Geophysical Research Abstracts, Vol. 8, 10015, 2006
SRef-ID: 1607-7962/gra/EGU06-A-10015

Accounting for representativity of ground-level air pollution monitoring stations in data assimilation systems

K.Eben, J.Resler and P.Jurus

Inst. of Computer Science, Acad. Sci. of the Czech Republic, Prague [eben@cs.cas.cz]

In data assimilation experiments in air quality modelling, data from background rural stations usually enter assimilation algorithms, whereas data from some or all background urban stations are discarded. On the other side, any operational installation needs to make proper forecasts for urban regions, where also a greater number of monitoring stations is available.

It is however not straightforward to use the observations from urban background stations for data assimilation, since their representativity can vary depending on their distance to emission sources.

Another problem arises in mountain regions, where orographic bias of the model is significant and some of the stations can have high altitude and completely different regime of daily course of chemical species.

If we want to utilize the information from urban background and mountain stations in a data assimilation system, e.g. in an ensemble Kalman filter, we have to correct the data for bias and other systematic errors. One way of doing so is to construct an (adaptive) observation operator, which is based on statistical postprocessing of model outputs and observations from the past. This operator may contain a statistical model for bias and cyclical component of the innovations. The same model can then be used for forecasting concentrations at the stations.

The potential improvement of the forecast of tropospheric ozone concentrations is tested and assessed on the example of an ozone epizode from June 2001.