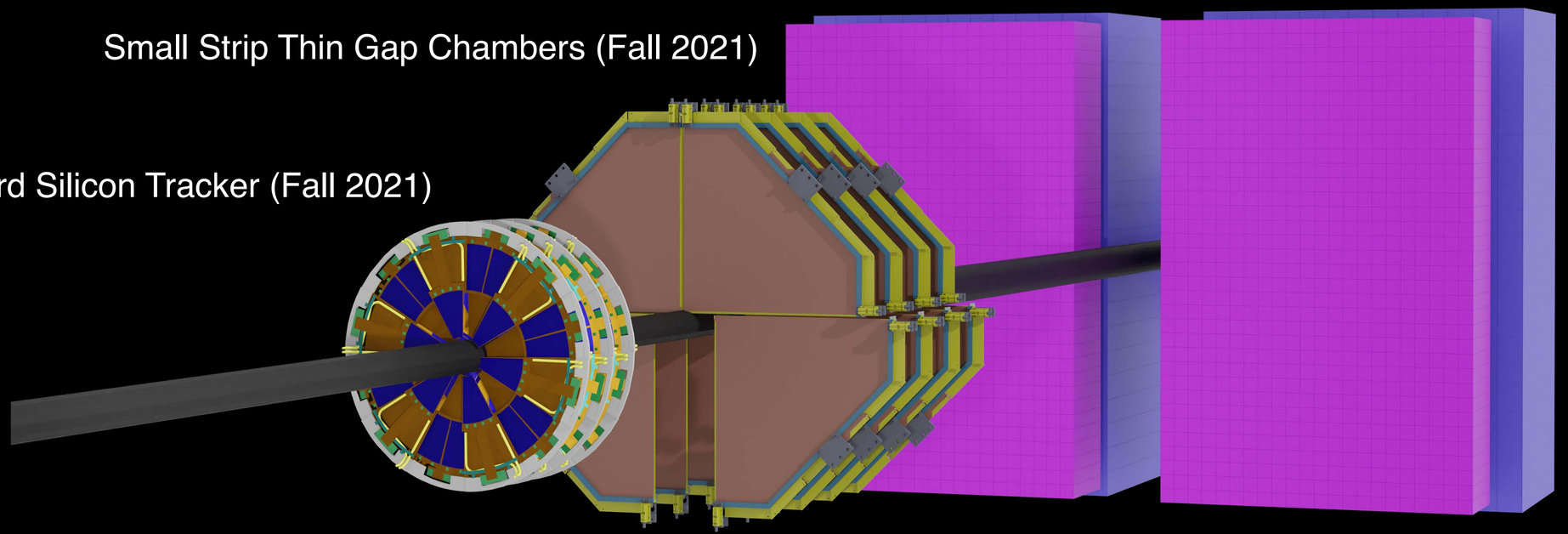
First observation of medium-induced broadening of acoplanarity

Forward upgrade and STAR beyond 2022+

Forward Calorimetry
EMCal, HCal (Jan 2021)

Small Strip Thin Gap Chambers (Fall 2021)

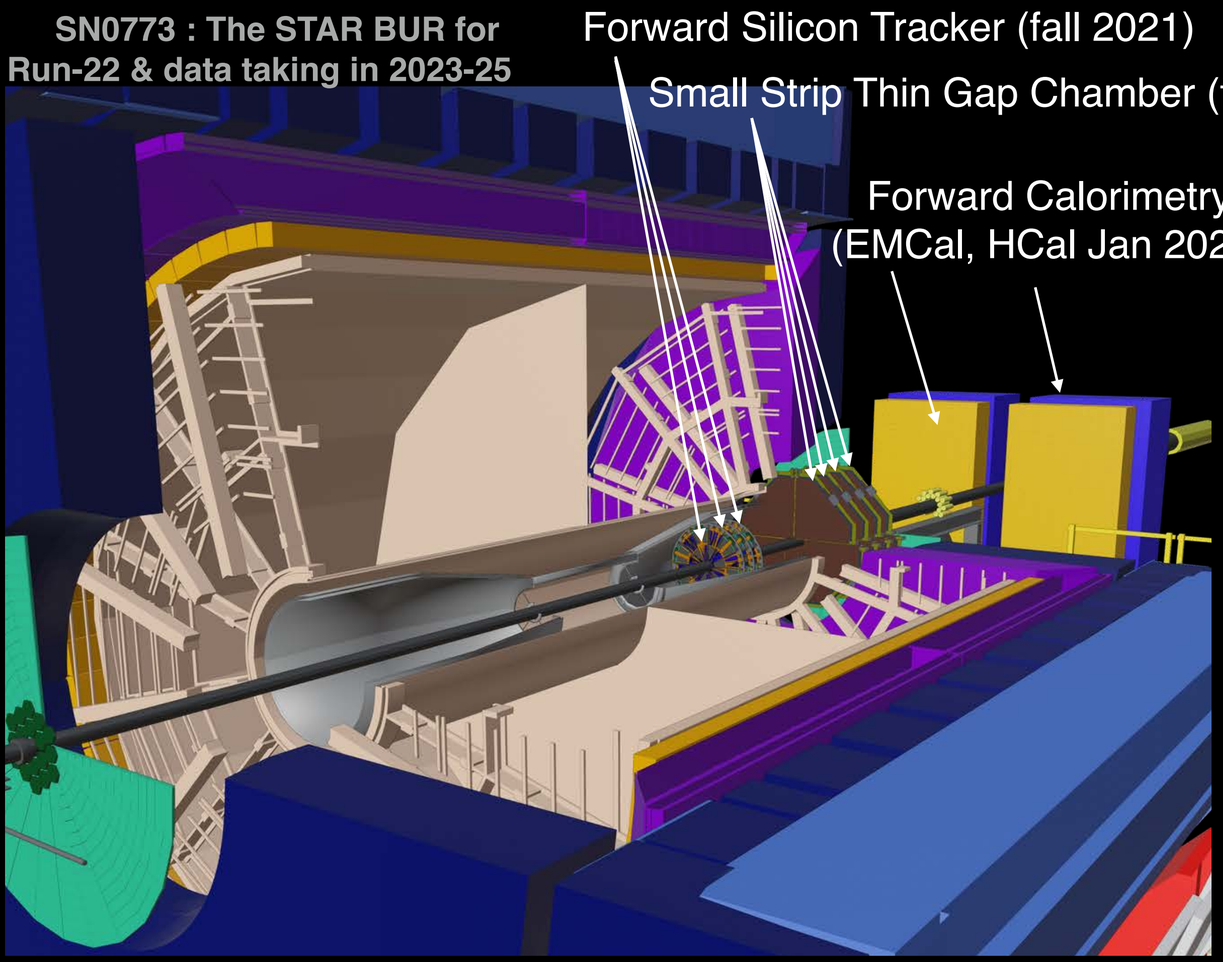
Forward Silicon Tracker (Fall 2021)



Forward upgrade program of STAR

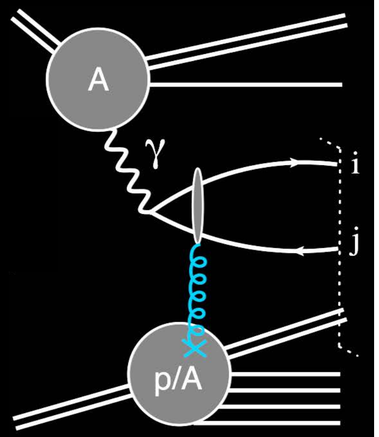
Talk by Xu Sun (Wed T15-I)
Talk by Tong Liu (Wed T05-II)

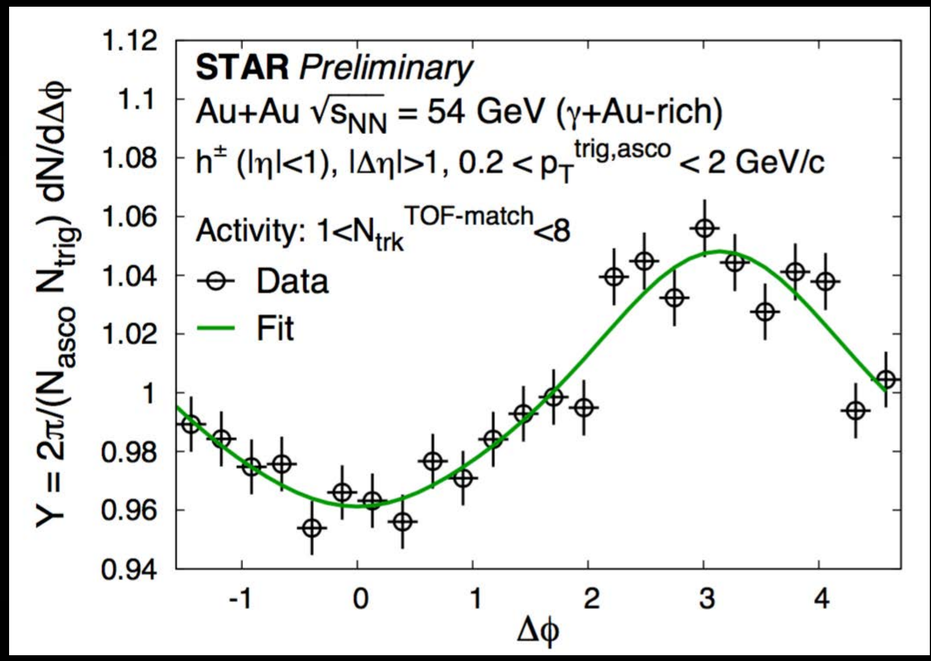
SN0773 : The STAR BUR for Run-22 & data taking in 2023-25



Anticipated runs with forward upgrades:
High statistics Au+Au in 2023 and 2025
Polarized p+p, p+Au in 2024

Di-hadron correlations studied in photonuclear processes using Au+Au $\sqrt{s_{NN}}$ = 54.4 GeV data





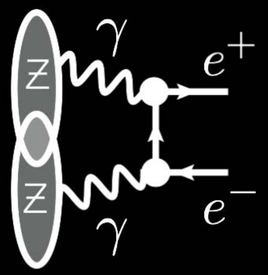
No signature of collectivity (near side ridge) in the γ+Au, higher energy and activity events under exploration with STAR forward upgrades

Focus will be on study of microstructure of QGP & RHIC measurements informative towards EIC science

STAR Talks details

- Isobar collisions & strong field effects
  1. Chiral magnetic effects **Yu Hu (Thu T02-III)**
  2. Directed flow splitting **Ashik Ikbal (Wed T08-)**
  3. Global polarization **Joey Adams (Thu T02-III)**
  4. Spin alignment **Subhash Singha (Tue T02-I)**
  5. Photoproduction **Xiaofeng Wang (Thu T09-I)**
- New Insights on collective effects
  6. Nuclear shape & structure **Haojie Xu (Wed T01-II)**
  7. Longitudinal dynamics **Gaoguo Yan (Thu T14-II)**
- Prerequisites for phase transitions & freezeout
  8. Baryon stopping **Benjamin Kimelman (Tue T03-I)**
  9. Strangeness production **Aswini K Sahoo (Thu T14-I)**
  10. Hyper-nuclei formation **Yue-Hang Leung (Thu T16)**
  11. Nuclei formation **Hui Liu (Thu T16)**
  12. Hadron & nuclei femtoscopy **Ke Mi (Thu T07-III)**
- Critical phenomena & mapping phase diagram
  13. Net-proton fluctuations **Yu Zhang (Tue T03-I)**
  14. Deuteron fluctuations **Debasish Mallick (Wed T07-I)**
  15. Search for chiral crossover **Ho San Ko (Thu T07-II)**
  16. Di-lepton as QGP thermometer **Zaochen Ye (Thu T13-I)**
- Hard probes in the medium
  17. J/ψ suppression **Ziyue Zhang (Thu T11-IV)**
  18. High p_T hadron R_{AA} **Tong Liu (Wed T05-II)**
  19. Heavy flavor jet shape **Diptanil Roy (Thu T11-III)**
  20. Broadening of γ/π^0+jets **Derek Anderson (Tue T04-I)**
- Upgrades and future program
  21. Forward upgrade of STAR **Xu Sun (Wed T15-I)**

List of STAR Posters

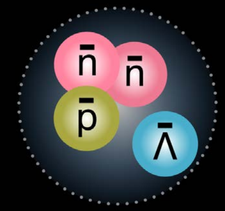


Yang Li - Identified particle spectra in isobaric collisions of Ru+Ru and Zr+Zr at √s = 200 GeV with the STAR experiment

Jian Zhou - Low-pT μ+μ– pair production in Au+Au collisions at √sNN = 200 GeV at STAR

Kaifeng Shen - Initial electromagnetic field dependence of photon-induced production in isobaric collisions at STAR

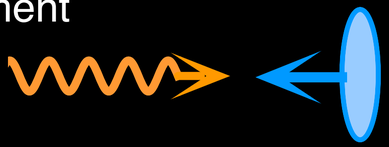
Yingjie Zhou - Strange hadron and resonance production in Au+Au collisions at RHIC Beam Energy Scan



Mate Csanad - Pseudorapidity distributions of charged particles measured with the STAR Event Plane Detector in 19.6 GeV and 27 GeV Au+Au collisions

Tan Lu - Observation of anti-H4L

Xiujun Li - Precision measurements of light hypernuclei lifetime and R3 in Au+Au Collisions from STAR experiment



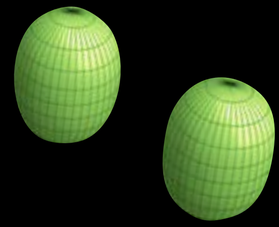
Nicole Lewis - Identified hadron spectra and baryon stopping in gamma-Au collisions at STAR

Matthew Harasty (Arushi Dhamija, Krishan Gopal) - Study of identified hadrons in Au+Au collisions at √sNN = 27 and 54.4 GeV using the STAR detector at RHIC

Yuanjing Ji - Precision measurements of light hypernuclei lifetime and branching ratio fraction R3 by the STAR experiment

Xingrui Gou - Measurements of Global and Local Polarization of Hyperons in 200 GeV Isobar Collisions from STAR

Chunjian Zhang - Observation and detailed measurements of nuclear deformations at STAR



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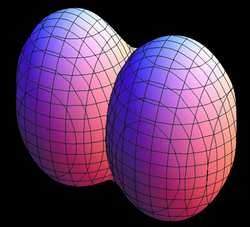

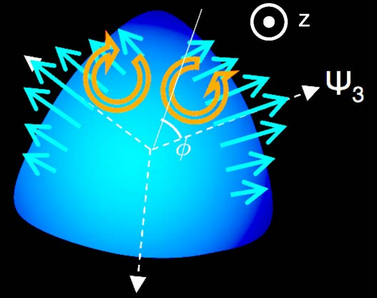

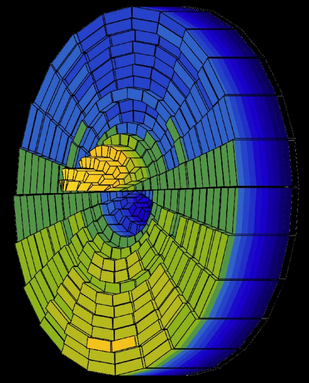

Diyu Shen - Significant charge splitting of rapidity-odd directed flow slope and its implication on electromagnetic effect in Au+Au, Ru+Ru, and Zr+Zr collisions from STAR

Jiangyong Jia - Probing the nuclear deformation effects in Au+Au and U+U collisions from STAR experiment

Takafumi Niida - Hyperon polarization along the beam direction relative to the second and third order event planes in isobarcollisions from STAR

Kosuke Okubo - Global polarization of \Lambda hyperons in Au+Au \sqrt(sNN) = 7.2 GeV fixed-target collisions at RHIC-STAR experiment

Jagbir Singh - Study of Chiral Magnetic Effect in Isobar (Ru+Ru & Zr+Zr) and Au+Au collisions at √sNN = 200 GeV at STAR using SDM

Xiaoyu Liu - Directed flow in the forward and backward region in Au+Au Collisions at √sNN = 27 GeV from STAR

Zuowen Liu - Directed flow of identified particles in Au+Au collisions at \sqrt{sNN} = 19.6 and 14.5 GeV

Priyanshi Sinha - Anisotropic flow of ϕ meson in Au+Au collisions at √sNN = 14.6 and 19.6 GeV in second phase of beam energy scan program

Li-ke Liu - Azimuthal anisotropy measurement of (multi)strange hadrons and ϕ mesons in Au+Au collisions at √sNN = 3 - 19.6GeV in BES-II at STAR

Ding Chen - Anisotropic flow of (multi-)strange hadrons and ϕ mesons in Au+Au collisions at fixed-target (FXT) and second phase beam energy scan (BES-II) programs from STAR

Prabhupada Dixit - Anisotropic flows of (multi-)strange hadrons and ϕ mesons in Au+Au collisions at √sNN = 3-19.6 GeV at STAR

Cameron Racz - Triangular Flow of Identified Particles in Fixed Target Au+Au Collisions at STAR

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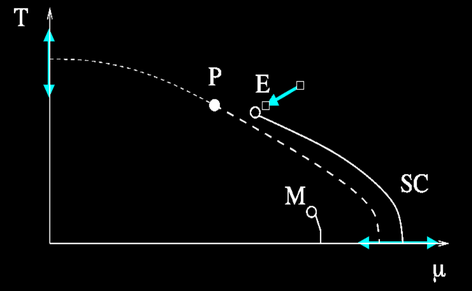
Eddie Duckworth - Net Proton directed flow in 19GeV Au+Au collisions

Rishabh Sharma - Elliptic flow of light nuclei produced in Au+Au collisions at √sNN = 7.7, 14.5, 19.6, 27 and 54.4 GeV

Yicheng Feng - Study nonflow via two-particle (deta, dphi) correlations from the isobar data at STAR

Jin Wu - Measurement of Intermittency for Charged Particles in Au+Au Collisions at \sqrt{sNN} = 7.7-200 GeV from STAR



Jonathan Ball - Fluctuations in Lambda Multiplicity Distribution in Au+Au collisions at √sNN = 3 GeV at STAR

Pawel Szymanski - Dynamics of particle production in the STAR experiment

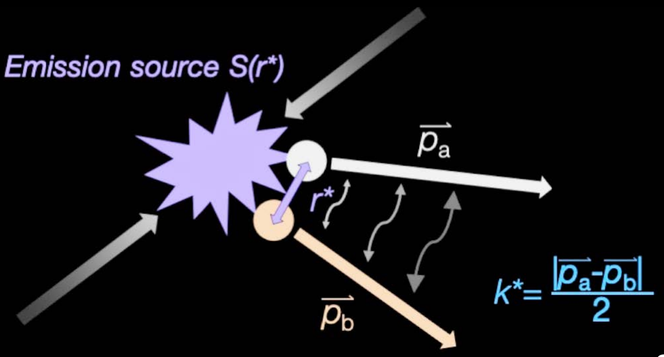
Ashish Pandav - Seventh and eighth order cumulants of net-proton number distribution in heavy-ion collisions recorded by STAR detector at RHIC

Changfeng Li - Measurement of Higher-order cumulants of net-(Kaon+Lambda) multiplicity distributions in √sNN =27 GeV with STAR

Ayon Mukherjee - Bose-Einstein correlations of charged kaons produced by \sqrt{sNN} = 200 GeV Au+Au collisions in STAR at the RHIC

Moe Isshiki - Measurements of Lambda-Lambda and Xi-Xi correlations in Au+Au collisions at \sqrt{sNN} = 200 GeV at RHIC-STAR

Zhi Qin, Yaping Wang - Studies of strong interactions with femtoscopy in Au+Au collisions at RHIC/STAR



Diana Pawlowska - Femtoscopic measurement of strange hadrons in Au+Au collisions at the STAR experiment

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Raghav Kunnawalkam Elayavalli - Exploring jet topological dependences in pp and Au+Au collisions at \sqrt{sNN} = 200 GeV at RHIC

Veronica Verkest - Measurements of jet and soft activity in √sNN = 200 GeV p+Au collisions at STAR

Monika Robotkova - Mult-dimensional measurements of the parton shower in pp collisions at RHIC

Mathew Kelsey - Measurements of D0-tagged Jet Spectra and Radial Profiles in Au+Au collisions from STAR

Nihar Sahoo - Search for large-angle jet deflection using semi-inclusive γ+jet and pi0+jet correlations in p+p in Au+Au collisions at √sNN =200 GeV with STAR

Ziyang Li - Very-low-pT J/ψ production in Au + Au collision at √sNN = 200 GeV at STAR

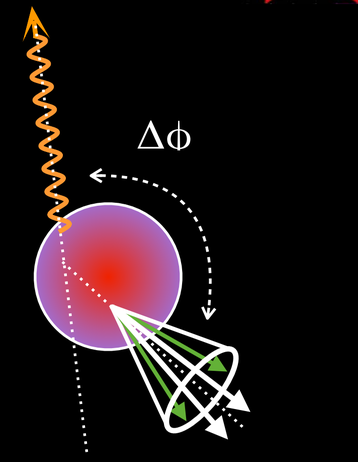
Yu Ming Liu - Study of J/psi elliptic flow in Zr+Zr and Ru+Ru collisions at sqrt{s_NN} = 200 GeV in the STAR experiment

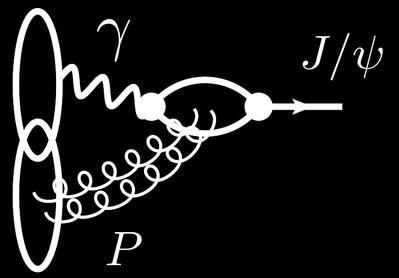
Yan Wang - J/ψ production in isobaric collisions at √sNN = 200 GeV

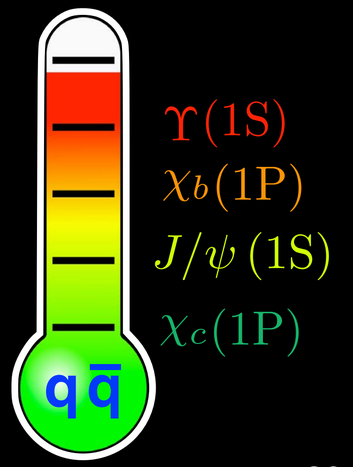
Hao Huang - Study of J/ψ production with jet activity in pp collisions at √s = 200 GeV in the STAR experiment

Leszek Kosarzewski - Quarkonium production in p+p collisions measured by the STAR experiment

Jan Vanek - Measurements of open-charm hadron production and total charm quark production cross section at midrapidity in Au+Au collisions at √sNN = 200 GeV by the STAR experiment







Thank you