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Isospin-violating dark matter with colored mediators

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In light of positive signals reported by the CDMS-II Si experiment and the recent results of the LUX and SuperCDMS experiments, we study isospin-violating dark matter scenarios assuming that the interaction of the dark matter is mediated by colored particles. We investigate the phenomenology of the model, including collider searches, flavor and CP phenomenology. A minimal possible scenario includes scalar dark matter and new vector-like colored fermions with masses of O(1) TeV as mediators. Such a scenario may be probed at the 14 TeV LHC, while flavor and CP constraints are stringent and severe tuning in the couplings is unavoidable. We also found that, as an explanation of the CDMS-II Si signal, isospin-violating fermionic dark matter models with colored scalar mediators are disfavored by the LHC constraints.

Based on work done with Koichi Hamaguchi, Seng Pei Liew, Takeo Moroi, Yasuhiro Yamamoto
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