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A Baseline for Source Reconstruction Using Forensic Radionuclide Event Analysis and Reconstruction

Tuesday, June 20, 2023 2:20 PM (15 minutes)

Inverse modelling allows to determine source parameters of an atmospheric release of radioactivity by combining atmospheric transport modelling and airborne radionuclide measurements in a statistically coherent manner. A series of inverse modelling experiments will be conducted using real-world Xe-133 observations from the International Monitoring System and the Forensic Radionuclide Event Analysis and Reconstruction tool to determine the (known) source parameters of the former medical isotope production facility CNL. The purpose of these experiments is to establish a baseline for source reconstruction from which new settings, new data, and/or new methods can be easily tested. Testing can include, but is not limited to: (i) different source parameterizations, (ii) different optimization formalisms, (iii) applying background-corrected Xe-133 observations and (iv) different atmospheric transport model input. In this study, the inverse modelling baseline will be presented together with a series of tests. A set of metrics for evaluating inverse modelling will be explored which will allow us to compare the performance of experiments with the baseline.

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Promotional text

The inverse modelling tool FREAR allows to link anomalous radionuclide detection from the International Monitoring System with Treaty-relevant events and is available for use by NDCs.

Oral preference format

in-person

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