Abstract:

The dissertation thesis deals with short-term gas releases (puffs) in an urban canopy studied utilizing wind-tunnel modelling. The urban canopy was composed of buildings with pitched roofs organised into closed courtyards. Into it, a ground-level point gas source was placed. The first part of the thesis is focused on specific definitions of puff characteristics. New definitions of puff arrival and departure times are presented. Various definitions of puff arrival time were applied on the same datasets and the results were compared. Moreover, it was studied how slight changes in determination of puff departure time can affect its values and other derived puff characteristics. The second part of the thesis is focused on modelling of probability density functions of puff characteristics with knowledge of sampling positions towards the gas source and mean values of concentrations valid for long-term gas sources. The found equations will be utilized in an operational model. The outputs in the form of the probability density functions of puff characteristics distinguish my model from the usually utilized operational models, in which only the ensemble-averaged puff outline and concentration field can be predicted.