Preparations for studying air quality and aerosols in the Rhine-Main region using MECO(2)

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The problem of poor air quality in cities and metropolitan areas is rising in the perception of society. A thorough understanding of factors contributing to air quality is necessary, as this implies not only lower living qualities but influences health as well.

We set up a simulation using the MECO(n) system in order to investigate contributing factors to air quality in the Rhine-Main region (Germany). The **MESS**y-fied **E**CHAM and **CO**SMO models nested **n** times (MECO(n)) is deployed in a MECO(2) configuration consisting of a global ECHAM5 simulation and two nested COSMO instances leading to a final resolution of about 3-4 km over Germany. In the MECO(n) ansatz we can use the same implementation of the physical and chemical processes across the different base models and thus spacial scales. Moreover it allows us to provide consistent boundary conditions from the global to the local scale.

The work focuses on a better understanding/representation of regional aerosol processes within the model. Therefore the MESSy aerosol module GMXe is adapted and tested within the COSMO/MESSy model. A brief synoptic evaluation of the chosen COSMO domains is performed to evaluate the physical dependence on the chosen COSMO domains. Furthermore the behaviour of important aerosol precursor species is evaluated. The partitioning between gas and aerosol phase as performed by the MESSy sub-module GMXe is already incorporated in the simulation set-up and preliminary results are presented.