Hadronic J/ψ absorption processes in a meson exchange model

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Abstract

Knowing the J/ψ absorption cross sections by hadrons is important for estimating the hadronic J/ψ suppression in RHIC. We present improved analyses on the dissociation processes of the J/ψ by π and ρ into $D+\bar{D}$, $D^*+\bar{D}$ $(D+\bar{D}^*)$, and $D^*+\bar{D}^*$ within a D and D^* exchange model. In addition to the dissociation mechanisms discussed in the literature [K. Haglin, Phys. Rev. C **61**, 031902 (2000); Z. Lin and C.M. Ko, *ibid.* **62**, 034903 (2000)], we consider anomalous parity interactions, whose couplings are constrained by heavy quark spin symmetry and phenomenology. This opens new dissociation channels and mechanisms in the absorption processes. Compared to the previous results, we find that these new additions reduce the $\pi + J/\psi$ cross section by about 50 % near the threshold. As a result, we obtain $2 \sim 6$ mb for $\sigma(\pi + J/\psi)$ and $3 \sim 9$ mb for $\sigma(\rho + J/\psi)$ at $\sqrt{s} \leq 5$ GeV. [nucl-th/0010064] The contribution from the axial-vector D_1 meson will be estimated and discussed as well.

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