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A dark matter search using CCDs

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DAMIC is a novel dark matter search experiment that has a unique sensitivity to hypothetic dark matter particles with masses below 10 GeV. Due to the CCD's low electronic readout noise (R.M.S. ˜ 3 electrons), this instrument is able to reach a detection threshold of 60 eV, suitable for the search in the low mass range. The excellent energy response and high spatial resolution of a CCD image allow a powerful background characterization. Early DAMIC runs determined the world's best cross-section limits for WIMPs with masses below 4 GeV. Here we report on DAMIC100, a fully funded dark matter search detector with a target mass of 100 grams of silicon that will be installed at Snolab during the Summer of 2014. We also discuss the challenges associated with the scale-up of the experiment, the calibration efforts for low energy nuclear recoils in silicon, and the prospects for the first physics results after a one year run.

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