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Cryogenic Crystal Phonon Detectors for meV-keV Signals

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Experiments employing transition-edge sensors (TESs) coupled to crystals for athermal phonon detection are a major part of the worldwide effort to detect dark matter. Such detectors can provide the highest sensitivity to meV to keV-scale signals from a variety of dark matter candidates, including axion-like particles, dark sector dark matter, and WIMPs. We review the current status of the detectors used by the SuperCDMS SNOLAB experiment. We then describe advances in several areas aimed at meV-scale excitations, including carbon-based detector fabrication, SQUID-based TES readout, and work to move to RF-based readout, including KIDs and SQUATs.

Early Career

Yes

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