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Predictions from High Scale Mixing Unification Hypothesis

Starting with 'High Scale Mixing Unification' hypothesis, we investigate the renormalization group evolution of mixing parameters and masses for both Dirac and Majorana type neutrinos. Following this hypothesis, the PMNS mixing parameters are taken to be identical to the CKM ones at a unifying high scale. Then, they are evolved to a low scale using MSSM renormalization-group equations. For both type of neutrinos, the renormalization group evolution "naturally" results in a non-zero and small value of leptonic mixing angle $\theta 13$. One
of the important predictions of this analysis is that, in both cases, the mixing angle $\theta 23$ is non-maximal and lies only in the second octant. We also elaborate on the important differences between Dirac and Majorana neutrinos within our framework and how to experimentally distinguish between the two scenarios. Furthermore, for both cases, we also derive constraints on the allowed parameter range for the SUSY breaking and unification scales, for which this hypothesis works. The results are novel and can be tested by present and future experiments.

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