



Contribution ID: 315

Type: **Poster**

Solid xenon bolometers for neutrinoless double beta decay

Cryogenic liquid xenon detectors have become a popular technology in the search for rare events, such as neutrinoless double beta decay and dark matter interactions. The power of the liquid xenon detector technology is in the combination of the ionization and scintillation signals, resulting in particle discrimination and improved energy resolution over the ionization-only signal. In comparison macrobolometers, which can be made from a variety of materials, have been shown to have an order of magnitude better energy resolution in the phonon channel. Solid xenon bolometers, under development at Drexel University, offer an opportunity to combine excellent energy resolution in the phonon channel with a scintillation or ionization signal for background rejection. This would be a powerful future detector technology in the search for neutrinoless double beta decay of Xe-136.

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Track Classification: Neutrinoless Double Beta Decay