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## of uncertainties in atmospheric transport modelling and their application to modelling radionuclide emissions

Atmospheric transport and dispersion models (ATDM) are routinely used in the simulation of the global radionuclide background as well as in the localisation and characterisation of unknown radionuclide emitters. However, ATDMs contain uncertainties due to the assumptions made in the model setup as well as the chaotic nature of the atmosphere. Currently, quantification of these uncertainties and an exploration of the information they can add to the background simulation and source characterisation is limited. In this study we utilise stack monitoring data from European radionuclide emitters together with two ATDMs (NAME and HYSPLIT) and meteorological data from a meteorological ensemble to quantify the uncertainties associated with the transport of radionuclides to a SAUNA Qb placed in northern England as well as nearby IMS stations. The ensemble results are compared to the Qb measurements on a sample-by-sample basis to demonstrate the value considering uncertainties adds to the analysis of radionuclide detections and also to the identification of radionuclide sources.

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