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# Deposition parameterisation and residence times of aerosols in the Lagrangian atmospheric transport model FLEXPART

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Deposition is an important part of atmospheric transport modelling (ATM), since it is a major influence factor for the atmospheric lifetime of aerosols and soluble gases. We are investigating and improving the deposition parameterisation in FLEXPART (FLEXible PARTicle dispersion model), a Lagrangian transport and dispersion model (see http://flexpart.eu/). Tests are done with the basic setup of the flexRISK project (http://flexrisk.boku.ac.at) where a noble gas and an aerosol species are tracked for 15 days. Calculations are performed for the year 1995, a climatologically representative period.

In the beginning of our study we used two climatologically different sites: Tihange (Belgium) as a maritime and Almaraz (central Spain) as a mediterranean site. First results showed that the deposition is too strong, resulting in atmospheric lifetimes of 1-4 days instead of typically 3-12 days. Longer lifetimes were found at the drier Spanish site than at the maritime site in Belgium. Therefore, we varied the wet deposition parameters to improve the modelled atmospheric residence times. A first attempt of parameter adaptation led to more reasonable results with an average residence time of about 5 days for the maritime site and about 14 days for the drier site. With this modification, a significant mass decrease is observed in the first one to two days of transport, which may be mainly due to dry deposition which could also be considered for improvement.

The investigations are expanded with respect to the number and geographical distribution of sites. Thus, it will be possible to look in more detail at dry and wet deposition, both in drier and wetter conditions.

In the end, an improved deposition parameterisation for FLEXPART shall be proposed. The Fukushima release provides an opportunity to test it and compare the results with the simulation carried out earlier.