

$D_{sJ}(2317)$ meson production at RHIC

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We have studied the production of $D_{sJ}(2317)$ mesons in central Au+Au collisions at RHIC. The initial number of $D_{sJ}(2317)$ mesons produced during hadronization of created quark-gluon plasma is determined by the quark coalescence model, and it depends sensitively on the quark structure of the $D_{sJ}(2317)$ meson. An order-of-magnitude larger yield is obtained for a conventional two-quark than for an exotic four-quark $D_{sJ}(2317)$ meson. Including the absorption and production of $D_{sJ}(2317)$ mesons during the hadronic stage of heavy ion collisions via a kinetic model with cross sections evaluated in a phenomenological hadronic model, we find that the final yield of $D_{sJ}(2317)$ mesons remains sensitive to its initial number produced from the quark-gluon plasma as shown in Fig. 1. Our results thus suggest that relativistic heavy ion collisions provides the possibility of studying both the quark structure of the $D_{sJ}(2317)$ meson and its production mechanism.

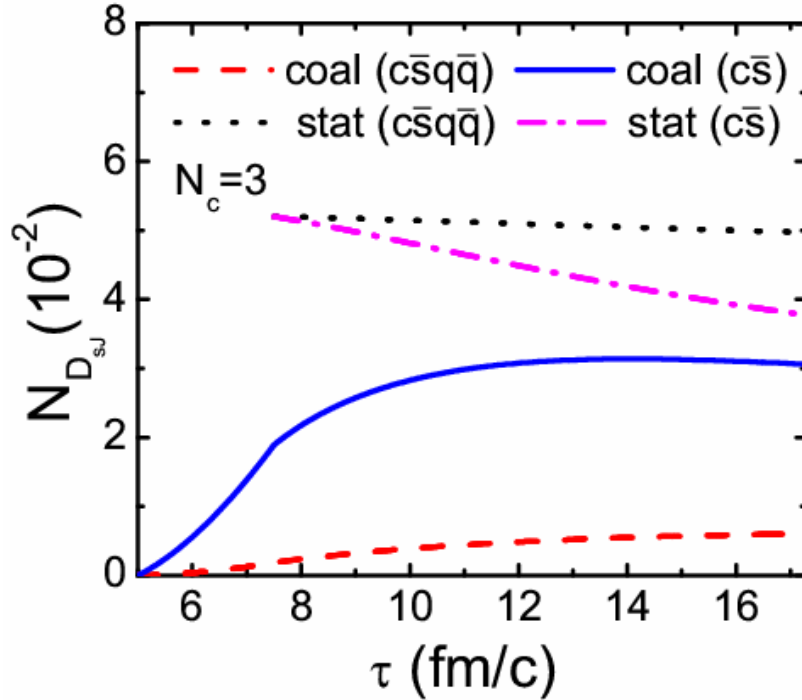


Figure 1. Time evolution of the $D_{sJ}(2317)$ meson abundance in central Au+Au collisions at $s_{NN}^{1/2}=200$ GeV for different initial numbers of $D_{sJ}(2317)$ mesons produced from the quark-gluon plasma.

[1] L. W. Chen, C. M. Ko, W. Liu, and M. Nielsen, nucl-th/07051697.