

Low-energy excesses in cryogenic solid-state phonon detectors

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Low-threshold experiments use cryogenic phonon detectors to test low-energy interactions of particles with target nuclei, e.g. from dark matter and coherent elastic neutrino-nucleus scattering. Such detectors use sensitive thermometers or Cooper pair breaking, or a combination of both, to measure changes in the phonon population of small, single-crystal targets. Currently, these technologies are limited by sharply increasing event rates of unknown origin below a few hundred eV recoil energy, much larger than expected from known backgrounds. The main hypothesis for the origin of the excesses are stress-related effects of the crystals or metallic sensor films. In our talk we will summarize the detector technology and the current state of knowledge on the observed low energy excess phenomena. The summary is based on the contributions to an international community effort, the EXCESS workshop.