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the Importance of high Resolution Atmospheric Transport Modelling in the case of Receptor Stations Being Close to the Source in Complex Terrain

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Atmospheric transport modelling (ATM) tracks the movement of released substances into the atmosphere. Dispersion of freshly emitted releases takes time to evolve, and the initial transport pathway depends strongly on surrounding conditions, such as wind patterns. Global ATM with reasonable coarse resolutions can usually reflect synoptic patterns, such as frontal systems. However, meteorological scales are even more important when considering complex topography. They have their own local wind patterns, superimposed on large scale winds. Small scale features like convective vertical transport or transport by land-sea breezes are not fully resolved. Mountains are smoothed on coarser grids and cause pathways to be distorted. Transport pathways of emissions from source locations in complex terrain are, among other things, strongly influenced by such small scale features. Therefore, global ATM simulations might not always be able to estimate sufficiently accurate activity concentrations at International Monitoring System (IMS) stations in the proximity of these source locations for confirming a radioisotope to be above or below the detection limit. This presentation uses high resolution ATM to investigate the consistency between ATM simulations and IMS measurements for such cases. Results will demonstrate the higher quality of high resolution ATM and how the accuracy of transport pathways increases for higher resolution in meteorological input.

E-mail

anne.tipka@ctbto.org

Promotional text

How the importance of high resolution is highlighted by demonstrating the influences of local small scale meteorological features on transport pathways of radionuclides in atmospheric transport modelling.

Oral preference format

Primary author: Ms TIPKA, Anne (CTBTO Preparatory Commission)

Co-authors: KUSMIERCZYK-MICHULEC, Jolanta (CTBTO Preparatory Commission); Mr SCHOEMAKER, Robin (CTBTO Preparatory Commission); Mr KALINOWSKI, Martin B. (CTBTO Preparatory Commission)

Presenter: Ms TIPKA, Anne (CTBTO Preparatory Commission)

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