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A scotogenic model for realistic neutrino mixing with S_3 symmetry

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In this model, realistic neutrino mixing is obtained radiatively using $S_3 \times Z_2$ symmetry at one-loop level. The two right-handed neutrinos present in the model when maximally mixed can yield the structure of the left-handed Majorana neutrino mass matrix corresponding to $\theta_{13} = 0$, $\theta_{23} = \pi/4$ and any value of θ_{12}^0 specific to the Tribimaximal (TBM), Bimaximal (BM) and Golden Ratio (GR) or some other mixings.

Non-zero θ_{13} , deviation of θ_{23} from $\pi/4$ and small corrections to the solar mixing angle θ_{12} can be achieved in a single stroke by shifting from this maximal mixing in the right-handed neutrino sector by a small amount.

In this scotogenic model where non-zero θ_{13} was obtained by deviating from maximal mixing in the right-handed neutrino sector, two Z_2 odd inert $SU(2)_L$ doublet scalars were also present, the lightest of which can be a dark matter candidate.

Summary

In this model, realistic neutrino mixing is obtained radiatively using $S_3 \times Z_2$ symmetry at one-loop level. The two right-handed neutrinos present in the model when maximally mixed can yield the structure of the left-handed Majorana neutrino mass matrix corresponding to $\theta_{13} = 0$, $\theta_{23} = \pi/4$ and any value of θ_{12}^0 specific to the Tribimaximal (TBM), Bimaximal (BM) and Golden Ratio (GR) or some other mixings.

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