

-relevant Xenon Isotopes Global Background in Ten Years (2013-2022)

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Monitoring radionuclide concentrations is an important component of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) verification regime and can provide direct evidence of the nuclear nature of an explosion. Whereas, in the case of underground nuclear testing, the radioxenon isotopes have the highest probability of escaping into the atmosphere. Four of the xenon isotopes are of interest for CTBT verification; Xenon-131m, Xenon-133m, Xenon-133 and Xenon-135. The current International Monitoring System (IMS) design foresees 40 radioxenon stations around the world to provide a 90% detectability of a 1 kt nuclear explosion within 14 days. In 2010, the first radioxenon station was integrated into the IMS. At the end of 2022, 26 systems are already certified and 5 additional were installed and already in operation. This work provides a systematic study of the CTBT-relevant xenon isotopes' global background in ten years (2013-2022) using all the available stations. The geographical distribution and the ratios between different Xenon isotopes were analysed.

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Promotional text

Systematic study of the CTBT-relevant xenon isotopes' global background in ten years (2013-2022) using all the available IMS stations.

Oral preference format

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