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The 167th HENPIC seminar by Prof. Min He, Nanjing University of Sci. & Tech., June 23th, Thursday, 10:30 am (Beijing time)

Title: Collectivity of J/ψ Mesons in Heavy-Ion Collisions

The production of J/ψ mesons in heavy-ion collisions at the Large Hadron Collider is believed to be dominated by the recombination of charm and anticharm quarks in a hot QCD medium. However, measurements of the elliptic flow (v2) of J/ψ mesons in these reactions are not well described by existing calculations of J/ψ recombination for transverse momenta pT ⊠ 4 GeV. We revisit these calculations in two main aspects. Employing the resonance recombination model, we implement distribution functions of charm quarks transported through the quark-gluon plasma using state-of-the-art Langevin simulations and account for the space-momentum correlations of the diffusing charm and anticharm quarks in a hydrodynamically expanding fireball. This extends the relevance of the recombination processes to substantially larger momenta than before. We also revisit the suppression of primordially produced J/ψ ' s
by propagating them through the same hydrodynamic medium, leading to a marked increase of their v2 over previous estimates. Combining these developments into a calculation of the pT-dependent nuclear modification factor and v2 of inclusive J/ψ production in semicentral Pb-Pb collisions at the LHC, we find a good description of the experimental results by the ALICE Collaboration. Our results thus resolve the abovementioned v2 puzzle and imply the relevance of recombination processes for pT ' s of up to ~8 GeV.

About the speaker: Min He earned his PhD from Nanjing University and then moved to Texas A&M University as a postdoc. Now he is a faculty member at Nanjing University of Science & Technology. His research interest lies in the field of heavy quark and quarkonium physics in the quark-gluon plasma.