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Pseudo-Nambu-Goldstone dark matter: Examples of vanishing direct detection cross section

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Content :

We consider cases where the dark matter-nucleon interaction is naturally suppressed. We explicitly show that extending the standard model scalar sector by a number of singlets can lead to a vanishing direct detection cross section, if some softly broken symmetries are imposed in the dark sector. In particular, it is shown that if said symmetries are SU(2) [SU(N)] or U(1)×SN, then the resulting Pseudo-Nambu-Goldstone bosons can constitute the dark matter of the Universe while naturally explaining the missing signal in nuclear recoil experiments.

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