

Light Dark Matter in Direct Detection: Plasmon and Migdal Effects

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The WIMP hypothesis has been a leading contender, yet recent null results from WIMP searches have prompted extensive exploration of alternative possibilities, particularly focusing on sub-GeV dark matter. Given that the nuclear recoil of light dark matter falls below the threshold of conventional detectors, great efforts have focused on utilizing ionization signals to extend sensitivity in direct detection experiments. In this talk, I will talk about two new important ionization signals from plasmon resonance in DM-electron scattering in semiconductors and Migdal effects in DM-nucleus scattering in noble liquid detectors. We found these novel mechanism can be used to extend the sensitivity of searching for light dark matter in conventional direct detections.

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