

Title:

Microscale flow and diffusion characteristics inside the urban area

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Abstract:

Dispersion of pollutants in the atmosphere of urban areas is the important task in environmental sciences. The main goal was the quantitative studying of a flow in a symmetrical urban built-up area depending on a running on flow direction. There was given a theoretical base of the physical modelling of the atmospheric boundary layer in this work. The measurement was done with a model of the urban build-up area at a scale of 1:200 in the aerodynamic wind tunnel of the IT AS CR, v.v.i. in Nový Knín. The requirements to the similarity to a real atmospheric boundary layer and a model boundary layer in the wind tunnel were accomplished. Velocity fields, concentration fields and fields of scalar fluxes were measured in the area of a rectangular intersection. Results of the experiment showed significant sensitivity of the velocity field about the running on flow direction that extensively influenced ventilation of street canyons.

Keywords: air pollution, atmospheric boundary layer, physical modelling, dispersion of passive contaminant, urban build-up area