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Towards a NNLO QCD+NLO EW Monte Carlo event generator for Drell-Yan production

Precision measurements of Standard Model parameters like the W-boson mass and the weak mixing angle rely on high-precision Monte Carlo (MC) tools to generate event samples for Drell-Yan production that should accurately describe cross-sections, decay product kinematics, and the W/Z transverse momentum (pT) spectrum.

The current frontier in MC generators for Drell-Yan is NNLO QCD with Parton Shower (PS) matching. However, electroweak (EW) corrections are only available in NLO EW+NLO QCD+PS tools, which are limited to LO+PS accuracy when describing the W/Z pT spectrum.

Our goal is to develop a MC generator at NNLO QCD+NLO EW+PS accuracy for the cross-section and NLO QCD+NLO EW+PS accuracy for differential observables like the W/Z boson pT. In this contribution, we take the first steps towards this goal by extending the MiNNLO method (basis for NNLO+PS generators in the POWHEG framework) to the case of QED corrections.

Primary authors: BELLONI, Filippo (INFN sezione di Pavia); CHIESA, Mauro (INFN Pavia)

Presenter: BELLONI, Filippo (INFN sezione di Pavia)

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