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Long Term Radioxenon Detector Background: First-year results

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Environmental radioxenon measurements for nuclear explosion monitoring use the net count method to determine activity concentrations and rely on detector sensitivities for each of the radioxenon isotopes. This method requires that a detector background measurement be made to account for environmental radioactivity and is only performed during the initial install or during a recalibration. Currently, there are no other standards for how often the detector background should be updated. We report on first-year observations of the backgrounds. The count rate of individual detectors and coincidence counts provide an important metric for identifying anomalies and the causes that could impact both the minimum detectable concentration of the system and the accuracy of the activity concentration measurement.

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Promotional text

This work explores the environmental effects on radioxenon systems, their corresponding detector backgrounds, and influence on the minimum detector concentration. When these effects and influences are known, guidelines and/or mitigations for detector backgrounds can be suggested.

Oral preference format

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