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Heavy quark baryon and meson production in pp and AA at RHIC and LHC within a coalescence plus fragmentation model

Tuesday 11 June 2019 15:00 (20 minutes)

The hadronization process of heavy hadrons with bottom and charm quarks, especially for baryons Λ_c and Λ_b , in a dense QGP medium is largely not understood.

We present predictions obtained with a coalescence plus fragmentation model, for D^0 , D_s , Λ_c , B and Λ_b spectra, the related baryon to meson ratios and the D_s/D^0 ratio, both at RHIC and LHC energies in a wide range of transverse momentum region up to 10 GeV.

We discuss the effects of the hadronization process and how it plays a fundamental role to describe simultaneously the experimental data for the nuclear suppression factor R_{AA} and the elliptic flow $v_2(p_T)$ from RHIC to LHC energies.

We point out that also the nuclear modification factor for D meson is strongly modified by Λ_c production, explaining the $R_{AA}(p_T) < 1$ observed by STAR at low momenta and also present first prediction about the R_{AA} for Λ_c at LHC energy that should be greatly enhanced at variance with all the other light hadrons.

We will discuss how our model can naturally predict values of the order of $O(1)$ for Λ_c/D^0 as recently measured at both RHIC and LHC, and we present the novel predictions for Λ_b/B not yet measured, which are much larger than the expectations from fragmentation.

Moreover assuming that at the LHC top energies there can be the formation of QGP, we show that in the same scheme due to considerable volume effect a still large $\Lambda_c/D^0 \approx 0.5$ is predicted as seen by ALICE in pp collisions

- [1] S. Plumari, V. Minissale, S.K. Das, G. Coci and V. Greco, Eur.Phys.J. C **78** (2018) no.4, 348
- [2] V. Minissale, F. Scardina, and V. Greco, Phys. Rev. C **92**, 054904 (2015)
- [3] F. Scardina, S. K. Das, V. Minissale, S. Plumari, V. Greco, Phys.Rev. C **96** (2017) no.4, 044905
- [4] STAR Collaboration, Nucl.Phys. A **967** (2017) 620-623
- [5] ALICE collaboration, JHEP **1804** (2018) 108

Collaboration name

Track

Hadronisation and coalescence

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