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Monte Carlo modelling of NLO DGLAP QCD Evolution in the fully unintegrated form

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We would like to present recent work, which is going to change three-decades old paradigm of perturbative QCD calculations, in which hard process matrix element calculated to LO+NLO(+NNLO) level is combined with: either the collinear PDF at LO+NLO(+NNLO) or with the Monte Carlo parton shower, but the MC PS restricted to LO only! For many years upgrading Monte Carlo parton shower to NLO level was regarded as unfeasible in practice or in principle, or both. In a series of the recent works we demonstrate that for NLO non-siglet subset of diagrams we are able to implement in the Monte Carlo PS the exact DGLAP evolution, without any approximation. This seminal work, after extending to complete NLO DGLAP, will lead to a new class of powerful techniques of combining resummed and finite order pQCD calculations in a form of Monte Carlo event generators for W/Z production at hadron collider experiments.

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