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{Explaining TM2 mixing pattern in a scoto-seesaw framework

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We propose a scoto-seesaw framework in an A_4 flavor symmetric framework which can explain the TM2 mixing pattern. In this set up, we explain tri-bimaximal mixing (TBM) pattern in a type I seesaw mechanism with two right-handed neutrinos. As TBM pattern cannot explain non-zero reactor mixing angle, we introduce a scotogenic contribution with one fermion which combining with seesaw mechanism successfully explain the observed value of the non-zero reactor angle. The scotogegic part acts as a deviation from TBM pattern to explain the correct neutrino oscillation data and provide suitable candidate for dark matter. Our model can distinguish between normal and inverted ordering of neutrino masses for some specific values of some model parameters. Due to the flavor symmetric construction, lepton flavor violating decay of $\mu \to e\gamma$ vanishes in the scotogenic contribution and sets some lower limit on the type I seesaw right-handed neutrinos. We have also predicted the effective mass parameter appearing in neutrinoless double beta decay which can be tested in the future experiments.

Session

Neutrino Physics

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