The 9th International Symposium on Heavy Flavor Production in Hadron and Nuclear Collisions

Report of Contributions

https://indico.cern.ch/e/1429980

Contribution ID: **1** Type: **not specified**

Enhanced ψ ′ yield and ψ ′ / (J / ψ) yield ratio as a possible signature of QGP formation in high multiplicity p + p p+p collisions

Suppression in the yield of quarkonia (heavy quark-antiquark bound states) has been considered one of the important signatures of the formation of the thermalized deconfined partonic matter, also known as the Quark Gluon Plasma (QGP), in Relativistic Heavy Ion Collision Experiments (RHICE). Traditionally, the in-medium dissociation of quarkonium states has been presented by implicitly assuming an adiabatic approximation, which considers that the heavy quark Hamiltonian
changes slowly over time owing to change in the medium. However, in high multiplicity smaller systems, such as in p+p collisions, the early development of transverse flow resulting from the finite
transverse size of the locally thermalized medium may cause the quarkonium states to undergo a non-adiabatic evolution. It has been argued that in the presence of such a non-adiabatic evolu tion, the suppression of heavy quark-antiquark bound state yields may not reliably indicate QGP formation [1]. We propose that, rather than concentrating on the suppression of J/ψ yields, the enhancement in the yield ratio of ψ′ to J/ψ (i.e., ψ′/(J/ψ)), along with an increase in ψ′ yield, should be considered as a probe of QGP formation for small systems. Our findings, based on real istic modeling of the time evolution of small systems, suggest that the yield ratio ψ′/(J/ψ) and the yield of ψ′ increase as a function of hydrodynamization temperature incorporating the non-adiabatic transitions in high multiplicity p + p collisions.

Primary author: PANDA, Ankit Kumar

Presenter: PANDA, Ankit Kumar

Contribution ID: **2** Type: **not specified**

Spin Polarization in Strongly Coupled Fluid

Recently, ALICE first measured the spin alignment of the J/ψ with respect to the event plane. To explain the experiment, we considered two possible spin-dependent processes of J/ψ –– LO (gluon dissociation) and NLO (inelastic scattering) processes in Bjorken flow, which contain chromomagnetic coupling between J/ψ and gluon. The coupling, together with flow, induces spin alignment, and the dissociation and regeneration will contribute to the spin alignment.

Primary authors: LIN, Shu; CHEN, Zhishun (SYSU)

Presenter: CHEN, Zhishun (SYSU)

Contribution ID: **4** Type: **not specified**

Recent progress on inclusive quarkonium production in the framework of NRQCD factorization

In this talk, I will report our recent progress on describing inclusive quarkonium production and polarization from pp, γp, $\gamma\gamma$ collisions in the framework of nonrelativistic QCD factorization at next-to-leading order in α_s expansion.

Primary author: WANG, Xiangpeng (Technische Universität München)

Co-authors: VAIRO, Antonio; BUTENSCHOEN, Mathias; BRAMBILLA, Nora

Presenter: WANG, Xiangpeng (Technische Universität München)

Contribution ID: **5** Type: **not specified**

Lattice QCD Study of Heavy Quark Diffusion

In this talk I will present recent progress of lattice calculation of the heavy quark diffusion coefficient.

Primary author: SHU, Hai-Tao

Presenter: SHU, Hai-Tao

Contribution ID: **6** Type: **not specified**

Energy dependence of J/ψ production in Au+Au collisions at $\sqrt{s_{NN}}$ = 14.6, 19.6 and 27 GeV at STAR

In relativistic heavy-ion collisions, the dissociation of charmonium is considered an important evidence for the formation of the quark-gluon plasma (QGP). However, charmonia also experience the regeneration effect in the QGP, which acts against the dissociation process. With decreasing collision energy, the regeneration effect decreases quickly, providing leverage to disentangle the two competing effects.

In this talk, we present the nuclear modification factor (R_{AA}) of J/ψ as a function of centrality and transverse momentum in Au+Au collisions at $\sqrt{s_{NN}}$ = 14.6, 17.3, 19.6 and 27 GeV using the Beam Energy Scan Phase II data. Additionally, we investigate the energy dependence of J/ψ R_{AA} from RHIC to LHC energies in central heavy-ion collisions, including a comparison to model calculations.

Primary author: ZHANG, Wei

Presenter: ZHANG, Wei

Contribution ID: **7** Type: **not specified**

Production and spin polarization of heavy flavor in heavy-ion collisions

Heavy flavor has been proposed as clean probes for the coupling strength and the initial energy density of a hot QCD medium. 1)We develop the time-dependent Schrodinger equation plus hydro to study the quarkonium suppression in pp, pA, and AA collisions. The evident sequential suppression pattern of quarkonium indicates a relatively weak color screening effect and a sizeable imaginary potential induced by the inelastic scatterings. 2)We also employ the deep learning method (CNN model) to extract the diffusion coefficient of heavy quarks based on the D meson observables. The effects of non-thermal charm distribution on the elliptic flow and pT-shape of charmonium RAA is also explored. 3) With the existence of magnetic field and QCD matter, spin of heavy quarks and quarkonium can be polarized. This is studied phenomelogically by taking realistic B(t) and hydro in nuclear collisions.

Primary author: Dr CHEN, Baoyi (Tianjin University)

Presenter: Dr CHEN, Baoyi (Tianjin University)

Contribution ID: **8** Type: **not specified**

Saturation effects in exclusive heavy vector meson photoproduction

The gluon density inside nucleons has been observed to increase rapidly with energy, which would eventually violate unitarity. At high energies, however, nonlinear effects start to become important, slowing down the evolution of the gluon density and giving rise to gluon saturation. While there have already been strong hints of saturation effects in the currently available data, definite evidence of saturation is still lacking. As exclusive vector meson production is a process that is very sensitive to the gluon density, it offers one possible channel for measuring gluon saturation.

The purpose of this talk is to study the magnitude of saturation effects in exclusive heavy vector meson photoproduction. This is done by comparing predictions from linear and nonlinear models for the evolution of the gluon density, described using the color-glass condensate effective field theory. The difference in these models is the high-energy evolution of the dipole amplitude which is done according to the BFKL and BK equations. We find that saturation effects are negligible for proton targets, but Pb targets show a strong indication for gluon saturation already in the currently available data.

Primary author: PENTTALA, Jani (UCLA)

Presenter: PENTTALA, Jani (UCLA)

Contribution ID: **9** Type: **not specified**

Non perturbative effect in charm diffusion and flow from Gribov-Zwanziger approach

Due to the longer relaxation time of heavy quarks compared to light quarks in the quark-gluon plasma, the non-equilibrium information is expected to be retained in the final momentum distribution of heavy flavors, making them suitable probes of the strongly interacting system. Using the Gribov-Zwanziger prescription to model the infrared behavior of QCD, we study the momentum diffusion coefficient κ of the charm quark and its dependence on both the medium temperature and the heavy quark momentum. We will also discuss the role played by the modified IR behavior in computing the diffusion coefficient. The scaled momentum diffusion coefficient is found to increase with momentum and decrease with the temperature.

Primary author: Dr ZHU, Xue-qiang (Central China Normal University)

Co-authors: Prof. KE, Wei-yao (Institute of Particle Physics and Key Laboratory of Quark and Lepton Physics (MOE), Central China Normal University, Wuhan, Hubei, 430079, China); Prof. QIN, guang-you (Institute of Particle Physics and Key Laboratory of Quark and Lepton Physics (MOE), Central China Normal University, Wuhan, Hubei, 430079, China)

Presenter: Dr ZHU, Xue-qiang (Central China Normal University)

Contribution ID: **10** Type: **not specified**

Heavy quark thermalization using quantum search algorithm

Heavy quark thermalization in the quark-gluon plasma is one of the most promising phenomena for understanding the strong interaction, where their energy loss and momentum broadening at low momentum can be well described by a stochastic process with drag and diffusion terms. We propose an accelerated quantum circuit Monte-Carlo framework that utilizes the quantum amplitude estimation, the generalized Grover search algorithm, to simulate heavy quark thermalization with quadratically less resources compared to classical Monte-Carlo method. Specifically, we simulate the thermalization of a heavy quark in both 1D and 2D and in isotropic and anisotropic mediums using an ideal quantum simulator and compare that to analytical thermal expectations.

Primary author: QIAN, Wenyang (University of Santiago de Compostela)

Presenter: QIAN, Wenyang (University of Santiago de Compostela)

Contribution ID: **11** Type: **not specified**

The collisional energy loss of a heavy fermion in the Quark-Gluon Plasma

We study the collisional energy loss of a heavy fermion in the Quark-Gluon Plasma by separately considering the following two effects that could be significant near the critical temperature. One is the collisions among the medium partons modelled by the Bhatnagar-Gross–Krook collisional kernel, the other is a nontrivial value of the Polyakov loop which is induced by a constant background field for the gauge fields. Our results show that in a temperature region not far above the critical temperature, the collisional energy loss of a heavy fermion has a moderate enhancement in a collisional plasma, on the other hand, it may be strongly suppressed in the presence of a background field.

Primary author: GUO, Yun

Presenter: GUO, Yun

Contribution ID: **12** Type: **not specified**

Flavor Hierarchy of Jet Energy Correlators inside the Quark-Gluon Plasma

Heavy flavor jets provide ideal tools to probe the mass effect on jet substructure in both vacuum and quark-gluon plasma (QGP).
Energy-energy correlator (EEC) is an excellent jet substructure observable owning to its strong sensitivity to jet physics at different scales.
We perform a complete realistic simulation on medium modification of heavy and light flavor jet EEC in heavy-ion collisions.
A clear flavor hierarchy is observed for jet EEC in both vacuum and QGP due to the mass effect.
The medium modification of inclusive jet EEC at different angular scales exhibits very rich structure: suppression at intermediate angles, and enhancement at small and large angles, which can be well explained by the interplay of mass effect, energy loss, medium-induced radiation and medium response.
These unique features of jet EEC are shown to probe the physics of jet-medium interaction at different scales, and can be readily validated by upcoming experiments.
Within this framework, we also provide a good description of the CMS data on the modification of inclusive jets' EEC in Pb-Pb collisions.

[1] Wen-Jing Xing, Shanshan Cao, Guang-You Qin and Xin-Nian Wang, arXiv:2409.12843

Primary author: Dr XING, Wen-Jing (Shandong University)

Co-authors: Prof. QIN, Guang-You (Central China Normal University); Prof. CAO, Shanshan (Shandong University); Prof. WANG, Xin-Nian (Central China Normal University)

Presenter: Dr XING, Wen-Jing (Shandong University)

Contribution ID: **13** Type: **not specified**

Cold Nuclear Matter Effect for Heavy Flavor at EIC

Deep inelastic scattering on nuclei at the Electron-Ion Collider will open new opportunities to investigate the structure of matter. Heavy flavor jets and hadron productions are complementary probes of the partonic composition and transport coefficients of large nuclei, but introduce a new mass scale that modifies the structure of parton showers and must be carefully accounted for in perturbative calculations. In the framework of soft-collinear effective theory with Glauber gluon interactions, we present the first calculation of inclusive heavy flavor jet and meson production in electron-nucleus collisions. The comprehensive study allows us to identify the optimal observables, center-of-mass energies, and kinematic regions most sensitive to the physics of energy loss and hadronization at the EIC.

Primary author: LI, Haitao (Shandong University)

Presenter: LI, Haitao (Shandong University)

Contribution ID: **14** Type: **not specified**

Production and nuclear modification of B_c mesons in relativistic heavy-ion collisions

Recent measurement on nuclear modification of B_c mesons at the LHC serves as a novel probe of heavy quark interaction with the QGP in relativistic heavy-ion collisions. Based on a linear Boltzmann transport model that incorporates both perturbative (Yukawa) and non-perturbative (string) interactions between heavy quarks and the QGP, we study the production and nuclear modification of B_c in these energetic nuclear collisions. A B_c bound state dissociates while one of its constituent heavy quark scatters with the QGP with momentum transfer greater than its binding energy. The medium-modified charm and bottom quarks can recombine into B_c mesons via the coalescence model, while the modified bottom quarks can also produce B_c mesons through fragmentation. We find that the dissociation, recombination, and fragmentation processes are sensitive to the interaction dynamics of heavy quarks with the QGP. Within the current kinematic range observed at the LHC, the string interaction leads to much stronger dissociation of B_c than the Yukawa interaction. Different types of interactions also yield different medium-modified spectra of open heavy quarks, which further affect the B_c spectrum from recombination and fragmentation. Furthermore, the recombination process of B_c mesons is highly sensitive to the volume of the QGP. We provide a satisfactory description of the nuclear modification factor of B_c mesons in Pb+Pb collisions at 5.02 ATeV, as well as predictions for Au+Au collisions at 200 AGeV. More precise experimental data on B_c in the future can provide a more stringent constraint on heavy quark dynamics in high-energy nuclear collisions, and may also shed light on the inner structure of B_c mesons.

Primary authors: Ms ZHANG, Lejing (Shandong University); Ms XING, Wen-Jing (Shandong University); Mr CAO, Shanshan (Shandong University)

Presenter: Ms ZHANG, Lejing (Shandong University)

Contribution ID: **15** Type: **not specified**

In-medium bottomonium properties from lattice NRQCD calculations with extended meson operators

Heavy quark-antiquark bound states, quarkonia, serve as a good thermometer for the quark-gluon-plasma (QGP) created in heavy-ion collisions. Due to color screening within the deconfined hot medium, quarkonia are expected to dissolve, making quarkonium suppression a signature of QGP formation. Hints for sequential in-medium modification of quarkonia according to the hierarchy of their sizes have also been observed in experiments. Thus knowledge of quarkonium properties at finite temperatures, especially that of excited states with large sizes, is crucial to understand experiment results and characterize QGP structure on different length scales.

In-medium quarkonium properties are encoded in the spectral function, which can be related to the Euclidean correlation function calculable on the lattice. To this end, we will present the lattice QCD studies on the temperature dependences of up to 3S and 3P bottomonium correlators in the range $T \simeq 133 - 250$ MeV [1], where 3P state is firstly explored. These correlators are computed using extended bottomonium operators with wave-function optimized for excited states and also Gaussian smeared for ground states, in order to be more sensitive to thermal effects. Lattice simulations are preformed with nonrelativistic dynamics for the bottom quark and on (2+1)-flavor gauge backgrounds using HISQ action near physical point, at two finer lattice spacings 0.0493 and 0.0602 fm compared with previous studies [2, 3].

We will show the temperature dependences of the thermal widths and in-medium masses extracted from bottomonium correlators with Gaussian- and Lorentzian-type ansatzes [2, 3] for the spectral function, where sequential thermal broadening can be confirmed but no clear mass shift is observed. We find the effects from thermal modifications are almost not affected by different choices of smeared sources.

References:
[1] H.-T. Ding, W.-P. Huang, R. Larsen, S. Meinel, S. Mukherjee, P. Petreczky, work in progress.
[2] R. Larsen, S. Meinel, S. Mukherjee, P. Petreczky, Phys. Rev. D 100 (2019) 074506.
[3] R. Larsen, S. Meinel, S. Mukherjee, P. Petreczky, Phys. Lett. B 800 (2020) 135119.

Primary authors: DING, Heng-Tong; HUANG, Wei-Ping; LARSEN, Rasmus (University of Stavanger); Prof. MEINEL, Stefan (University of Arizona); MUKHERJEE, Swagato; PETRECZKY, Peter

Presenter: HUANG, Wei-Ping

Contribution ID: **16** Type: **not specified**

Study of EEC discrimination power on quark and gluon quenching effects in heavy-ion collisions at $\sqrt{s} = 5.02$˜TeV

The energy-energy correlator (EEC) is considered a powerful probe of jet substructure. To study the utility of such observable for quark vs gluon discrimination of jet quenching phenomenon, this work first predicts the energy-energy correlators of inclusive jets in central˜$(0-10\%)$ Pb+Pb collisions at $\sqrt{s}$ = 5.02 TeV for jet transverse momentum interval $40-60$ GeV. The Pb+Pb EEC distribution shifts to larger $R_{\rm L}$ and smaller $R_{\rm L}$ simultaneously. The shift towards larger $R_{\rm L}$ is attributed to the energy loss effect when the jet evolves in the hot/dense medium and the shift towards smaller $R_{\rm L}$ is due to the selection bias effects. Moreover, we find the EEC distribution for pure quark jets in nucleus-nucleus (A+A) collisions will only be suffering even stronger enhancement at $R_{\rm L} > 0.2$, and the EEC distribution for pure gluon jets in A+A collisions will be observed shifting toward smaller and larger $R_{\rm L}$ at the same time. The jet quenching patterns (A+A/p+p) of the quark jets and the gluon jets can then be separated. We also find that the differences are mainly determined by the initial EEC distribution in p+p, and are not affected much by the energy loss differences between quark and gluon. Inclusive jets are dominated by gluon jets and photon-tagged jets are used to represent quark jets, we propose this double-ratio measurement to demonstrate the quark/gluon discrimination for the jet quenching phenomenon of jet substructures. The impact of the medium response effect is also discussed.

Primary authors: ZHANG, Ben-Wei (Central China Normal University); Dr CHEN, Shi-Yong (Huang Gang Normal University); DAI, Wei; LI, Yao

Presenter: DAI, Wei

Contribution ID: **17** Type: **not specified**

Prospects for open heavy-flavour and quarkonium measurements with NA60+

The high-intensity beams provided by the CERN SPS in a wide energy interval offer a unique opportunity to investigate the region of the QCD phase diagram at high baryochemical potential. The NA60+ experiment, proposed for taking data with heavy-ion collisions at the SPS in the next years, has the strong potential to provide new insights into the QCD phase diagram via measurements of rare probes in a beam-energy scan of Pb-Pb and p-A collisions in the interval $\sqrt{s_{NN}} = 6$-17 GeV. In this talk, the prospects for measurements of hidden and open charm will be presented.\\
Open charm hadrons will be measured from their decay into charged hadrons, reconstructed from the tracks in the silicon detectors of the vertex telescope.
This will enable high-precision measurements of the yield of D^0, D^+, and D_c^+ mesons, and Λ_c^+ baryons, thus allowing us to constrain the transport properties of the QGP and the charm-quark hadronisation. Charmonium states, J/ψ and ψ(2S) will be measured through dimuon decays reconstructed with the muon spectrometer. By measuring the charmonium yield in p-A and Pb-Pb. Pb collisions at different collision energies, NA60+ will provide a unique opportunity to study the threshold energy for the onset of deconfinement.\\
The competitiveness and complementarity of NA60+ in the landscape of the experiments foreseen at other facilities in the next decade will be discussed.

Primary author: ALOCCO, Giacomo (Universita e INFN, Torino (IT))

Presenter: ALOCCO, Giacomo (Universita e INFN, Torino (IT))

Contribution ID: **18** Type: **not specified**

Charmonium production in isobaric collisions at √sNN = 200 GeV with the STAR experiment

Charmonium is an important to probe the properties of the quark-gluon plasma (QGP) created in heavy-ion collisions due to the modification of its yield by the effects of dissociation and regeneration in QGP. The production of J/ψ in heavy ion collisions has been extensively studied at RHIC energies. However, many new observables studied at LHC energies are yet to be explored at RHIC energies. 4 billion isobaric collisions ($^{96}_{44}Ru$ + $^{96}_{44}Ru$ and $^{96}_{40}Zr$ + $^{96}_{40}Zr$) at $\sqrt{s_{\rm NN}}$ = 200 GeV has been collected by STAR in 2018, providing a unique opportunity for the study of charmonium with observables has never been explored at RHIC before.

In this contribution, the first measurement of $\psi(2{\rm S})$ production in heavy ion collisions at RHIC will be presented with the 4B isobaric collision date. The J/ψ and $\psi(2{\rm S})$ signals are reconstructed via the e^+e^- decay channel with machine learning technique. Centrality and transverse momentum dependence of the ratio of $\psi(2{\rm S})$ yield over that of J/ψ will be shown and physics implication will be discussed.

Primary author: WANG, Yan (University of Science and Technology of China)

Presenter: WANG, Yan (University of Science and Technology of China)

Contribution ID: **19** Type: **not specified**

Aspects of holographic Langevin diffusion in the presence of anisotropic magnetic field

We revisit the holographic Langevin diffusion coefficients of a heavy quark, when travelling through a strongly coupled anisotropic plasma in the presence of magnetic field $\mathcal{B}$. The Langevin diffusion coefficients are calculated within the membrane paradigm in the magnetic branes model which has been extensively studied to investigate the magnetic effects on various observables in strongly coupled QCD scenarios by holography.

In addition to confirming some conventional conclusions, we also find several new interesting features among the five Langevin diffusion coefficients in the magnetic anisotropic plasma. It is observed that the transverse Langevin diffusion coefficients depend more on the direction of motion rather than the directions of momentum diffusion at the ultra-fast limit, while one would find an opposite conclusion when the moving speed is sufficiently low. For the Longitudinal Langevin diffusion coefficient, we find that motion perpendicular to $\mathcal{B}$ affects the Langevin coefficients stronger at any fixed velocity. We should also emphasize that all five Langevin coefficients are becoming larger with increasing velocity. We find that the universal relation $\kappa^{\parallel} > \kappa^{\perp}$ in the isotropic background, is broken in a different new case that a quark moving paralleled to $\mathcal{B}$. This is one more particular example where the violation of the universal relation occurs for the anisotropic background.Further, we find the critical velocity of the violation will become larger with increasing $\mathcal{B}$.

Primary author: ZHOU, qi

Co-author: ZHANG, Ben-Wei (Central China Normal University)

Presenter: ZHOU, qi

Contribution ID: **20** Type: **not specified**

Quarkonium Energy Correlator

We propose to measure the energy correlator in quarkonium production, which tracks the energy deposited in the calorimeter χ-angular distance away from the identified quarkonium. The observable eliminates the need for jets while sustaining the perturbative predictive power. Analyzing the power correction to the energy correlator, we demonstrate the novel observable supplies a unique gateway to probing the hadronization, especially when $\cos\chi$
$gtrsim0$ in the quarkonium rest frame where the perturbative emissions are depleted due to the dead-cone effects. We expect the quarkonium energy correlator to add a new dimension to quarkonium studies.

Primary author: CHEN, AnPing (Jiangxi Normal University)

Presenter: CHEN, AnPing (Jiangxi Normal University)

Contribution ID: **21** Type: **not specified**

Medium modifications of heavy-flavor jet angularities in heavy-ion collisions

We present the first theoretical study of heavy-flavor jet angularities (λ_α^κ) in Pb+Pb collisions at $\sqrt{s_{\rm NN}} = 5.02$ TeV. The initial production of heavy-flavor jets is carried out using the POWHEG+PYTHIA8 prescription, while the jet evolution in the quark-gluon plasma (QGP) is described by the SHELL transport model. In p+p collisions, we observe narrower angularity distributions for the $\rm D^0$-tagged jets compared to inclusive jets, consistent with the ALICE preliminary results. We then demonstrate that jet quenching in the QGP may slightly widen the angularity distributions of both inclusive and $\rm D^0$-tagged jets in Pb+Pb collisions relative to p+p at $10 < p_{\rm T,jet} < 20$ GeV/c. Additionally, by comparing the averaged angularities $\langle\lambda_\alpha^\kappa\rangle$ of inclusive, $\rm D^0$-tagged and $\rm B^0$-tagged jets with varying α and κ, we show that the larger the quark mass is, the lower the jet's $\langle\lambda_\alpha^\kappa\rangle$ values are. As a result of the slenderer initial distribution, we predict that as compared to inclusive jets, the heavy-flavor jets, especially the $\rm B^0$-tagged one, will suffer more distinct modifications of $\langle\lambda_\alpha^\kappa\rangle$ in Pb+Pb relative to p+p at $10 < p_{\rm T,jet} < 20$ GeV/c. For a larger jet radius, a more significant broadening of jet angularities could be obtained because of the enhanced contributions of the wide-angle particles. It is also noted that the angularity distributions of inclusive and $\rm D^0$-tagged jets become narrower in Pb+Pb collisions relative to p+p at $p_{\rm T,jet} > 20$ GeV/c due to the strong influence of the selection bias.

Primary authors: ZHANG, Ben-Wei (Central China Normal University); Dr WANG, Sa (China Three Gorges University); Dr CHEN, Shi-Yong (Huang Gang Normal University); KONG, WeiXi (Central China Normal University); LI, Yao

Presenter: LI, Yao

Contribution ID: **22** Type: **not specified**

Measurements of inclusive J/ψ and ψ(2S) production at midrapidity in pp collisions at $\sqrt{s}$ = 13.6 TeV with ALICE

Quarkonium production in high-energy proton-proton (pp) collisions is an important tool for studying perturbative and non-perturbative aspects of quantum chromodynamics (QCD). Charmonia are bound states of charm and anti-charm quarks and their production process can be factorized into two stages: the heavy quark production and the formation of the bound state. The former happens within initial hard parton-parton scatterings with large momentum transfers, and can be well described by perturbative QCD. The second one, which involves long distances and soft momentum scales, is a typical non-perturbative process. Measurements of J/ψ and ψ(2S) cross section in pp collisions are crucial for studying charmonium production mechanisms and testing different QCD-based model calculations. They can also provide a reference for investigating the quark-gluon plasma formed in nucleus-nucleus collisions and the cold nuclear matter effects in proton-nucleus collisions.

In this talk, we will present the results of inclusive J/ψ and ψ(2S) production at midrapidity ($|y| < 0.9$) in pp collisions at the center-of-mass energy of $\sqrt{s}$ = 13.6 TeV. The analysis is based on the data collected in 2022 by the upgraded ALICE detector during LHC Run 3, which offers significantly higher statistics compared to Run 1 and 2. The p_{T}-differential production of inclusive J/ψ cross section, as well as the ψ(2S)-to-J/ψ ratio, will be reported. Results will be shown along with similar measurements at forward rapidity and compared with model caulculations.

Primary author: ZHANG, Yuan (University of Science and Technology of China (CN))

Presenter: ZHANG, Yuan (University of Science and Technology of China (CN))

Contribution ID: **23** Type: **not specified**

ALICE 3: A next-generation heavy-ion experiment at the LHC

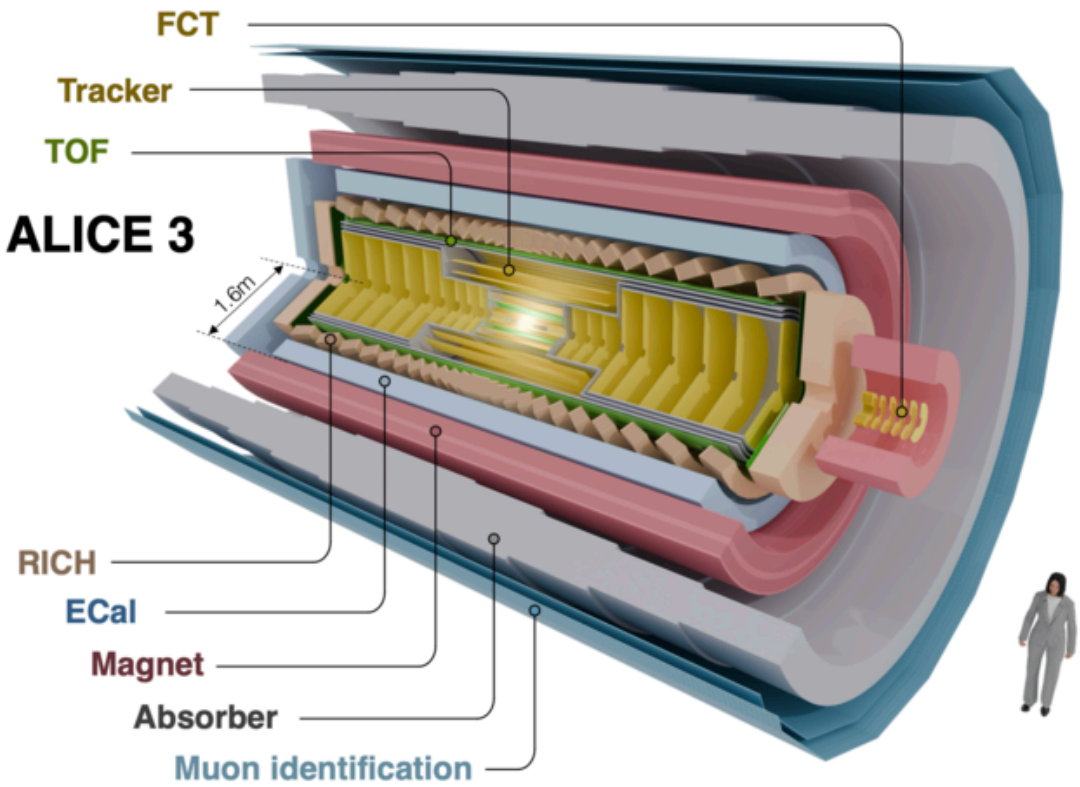

Figure 1: ALICE 3

The ALICE experiment at CERN focuses on the properties of strongly interacting matter and how they arise from the underlying interactions as described by quantum chromodynamics. Collisions of heavy nuclei at the LHC provide unique experimental access to the hottest and longest-lived quark–gluon plasma available in the laboratory, with abundant production of heavy-flavor probes. To deliver the measurements needed to pursue its physics program, ALICE is developing and planning several upgrades to its detectors for the remaining LHC Runs.

For Runs 5 and 6, a compact all-silicon tracker is in the planning stage, under the name ALICE 3. It includes a vertexing detector housed in vacuum within the beam pipe for ultimate pointing resolution, for measurements on heavy-flavor mesons, baryons, and multi-charm (yields, flow, correlations) and rejection of heavy-flavor background in dielectron and dimuon measurements; a large-acceptance silicon pixel tracker for correlation measurements and rapidity-dependent measurements; a time-of-flight layer and a ring-imaging Cherenkov detector for hadron and electron identification; a steel absorber and two layers of muon detectors for muon identification down to $p_T = 1.5$ GeV; a forward conversion tracker for ultra-soft photons; an electromagnetic calorimeter for photon detection.

The proposed detector is conceived for studies of pp, pA and AA collisions at luminosities a factor of 20 to 50 times higher than possible with the upgraded ALICE detector, enabling a rich physics program ranging from measurements with electromagnetic probes at ultra-low transverse momenta

to precision physics in the charm and beauty sector. This contribution provides a comprehensive overview of the upgrade and how it would enable ALICE and its extensive physics program to fully exploit the LHC to explore the properties of the quark–gluon plasma.

Primary author: SARRITZU, Valerio (CERN, UniCA & INFN)

Presenter: SARRITZU, Valerio (CERN, UniCA & INFN)

Contribution ID: **24** Type: **not specified**

Phenomenological study of the angle between jet axes in heavy-ion collisions

This paper presents a phenomenological study on the angle between the Standard and Winner-Take-All (WTA) jet axes ($\Delta R_{\rm axis}^{\rm WTA-Std}$) in high-energy nuclear collisions. The p+p baseline is provided by the Pythia8 event generator. The in-medium jet propagation is simulated by the linear Boltzmann transport (LBT) model, which considers both the elastic and inelastic jet-medium interactions. Our theoretical results calculated by the \textsc{Lbt} model show that the $\Delta R_{\rm axis}^{\rm WTA-Std}$ distribution in Pb+Pb at $\sqrt{s} = 5.02$ TeV is narrower than that in p+p, which agrees well with the recent ALICE measurements. The narrowing of $\Delta R_{\rm axis}^{\rm WTA-Std}$, which seems to violate the nature of intra-jet broadening due to jet quenching, may be attributed to the influence of "selection bias". However, the physical details still need to be fully understood. Utilizing a matching-jet method to track the jet evolution in the QGP to remove the selection bias in the Monte Carlo simulations, we observe that the $\Delta R_{\rm axis}^{\rm WTA-Std}$ distribution becomes broader due to the jet-medium interactions. At the same time, by rescaling the quark/gluon-jet fractions in Pb+Pb collisions to be the same as that in p+p, we find that the fraction change may not significantly influence the modification pattern of jet $\Delta R_{\rm axis}^{\rm WTA-Std}$. On the other hand, the selected jet sample in A+A collisions has a significantly narrower initial $\Delta R_{\rm axis}^{\rm WTA-Std}$ distribution than the p+p baseline, and such a biased comparison between p+p and A+A conceals the actual intra-jet broadening effect in the experimental measurements. The investigations presented in this paper will deepen our understanding of the relationship between the actual intra-jet modifications in the QGP and the experimental observations.

Primary author: KANG, Jin-Wen (CCNU)

Co-authors: Dr WANG, Sa (China Three Gorges University); WANG, Lei; ZHANG, Ben-Wei (Central China Normal University)

Presenter: KANG, Jin-Wen (CCNU)

Contribution ID: **25** Type: **not specified**

Probing the mass effect of heavy quark jets in high-energy nuclear collisions

The production of heavy quark (HQ) jets provides a new arena to address the mass effect of jet quenching in heavy-ion physics. This paper presents a theoretical study of HQ jet yield suppression in Pb+Pb collisions at the LHC and focuses on the energy loss of HQ jets produced by different mechanisms. The p+p baseline is carried out by the SHERPA generator, and the jet-medium interactions are described by the SHELL transport model, which considers the elastic and inelastic partonic energy loss in the quark-gluon plasma (QGP). In p+p collisions, our numerical results indicate that the HQ jets from gluon splitting ($g \to Q$-jet) give the dominant contribution at high p_T, and it shows more dispersive structures than the HQ-initiated one ($Q \to Q$-jet). In nucleus-nucleus collisions, our calculations are consistent the inclusive and b-jet R_{AA} recently measured by the ATLAS collaboration, which suggests a remarkable manifestation of the mass effect of jet energy loss. As a result of the dispersive substructure, the $g \to Q$-jet will lose more energy than the $Q \to Q$-jet in the QGP. Due to the significant contribution of $g \to c$-jet, the R_{AA} of c-jet will be comparable or even smaller than that of inclusive jet. To experimentally distinguish the $g \to Q$-jet and $Q \to Q$-jet, we propose the event selection strategies based on their topological features and test the performances. By isolating the $c \to c$-jet and $b \to b$-jet, the jets initiated by heavy quarks, we predict that the order of their R_{AA} are in line with the mass hierarchy of energy loss. Future measurements on the R_{AA} of $Q \to Q$-jet and $g \to Q$-jet will provide a unique chance to test the flavour/mass dependence of energy loss at the jet level.

Primary author: Dr WANG, Sa (China Three Gorges University)

Co-authors: ZHANG, Ben-Wei (Central China Normal University); Prof. WANG, Enke (South China Normal University)

Presenter: Dr WANG, Sa (China Three Gorges University)

Contribution ID: **26** Type: **not specified**

Rotational effect of quarkonium dissociation

ALICE collaboration observed the spin polarization of J/ψ particles with respect to the event plane, finding less particles in the spin zero states. A possible explanation is the spin dependent dissociations of prompt J/psi in the quark-gluon plasma. we consider the effect of vorticity on the dissociation rate in the dominant inelastic scattering process. Using quark and gluon propagators from the quantum kinetic theories, we find correction to dissociation first order in vorticity.

Primary authors: LIN, Shu; YUHAO, Liang

Presenter: YUHAO, Liang

Contribution ID: **27** Type: **not specified**

Measurements of inclusive Jpsi production in Au+Au collisions at 54.4 GeV with the STAR experiment

Heavy quarkonia are ideal probes of the Quark-Gluon Plasma (QGP). J/ψ is the most abundantly produced quarkonium state accessible experimentally and its suppression due to the color screening effect in hot and dense medium has been suggested as a signature of the formation of the QGP. Besides the screening effect, there are other mechanisms, such as the cold nuclear effects and charm quark recombination, which could affect the J/ψ yield in heavy-ion collisions. Measurements of J/ψ production at different collision energies will help to understand the interplay of these mechanisms. STAR has observed significant suppressions of the J/ψ production at mid-rapidity in Au+Au collisions at $\sqrt{s_{\rm NN}}$ = 39, 62.4, and 200 GeV. However, the nuclear modification factor shows no significant collision energy dependence from SPS to RHIC top energy within large uncertainties.

In 2017, STAR took a large sample of 54.4 GeV Au+Au collisions and the statistics is more than ten times of the 39 and 62.4 GeV Au+Au data. In this talk, we will present new measurements of the inclusive J/ψ production in Au+Au collisions at $\sqrt{s_{\rm NN}} = 54.4$ GeV. The collision energy and transverse momentum dependences of the nuclear modification factor will be presented. Physics implications of these results will also be discussed.

Primary author: SHEN, Kaifeng

Presenter: SHEN, Kaifeng

Contribution ID: **28** Type: **not specified**

Heavy flavor production under a strong magnetic field

The magnetic field created in high energy nuclear collisions will affect the dynamical processes in the QCD medium, especially the heavy quark production that happens in the initial stage of the collisions. We calculate in a strong magnetic field the heavy quark production cross section for the elementary process $gg \to Q\bar{Q}$ at leading order and the corresponding transverse momentum distribution in nucleus-nucleus collisions. In comparison to the QED process, the heavy quark production is dominated by the unique QCD channel with gluon self-interaction. Due to the dimension reduction of quark phase space in a strong magnetic field, the production is concentrated in a very narrow energy region above the threshold. Since the translation invariance is broken, the production becomes anisotropic in magnetic field.

Primary authors: Dr ZHAO, Jiaxing (Subatech); ZHUANG, Pengfei; CHEN, Shile (Tsinghua University)

Presenter: CHEN, Shile (Tsinghua University)

Contribution ID: **29** Type: **not specified**

Measurements of Upsilon and very low pT J/psi production in Au+Au collisions at 200 GeV at STAR

Heavy quarkonium states, predominantly generated via initial hard scatterings, traverse the evolution of the Quark-Gluon Plasma (QGP), thus serving as ideal probes to study the properties of the QGP. The suppression of these states due to color screening suggests direct evidence of QGP formation. In heavy-ion collisions, the strong electromagnetic fields produced by colliding nuclei can be represented by a spectrum of photons, leading to photon-induced interactions. While such interactions are traditionally studied in ultra-peripheral collisions (UPC) without any nuclear overlap, significant enhancements of J/ψ production at very low transverse momentum (p_{T} < 0.3 GeV/c) above the expected hadronic interaction yields have been observed experimentally in non-UPC events, likely due to coherent photon interactions. Studies of very low p_{T} J/ψ production in peripheral collisions offer a chance to investigate photoproduction under more defined and confined conditions compared to UPC. Moreover, different Υ states are expected to dissociate at different temperatures depending on their binding energies. Measurement of such sequential suppression of the Υ states can be used to study the modification of the QCD force in the medium and the QGP' s thermodynamic properties.

In this presentation, we will present heavy quarkonium states measurements in Au+Au collisions at $\sqrt{s_{\mathrm{NN}}}$ = 200 GeV by the STAR experiment at RHIC. The Υ yields and nuclear modification factors are presented as a function of centrality and p_{T}. The J/ψ yields and nuclear modification factors are presented as a function of p_{T}. The excess yields of very low p_{T} J/ψ are shown as a function of p_{T}^2 and N_{part}. Physics implications will also be discussed together with model comparisons.

Primary author: LI, Ziyang

Presenter: LI, Ziyang

Contribution ID: **30** Type: **not specified**

Exploring hadronic quarkonium production in QCD factorization formalism

Understanding heavy quarkonium production in hadronic collisions has attracted much interest and remains an exciting challenge in QCD studies. QCD factorization is a powerful approach for studying hadronic heavy quarkonium production at high transverse momentum (p_T) by implementing heavy quarkonium fragmentation functions (FFs). These FFs contain rich information on how a physical quarkonium bound state emerges from partons produced at short distances in high-energy scatterings. The scale evolution of quarkonium FFs is capable of resumming logarithmically enhanced corrections to the hadronic quarkonium production cross-section. Within the QCD factorization formalism, incorporating both leading-power and next-to-leading-power contributions at short distances in $1/p_T$ with the evolved quarkonium FFs allows for a description of the p_T spectrum of hadronic quarkonium production over a broad range of p_T.

This talk will present that the QCD factorization approach at leading power in $1/p_T$ with single-parton FFs describes recent LHC data on the prompt J/ψ production cross section in pp collisions at high p_T even larger than 100GeV. In contrast, the next-to-leading-power contributions with double-parton FFs are essential for describing the J/ψ p_T spectrum at low p_T, where the QCD factorization should be matched to NRQCD fixed-order calculations. We will also remark quarkonium's polarization in hadronic collisions.

Primary author: WATANABE, Kazuhiro (Tohoku University)

Presenter: WATANABE, Kazuhiro (Tohoku University)

Contribution ID: **31** Type: **not specified**

Welcome speech

Saturday 7 December 2024 08:30 (15 minutes)

Session Classification: Session 1

Contribution ID: **32** Type: **not specified**

What have we learned from experiments?

Saturday 7 December 2024 08:45 (35 minutes)

Presenter: WANG, Jing (CERN)

Session Classification: Session 1

Contribution ID: **33** Type: **not specified**

ALICE heavy flavor overview

Saturday 7 December 2024 09:20 (25 minutes)

Presenter: ZHU, Jianhui (Fudan University)

Session Classification: Session 1

Contribution ID: **34** Type: **not specified**

ATLAS heavy flavor overview

Saturday 7 December 2024 09:45 (25 minutes)

Presenter: LIU, Xinyan (Shandong University (CN))

Session Classification: Session 1

Contribution ID: **35** Type: **not specified**

Heavy flavor under extreme conditions

Saturday 7 December 2024 10:40 (25 minutes)

Presenter: ZHUANG, Pengfei

Session Classification: Session 2

Contribution ID: **36** Type: **not specified**

Theoretical overview of exotic production in heavy-ion collisions

Presenter: LIAO, Jinfeng

Session Classification: Session 2

Contribution ID: **37** Type: **not specified**

Cold nuclear matter effect for heavy flavor at EIC

Saturday 7 December 2024 11:30 (25 minutes)

Presenter: LI, Haitao (Shandong University)

Session Classification: Session 2

Contribution ID: **38** Type: **not specified**

CMS heavy flavor overview

Saturday 7 December 2024 14:00 (25 minutes)

Presenter: SAHA, Nihar Ranjan (Indian Institute of Technology Madras (IN))

Session Classification: Session 3

Contribution ID: **39** Type: **not specified**

LHCb heavy flavor overview

Saturday 7 December 2024 14:25 (25 minutes)

Presenter: WANG, Jianqiao (Tsinghua University (CN))

Session Classification: Session 3

Contribution ID: **40** Type: **not specified**

STAR heavy flavor overview

Saturday 7 December 2024 14:50 (25 minutes)

Presenter: SHEN, Dandan (shandong university)

Session Classification: Session 3

Contribution ID: **41** Type: **not specified**

Experimental overview of quarkonium production

Saturday 7 December 2024 15:15 (25 minutes)

Presenter: TANG, Zebo (University of Science and Technology of China (CN))

Session Classification: Session 3

Contribution ID: **42** Type: **not specified**

Heavy flavor in holographic QCD

Saturday 7 December 2024 16:10 (25 minutes)

Presenter: HOU, Defu (Central China Normal University)

Session Classification: Session 4

Contribution ID: **43** Type: **not specified**

Heavy flavors in the AMPT model

Presenter: LIN, Ziwei (East Carolina University)

Session Classification: Session 4

Contribution ID: **44** Type: **not specified**

Bottomonium potential from deep learning

Saturday 7 December 2024 17:00 (25 minutes)

Presenter: SHI, Shuzhe (Tsinghua University)

Session Classification: Session 4

Contribution ID: **45** Type: **not specified**

Heavy quark thermalization using quantum search algorithm

Saturday 7 December 2024 17:25 (25 minutes)

Presenter: QIAN, Wenyang (University of Santiago de Compostela)

Session Classification: Session 4

Contribution ID: **46** Type: **not specified**

Experimental overview of open HF production in small systems

Sunday 8 December 2024 09:25 (25 minutes)

Presenter: ZHU, Xianglei (Tsinghua University (CN))

Session Classification: Session 5

Contribution ID: **47** Type: **not specified**

Experimental overview of open HF production in large systems

Sunday 8 December 2024 09:00 (25 minutes)

Presenter: ZHANG, Xiaoming (Central China Normal University CCNU (CN))

Session Classification: Session 5

Contribution ID: **48** Type: **not specified**

Bottom quark hadronization in proton-proton collisions

Sunday 8 December 2024 09:50 (25 minutes)

Presenter: HE, Min (Nanjing University of Science & Technology)

Session Classification: Session 5

Contribution ID: **49** Type: **not specified**

Lattice QCD study of heavy quark diffusion

Sunday 8 December 2024 11:10 (25 minutes)

Presenter: SHU, Haitao (Central China Normal University)

Session Classification: Session 6

Contribution ID: **50** Type: **not specified**

Non perturbative effect in charm diffusion and flow from Gribov-Zwanziger approach

Sunday 8 December 2024 11:35 (25 minutes)

Presenter: ZHU, Xueqiang (Central China Normal University)

Session Classification: Session 6

Contribution ID: **51** Type: **not specified**

Aspects of holographic Langevin diffusion in the presence of anisotropic magnetic field

Presenter: ZHOU, Qi (Central China Normal University)

Session Classification: Session 6

Contribution ID: **52** Type: **not specified**

Overview of heavy flavor jet

Presenter: ZHANG, Benwei (Central China Normal University)

Session Classification: Session 7

Contribution ID: **53** Type: **not specified**

Heavy flavor jet quenching

Sunday 8 December 2024 14:00 (25 minutes)

Presenter: HOROWITZ, William Alexander (University of Cape Town (ZA))

Session Classification: Session 7

Contribution ID: **54** Type: **not specified**

Heavy quark hadronization

Presenter: ZHAO, Jiaxing (HFHF/Goethe University)

Session Classification: Session 7

Contribution ID: **55** Type: **not specified**

Heavy flavor jets as probes of the QGP

Sunday 8 December 2024 14:25 (25 minutes)

Presenter: KALIPOLITI, Lida (LLR, École Polytechnique (FR))

Session Classification: Session 7

Contribution ID: **56** Type: **not specified**

Asymmetric jet shapes with 2D jet tomography

Sunday 8 December 2024 16:10 (25 minutes)

Presenter: ZHANG, Hanzhong (IOPP, CCNU)

Session Classification: Session 8

Contribution ID: **57** Type: **not specified**

The collisional energy loss of a heavy fermion in the Quark-Gluon Plasma

Sunday 8 December 2024 16:35 (25 minutes)

Presenter: GUO, Yun

Session Classification: Session 8

Contribution ID: **58** Type: **not specified**

Phenomenological study of the angle between jet axes in heavy-ion collisions

Sunday 8 December 2024 17:00 (25 minutes)

Presenter: KANG, Jinwen (Central China Normal University)

Session Classification: Session 8

Contribution ID: **59** Type: **not specified**

Medium modifications of heavy-flavor jet angularities in heavy-ion collisions

Sunday 8 December 2024 17:25 (25 minutes)

Presenter: LI, Yao (Central China Normal University)

Session Classification: Session 8

Contribution ID: **60** Type: **not specified**

Saturation effects in exclusive heavy vector meson photoproduction

Presenter: PENTTALA, Jani (UCLA)

Session Classification: Session 9

Contribution ID: **61** Type: **not specified**

Heavy flavor production in UPC

Monday 9 December 2024 09:00 (25 minutes)

Presenter: YE, Zaochen (South China Normal University)

Session Classification: Session 9

Contribution ID: **62** Type: **not specified**

Measurements of Upsilon and very low pT J/ψ production in Au+Au collisions at 200 GeV at STAR

Monday 9 December 2024 09:25 (25 minutes)

Presenter: LI, Ziyang

Session Classification: Session 9

Contribution ID: **63** Type: **not specified**

Exploring hadronic quarkonium production in QCD factorization formalism

Monday 9 December 2024 10:45 (25 minutes)

Presenter: WATANABE, Kazuhiro (Tohoku University)

Session Classification: Session 10

Contribution ID: **64** Type: **not specified**

How well does nonrelativistic QCD factorization work for inclusive quarkonium production at NLO?

Monday 9 December 2024 11:10 (25 minutes)

Presenter: WANG, Xiangpeng (Technische Universität München)

Session Classification: Session 10

Contribution ID: **65** Type: **not specified**

Measurements of inclusive J/ψ and ψ(2S) production at midrapidity in pp collisions at 13.6 TeV with ALICE

Monday 9 December 2024 12:00 (25 minutes)

Presenter: ZHANG, Yuan (University of Science and Technology of China (CN))

Session Classification: Session 10

Contribution ID: **66** Type: **not specified**

Heavy flavor production under a strong magnetic field

Presenter: CHEN, Shile (Tsinghua University)

Session Classification: Session 10

Contribution ID: **67** Type: **not specified**

ALICE 3: A next-generation heavy-ion experiment at the LHC

Tuesday 10 December 2024 09:00 (25 minutes)

Presenter: SARRITZU, Valerio (CERN, UniCA & INFN)

Session Classification: Session 11

Contribution ID: **68** Type: **not specified**

Prospects for open heavy-flavour and quarkonium measurements with NA60+

Tuesday 10 December 2024 09:25 (25 minutes)

Presenter: ALOCCO, Giacomo (Universita e INFN, Torino (IT))

Session Classification: Session 11

Contribution ID: **69** Type: **not specified**

sPHENIX heavy flavor perspective

Tuesday 10 December 2024 09:50 (25 minutes)

Presenter: YU, Xudong

Session Classification: Session 11

Contribution ID: **70** Type: **not specified**

Quarkonium Energy Correlator

Presenter: CHEN, AnPing (Jiangxi Normal University)

Session Classification: Session 12

Contribution ID: **71** Type: **not specified**

Study of EEC discrimination power on quark and gluon quenching effects in heavy-ion collisions at 5.02 TeV

Tuesday 10 December 2024 11:10 (25 minutes)

Presenter: DAI, Wei

Session Classification: Session 12

Contribution ID: **72** Type: **not specified**

Flavor Hierarchy of Jet Energy Correlators inside the Quark-Gluon Plasma

Presenter: XING, Wenjing (Shandong University)

Session Classification: Session 12

Contribution ID: **73** Type: **not specified**

Production and nuclear modification of Bc mesons in relativistic heavy-ion collisions

Tuesday 10 December 2024 12:00 (25 minutes)

Presenter: ZHANG, Lejing (Shandong University)

Session Classification: Session 12

Contribution ID: **74** Type: **not specified**

Production and spin polarization of heavy flavor in heavy-ion collisions

Tuesday 10 December 2024 14:00 (25 minutes)

Presenter: CHEN, Baoyi (Tianjin University)

Session Classification: Session 13

Contribution ID: **75** Type: **not specified**

The heavy quark dynamics in the presence of magnetic field and chirality

Tuesday 10 December 2024 14:25 (25 minutes)

Presenter: JAMAL, Mohammad Yousuf (Central China Normal University)

Session Classification: Session 13

Contribution ID: **76** Type: **not specified**

Spin-alignment of moving quarkonium from spin-chromomagnetic coupling

Tuesday 10 December 2024 14:50 (25 minutes)

Presenter: CHEN, Zhishun (SYSU)

Session Classification: Session 13

Contribution ID: **77** Type: **not specified**

Rotational effect of quarkonium dissociation

Tuesday 10 December 2024 15:15 (25 minutes)

Presenter: LIANG, Yuhao (Sun Yat-sen University)

Session Classification: Session 13

Contribution ID: **78** Type: **not specified**

In-medium bottomonium properties from lattice NRQCD calculations with extended meson operators

Tuesday 10 December 2024 16:10 (25 minutes)

Presenter: HUANG, Weiping (Central China Normal University)

Session Classification: Session 14

Contribution ID: **79** Type: **not specified**

Charmonium production in isobaric collisions at 200 GeV with the STAR experiment

Tuesday 10 December 2024 16:35 (25 minutes)

Presenter: WANG, Yan (University of Science and Technology of China)

Session Classification: Session 14

Contribution ID: **80** Type: **not specified**

Measurements of inclusive J/ψ production in Au+Au collisions at 54.4 GeV with the STAR experiment

Tuesday 10 December 2024 17:00 (25 minutes)

Presenter: SHEN, Kaifeng

Session Classification: Session 14

Contribution ID: **81** Type: **not specified**

Energy dependence of J/ψ production in Au+Au collisions at 14.6, 19.6 and 27 GeV at STAR

Tuesday 10 December 2024 17:25 (25 minutes)

Presenter: ZHANG, Wei

Session Classification: Session 14

Contribution ID: **82** Type: **not specified**

Heavy quark hadronization

Sunday 8 December 2024 10:45 (25 minutes)

Presenter: ZHAO, Jiaxing (HFHF/Goethe University)

Session Classification: Session 6

Contribution ID: **83** Type: **not specified**

Aspects of holographic Langevin diffusion in the presence of anisotropic magnetic field

Presenter: ZHOU, Qi (Central China Normal University)

Session Classification: Session 7

Contribution ID: **84** Type: **not specified**

Aspects of holographic Langevin diffusion in the presence of anisotropic magnetic field

Presenter: ZHOU, Qi (Central China Normal University)

Session Classification: Session 12

Contribution ID: **85** Type: **not specified**

Quarkonium Energy Correlator

Presenter: CHEN, Anping (Jiangxi Normal University)

Session Classification: Session 7

Contribution ID: **86** Type: **not specified**

Aspects of holographic Langevin diffusion in the presence of anisotropic magnetic field

Sunday 8 December 2024 15:15 (25 minutes)

Presenter: ZHOU, Qi (Central China Normal University)

Session Classification: Session 7

Contribution ID: **87** Type: **not specified**

Quarkonium energy correlator

Monday 9 December 2024 11:35 (25 minutes)

Presenter: CHEN, Anping (Jiangxi Normal University)

Session Classification: Session 10

Contribution ID: **88** Type: **not specified**

Heavy flavor production under a strong magnetic field

Tuesday 10 December 2024 11:35 (25 minutes)

Presenter: CHEN, Shile (Tsinghua University)

Session Classification: Session 12

Contribution ID: **89** Type: **not specified**

Heavy flavors in the AMPT model

Saturday 7 December 2024 11:05 (25 minutes)

Presenter: LIN, Ziwei (East Carolina University)

Session Classification: Session 2

Contribution ID: **90** Type: **not specified**

Saturation effects in exclusive heavy vector meson photoproduction

Saturday 7 December 2024 16:35 (25 minutes)

Presenter: PENTTALA, Jani (UCLA)

Session Classification: Session 4

Contribution ID: **91** Type: **not specified**

Flavor hierarchy of jet energy correlators inside the Quark-Gluon Plasma

Sunday 8 December 2024 14:50 (25 minutes)

Presenter: XING, Wenjing (Shandong University)

Session Classification: Session 7

Contribution ID: **92** Type: **not specified**

Quantum computing of chirality imbalance in SU(2) gauge theory

Monday 9 December 2024 09:50 (25 minutes)

Presenter: GUO, Xingyu (South China Normal Univeristy)

Session Classification: Session 9

Contribution ID: **93** Type: **not specified**

Overview of heavy flavor jet

Tuesday 10 December 2024 10:45 (25 minutes)

Presenter: ZHANG, Benwei (Central China Normal University)

Session Classification: Session 12