



Local-scale variability in regional air quality modelling: Implications on temporal distribution of emissions

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In the field of air quality modeling, the comparison of model results with ground-based measurements is essential for validation purposes. The usefulness of these measurements for regional air quality modeling is however limited by the extremely local nature of station measurements. This is especially true for short-lived species like NO₂, which is of high importance for public health. Nevertheless station observations are the only continuously available source of data on ground level air quality besides model results.

Uncertainties in air quality models mainly arise from the lack of precise knowledge of the spatial and temporal distribution of pollutants.

Most emission inventories provide aggregated values for long periods of time and yield no information on the temporal (diurnal) distribution of emissions. By applying ground-based measurements, our study yields optimized diurnal variations of anthropogenic emissions for different urban regions of Germany.

In the course of the study the variability of air pollution on the urban scale (the model's subgrid scale) is also addressed.

The study applies the newly established POLYPHEMUS/DLR model at a moderate resolution. In the framework of the GMES project "PROMOTE", this model system operationally analyzes and forecasts air quality in Bavaria, Germany.

The model employs the latest version of the EMEP emission register in combination with high-resolution emission data provided by Bavarian authorities.