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R_{AA} of charm quarks at RHIC and LHC

We estimate nuclear modification factor R_{AA} at more forward rapidities of charm quarks/antiquarks produced from the initial fusion of partons in a nuclear collision, taking in to account the shadowing effect for nucleus-nucleus collision as well as the energy loss suffered by them while passing through Quark Gluon Plasma.

Summary

Charm quarks/antiquarks are expected to be produced at the initial fusion of the ultrarelativistic heavy-ion collisions. Just after the production, they will propagate through the quark gluon plasma and will loose energy by colliding with quarks and gluons and radiating gluons.
We have considered DGLV [1], ASW [2] and XDZR [3] formalisms for the calculation of medium-induced radiative energy loss and BT [4], PP [5] and Bjorken [6] formalisms for the calculation of collisional energy loss. The shadowing effect is introduced by using EKS 98 parameterization for structure functions [7].

For charm quark energy loss at Pb+Pb collision @ 5.5A TeV, we see that once p_T is of the order of 10 GeV or more the radiative energy loss dominates over the collisional energy loss. But at Au+Au collision @ 200A GeV, radiative energy loss predicted by ASW formalism dominates over collisional energy loss after p_T=5 GeV or more. R_{AA} is calculated considering PP formalism for collisional energy loss and DGLV and ASW formalisms for radiative energy loss. At forward rapidites R_{AA} of charm quarks/antiquarks shows more suppression at Pb+Pb collision @ 5.5A TeV but less suppression at Au+Au collision @ 200A GeV.
More suppression is observed when going from RHIC energy to LHC energy.

References:
[1] M. Djordjevic and M. Gyulassy, \npa {\bf 733} 265 (2004).
[2] N.Armesto, C. A. Salgado, and U. A. Wiedemann, \prd {\bf 69}, 114003 (2004).
[3] W.C.Xiang, H. T. Ding, D. C. Zhou, and D. Rohrich, \epja {\bf 25}, 75 (2005).
[4] E.Braaten and M.H.Thoma, \prd {\bf 44}, 2625 (1991).
[5] S.Peigne and A.Peshier, \prd {\bf 77}, 114017 (2008).
[6] J.D.Bjorken,FERMILAB-PUB-82/059-THY(1982).
[7] K. J. Eskola, V.J. Kolhinen, and C.A. Salgado, \epjc {\bf 9} 61 (1999).

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