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Light NMSSM Higgs bosons in SUSY cascades

The next-to-minimal supersymmetric SM (NMSSM) admits light Higgs bosons (MH < MZ) without being in conflict with current experimental bounds. Due to a large singlet component, their direct production in standard channels at the Large Hadron Collider (LHC) is suppressed. We demonstrate that there are good prospects for observing such a light Higgs boson in decays of heavy neutralinos and charginos. We consider an example scenario with 20 GeV < MH < MZ. Performing a Monte Carlo analysis at the level of fast detector simulation, it is demonstrated how the Higgs signal can be separated from the main backgrounds. The resulting b⁻b mass spectrum could provide an opportunity for light Higgs boson discovery already with 5 fb–1 of LHC data at 7 TeV.

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