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Quarkonia and Open Heavy Flavour Hadrons in High Energy pp Collisions - Collectivity and the Importance of Correlations between Heavy Quark ($Q\bar{Q}$) Pairs

Tuesday 24 September 2024 14:00 (20 minutes)

Quarkonia and Open Heavy Flavour Hadrons in pp Collisions.
Collectivity and the Importance of Correlations between Heavy Quark (Q̄Q) Pairs.

Several heavy quark observables, like the meson to baryon ratio and the elliptic flow indicate that the interaction of the produced particles with heavy quarks play an important role. Correlations between $Q\bar{Q}$ pairs show the complexity of the production process which should manifest itself also in the production of $Q \bar Q states.
Employing the EPOS4HQ approach we discuss heavy quark observales in pp collisions. There energy densities are reached, which in AA collisions lead to the formation of a QGP. Employing the same critical energy density in pp collisions the enhancement of the heavy meson to baryon ratio as well as the collective flow find a natural explanation. Agreement with the transverse momentum spectra for charm and bottom mesons as well as Bc is also found.
Extending our study to the correlations we find that the measured azimuthal correlations are due to LO and NLO pQCD processes, which are therefore accessible to experiment. These correlations influence also the formation of quarkonia, which we treat in the recently advanced Wigner density approach [1]. We study the dependence of quarkonium production on this pQCD processes and show that the different pQCD processes influence the single particle spectra of charm and bottom mesons, although in a quite different way.
[1] J. Zhao et al, arXiv:2312.11349 [hep-ph]

Category

Theory

Collaboration

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