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J/ψ enhancement in heavy ion collisions: Statistical and kinetic approach

Content :

At Large Hadron Collider (LHC), collisions of Pb+Pb ions at energies $\sqrt{s_{NN}} = 2.76$ TeV would create strongly interacting matter at very high temperatures, where a phase transition from hadronic phase to quark gluon plasma (QGP) is expected. The J/ψ particles are the richest and most interesting probes of QGP. The SPS data convincingly show that J/ψ is suppressed, while PHENIX data are explained by accounting for both partial suppression and partial enhancement scenarios. At LHC, a large number of $c\bar{c}$ pairs are produced initially which could lead to an important source of final charmonium. This coalescence mechanism may lead to enhancement instead of suppression of J/ψ at LHC.

We discuss the charmonium (J/ψ) enhancement in the nucleus-nucleus collisions within the framework of statistical hadronization and the kinetic formation approach. We compare our results with the J/ψ measured at SPS and RHIC. Also we predict the number of J/ψ which will be measured in the first year of heavy ion run at LHC in Pb+Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV.

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