

Transverse-momentum resummation for gaugino-pair production at hadron colliders

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We present a first precision analysis of the transverse-momentum spectrum of gaugino pairs produced at the Tevatron and the LHC with center-of-mass energies of 1.96 and 10 or 14 TeV, respectively. Our calculation is based on a universal resummation formalism at NLL order, which is consistently matched to the perturbative prediction at $O(\alpha_s)$. Numerical results are given for the “gold-plated” associated production of neutralinos and charginos decaying into three leptons with missing transverse energy as well as for the pair production of neutralinos and charginos at two typical benchmark points in the constrained MSSM. We show that the matched resummation results differ considerably from the Monte Carlo predictions employed traditionally in experimental analyses and discuss the impact on the determination of SUSY mass parameters from missing transverse mass spectra. We also investigate in detail the theoretical uncertainties coming from scale variations, parton-density functions, and non-perturbative effects.

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