

Experimental signatures for direct, indirect, and collider detection of a 70 GeV dark matter WIMP with precisely-defined 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/c² 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 $\langle\sigma_{ann}v\rangle \approx 1.2 \times 10^{-26} \text{ cm}^3/\text{s}$. The estimated sensitivities for LZ and XENONnT indicate that these experiments may achieve direct detection within a 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.

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