Abstract Submitted
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Germanium Detector Crystal Axis Orientation for the MAJORANA Demonstrator[1] HANNAH LETOURNEAU, Whitworth University — The MAJORANA Demonstrator, currently being constructed at Sanford Underground Research Facility in Lead, South Dakota, is an array of germanium detectors which will be used to search for neutrinoless double beta decay, which would demonstrate that neutrinos have a Majorana mass term and lepton number is not conserved. An important characteristic of semiconductor detectors is the crystal axis orientation, because the propagation of electromagnetic signals is attenuated by the location of the interaction relative to the axis of the crystal. Conventionally, a goniometer is used to position a collimated low energy gamma source in many small increments around the detector to measure the rise time at each position. However, due to physical constraints from the casing of the Demonstrator, a different method must be developed. At the University of Washington this summer, I worked with a ^{76}Ge point-contact detector. I found the crystal axis orientation first with Americium 241, a lower energy gamma source. Then, I used a higher energy source, Thorium 232, in conjunction with the only a few angular reference points to also calculate rise time. Also, I wrote code to process the data. The success of this method will be evaluated and discussed.

[1]NSF

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