

Towards a Better Noble Gas Characterization Scheme Based on 10 Years of National Data Centers (NDC) Analysis

Releases from industrial facilities, due to mainly Medical Isotopes Production facilities (MIPs) and in a lesser extend to Nuclear Power Plants (NPPs), are at the origin of the worldwide radioxenon background and lead to specific activity concentration levels at the most noble gas stations of the IMS network. In parallel, owing to the tremendous atmospheric dilution, signature of an underground nuclear test in case of a prompt or/and delayed release into the atmosphere is likely to be detected at the IMS station at the background level. NDCs follow up over years of detection time series at each IMS noble gas station and the assessment of the worldwide radioxenon background from the atmospheric transport modelling calculations can be of a great help to screen out numerous events but only a radioxenon isotopic ratio will give a clear event discrimination. Analysis and validation by NDCs of isotopic ratios involving three radioxenons (^{135}Xe , $^{133\text{m}}\text{Xe}$ and ^{133}Xe), measured by the IMS noble gas stations over the last decade, allows today to efficiently enhance the current IDC event characterization scheme.

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Track Classification: 2. Events and Nuclear Test Sites