

Anapole Moment of Neutralino Dark Matter

Thursday, 15 June 2023 15:00 (20 minutes)

Albeit typically considered to be “dark”, a dark matter particle can interact electromagnetically with ordinary matter via higher multipole moments generated at the quantum level. If dark matter particles are of Dirac nature, only a millicharge, an electric- and magnetic dipole and an anapole moment can exist. If however it is a Majorana fermion—as naturally predicted by some BSM theories such as the MSSM—the only allowed electromagnetic moment is the anapole moment. In this talk I will present a model-independent UV-finite calculation of the anapole moment of a generic Majorana fermion including contributions from both scalar-fermion and vector-fermion pairs at the one-loop level. Based on these general results I will present the predictions for the anapole moment of the lightest neutralino within the MSSM serving as an archetypical DM candidate. Finally I compare these theory predictions with experimental limits on the anapole moment of dark matter utilizing nuclear recoil experiments such as XENON1T.

Secondary category for the parallel session (optional)

BSM Theories

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Session Classification: Parallel: Dark Matter 5

Track Classification: Parallel Sessions: Dark Matter Physics