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The low-energy spectrum in DAMIC at SNOLAB

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The DAMIC experiment employs large area, thick charge-coupled devices (CCDs) to search for the interactions of low-mass dark matter (DM) particles in the galactic halo with silicon atoms in the CCD target. The low pixel noise provides DAMIC with sensitivity to ionization signals of only a few charges, for a remarkably low energy threshold. From 2017 to 2019, DAMIC collected dark-matter search data with a seven-CCD array (40-gram target) installed in a low radiation environment in the SNOLAB underground laboratory. Results include exclusion limits on the existence of hidden-sector DM candidates and low-mass weakly interacting massive particles (WIMPs). We reported a conspicuous excess of events above our background model below 200 eV_{ee}, whose origin remains unknown. We will present details of the background model construction, discuss sources of systematic uncertainty, and report on the deployment of skipper CCDs in DAMIC at SNOLAB to perform a more precise spectral measurement by the end of 2022.

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