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Renormalization Group Evolution of Neutrino Mixing Angles & Masses

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Neutrinos are fundamental yet ill-understood particles in the standard model. The fact that they oscillate among each other is an indication towards non-zero masses of neutrinos. This highlights the limitations of the Standard Model of particle physics, which predicts massless neutrinos. Recent measurements of non-zero reactor angle has also opened up an opportunity for a wide variety of models and ansatz which try to explain neutrino masses'and angles'hierarchy. One key hypothesis is High Scale Mixing Unification (HSMU) hypothesis which tries to do the same by unifying mixing angles of quarks and leptons at GUT energy scale. In this work, the validity of HSMU predictions is verified with the recent experimental bounds, as the measurements in recent years have highly increased in their precision. Furthermore, we also check an ansatz which demands less stringent requirements than HSMU, called Wolfenstein ansatz. It hypothesizes that the Wolfenstein parameterization structure in quarks'mixing matrix is duplicated in leptons'mixing matrix. We find that the current measured values of neutrino oscillation parameters discards the possibility of HSMU even with the added modifications.

Session

Neutrino Physics

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