

# new Prototype Detection System Based on the Beta-Gamma Coincidence Technique for Radioxenon Measurement.

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In this study, we develop a new radioxenon detection system based on beta-gamma coincidence to improve the sensitivity of detection in laboratory analysis. The designed system is a new prototype that is tested by injecting the  $^{222}\text{Rn}$  and its daughters ( $^{214}\text{Pb}$  and  $^{214}\text{Bi}$ ) as a beta-gamma emitter and also  $^{131}\text{mXe}$  gaseous sources, which are in the interest of CTBTO. Further, the system is calibrated and checked using a  $^{166}\text{mHo}$  source. This system consists of a NaI (Tl) as a gamma, X ray radiation detector, and a Silicon detector for the beta or the conversion electron detection. Silicon is used for improving energy resolution and minimizing the potential for memory effect compared to the scintillator detector. The list-mode multi-parameter data acquisition system is used to set up coincidence parameters. The efficiency of two detectors and MDA are obtained.

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## Promotional text

A new prototype detection system based on the beta-gamma coincidence technique for radioxenon measurement.

## Oral preference format

pre-recorded video

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