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## Nonstandard Higgs Decays and Dark Matter in the E6SSM

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We study the decays of the lightest Higgs boson within the exceptional supersymmetric (SUSY) standard model (E6SSM). The E6SSM is based on the SM gauge group together with an extra  $U(1)_N$  gauge symmetry under which right-handed neutrinos have zero charge. The low energy matter content of the E6SSM involves three 27 representations of  $E_6$  and a pair of  $SU(2)$  doublets from additional 27 and  $\bar{27}$ . Thus E6SSM predicts three families of Higgs-like doublets plus three SM singlets that carry  $U(1)_N$  charges. One family of Higgs-like doublets and one SM singlet develop vacuum expectation values. The fermionic partners of other Higgs-like fields and SM singlets form Inert neutralino and chargino states. Two lightest Inert neutralinos tend to be the lightest and next-to-lightest SUSY particles (LSP and NLSP). The considered model can account for the dark matter relic abundance if the lightest Inert neutralino has mass close to half the Z mass. In this case the usual SM-like Higgs boson decays more than 95% of the time into either LSPs or NLSPs. As a result the decays of the lightest Higgs boson into  $l^+ l^- + X$  might play an essential role in the Higgs searches. This scenario also predicts other light Inert chargino and neutralino states below 200 GeV, and large LSP direct detection cross-sections which is on the edge of observability of XENON100.

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