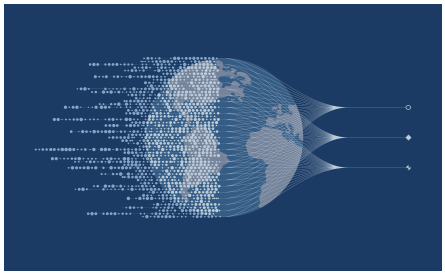

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of the short-lived 135Xe in the natural background of xenon isotopes in the soil

The knowledge of the natural background of xenon radioisotopes in the ground is required to be able to distinguish it from any signals due to a potential underground nuclear explosion, as would be the case during an on-site inspection (OSI). The natural background of xenon isotopes from spontaneous fission in the soil has been studied during several measurement campaigns in Sweden. In most of these samples ¹³³Xe is detected. The method and logistics were improved during the latest campaign resulting in that also the short-lived isotope ¹³⁵Xe could be detected in multiple samples simultaneously with ¹³³Xe. This gives the potential to calculate the activity ratios, an important tool to distinguish between different sources. This is the first time, to our knowledge, that ¹³⁵Xe has been detected in the natural background in the soil. The method and results will be presented and compared with model predictions as well as a potential impact on noble gas collection and analysis in an OSI.

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