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Radio Assay for nEXO

The next Enriched Xenon Observatory (nEXO) is building on the knowledge gained from the EXO-200 experiment. In the February 2014 paper with 99.8 kg*yr of Xe-136 exposure a background rate of $(1.7 \pm 0.2) 10^{-3}$ keV/kg/yr in the ± 2 sigma region of interest around the Q-value of the Xe-136 decay. To achieve this low rate a radio assay of material was carried out (Nucl.Instrum.Meth, A591, pg 490-509), nEXO looks to improve on EXO-200 backgrounds, to do this the material needs to be screen for potential elements that could be a background near the Xe-136 Q-value.

To do this we use a multitude of methods, including: above ground counting on high resolution Ge detectors above (sensitivity of 500 ppt) and below ground (sensitivity of 50 ppt); neutron activation analysis which has a sensitivity of 0.5 ppt; GDMS (sensitivity of 10 ppt); ICPMS and radon detection.

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Track Classification: Neutrinoless Double Beta Decay