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## **Developments on Skipper-CCD detectors for dark matter searches**

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We present a novel “Skipper” readout technology for Charge Coupled Devices (CCDs). Skipper-CCDs have a readout stage that allows the charge contained in every pixel of the CCD to be measured non-destructively multiple times. These multiple samples can be averaged, so that the root-mean-square (RMS) of the measurement noise decreases with the square root of the number of samples. By averaging 4000 samples per pixel, we are able to reach an unprecedentedly low sub-electron RMS noise of  $0.06 e^-$ . We discuss various design aspects, the clocking, and the electronic readout noise optimization of the device. Moreover, we present a new Low Threshold Acquisition (LTA) system specifically designed to read out Skipper-CCDs. As an immediate application of this technology, we discuss SENSEI (Sub-Electron Noise Skipper-CCD Experimental Instrument), a dark matter direct detection experiment that takes advantage of the ultra-low read-out noise of Skipper-CCDs to search for electron recoils from dark matter interactions.

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