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Boosting Electroweakino Searches at the LHC in Baryon Number Violating MSSM using Machine Learning

Data from LHC Run-I and Run-II have placed strong constraints on the electroweakino masses in R-parity conserved supersymmetric scenarios. However, in R-parity violating (RPV) scenarios, these constraints can vary depending on the specific RPV decay modes of the lightest supersymmetric particles (LSP). In this work, we explore the potential implications of the baryon-number-violating $\lambda''_{ijk} U^c_i D^c_j D^c_k$ RPV coupling, that allows the LSP to decay into three quarks, on the chargino-neutralino pair production processes at the High Luminosity LHC ($\sqrt{s} = 14$ TeV, $\mathcal{L} = 3000$ fb^{-1}). We employ Machine Learning techniques to enhance the sensitivity of the search.

Field of contribution

Phenomenology

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Track Classification: Beyond the standard model