

# the use of Radioxenon to Radioiodine Isotopic Ratios as Additional Screening Method Regarding Possible CTBT-relevant Events

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Xenon and iodine isotopes are, among other CTBT-relevant radionuclides, major indicators for nuclear explosions. They are therefore globally monitored by the International Monitoring System to verify compliance with the CTBT, using different technologies. Xenon isotopes are intermediate decay products of radioiodine. If originating from the same source, the radioxenon to radioiodine ratio of isotopes from the same mass chain may be suitable for additional screening of events. This study investigates the radioxenon to radioiodine isotopic activity concentration ratios, as they occur in samples of co-located noble gas and particulate systems that significantly overlap in sampling time. These IMS observations are compared to ratios of the same isotopes for different sources that may be observed. These are simulations of nuclear explosions and nuclear facilities (NPPs and MIPFs), as well as empirical data from published reports for both historic nuclear tests and for releases from nuclear facilities. Based on this comparison, conclusions can be drawn on the usefulness of radioxenon to radioiodine ratios for event screening in CTBT monitoring.

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## Promotional text

Can radioxenon to radioiodine ratios be used for event screening in CTBT monitoring? All IMS observations of the coincidence detection of radioxenon and radioiodine are compared to typical ratios in releases from nuclear facilities and to the signatures of a nuclear explosion.

## Oral preference format

in-person

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