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Dear Sir/Madam

Ref: “Urban ventilation dependence on geometric configuration”, by RNDr. Ing. Libor Kubačka

I reviewed the doctoral thesis “Urban ventilation dependence on geometric configuration” by Libor Kubačka. The thesis reports on a series of wind tunnel experiments designed to study and analyse flow and dispersion in complex urban arrays. The author helped developing a wind tunnel methodology to measure both advective and turbulent components of momentum and scalar fluxes in complex models (as reported in Chapter 1 and the following). The application of such a methodology to complex urban models by the author and collaborators is among the first ones in the published literature. Results were analysed by means of both a series of well-established techniques and an innovative application of the quadrant analysis, rarely seen in such kind of studies.

New scientific results from the thesis include the development of the measurement technique (Chapters 1, 2 and 3), the application of the quadrant analysis on a regular building array (Chapters 4 and 5) and a deeper analysis of the flow and dispersion phenomena in a very complex urban array (Chapters 6 and 7). Applications of the results include the improvement and development of new mathematical models and parametrisations to tackle more complex physical processes in urban areas, in particular when complex geometries are involved (such as variable height buildings). Both the developed measurement technique and analysis methodology have the potential to be applied to other similar studies in urban areas and can further enhance our understanding of the physical processes at work.

The form and presentation of the thesis are of the required doctoral standard. One weakness is probably the level of the English language fluency, – with the only exception of Chapters 6 and 7 – not always of the highest standard. Another area where the author could improve in the future is the level of independence on his research: while probably good enough for a doctoral degree, it is evident that several collaborators have had determinant contributions to the candidate’s research, in particular Dr. Nosek.



Overall, I believe that the submitted thesis proves the author's ability for creative scientific work and is of the required level for a doctoral degree.

Yours sincerely,

Matteo Carpentieri

