

Detector design for the precise measurement of scintillation light in liquid xenon

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Liquid Xenon detectors are playing a pivotal role in the search for both dark matter and neutrinoless double beta decay. The principle of these detectors is based upon the measurement of scintillation light from the liquid xenon. The light response of these detectors to nuclear and electronic recoils must therefore be particularly well understood. While many such calibrations have been performed before, none have ever been done spanning a full energy range from sub-keV to MeV. As liquid xenon detectors are getting bigger and more multiphysics oriented, such a full calibration becomes not only important but necessary. To do this, a liquid xenon detector is being built at UAlbany. Once the detector's response to light is properly modelled for both nuclear and electronic recoils, this detector will be used to investigate means of increasing scintillation yield in liquid xenon.

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