

Abstract Submitted
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Squeaky Clean: Filtering Contaminants from Water Based Liquid Scintillator¹ JESSE MENDEZ, Humboldt State University, ROBERT SVOBODA, LEON PICKARD, DEANGELO WOOLEY, University of California, Davis, UC DAVIS NEUTRINO GROUP COLLABORATION — Water Based Liquid Scintillator (WbLS) is a new development in liquid scintillator detection technology. WbLS uses a chemical surfactant to form micelles around liquid scintillator in aqueous solution. WbLS is more environmentally friendly and cost effective making gadolinium doped WbLS based detectors good candidates for neutrino projects . WbLS based detectors are very sensitive to contamination. Contaminants decrease the light yield and degrade the neutrino detecting capability. Chemicals and ions from construction materials can leech into the WbLS. In addition radioactive isotopes from radon, uranium, and thorium can be present in the environment of the detector. WbLS must be separated from water before removing ions from solution. A two stage filter system will be used to accomplish this. Stage one separates the micelles from solution passing on the remaining free surfactant and gadolinium in solution. Stage two removes any remaining organics and passes on just gadolinium ions in solution with water for further processing. We found that a 600-800 Da nanofilter was successful in separating micelles from organics in solution. Our testing found the filter allowed between 93%-98% of the Gadolinium through making it viable choice for a first stage filter.

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