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Fast computation of NLO electroweakino cross-sections

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Phenomenological studies of SUSY models typically imply the sampling of multidimensional parameter spaces. Each parameter point needs to be checked against the available theoretical and experimental limits from indirect and direct SUSY searches. The constraints from direct electroweakino searches are particularly challenging due to the computational resources needed to calculate their production cross section using the currently available tools. We address this issue and present a novel computer program (EWKFast) to compute electroweakino cross-sections at hadron colliders, at NLO-QCD, which has been optimized for speed. Our approach is based on the observation that the cross-section can be written as a sum of terms, each of which can be factorized in a coefficient, which depends on the electroweakino mixing-angles times a kinematical function which solely depends on their masses. The latter needs to be evaluate numerically, which is time consuming. In our approach the values of the kinematical functions are interpolated from pre-calculated grids. As an example of application, we will present the recasting of a few LHC electroweakinos searches.

Content of the contribution

Theory

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