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Sterile neutrino portal to Dark Matter

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We analyze a simple extension of the Standard Model (SM) with a dark sector composed of a scalar and a fermion, both singlets under the SM gauge group but charged under a dark sector symmetry group, G_{DM} . The lightest of them is stable. Sterile neutrinos, which are singlets under both groups, mediate the interactions between the dark sector and the SM particles, and generate masses for the active neutrinos via the seesaw mechanism. We explore the parameter space region where the observed dark matter relic abundance is determined by the annihilation into sterile neutrinos, both for fermion and scalar dark matter particles. We also study the constraints from direct dark matter searches and the prospects for indirect detection.

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