

# Angular Resolution of a Solid State 0vbb-Decay Detector

*Friday, 20 July 2018 13:45 (15 minutes)*

The search for neutrinoless double beta decay has spawned dozens of detectors looking for this rare decay and to determine whether neutrinos are Majorana or Dirac particles. Majorana neutrinos are required for most See-Saw Mechanisms for mass generation, as well as many models of sterile neutrinos, but is severely limited in what mechanisms it can rule out. Should a discovery be made, the next stage in 0vbb research requires the ability to resolve the angular/energy spectrum of 0vbb-decay. This spectrum is dominated by various nuclear processes as well as different mass generation mechanisms and right/left handed current mixing for neutrinos. Making measurements of these spectra would then shed light on the nature of heavy right handed neutrinos and neutrino generation. Presented is preliminary work for a thin-film tracking calorimeter based on CdTe semiconductor research. This design allows for investigation of multiple 0vbb candidate isotopes simultaneously, and the tracking ability provides both a significant background reduction by means of vetoing external sources, and the ability to discern angular spectra. The design and simulation of this detector is done with Geant4 simulation toolkit, and convolutional neural net development has begun with simulated signals to resolve energy and angle of the two emitted electrons.

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