(sub)GeV Dark Matter in the $U(1)_X$ Higgs Portal Model

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Introducción

In this research we consider a $U(1)_X$ gauge boson acting as a dark matter candidate. The vector dark matter gets mass when a complex singlet scalar breaks the gauge symmetry spontaneously. The dark matter candidates communicate with the SM particles via a scalar-Higgs portal. The focus in this work is on the dark matter mass smaller than 10 GeV. This parameter space is not studied thoroughly before. Dark matter annihilation via forbidden channel and near pole [1,2,3] are studied in order to place constraints from observed relic density and CMB. Other bounds from colliders, beam-dump experiments, and astrophysical observations are imposed. Taking into account all the bounds including the direct detection upper limits, the viable space is achieved.

Referencias

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