

Contribution of Petra Kastner-Klein to the TRAPOS WG-TPT meeting in Cambridge, 25.02.2000:

Wind tunnel modelling of traffic produced turbulence - similarity concepts and comparison of wind - tunnel and field data

Basically I will present a summary of the wind-tunnel studies, which I did during my PhD at the University of Karlsruhe. Some additional data from more recent wind-tunnel studies will be integrated in the analysis as well. I will put special emphasis on scaling considerations, which were derived from Plate's similarity law. The basic ideas and most of the relevant results are described in the publications listed below. Additionally I will present a comparison of the wind-tunnel data with field data from the Göttinger Straße in Hannover and Schildhornstraße in Berlin which I have done in co-operation with Ruwim..

Open questions which should be addressed in the future are from my point of view:

- Is it possible to take into account the effects of traffic produced turbulence on concentration fields in urban areas keeping the concept of normalised concentrations in dispersion modelling?
- Do traffic motions influence the mean transport of pollutants in urban areas?
- Is it necessary to distinguish between one-way traffic and two-traffic situations?
- Incorporation of traffic produced turbulence in numerical models

REFERENCES

- Kastner-Klein, P., Berkowicz, R., Rastetter, A., and Plate E. J.: 1998:** Modelling of vehicle induced turbulence in air pollution studies for streets, *Proc. 5th Workshop on Harmonisation within Atmospheric Dispersion Modelling*, Rhodes, Greece, 18-21 May 1998.
- P. Kastner-Klein, E. Fedorovich, J.-F. Sini, P. G. Mestayer, 1999:** Experimental and numerical verification of similarity concept for diffusion of car exhaust gases in urban street canyons, Submitted to the *Journal of Environmental Monitoring and Assessment*.
- P. Kastner-Klein, E. Fedorovich, M.W. Rotach, 1999:** Organised and turbulent air motions in a wind tunnel model of a street canyon with and without moving vehicles, *Proceedings of 6th International Conference on Harmonisation within Atmospheric Dispersion Modelling*, 11-14 October, Rouen, France.
- P. Kastner-Klein, E. Fedorovich, 1999:** Scaling considerations regarding the influence of vehicle induced turbulence on dispersion in street canyons, *Text prepared for the TRAPOS discussion meeting on vehicle induced turbulence*, Aveiro, Portugal, August 99.