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Jet production at high precision using the CoLoRFuNNLO method

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We compute cross section for the production of three jets in electron-positron annihilation at next-to-next-to-leading order (NNLO) accuracy. We use a general subtraction scheme developed for computing QCD jet cross sections in perturbation theory. This method is implemented in the Monte Carlo for the CoLoRFuNNLO Subtraction Method (MCCSM) program that provides a general framework for computing QCD jet cross sections at NNLO accuracy, requiring only the implementation of the necessary squared matrix elements. We demonstrate the good numerical convergence of the MCCSM program by providing stable predictions over the whole kinematic range including small values of the jet resolution variable. We provide high-precision perturbative predictions for jet rates by matching the predictions at NNLO accuracy with cross sections obtained by resumming the leading and next-to-leading logarithms at all orders in perturbation theory for jets defined by the exclusive and inclusive Durham clustering algorithms. We also discuss the status of extending the method to jet hadroproduction.

Experimental Collaboration

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