

Precise Predictions for Higgs Production in Neutralino Decays

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Complete one-loop results are presented for the class of processes $\tilde{\chi}0_i \rightarrow \tilde{\chi}0_j h_a$ in the MSSM with CP-violating phases beyond the lowest order. We combine the genuine vertex contributions with two-loop Higgs propagator-type corrections, thus obtaining the currently most precise prediction for this class of processes. The numerical impact of the genuine vertex corrections is studied in several examples of CP-conserving and CP-violating scenarios. The corrections to the decay width can be particularly large in the CP-violating CPX benchmark scenario, where a very light Higgs boson is unexcluded by present data. We find that in this parameter region, which will be difficult to cover by standard Higgs search channels at the LHC, the branching ratio for the decay $\tilde{\chi}0_2 \rightarrow \tilde{\chi}0_1 h_1$ is large. This may offer good prospects to detect such a light Higgs boson in cascade decays of supersymmetric particles.

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