J/ψ Production and Suppression in Nuclear Collisions

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Abstract

We show that the color evaporation model and NRQCD model for calculating the hadronic J/ψ production correspond to two very different approximations of a newly proved QCD factorization formula for quarkonium production; and these two production models lead to different suppression mechaniums of J/ψ in nuclear medium. Using the new QCD factorization formula for J/ψ production, and including the multiple scattering between the pre-J/ψ partonic states and the nuclear medium, we calculated the J/ψ suppression in nuclear collisions. We find that all observed data on J/ψ suppression in PA and AA collisions, except the five points (the "second drop") at the highest E_T bins of the new NA50 data, are consistent with our calculation.

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