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Dark matter in the Randall-Sundrum model

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We consider simplified dark matter models (DM) interacting gravitationally with the Standard Model particles in a Randall-Sundrum (RS) frame work. In this frame work the DM particles interact through the exchange of spin-2 Kaluza-Klein (KK) gravitons in the s -channel with the SM particles. The parameter space of RS model with universal couplings to SM particles is known to be strongly constrained from the LHC data. We are thus led to consider models with non-universal couplings. The first model we consider in this study is a top-philic graviton model in which only the right-handed top quarks are taken to interact strongly with the gravitons. In the second lepton-philic model, we assume that only the right-handed charged leptons interact strongly with the gravitons. We extend the study to include not only the scalar, vector and spin-1/2 fermions but also spin-3/2 fermionic dark matter. We find that there is a large parameter space in these benchmark models where it is possible to achieve the observed relic density consistent with the direct and indirect searches.

Apply to be considered for a student award (Yes / No)?

No

Level for award (Hons, MSc, PhD, N/A)?

N/A

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