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An MCMC analysis to probe the trilinear R-parity violating supersymmetric models with neutrino oscillation and other data

We investigate a well-motivated Trilinear Lepton Number Violating Supersymmetric model with both LLE and LQD couplings to account for neutrino oscillation data. Our analysis includes neutrino mass splittings, mixing angles from oscillation data, and additional experimental constraints such as the Higgs mass, coupling modifiers, and low-energy flavor-violating observables. To achieve a good fit, we conduct a chi-square-based likelihood analysis using Markov Chain Monte Carlo (MCMC). We explore scenarios with different lightest supersymmetric particles (LSPs), specifically bino-LSP and stop-LSP, to constrain the model's viable parameter space. Finally, we evaluate the capability of the High-Luminosity LHC (HL-LHC) to probe these parameter regions.

Field of contribution

Phenomenology

Author: Ms MONDAL, ARPITA (Indian Institute of Technology Patna)

Co-authors: CHOUDHURY, Arghya (Indian Institute of Technology, Patna); MITRA, Sourav (Surendranath

 $College); \ \ MONDAL, Subhadeep \ (Department \ of \ Physics, \ Bennett \ University)$

Presenter: Ms MONDAL, ARPITA (Indian Institute of Technology Patna)

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