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Erratum

Erratum to: Dark matter direct detection of a fermionic singlet at one loop

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Abstract This erratum corrects Fig. 3a in [1] and clarifies the enhanced direct detection rate of the Dirac dark matter scenario with a vector-like fermion.

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The complex phase of the Yukawa coupling y_A has been erroneously set to zero in the code for Fig. 3a in [1]. The corrected figure is shown in Fig. 1. The Wilson coefficients c_1^N change sign at about $m_\psi \simeq 225$ GeV and $c_{4,5,6}^N$ at $m_\psi \simeq 425$ GeV. In the Majorana dark matter (DM) case, all the Wilson coefficients are in the range 10^{-5}–10^{-4}, except in the region of DM mass when a Wilson coefficient changes sign. No other results have been affected by this error.

We further want to clarify that the large enhancement of the differential rate for Dirac DM with a vector-like fermion in Fig. 4a in [1] is mainly due to the electric dipole moment d_ψ. The contribution from the magnetic dipole moment μ_ψ is large but subdominant, because the relevant non-relativistic operator $\mathcal{O}_5^N$ is suppressed by $\vec{v}_\perp$ compared to $\mathcal{O}_{11}^N$. The different spectral shapes in Fig. 4b in [1] are due to the absence of dipole moments for Majorana DM.

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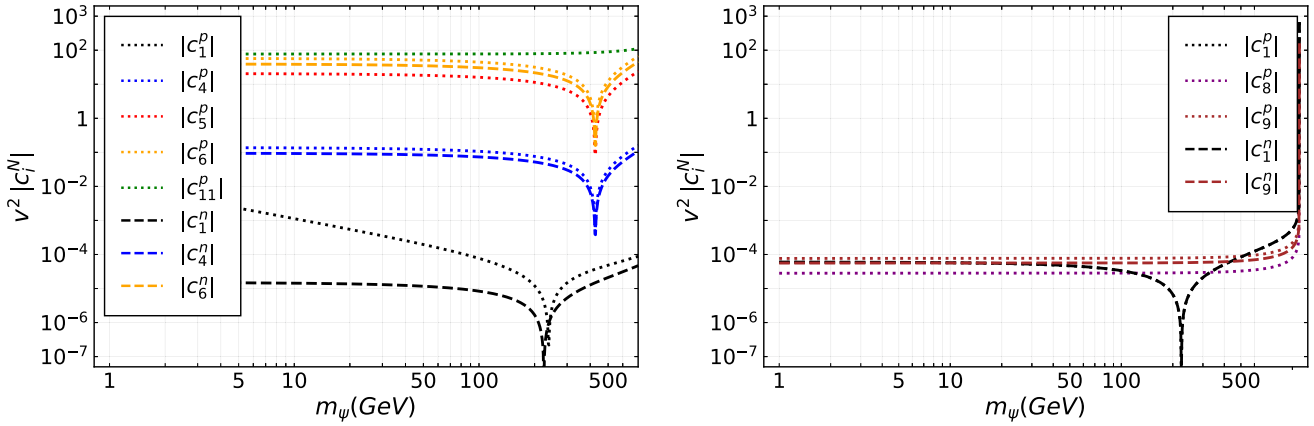

Fig. 1 Dirac DM (top) and Majorana DM (bottom) with a vector-like fermion F of mass $m_F = 600$ GeV and a scalar S of mass $m_S = 500$ GeV. The Yukawa couplings are fixed to $y_V = 1$ and $y_A = 1.3\,e^{i\,1.4}$ and Higgs portal coupling $\lambda_{HS} = 3$. The Wilson coefficients are evaluated for $^{132}_{54}$Xe at $E_R = 8.59$ keV and are displayed in dimensionless units by rescaling with the square of the electroweak VEV $v = 246.2$ GeV

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Reference

1. J. Herrero-Garcia, E. Molinaro, M.A. Schmidt, Eur. Phys. J. C **78**(6), 471 (2018). https://doi.org/10.1140/epjc/s10052-018-5935-5