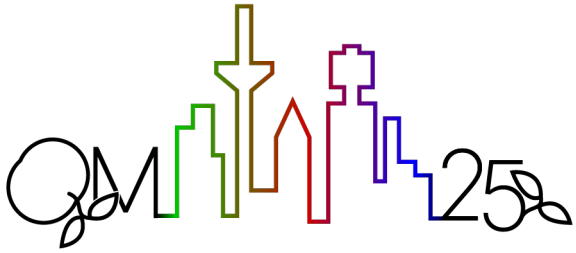

Contribution ID: **7** Type: **Oral**

Statistical Production of B_c Mesons in Heavy-Ion Collisions at the LHC Energy

The recombination production of B_c mesons in heavy-ion collisions at the LHC energy is facilitated by the abundant and highly thermalized charm (c) quarks transported in the deconfined medium created. We study the production of B_c mesons via c and bottom (b) quark recombination in a statistical fashion by placing B_c in the position of a member of the family of open b hadrons, which allows us to make quantitative predictions for the modifications of the production fraction (f_c) of B_c mesons and its relative production to B mesons in $\sqrt{s_{\rm NN}} = 5.02$ TeV Pb-Pb collisions with respect to proton-proton (pp) collisions at the same energy [1]. The statistical production yield of B_c mesons is converted into the transverse momentum (p_T) distribution with the shape computed from resonance recombination using the c- and b-quark phase space distributions that have been simulated via Langevin diffusion and constrained by open c- and b-hadron observables. Supplemented with the component fragmented from b-quark spectrum that dominates at high p_T, the total p_T spectrum of B_c mesons is obtained and converted into the p_T dependent nuclear modification factor ($R_{\rm AA}$). Both f_c and the integrated $R_{\rm AA}$ exhibit a $\sim$ 5-fold enhancement in central Pb-Pb collisions relative to the pp reference. Comparison with data measured by the CMS experiment [2] shows decent agreement within theoretical and experimental uncertainties.

References:
[1] Shouxing Zhao and Min He, arXiv: 2407.05234
[2] CMS Collab., Phys. Rev. Lett. 128, 252301 (2022).

Category

Theory

Collaboration (if applicable)

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Track Classification: Heavy flavor & quarkonia