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Inclusive production of J/ψ, ψ(2S), and Υ states in pNRQCD

Tuesday, 18 July 2023 15:20 (20 minutes)

Under some assumptions on the hierarchy of relevant energy scales, we compute the nonrelativistic QCD (NRQCD) long-distance matrix elements (LDMEs) for inclusive production of J/ψ, ψ(2S), and Υ states based on the potential NRQCD (pNRQCD) effective field theory. Based on the pNRQCD formalism, we obtain expressions for the LDMEs in terms of the quarkonium wavefunctions at the origin and universal gluonic correlators, which do not depend on the heavy quark flavor or the radial excitation. This greatly reduces the number of nonperturbative unknowns and substantially enhances the predictive power of the nonrelativistic effective field theory formalism. We obtain improved determinations of the LDMEs for J/ψ, ψ(2S), and Υ states thanks to the universality of the gluonic correlators, and obtain phenomenological results for cross sections and polarizations at large transverse momentum that agree well with measurements at the LHC.

Consent

I consent to recording/broadcasting my presentation.

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