

the Distribution of J/ψ under the Influence of Quark-gluon Plasma

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We study the hot-medium effects on charmonium. Previously most work were focused on the medium effects on the gluon propagator of the charmonium, but ignored that on the c quark and \bar{c} anti-quark. However, the hot medium interacts with not only gluons but also quarks. Here we study the hot-medium effects on both c , \bar{c} and the transferred gluon based on two-particle fractal model. We analyze the probability and entropy of the charmonium from quark and charmonium aspects. We solve the probability and entropy equations and obtain the medium influencing factor q_{gQ} and q_Q . The factor q_{gQ} and q_Q reflect medium effects on gluons and heavy quarks and on heavy quarks respectively. It is found q_{gQ} and q_Q are both more than 1. This implies that the hot medium influence both the transferred gluon and heavy quarks. When increasing the temperature q_{gQ} and q_Q are found to deviate more from 1. This illustrates the hot medium influence charmonium more at higher temperature. We calculate the value of q_{gQ} at critical temperature and obtain the transverse momentum spectrum of J/ψ . Our result shows a good agreement with the experimental data. The two-particle fractal model can be used to study other mesons and tetraquark system in the future.

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