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Neutrino Phenomenology with Two-Zero Textures in Left-Right Asymmetric Model: $0\nu\beta\beta$, LFV, and Resonant Leptogenesis

In this work, we investigate the two-zero textures of the light neutrino mass matrix within the framework of a Left-Right Asymmetric model. The model is constructed using the modular group Γ_3 , which is isomorphic to the A_4 discrete group, and the light neutrino masses are generated via an extended seesaw mechanism by introducing an additional sterile fermion. After assigning the appropriate A_4 charges to the particle content, we identify five classes of two-zero textures. We perform a comprehensive analysis of the phenomenological consequences of these textures. We explore the implications for neutrinoless double beta decay, lepton flavor violation (LFV) processes. Furthermore, we analyze the potential for resonant leptogenesis in each texture class. A detailed comparison between the different two-zero texture classes is conducted, considering their predictions for neutrino oscillation parameters, LFV observables, and baryogenesis. The results are discussed in light of current experimental data, providing insight into the viability of each texture within this extended seesaw framework.

Field of contribution

Phenomenology

Author: KUMAR, Bhabana (Tezpur University)

Co-author: Prof. DAS, Mrinal Kumar (Tezpur University)

Presenter: KUMAR, Bhabana (Tezpur University)

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