

J/ ψ suppression measurements by the PHENIX experiment at RHIC

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Heavy ion collisions provide a unique experimental way to create and characterize the hot and dense matter that lattice QCD predicts to be produced at high energy density and temperature. Products of hard processes, which take place in the early stage of the collision, are highly sensitive probes to the evolution of the created system. Suppression of the quarkonium J/ ψ , which constitutes such a probe, has been measured by the PHENIX experiment at RHIC in AuAu, CuCu, dAu and pp interactions, as a function of impact parameter, rapidity and transverse momentum.

The strong suppression factors observed in central collisions in heavy ion systems suggest that cold nuclear matter effects such as shadowing and nuclear absorption are not the only mechanisms involved. On the other hand, suppression due to color screening effects alone seems to overestimate the suppression measured both at forward rapidity and at mid rapidity. PHENIX also measures a stronger suppression at forward rapidity compared to the one measured at mid rapidity. Regeneration has been suggested as a possible explanation for these observations. Here, models that combine in different ways a regeneration scenario with color screening and cold nuclear effects will be compared to the data. Higher luminosities are expected to bring more information in the future by allowing to perform differential measurements in other variables.

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