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Non-relativistic effective theory approach to dark matter direct detection

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Direct detection (DD) experiments will play a pivotal role in shedding light on the nature of dark matter during the next decade. An effective theory approach is a solid strategy to interpret DD experiments when the momentum transferred in the dark matter scattering by nuclei is small compared to the mass of the particle mediating the interaction. In this talk I compare a recently developed non-relativistic effective theory for dark matter-nucleon interactions to current DD data, including the observation of a modulation signal in the nuclear recoil energy spectrum reported by the DAMA collaboration. Emphasis will be placed on the comparison between the proposed approach and the standard paradigm.

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