

WINHAC - the Monte Carlo event generator for single W-boson production in hadronic collisions

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The charged-current Drell-Yan process, i.e. single W-boson production with leptonic decays in hadronic collisions, will play an important role in the experimental programme at the LHC. It will be used for improved measurements of some Standard Model parameters (such as the W-boson mass and widths, etc.), for better determination of the Higgs-boson mass limits, in “new physics” searches, as a “standard candle” process, etc. In order to achieve all these goals, precise theoretical predictions for this process in terms of a Monte Carlo event generator are indispensable. In this talk the Monte Carlo event generator WINHAC for the charged-current Drell-Yan process will be presented. It features higher-order QED corrections within the exclusive Yennie-Frautschi-Suura exponentiation scheme with the 1st order electroweak corrections. It is interfaced with PYTHIA for QCD/QED initial-state parton shower as well as hadronization. It includes options for proton-proton, proton-antiproton and nucleus-nucleus collisions. Moreover, it allows for longitudinally and transversely polarized W-boson production. It has been cross-checked numerically to high precision against independent programs/calculations. Some numerical results from WINHAC will also be presented. Finally, interplay between QCD and electroweak effects will briefly be discussed.

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