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Effective Field Theory of Dark Matter Direct Detection With Collective Excitations

Friday, 16 April 2021 00:12 (24 minutes)

I will present a framework for computing dark matter direct detection rates via phonon and magnon excitations in crystal targets for general dark matter models. It consists of parameterizing dark matter interactions by a nonrelativistic EFT, and computing material responses to the EFT operators. Our work extends previous calculations that focused on simple models such as standard spin-independent interactions, and shows that new direct detection experiments that utilize collective excitations, such as SPICE, will have discovery potential over a broad range of dark matter theories.

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