

Precision neutrino data confronts $\mu \leftrightarrow \tau$ symmetry

The neutrino mixing angles are predicted to be $\theta_{23} = -\pi/4$ and $\theta_{13} = 0$ if the neutrino mass matrix has $\mu \leftrightarrow \tau$ exchange symmetry. We need to break this symmetry to obtain a match with experimental measurements. This breaking is given by two parameters: ε_1 and ε_2 . We show that the magnitude of θ_{13} is controlled by ε_1 whereas the deviation of θ_{23} from maximality is controlled by ε_2 . The measured value of θ_{13} requires $\mu \leftrightarrow \tau$ symmetry to be badly broken for both normal hierarchy and inverted hierarchy, though the level of breaking depends sensitively on the hierarchy. We also find that the precision oscillation data constrains all elements of neutrino mass matrix to be in very narrow ranges. In the case of inverted hierarchy, we find that $\mu \leftrightarrow -\tau$ exchange symmetry provides an explanation of neutrino mixing angles with some fine-tuning.

Session and Location

Wednesday Session, Poster Wall #146 (Hölderlin-Room)

Poster included in proceedings:

yes

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