

Quarkonium production in heavy-ion collisions at RHIC and LHC

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Since late 80's when the relativistic heavy-ion experiments started at AGS and SPS, the quarkonium production has been regarded as one of the golden probes for the deconfined phase transition of the hadronic matter to the quark-gluon plasma (QGP). The heavy quarkonia can be generated in gluon-gluon scatterings at early stage of the collision as the large momentum transfer is required. Later the binding potential between a quark and its antiquark in quarkonium is screened by surrounding light quarks and antiquarks. Thus, the various quarkonium states are expected to be melt at different temperatures depending on their binding energies, which allows us to characterize the QCD phase transition. At collider energies, the suppression of the J/psi yield in Au + Au and other lighter systems were observed by the PHENIX and STAR Collaborations at the Relativistic Heavy Ion Collider (RHIC) at BNL more than a decade ago. More recently, the suppression of the yields for the J/psi and Upsilon families in Pb + Pb collisions was also observed by the ALICE and CMS Collaborations at the Large Hadron Collider (LHC). Although the suppression of the various quarkonium yields in heavy-ion collisions when compared to those in p + p is a general trend, the detailed suppression pattern is different for each particle species, depending on the rapidity, momentum, and collision centrality. In this presentation, we are going to review the quarkonium data at RHIC and LHC, and will discuss possible implications related to the propagation of quarkonia in the deconfined hot, dense matter.

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