

Migdal effect in Dark Matter Direct Detection Experiments

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Due to the negative results in dark matter search, people started to consider alternatives to the ordinary WIMP dark matter. In particular, they discuss a light dark matter having a mass less than a few GeV, which is difficult to detect in direct detection experiments. Recently, a new technique to detect such a light dark matter is proposed. It uses scintillation light from the inelastic scattering of an atom by a dark matter although the probability is very small. Since there had been no valid formulation of the process, we formulated it at the leading order and showed that the existing detectors already have sensitivity comparable to the current experimental limit.

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