

Constraining the R-symmetric chargino NLSP with the LHC and a 125 GeV Higgs

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Tuesday

November 14

4:00 P.M.

Rm 415 NSH

A popular class of extensions of the minimal supersymmetric standard model is based on Dirac gauginos and R-symmetries. Apart from many phenomenological consequences this framework includes a reduction of the fine-tuning, a welcomed feature in light of the absence of gluinos and squarks, whose LHC mass limits sit nowadays sit around 1.9 and 1.5 TeV. Also, these models display a lightest-supersymmetric particle (LSP) which is not necessarily a neutralino, and a next-to-LSP which can be long-lived. Yet, these setups must be able to reproduce the 125 GeV Higgs mass to survive. I analyze an R-symmetric Dirac gaugino scenario where the LSP and the next-to-LSP are the gravitino and a Higgsino-like chargino. After demanding a 125 GeV Higgs, I constrain the chargino and gravitino masses by applying LHC-13 limits from opposite-sign dilepton plus MET, from opposite-sign dilepton plus 2-jet plus MET, and from searches of charged long-lived particles.