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## Isospin violating dark matter in Stückelberg portal scenarios

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In this work we study the phenomenological aspects of Stückelberg portals where the mediator between the Standard Model and the dark matter (DM) is a massive  $Z'$  boson. Those scenarios are well motivated by certain string theory constructions and naturally lead to isospin violating interactions of DM particles with nuclei. We show that within this construction the relations between the DM coupling to neutrons and protons for both, spin-independent (fn/fp) and spin-dependent (an/ap) interactions are generically different from plus and minus 1 (i.e. different couplings to protons and neutrons) leading to a potentially measurable distinction from other popular portals. Finally, we perform a scan over all the parameters of the model and we incorporate bounds from searches for dijet and dilepton resonances at the LHC as well as LUX bounds on the elastic scattering of DM off nucleons to determine the experimentally allowed values of fn/fp and an/ap. We also obtain the phenomenological consequences of this kind of constructions for direct detection and indirect detection signals.

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