

# The relation between Migdal effect and dark matter-electron scattering in isolated atoms and semiconductors

*Wednesday 25 March 2020 19:07 (1 minute)*

Sub-GeV dark matter direct detection experiments can look for small ionization signals that arise from dark matter-electron scattering or from the Migdal effect in dark matter-nucleus scattering. In this talk, I will show that the theoretical description of both these processes is closely related, and that there is a parametric mapping between them. I will first consider the case of noble-liquid targets and will then show first estimates of the Migdal effect in semiconductors using a crystal form factor that takes the band structure into account. I will then present new dark matter-nucleus scattering limits using XENON10, XENON100, and SENSEI data, and give projections for proposed experiments. Finally, I will show a comparison of DM-electron scattering and the Migdal effect in the concrete case of the Dark Photon model.

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**Session Classification:** RECEPTION and POSTER SESSION IN THE SAME ROOM