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Radiative neutrino masses and dark matter

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The Standard Model, despite its tremendous theoretical and experimental success, is known to lack explanation for several physical realities, namely gravity, dark energy, dark matter, and the neutrino masses. Of these, the last two are arguably related to the electroweak sector.

Neutrino masses can be generated by different realizations of the Weinberg operator. In particular, radiative seesaw models, in which the Weinberg operator is realized with loops, have long been known as a viable solution. More recently radiative seesaw models have gained popularity in models connecting neutrino masses with dark matter, and several minimal models have appeared that address both issues simultaneously, which have proven to be an interesting theoretical possibility with a rich phenomenology.

In this work we investigate the phenomenology of a variation of the scotogenic inverse seesaw model in which neutrino masses are generated through a one-loop radiative seesaw mechanism and which contains fermionic and scalar dark matter candidates. We find that the model is phenomenologically viable in the light of current dark matter and lepton flavor violation constraints.

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