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Annihilation processes for a new dark matter WIMP BRANDON TORRES, CADEN LAFONTAINE, BAILEY TALLMAN, SPENCER ELLIS, SABRINA HERNANDEZ, DIEGO CRISTANCHO GUERRERO, TREVOR CROTEAU, ROLAND ALLEN, Texas A&M University — We propose a new dark matter WIMP which results from an extended Higgs sector, and which has only second-order gauge couplings. The coupling to the Higgs is constrained to be small by direct-detection experiments, and potential couplings to supersymmetric partners are also second-order. For this reason the annihilation cross-section is relatively small. Nevertheless, there would be inconsistency with both the observed relic abundance of the dark matter and the Fermi-LAT measurements of gamma-ray emissions from dwarf spheroidal galaxies if the mass of our proposed particle were larger than that of the W boson. We will discuss the annihilation processes for this particle, and contrast them with those for the neutralino of supersymmetry and the bosonic dark matter candidate of the ad hoc “inert doublet model”. Our estimates of the past were based on simple approximations, and we are now undertaking more detailed calculations of cross-sections with software packages such as MadDM.

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