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# Chiral Dark Matter and radiative neutrino mass generation from gauged □(□) symmetry

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We propose a class of dark matter models based on a chiral U(1) gauge symmetry acting on a dark sector. The chiral U(1) protects the masses of the dark sector fermions, and also guarantees the stability of the dark matter particle by virtue of an unbroken discrete Z_N gauge symmetry. We identify 38 such U(1) models which are descendants of a chiral SU(3)×SU(2) gauge symmetry, consisting of a minimal set of fermions with simple U(1) charge assignments. We show how these models can also be utilized to generate small Majorana neutrino masses radiatively via the scotogenic mechanism with the dark sector particles circulating inside loop diagrams. We further explore the phenomenology of the simplest model in this class, which admits a Majorana fermion, Dirac fermion or a scalar field to be the dark matter candidate, and show the consistency of various scenarios with constraints from relic density and direct detection experiments.

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