Resummation, Evolution, Factorization 2021



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Curing high-energy instability of the NLO heavy-quarkonium hadroproduction cross section with High-Energy Factorization

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The energy dependence of the total hadroproduction cross section for pseudoscalar quarkonia is computed via matching of the NLO Collinear-Factorisation (CF) results with Leading-Logarithmic resummation of higher-order corrections $\propto \alpha_s^n \ln^{n-1}(1/z)$ to the CF hard-scattering coefficient, where $z = M^2/\hat{s}$ with \hat{s} being partonic center-of-mass energy squared. The resummation is performed using High-Energy Factorization(HEF). The resummation cures the collinear over-subtraction problem of the Next-to-Leading Order(NLO) CF calculation, stabilizing the high-energy behaviour of the cross section. Predictions of the NNLO $\alpha_s^2 \ln(1/z)$ term of the CF hard-scattering coefficient are made. The matching is performed directly in z-space for the first time using the Inverse-Error Weighting (InEW) matching.

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