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Universal suppression in production of different high-pT hadrons in heavy ion collisions

The recent ALICE data clearly demonstrate the universality of suppression of different high-pT hadrons containing light quarks produced inclusively in heavy ion collisions at Large Hadron Collider (LHC). Moreover, the last ATLAS results on production of prompt charmonia show almost the same attenuation as is observed in production of light hadrons. This fact leads naturally to a conclusion about an absence of a direct interplay between the parton energy loss in the medium and the particle species composition within the quenched jet. For this reason, such the universality cannot be predicted by models based on energy loss scenario and consequently on a long production length since different medium-induced radiation expected especially in production of light and heavy mesons and baryons should lead naturally to a different suppression. Within our non-energy loss interpretation of the jet quenching as a consequence of a short production length we can conclude that the main reason for suppression of high-pT hadrons in heavy ion collisions is controlled by the color transparency attenuation of high-pT dipoles propagating through the hot and dense medium. Using the same single parameter, the maximal value of the transport coefficient, adjusted in our previous studies of high-pT hadron production in the LHC kinematic region, we predict a similar suppression for inclusive high-pT production of pions, kaons, protons and charmonia calculating the nuclear attenuation factor R_{AA} as function of pT and centrality in a good agreement with available LHC data.

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