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# Multipartite dark matter in a leptophilic gauge theory

The classical conservation of the lepton number is an accidental symmetry present in the Standard Model (SM). Thus, we consider here a scenario where the SM is extended with a  $U(1)$  gauge group, promoting the lepton number to a local symmetry. The gauge anomaly cancellations necessitate the extension of the particle spectrum with several beyond the SM (BSM) particle fields. The extended lepton gauge group breaks around the TeV scale via spontaneous symmetry breaking, and a  $Z_2$  symmetry remains, which ensures the stability of the light  $Z_2$  odd BSM particles. Interestingly, the particle spectrum of the model has two distinct dark sectors, with one having a Dirac-type DM and the other one containing a Majorana-type DM, thus resulting in a multipartite dark matter scenario. We have explored the available parameter space consistent with the observed dark matter relic density and direct detection measurements for both of the DM particles. Having a Majorana dark matter, we have also studied for the gamma line signatures to constrain the parameter space from the indirect dark matter detection experiments like FermiLAT and CTA.

## Field of contribution

Phenomenology

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