

Inverse Atmospheric Transport Modelling: Determining the Source Location, Source Term and Its Uncertainty Quantification

Atmospheric transport modelling allows to determine the possible source regions of airborne radionuclides measured by for instance the International Monitoring System. This makes it a valuable tool for the verification of the CTBT. However, the output from such models contain uncertainties that are difficult to quantify. Given the importance of a correct interpretation of the ATM output, an uncertainty quantification is desired. We have used the atmospheric transport model Flexpart to backtrack observed and fictitious radioxenon concentrations from the International Monitoring System. A method for determining the source location and source term will be described, together with its uncertainty quantification. The latter is achieved by applying the ensemble method: use has been made of the ensemble data assimilation product of the European Centre for Medium-range Weather Forecasts (ECMWF). The ensemble consists of 51 equally likely meteorological scenarios and allows to quantify uncertainty on the simulations.

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