Comment on hess-2021-412

Anonymous Referee #2

Referee comment on "The impact of wind on the rainfall–runoff relationship in urban high-rise building areas" by Xichao Gao et al., Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2021-412-RC2, 2021

General comments:

This paper discusses the development of an equation to describe the effects of wind on the rainfall-runoff process in areas with high rise buildings, developed using a CFD method and validated using scale model-based experiments. It appears to be well-structured and well-written, with referencing of relevant material and limitations clearly stated and accounted for where appropriate.

The paper appears to be appropriate for, and of interest to the readers of, HESS. I suggest below some changes that I believe are needed before publication, but most of these are fairly minor in nature. Please find some specific comments and technical comments below.

Specific comments:

Although this method appears to be novel, a recent work by Yoo et al. (2021) in the Journal of Hydrology, titled "Change of rainfall–runoff processes in urban areas due to high-rise buildings", covers some of the same material. I think that it is vital to acknowledge this early on in the work (e.g. in the introduction) and explain how this paper is still novel. Some comparison of the results from the two studies would also be of interest, where the results are comparable (perhaps added in the discussion section).

Technical comments:

Line 17 (abstract): Main result 2 here does not mention the angle, although this is mentioned in the conclusions, so that it may be of interest to add here too.

Line 49: \varepsilon is shown here (and throughout the paper) instead of the symbol itself.

Line 191: I think "cube" should be "cuboid", as not all sides are of equal length.

Lines 274 and 276 (Figure 4 and 5): The individual lines of the plots are hard to see here. Can the line width and/or plotting symbol size be reduced to make these plots clearer?

Lines 314 and 331 (Figures 8 and 9 captions): A bit more explanation is required here. For example what exactly do "Location x" and "Location y" mean? I think "x" means different things on different plots, but "y" is always along the vertical direction? It would be good to clarify this.

Line 348: "spatial" should be "spatially".

Line 362 (Figure 13 caption): The caption states that the Figure shows uncertainty, but it does not look like this is what the plot shows. Can this be checked?

Line 370: I think there is a missing word after "impervious".