Abstract Submitted
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Monte Carlo Simulations for Future Geoneutrino Detectors MORGAN ASKINS, University of Washington — The main contribution of heat in the earth's mantle is thought to be the radioactive decays of 238U, 232Th, and 40K. A precise measurement of the levels of 238U and 232Th can be determined by measuring the flux of electron anti-neutrinos (geoneutrinos) emitted from their decay chains. Although detectors such as kamLAND and Borexino have detected few geoneutrinos, a new cost effective geoneutrino detector is proposed which takes advantage of the total internal reflection within a long rectangular prism acrylic container of liquid scintillator having a single photomultiplier tube (PMT) on each end. An array of these containers would allow for a large scintillator volume relative to the number of PMTs, but could have a lower radio-purity. The event signatures of these decays were compared to those from neutrino interactions using Monte Carlo simulation software based upon GEANT4. In this poster I will discuss the limitations which arise from this design such as, the thickness of the acrylic container which causes high loss of optical photons due to scattering and absorption, rod length which results in higher scattering rates within the scintillator, and size of the array.

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