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Implementation of Wet Deposition into Atmospheric Transport Modelling for CTBT Verification Purposes Using Available Precipitation Observation Data

Air concentrations of particulate radioisotopes are strongly influenced by wet deposition. Therefore the impact of precipitation should generally being included for atmospheric transport modeling applied in the CTBT verification context. Switching on the existing parameterizations for wet deposition in Lagrangian particle dispersion models leads to a more complete representation of involved physical processes, but not necessarily to better simulation results. Those are strongly dependent on the quality of the driving meteorological data determining presence and strength of precipitation and the correct choice of particle properties. While atmospheric reanalysis data show numerically consistent fields with global coverage, computing spatial and temporal precipitation patterns and their variability is limited in many cases. Therefore the use is discussed of additional observation data as provided by the Global Precipitation Climatology Center of the German Weather Service. Methods of introducing a correction for wet deposition in post-processing of backward simulations are compared with online calculations during the ATM runs. This comparison leads to the conclusion that in a first step wet deposition should be neglected to ensure robust and reliable back-tracking results. However, the following in-depth special event analysis should be based on the best available models and data, including wet deposition schemes.

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