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The Migdal Effect: I'll believe it when I see it

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The Migdal Effect has seen a surge of interest in the last three years, particularly since Ibe et al (1707.07258) laid out the formalism for how to calculate an expected rate in a detector due to a dark matter signal. Multiple groups since then have expanded on this theoretical work to demonstrate the importance of such a signal in searching for sub-GeV dark matter, but all suffer from the same problem: a lack of experimental measurement to validate the calculation. I lay out the importance of measuring the Migdal effect through nuclear recoil calibrations, what sort of signal to expect in such a calibration, and why this question is particularly interesting for existing and upcoming semiconductor experiments with single electron thresholds.

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