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Low-mass inelastic dark matter direct detection via the Migdal effect

Wednesday 26 May 2021 14:00 (15 minutes)

We consider searches for the inelastic scattering of low-mass dark matter against nuclei at direct detection experiments, using the Migdal effect. We find that there are degeneracies between the dark matter mass and the mass splitting that are difficult to break. Using XENON1T data we set bounds on a previously unexplored region of the inelastic dark matter parameter space. For the case of exothermic scattering, we find that the Migdal effect allows xenon-based detectors to have sensitivity to dark matter with $calO(\mathrm{MeV})$ mass, far beyond what can be obtained with nuclear recoils.

Summary

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