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Coalescence plus fragmentation approach for heavy hadrons production: spectra and ratios in AA and pp collisions

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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.
The Λ_c/D^0 ratio observed in AA collision at RHIC and LHC energies has a value of the order of the unity. Recent experimental measurements in *pp* collisions at both $\sqrt{s} = 5.02\,\mathrm{TeV}$ $\sqrt{s} = 13\,\mathrm{TeV}$ have shown ratios for charm baryons Λ_c, Ξ_c^0 and Ω_c^0 respect to D^0 meson larger than that measured and expected in e^+e^-, ep collisions.
We study the hadronization after the propagation of charm quarks in the quark-gluon plasma (QGP). The propagation is described by means of a relativistic Boltzmann transport approach where the non-perturbative interaction between heavy quarks and light quarks is described by means of a quasi-particle approach.
We present a coalescence plus fragmentation model for the hadronization and the results obtained in AA collisions for D^0, D_s, Λ_c spectra and the related baryon to meson ratios at RHIC and LHC.
We found a large Λ_c production resulting in a baryon over meson ratio of order O(1). We propose the v_2 of charmed baryons as a possible way to have a deeper insight into the hadronization mechanism.
We have furthermore extended this approach to study the production of hadrons containing multiple charm quark, i.e. Ξ_{cc}, Ω_{cc} and Ω_{ccc}, and bottom quarks.
We present, also, results for the charmed hadron production in *pp* collisions at top LHC energies (5 TeV, 13 TeV) assuming the formation of an hot QCD matter at finite temperature for these systems.
We calculate the heavy baryon/meson ratio and the p_T spectra of charmed hadrons with and without strangeness content: D^0, D_s, Λ_c^+, Σ_c and the recently measured Ξ_c baryon, finding an enhancement in comparison with the ratio observed for e^+e^-, ep collisions; moreover with this approach we predict also a significant production of Ω_c respect to D^0 such that $\Omega_c/D^0 \sim 0.15$.

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