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Left-Right Mirror Model with Dark Matter

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We consider a model with Left-Right symmetry with $SU(3)C \times SU(2)_R \times SU(2)_L \times U(1)_{Y'}$ gauge group that includes an additional fermions which are charged under the $SU(2)_R$. The model and their fields charged under $SU(2)_R$ are known as Left–Right Mirror Model (LRMM) and mirror fermions, respectively. Although the motivation for introducing LRMM was to analyze the CP problem, in addition we have redirected the model to be able to introduce a candidate for dark matter. This candidate arises from a physical state of mixture of mirror fermions. To ensure the dark matter as viable proposal, a Z_2 discrete symmetry has been introduced, which not only guarantees the stability of the dark matter but also controls the free parameters of the model such that they are significantly reduced. In this work we also obtain the relic density for the dark matter candidate in LRMM and the spin independent scattering cross section between dark matter and proton (neutron).

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