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Potential for definitive discovery of a 70 GeV dark matter WIMP with only second-order gauge couplings

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We discuss the potential for discovery of a recently proposed dark matter WIMP which has a mass of about 70 GeV/c^2 and only second-order couplings to W and Z bosons. There is evidence that indirect detection may already have been achieved, since analyses of the gamma rays detected by Fermi-LAT and the antiprotons observed by AMS-02 are consistent with 70 GeV dark matter having our calculated $\langle \sigma_{ann} v \rangle \approx 1.2 \times 10^{-26}$ cm^3/s. The estimated sensitivities for LZ and XENONnT indicate that these experiments may achieve direct detection within the next few years, since we estimate the relevant cross-section to be slightly above 10^{-48} cm^2. Other experiments such as PandaX, SuperCDMS, and especially DARWIN should be able to confirm on a longer time scale. The high-luminosity LHC might achieve collider detection within about 15 years, since we estimate a collider cross-section slightly below 1 femtobarn.

[1] Reagan Thornberry, Maxwell Throm, John Killough, Dylan Blend, Michael Erickson, Brian Sun, Brett Bays, Gabriel Frohaug, and Roland E. Allen, EPL [European Physics Letters] 134, 49001 (2021), arXiv:2104.11715 [hep-ph], and references therein.

[2] Caden LaFontaine, Bailey Tallman, Spencer Ellis, Trevor Croteau, Brandon Torres, Sabrina Hernandez,Diego Cristancho Guerrero, Jessica Jaksik, Drue Lubanski, and Roland E. Allen, Universe 7, 270 (2021), arXiv:2107.14390 [hep-ph].

[3] Bailey Tallman, Alexandra Boone, Caden LaFontaine, Trevor Croteau, Quinn Ballard, Sabrina Hernandez, Spencer Ellis, Adhithya Vijayakumar, Fiona Lopez, Samuel Apata, Jehu Martinez, and Roland Allen, proceedings of the 41st International Conference on High Energy Physics, ICHEP 2022, arXiv:2210.05380 [hep-ph].

[4] Bailey Tallman, Alexandra Boone, Adhithya Vijayakumar, Fiona Lopez, Samuel Apata, Jehu Martinez, and Roland Allen, submitted to Letters in High Energy Physics, arXiv:2210.15019 [hep-ph].

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