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Exploring the Neutrino Sector of the Minimal Left-Right Symmetric Model

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We explore the neutrino sector of the minimal left-right symmetric model, with the additional charge conjugation discrete symmetry, in the novel regime where type-I and type-II seesaw mechanisms are equally responsible for the light neutrino masses, which can result in large active-sterile mixing. We show that unless the charged lepton mixing matrix is the identity and the right handed neutrino mass matrix has no phases, we expect sizable lepton flavor violation and electron dipole moment in this region. We use recent results from neutrino oscillation fits, bounds on neutrinoless double beta decay, $\mu \to e\gamma$, $\mu \to 3e$, $\mu \to e$ conversion in nuclei, the muon anomalous magnetic moment, the electron electric dipole moment, the CDF II determination of W boson mass and cosmology to determine the viability of this region.

We derive stringent limits on the heavy neutrino masses and mixing angles as well as on the vacuum expectation value v_L, which drives the type-II seesaw contribution, using the current data. We discuss the perspectives of probing the remaining parameter space by future experiments.

Authors: Prof. FONG, Chee (UFABC); FIGUEIREDO SEVERIANO ALVES, Gustavo (University Of Sao Paulo); Mr LEAL, Luighi (University Of Sao Paulo); Prof. FUNCHAL, Renata (University Of Sao Paulo)

Presenter: FIGUEIREDO SEVERIANO ALVES, Gustavo (University Of Sao Paulo)

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