

Constraining sub-GeV Dark Matter from Boosted and Migdal Effects

Given the current strong constraints on WIMPs, search for sub-GeV Dark Matter (DM) now is an essential task in direct detections. To overcome the limitation of low recoils, enhancing the ionization rate of electrons from the Migdal effect and modifying the velocity distribution of DM from the interaction of DM and cosmic rays are two important ways. In this work, we find that these two ways are complementary to probe sub-GeV DM. The former can cover heavier DM, while the latter can cover lighter DM. Both of them can cover DM with a mass of 20 MeV to 200 MeV. Including momentum, the transfer effect can greatly improve the existing bounds.

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