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Exploring Neutrinoless Double Beta Decay in the 3+3 Model

Sterile neutrinos, non-interacting fermion singlets, are crucial in BSM physics, addressing oscillation anomalies and facilitating neutrino mass generation via type-I seesaw mechanism. We investigate a model extending the SM with 3 sterile neutrino states, employing a specific (6×6) unitary mixing matrix. Analytically deriving the masses of added sterile states using the exact seesaw relation, we study their impact on $lvertm_{ee}$

rvert, relevant to neutrinoless double beta decay $(0\nu\beta\beta)$ searches. Exploring the parameter space of $lvertm_{ee}$

rvert with consideration of the present and future sensitivity of $0\nu\beta\beta$ decay searches, we incorporate constraints from charged lepton flavor violation (cLFV) and non-unitarity effects, including additional CP-violating phases and active-sterile mixing angles. Our analysis also assesses the branching ratio of $\mu \rightarrow e\gamma$, a key cLFV process, within this framework.

Field of contribution

Phenomenology

Authors: DAS, Debashree Priyadarsini (NIT Rourkela); Dr MISHRA, Sasmita (NIT Rourkela)

Presenter: DAS, Debashree Priyadarsini (NIT Rourkela)

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