

Inclusive $\Upsilon(1S) \rightarrow \eta^{(\prime)} + X$ Decays with Account of α_s Running in Effective $\eta^{(\prime)} g^* g$ -Vertex

Friday 31 July 2020 13:48 (3 minutes)

The η' -meson energy spectrum in the inclusive $\Upsilon(1S) \rightarrow \eta' g g g \rightarrow \eta' X$ decay measured by the CLEO Collaboration in 2002 allowed one to constrain the lowest Gegenbauer coefficients B_2^g and B_2^g of the quark-antiquark and gluonic distribution amplitudes of the η' -meson entering the $\eta' g^* g$ effective vertex function (EVF). The fitting procedure of the CLEO data on the hard part of the η' -meson energy spectrum was based on the theoretical expression calculated in the leading-order perturbative QCD in the static-quark limit for the orthoquarkonium. The resulting constraints were combined with the existing ones on these coefficients from an analysis of the $\eta' - \gamma$ transition form factor. The updated measurements of the η' -meson energy spectrum by the CLEO Collaboration in 2006 results a worse consistency with theoretical expectations and require some improvements from a theory. As a first step, we assume the dependence of the strong coupling constant in the $\eta' g^* g$ EVF on the quark energy the η' -meson and repeat the fitting procedure within the improved approach. The corresponding results for the Gegenbauer coefficients are presented. With this values we plot the

QCD-based η -meson energy spectrum in the inclusive $\Upsilon(1S) \rightarrow \eta g g g \rightarrow \eta + X$ decay in the leading-order perturbative QCD in the static-quark limit for the orthoquarkonium. Both the η - and η' -meson energy spectra in the decays considered can be checked by the Belle Collaboration based on the existing and forthcoming data on $\Upsilon(1S)$ -meson.

Secondary track (number)

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Session Classification: Strong Interactions and Hadron Physics - Posters

Track Classification: 06. Strong Interactions and Hadron Physics