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# Phenomenology of an asymmetric Scotogenic model

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In this study, we propose a new version of the Scotogenic model, it is an economically appealing theoretical framework which addresses two problems of particle physics, neutrino mass generation and dark matter. The Scotogenic model generates neutrino mass via a 1-loop Feynman diagram by extending the standard model by the $Z_2$ discrete symmetry.
In our model, we extend the standard model by $Z_4$, it preserves the divergence cancellation of the loop induced neutrino mass generation, not requiring symmetry between the right and left side of the loop. To constrain our model, we investigate lepton flavour violation of our model through $l_\alpha \rightarrow l_\beta + \gamma$ radiative decay. We also take into account results from neutrino oscillation experiments using the Casas-Ibarra parametrization. Additionally, we have also considered dark matter phenomenology, where our Majorana fermion dark matter candidate is able to avoid latest LUX-ZEPLIN direct detection constraints and can reproduce the correct dark matter relic density via the lepton portal as well as for the Higgs portal. We show a viable parameter space of our model which satisfies all the constraints mentioned.

## Designation

Student

## Reference publication/preprint

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