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Realistic neutrino mixing in a scotogenic model using S_3 symmetry

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[This talk will be on Phys.Rev. D100 (2019) no.3, 035009 by Soumita Pramanick]

Using $S_3 \times Z_2$ symmetry a scotogenic model for realistic neutrino mixing at one-loop level will be discussed. In this model, there are two right-handed neutrinos. It was found when these two right-handed neutrinos are mixed maximally one can obtain the form of the left-handed Majorana neutrino mass matrix with $\theta_{13} = 0$, $\theta_{23} = \pi/4$ and the solar mixing θ_{12} can have any value like that of Tribimaximal (TBM), Bimaximal (BM) and Golden Ratio (GR) or any other mixing scenario.

A little shift from the maximal mixing between the two right-handed neutrino states can yield the realistic neutrino mixing angles i.e., non-zero θ_{13} , deviation of θ_{23} from $\pi/4$ and small corrections to θ_{12} .

Thus this scotogenic mechanism at one-loop level produces non-zero θ_{13} by shifting from maximal mixing between the two-right handed neutrinos. The model also has two inert $SU(2)_L$ doublet scalars odd under Z_2 , the lightest among which can become a dark matter.

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