

Interactive comment on “Longpath DOAS tomography on a motorway exhaust gas plume: numerical studies and application to data from the BAB II campaign” by T. Laepple et al.

Anonymous Referee #1

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The paper presents an innovative method to determine concentrations fields of trace gases using a combination of known experimental and analysis techniques for outdoor studies.

A discussion or inclusion of the following (important) points is still missing in the revised version:

-Sec. 1.3

'...absolute reconstruction error...' Please define the item 'environmental physics', if studies in oceanography (see e.g. Munk, Wunsch, Worcester, Gaillard) or in geo-physics (see e.g. Humphreys, Clayton, Gilbert, Friedel) also belong to environmen-

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tal physics, such investigations of the reconstruction error were already presented. Furthermore, a study exists, which uses stochastic inverse for the reconstruction of temperature and wind fields in the atmosphere (Wilson, D.K. und Thomson, D.W., 1994a: Acoustic tomographic monitoring of the atmospheric surface layer. J. Atmosph. Ocean. Technol. 11, 751-769). The authors give also a quantitative error estimation.

-Sec. 6

A short description of the (large-scale) weather conditions and the special meteorological situation (e.g, influence of advection) during the three periods is missing. These information are necessary to evaluate the results (tracer distributions).

Do the different lengths of the three time periods influence the comparability of the results (influence on statistics)?

-Sec. 7.1

Please discuss the possible effects of a time difference between the single measurements along the single light paths more detailed, because a 'constant' measuring object during the measuring time is an important assumption for tomographic measurements especially in turbulent media and because turbulent effects of different space-time scales interacting in the atmosphere.

Could you estimate the possible influence of advection or coherent structures (no microscale turbulence!) on the single measurements?

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 2435, 2004.

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