Hot medium effects on J/ψ production in p+Pb collisions at $\sqrt{s_{NN}}$ = 5.02 TeV

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Based on a kinetic description of J/ψ dissociation and production in an expanding quark-gluon plasma that is described by a 2+1-dimensional ideal hydrodynamics, we have studied the hot medium effects on J/ψ production in p+Pb collisions at $\sqrt{s_{NN}}$ = 5.02 TeV [1]. Including also the cold nuclear matter effects, we have been able to reproduce recent experimental results on the J/ψ nuclear modification factor measured by the ALICE Collaboration [2] as shown in Fig. 1. Our results indicate that the suppression of J/ψ production due to screening and thermal dissociation is more important than the contribution due to regeneration from the charm and anticharm quarks in the produced QGP, which leads to a smaller J/ψ nuclear modification factor than in the case of including only the cold nuclear matter effects. We have also found that the canonical enhancement effect due to smaller number of produced charm and anticharm quarks is important for the regeneration contribution since it would be negligible otherwise. We have further made predictions for the J/ψ nuclear modification factor and the ratio of the nuclear modification factor of prompt ψ' to that of J/ψ, and found that the J/ψ nuclear modification factor is slightly smaller than that in the minimum bias collisions, and the ratio is significantly less than one at backward rapidity.

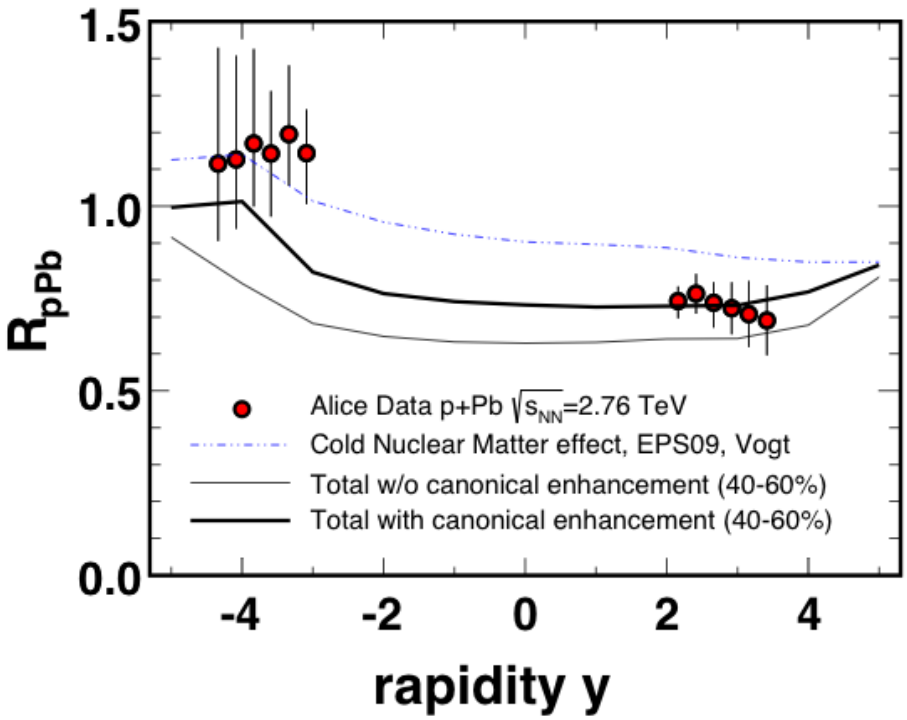

FIG. 1. Nuclear modification factor of J/ψ in the 40-60% centrality bin of p+Pb collisions as a function of rapidity. The (blue) dash-double-dotted line is for results with only cold nuclear matter effects [2]. The (black) thin solid line and (black) thick solid line are the total nuclear modification factor without and with the canonical enhancement, respectively. Experimental data are for minimum bias collisions from the ALICE Collaboration [3].

[1] Y.P. Liu, C.M. Ko, and T. Song, Phys. Lett. B **728**, 437 (2013).
[2] J.L. Albacete *et al.*, Int. J. Mod. Phys. E **22**, 1330007 (2013).
[3] L. Manceau, ALICE Collaboration, Quarkonium measurements in Pb–Pb and *p*–Pb collisions with ALICE at the LHC, 2013.