

Understanding θ_{13} from μ - τ symmetry

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Abstract content

Current neutrino oscillation data strongly suggest that, in the lepton flavor basis, there exist a μ - τ exchange invariance on neutrino mass matrix. Such a symmetry gives a simple explanation of the observable values of atmospheric mixing angle, which seems maximal, and the smallness (null value) of θ_{13} angle in the PMNS mixing matrix. The most general breaking of μ - τ symmetry is parameterized by a sole couple of mass parameters, which encode all possible physical sources. This provides a framework where existing neutrino data is found to constrain the possible values for θ_{13} , strongly depending on neutrino mass hierarchy. Largest allowed values for θ_{13} , reachable by future experiments, are possible only for given cases, thus, pinpointing particular configurations of neutrino mass spectrum, aside of locating the predicted atmospheric angle a sigma deviation away from its current central value.

Summary

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