

# The magic of four zero neutrino Yukawa textures

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Within the type-I seesaw framework with three heavy right chiral neutrinos and in the basis where the latter and the charged leptons are mass diagonal, we investigate the effects of mu-tau symmetry as well as tribimaximal mixing on the maximally allowed four zero neutrino Yukawa textures which had already led to a predictive and highly constrained theoretical scheme. A drastic reduction of the seventy two allowed textures is found, leaving only two allowed forms of the light neutrino mass matrix, one of which is on the margin of being ruled out by the present neutrino oscillation data. The other remains a viable candidate for the actual light neutrino mass matrix chosen by nature and will be crucially tested by future measurements of  $\theta_{13}$ . Implications for leptogenesis and radiative lepton flavor violating decays are also discussed. The stability of these conclusions under running from a high scale, where those symmetries are imposed, to the weak scale is also demonstrated.

## Summary

Mu-tau symmetry is found to reduce the seventy two allowed four zero neutrino Yukawa textures in the standard weak basis to only four. These lead to just two different forms of the light neutrino mass matrix, each being characterized by two real constants and one phase which are highly constrained. Further, a required tribimaximal mixing reduces these three constants to just one with a nearly fixed value. Interesting consequences for both flavored and unflavored leptogenesis as well as radiative lepton flavor violating decays are pointed out. These conclusions are found to be stable under RG running from a high to the weak scale.

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