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Anapole Moment of Majorana Fermions and Implications for Direct Detection of Neutralino Dark Matter

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In many theories dark matter is assumed to be a Majorana fermion, for which the anapole moment can induce an effective interaction with targets in direct detection experiments via the exchange of a virtual photon. In this talk, I will present the novel contribution to the anapole moment of a generic Majorana fermion due to vectors in the one-loop expression. For this, the diagrams are evaluated by application of the background field method, ensuring a gauge- and gauge-parameter independent result. After the model-independent discussion I will focus on the anapole moment of the lightest neutralino in various MSSM scenarios and will highlight its implication for direct detection experiments of neutralino dark matter. Notably the here presented novel contribution can be significant in scenarios in which squarks and sleptons are heavy and the chargino mixing angles are non-degenerate.

Primary authors: IBARRA, Alejandro; REICHARD, Merlin (Technical University of Munich (TUM)); Dr NAGAI, Ryo (Osaka University)

Presenter: REICHARD, Merlin (Technical University of Munich (TUM))

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