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Anapole dark matter in the non-commutative standard model and the standard model extension

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Abstract

In the ADM, the dark matters interact with the ordinary matters exclusively through the electromagnetic anapoles. Meanwhile, the only allowed electromagnetic form factor for the spin 1/2 Majorana fermions is the anapole one. We study the electromagnetic interaction of the Majorana neutrinos in the non-commutative standard model (NCSM) and the Lorentz violated extension of the standard model (SME). Consequently, we obtain the anapole form factors in both models. Comparing the obtained results in the SME with the experimental data only put a bound on the d_{00} -parameter among the SME- parameters, which is of the order of 0.04. We estimate a bound of the order of 0.5 TeV on the parameter of non-commutativity.

Keywords: anapole, dark matter, non-commutative standard model, standard model extension

For full article, refer to the Persian section