

Filling a gap in the wet scavenging scheme in FLEXPART 10.3

Recently an improved wet scavenging scheme was released for FLEXPART 10.3 (April 2017). It focuses on physically-based improvements by using 3D cloud water fields which allow to better distinguish between in- and below-cloud scavenging. Even though this procedure shows much better realistic results than previous schemes, improvements with respect to numerical aspects (interpolation in time of clouds/cloud water and the falsification of precipitation disaggregation) and fall-back options for missing cloud water fields are still pending. Therefore, we introduce a new disaggregation method for precipitation data and linearly interpolate the cloud information. Additionally, the relationship between clouds and precipitation and the impact of different scavenging parameters are studied. Missing cloud information can be substituted with parameterizations based on precipitation rates and relative humidity, distinguishing between large-scale and convective clouds. To ensure consistent quality for future FLEXPART versions, the testing environment introduced in FLEXPART 10.3 is extended by some automated test cases to allow regression testing. The methodology together with, idealised and real case tests are presented.

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