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Quarkonium hadroproduction and photoproduction in quark-gluon plasma and strong electromagnetic fields at RHIC and LHC

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We study the charmonium coherent photoproduction and hadroproduction consistently with modifications from both cold and hot nuclear matters. The strong electromagnetic fields from fast moving nucleus interact with the other target nucleus, producing abundant charmonium in the extremely low transverse momentum region $p_T < 0.1$ GeV/c, based on the process $\gamma + A \rightarrow J/\psi + A$. This results in significant enhancement of J/ψ nuclear modification factor in semi-central and peripheral collisions. In the middle p_T region such as $p_T < 3 \sim 5$ GeV/c, J/ψ final yield is dominated by the combination process of single charm and anti-charm quarks moving in the deconfined matter, $c + \bar{c} \rightarrow J/\psi + g$. In the higher p_T region, J/ψ production are mainly from parton initial hard scatterings at the beginning of nucleus-nucleus collisions and decay of B hadrons. We include all of these production mechanisms and explain well the experimental data from ALICE and STAR in different transverse momentum regions at LHC and RHIC energies.

Content type

Theory

Collaboration

Centralised submission by Collaboration

Presenter name already specified

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