

The Anomalous J/ψ Suppression in Pb-Pb Collisions and the Production of the Quark-Gluon Plasma

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Recent experimental observations of an anomalous suppression of J/ψ production in high-energy Pb-Pb collisions have led to a flurry of activities. Different mechanisms of absorption have been suggested, including the production of the quark-gluon plasma. However, these analyses are highly uncertain because the π - and ρ -induced J/ψ dissociation cross sections are not known reliably and the evolution of a J/ψ produced in a heavy-ion collision depends sensitively on these dissociation cross sections. Recently, these cross sections have been calculated with the Barnes and Swanson Model [1], which has been supported by its successes in the analysis of many low-energy hadron-hadron reaction processes. The model gives a small J/ψ dissociation cross section for π with a high threshold, but a large cross section for ρ with no threshold [2]. We shall report results of the J/ψ survival probability in heavy-ion collisions using these theoretical cross sections in a Monte Carlo simulation in order to provide information on the question of the production of the new phase of matter in high-energy Pb-Pb collisions.

1. T. Barnes and E. S. Swanson, Phys. Rev. D46, 131 (1992).
2. C. Y. Wong, E. S. Swanson, and T. Barnes, hep-ph/99120431 and nucl-th/0002034.

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