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LHC phenomenology with KrkNLO matching

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The systematic combination of perturbative QCD with parton-shower resummation is achieved at NLO by a small, but growing, number of 'NLO matching' methods.

Among them, the KrkNLO method is unique in exploiting a modification of the PDF factorisation scheme, from the conventional $\overline{\rm MS}$ scheme, to a scheme (the 'Krk' scheme) in which the NLO corrections can be applied as a simple multiplicative reweight. This is positive by construction, since it does not use subtraction, and unlike other methods has no dependence on an unphysical choice of shower-scale or suppression factor.

We summarise the KrkNLO method, its recent implementation for general colour-singlet processes in Herwig 7, and present results for LHC processes involving the production of massive and massless vector bosons. We will summarise the results of a systematic comparison with MC@NLO, and also review the properties of the Krk scheme among other factorisation schemes proposed as alternatives to $\overline{\rm MS}$, including their positivity.

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