

XXV DAE-BRNS High Energy Physics Symposium 2022



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Phenomenology of an asymmetric Scotogenic model

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The discovery of neutrino oscillations i.e. the discovery of neutrino mass, and progress of other experimental observations motivate us to develop models that can address multiple beyond Standard model issues that can be tested using present and future experiments. One such economic model is Ma's Scotogenic model, which generates Majorana neutrino mass at the 1-loop level and includes a dark matter candidate. We present a new variation of the Scotogenic model, which has an asymmetric loop contributing to neutrino masses unlike in the other variations of the Scotogenic model. Our Z_4 symmetric Scotogenic model preserves divergence cancellation of the original Z_2 model but generalizes the structure of the Feynman diagrams, not requiring symmetry between the right and left side of the Feynman loop. To generate a non-vanishing contribution to neutrino mass we break Z_4 symmetry going to Z_2 symmetry via a new singlet $SU(2)$ scalar taking a VEV. We further discuss lepton flavour violation, dark matter freeze out and other phenomenology applying the latest experimental results to constrain our model and provide a viable parameter space for our model.

Session

Astroparticle Physics and Cosmology

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