

Estimation of the distribution of ground concentrations from point sources in complex terrain - by simulation in the wind-tunnel

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Abstract of rigorous thesis

Task of this work has been to monitor the behaviour and to estimate the concentration of pollutants in atmosphere. To this purpose was selected as a model town Jablonné nad Orlicí and as a technical solution to the problem was physical modeling in the wind-tunnel (in scale 1:1000).

First of all, I define important terms (mainly turbulence, atmospheric boundary layer), equations, that describe atmospheric motions, and give account of wind-tunnel and methods of measurement.

I estimated the concentrations above the ground qualitatively (visually - using laser knife) and quantitatively (using the infrared analyzer IREX and the flame ionization detector FID).

High imission load in a densely settled part of the town Jablonné nad Orlicí was demonstrated. From the theoretical point of view I tested the influence of the complex terrain and of the source-parameters on the dispersion of the pollutants. I compared measurements by two instruments, which work on different principles.

I propose topics for further measurements on the same model and estimate for this, in terms of pollution, critical area.

Key words: atmospheric boundary layer - turbulence - fundamental equations of the flow and their approximation - scales of atmospheric movements -- wind-tunnel