

New Perspectives



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Low energy calibration and characterization of novel dark matter detectors with a scanning laser device

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The search for sub-GeV particle-like dark matter has developed rapidly in recent years. A major hurdle in such searches is in demonstrating sufficiently low energy detection thresholds to detect recoils from light dark matter particles. Many detector concepts have been proposed to achieve this goal, which often include novel detector target media or sensor technology. A universal challenge in understanding the signals from these new detectors and enabling discovery potential is characterization of detector response near threshold, as the calibration methods available at low energies are very limited. We have developed a cryogenic device for robust calibration of any photon-sensitive detector over the energy range of 0.62 - 6.89eV, which can be used explore a variety of critical detector effect such as position sensitivity of detector configurations, phonon transport in materials, and the effect of quasiparticle poisoning. In this talk, I will present the design overview and specifications, along with current status of the testing program.

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