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Searching for Singlino-Higgsino Dark Matter in the NMSSM

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We study a simplified scenario in the next-to-minimal supersymmetric standard model with a split electroweak spectrum, in which only the singlino and higgsinos are light and other superpartners are decoupled. Serving as a dark matter candidate, a singlino-dominated neutralino $\tilde{\chi}_1^0$ should have either resonant annihilation effects or sizable higgsino components to satisfy the observed relic abundance. The sensitivities of LHC searches and dark matter detection experiments are investigated. With an integrated luminosity of 30 (300) fb^{-1} , $3l + E_T$ and $2l + E_T$ searches at the 13(14) TeV LHC are expected to reach up to $m_{\tilde{\chi}_1^0} \sim 150$ (270) GeV and $m_{\tilde{\chi}_2^0, \tilde{\chi}_1^\pm} \sim 320$ (500) GeV. Near future dark matter direct and indirect detection experiments are promising to cover the parameter regions where collider searches lose their sensitivities.

Summary

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