

Sub-GeV dark matter and neutrino searches with Skipper-CCDs: status and prospects.

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High-resistivity silicon has made possible the fabrication of thick fully-depleted charge-coupled devices (CCDs) that have found a wide range of scientific applications, from particle detection to astronomical imaging. Their low noise and high charge collection efficiency allow us to reach unprecedented sensitivity to physical processes with low-energy transfers. The newly-developed Skipper-CCD enhances this sensitivity by reducing the read-out noise reaching a sub-electron resolution. In this work, we introduce the fundamentals of the Skipper-CCD operation and the prospects for both sub-GeV dark matter searches and the detection of coherent elastic neutrino-nucleus scattering. A discussion of the challenges associated with the construction of the foreseen detectors with multi-kilogram target mass is also presented.

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