

Long-Range Transport of Xe-133 Emissions Under Convective and Non-Convective Conditions

To investigate the transport of xenon emissions, the Provisional Technical Secretariat (PTS) operates an Atmospheric Transport Modelling (ATM) system based on the Lagrangian Particle Dispersion Model FLEXPART. The air mass trajectory provides a “link” between a radionuclide release and a detection confirmed by radionuclide measurements. The aim of this study is to investigate the long-range transport of Xe-133 emissions under convective and non-convective conditions, with special emphasis on evaluating the changes in the simulated activity concentration values due to the inclusion of the convective transport in the ATM simulations. For that purpose a series of 14 day forward simulations, with and without convective transport, released daily in the period from 1 January 2011 to 30 June 2013, were analysed. The release point was at the ANSTO facility in Australia. The simulated activity concentrations for the period January 2011 to February 2012 were calculated using the daily emission values provided by the ANSTO facility; outside the aforementioned period, the median daily emission value was used. In the simulations were used the analysed wind data provided by ECMWF. Availability of both daily emission values and measured Xe-133 activity concentration values was an opportunity to validate the simulations.

Primary author: KUSMIERCZYK-MICHULEC, Jolanta (CTBTO Preparatory Commission)

Presenter: KUSMIERCZYK-MICHULEC, Jolanta (CTBTO Preparatory Commission)

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