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Heavy Hadrons production by coalescence along a system size scan from AA down to pp collisions

Measurements of heavy baryon production in pp, pA and AA collisions from RHIC to top LHC energies have recently attracted more and more attention, currently representing a challenge for the heavy-quark hadronization theoretical understanding.
An hybrid coalescence plus fragmentation approach has been able to correctly predict the large baryon over meson ratio $\Lambda_c/D^0 \sim O(1)$
observed in both AA collisions at RHIC and LHC [2] as well as in pp collisions at 5.02 and 13 TeV. The ratio obtained is, in general, quite larger than the one measured and expected in e^+e^-, ep collisions.
Furthermore, with the same approach, also a quite large $\Xi_c/D^0 \sim 0.15$ and $\Omega_c/D^0 \sim 0.05$ has been predicted in pp collisions at $5.02\ \mathrm{TeV}$, and appears to be in quite good agreement with the early ALICE measurements [3].
Given such successful predictions, we present here a critical assessment of the elements of the hadronization modeling that are mainly driving heavy baryon enhancement, moreover we discuss the extensions of the approach applied in order to supply the prediction for the multi-charmed baryon production, i.e. Ξ_{cc}, Ω_{cc} and Ω_{ccc}, over a wide system size scan from $PbPb$ to $KrKr$, $ArAr$ and OO [4], and the bottomed hadron production in pp and $PbPb$ collisions [5][6]. Furthermore we present a new extension of the same approach for charm and bottom quarkonia in pp collisions, i.e. J/ψ, $\psi(2S)$, $\Upsilon(1S)$ and $\Upsilon(2S)$[7].
We can compare the coalescence prediction with the SHM one and on the other hand we can investigate the impact on the production coming from non-equilibrium features in the heavy quark distribution.
In fact, the model can acquire the heavy quark distribution from a relativistic Boltzmann transport approach or from a Langevin one with a space transport coefficient D_s in agreement with lattice QCD data.

[1] V. Minissale, S. Plumari, Y. Sun and V. Greco, arXiv:2305.03687
[2] S. Plumari, V. Minissale, S.K. Das, G. Coci and V. Greco, Eur.Phys.J. C 78 (2018) no.4, 348
[3] V. Minissale, S. Plumari and V. Greco, Physics Letters B 821 (2021) 136622.
[4] V.Minissale, S.Plumari and V.Greco, Eur.Phys.J.C 84 (2024) 3, 228
[5] M.L.Sambataro, V.Minissale, S.Plumari and V.Greco,Phys.Lett.B 849 (2024) 138480
[6] V.Minissale, V.Greco and S.Plumari, ArXiv:2405.19244
[7] G.Calà,V.Minissale, V.Greco and S.Plumari, in preparation

Category

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