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Quarkonium inclusive production: negative NLO cross sections, scale fixing and high-energy resummation

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We address the issue of negative total cross sections for inclusive hadroproduction of pseudoscalar quarkonia (η_Q) and photoproduction of vector quarkonia (ψ, Υ) at increasing energies in NLO collinear-factorisation computations in the $\overline{MS}$ scheme. We discuss two solutions:

- fixing the factorisation scale to avoid an over-subtraction of the collinear contributions by the Altarelli-Parisi counter terms at large partonic energies;
- resumming $\ln(1/z)$ contributions through high-energy factorisation with a new matching to collinear factorisation at finite z.

In both cases, we discuss the corresponding phenomenology at different energies including a detailed assessment of the theoretical uncertainties.

References:

- J.P. Lansberg, M. Nefedov and M.A. Ozcelik, *Matching next-to-leading-order and high-energy-resummed calculations of heavy-quarkonium-hadroproduction cross sections*, JHEP **05** (2022), 083
- A. Colpani Serri, Y. Feng, C. Flore, J.P. Lansberg, M.A. Ozcelik, H.S. Shao and Y. Yedelkina, *Revisiting NLO QCD corrections to total inclusive J/ψ and Υ photoproduction cross sections in lepton-proton collisions*, [arXiv:2112.05060 [hep-ph]].
- J.P. Lansberg and M.A. Ozcelik, *Curing the unphysical behaviour of NLO quarkonium production at the LHC and its relevance to constrain the gluon PDF at low scales*, Eur. Phys. J. C **81** (2021) no.6, 497 [arXiv:2012.00702 [hep-ph]].

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