

Interactive comment on “A physical approach on flood risk vulnerability of buildings” by B. Mazzorana et al.

Anonymous Referee #3

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This article proposes a conceptual scheme to assess flood risk vulnerability of buildings. Thereby, the approach aims at understanding and describing the physical processes in order to provide not only a basis for damage analysis but also for planning and vulnerability reduction interventions. The topic is very relevant and the described approach is innovative and promising for a multitude of applications. The article is written in a clear and well-understandable way. Some minor modifications may still enhance the high quality of the proposed publication:

Abstract: P. 1412, L. 13: In order to provide a reader of the abstract with more concrete indications on your approach, you may want to include another sentence with some characteristics of your “conceptual assessment scheme” and state explicitly how it responds to the research gap you outlined before.

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Introduction: P. 1413, L. 1ff: In lines 1&2 you outline that there is a particular gap you see and the following paragraph deals with different types of vulnerability as well as the disconnect between them. While I fully agree that this is a gap, the article at hand is not focusing on solving this issue and in the discussion you state “Taking an engineering perspective, and therefore neglecting any social implications, we presented a method to quantify vulnerability of buildings exposed to torrent processes.” Thus, presenting this issue in such a prominent position in your introduction may mislead the reader and suggest that this problem will actually be addressed in the article. I would propose to clearer focus the introduction on the research gap you approach in this paper while this doesn’t mean that you have to eliminate the challenges related to different types of vulnerability but explain clearer what your work aims at and what it doesn’t.

P1413, L. 29: You mention three vulnerability curves Quan Luna developed – are those separate ones for depth and impact pressure (or a third component) or for different building types while combining depth and impact pressure? Some additional detail would be helpful.

P.1414, L. 9: The term “hazard-proof” suggests the complete elimination of vulnerability while I imagine that this is not the idea you want to give.

P. 1416, L. 23: The figure is presented without any further explanation. I would suggest you mention the figure much earlier and explain the components you already outline in the introduction in relation to the figure. I would also propose that you state much clearer where your innovation lies – currently I find it a bit challenging to read this out of the introduction.

2.1 Overview P. 1417 L. 22: I would suggest to briefly define/explain the terms control volume and control sections

P. 1419, L. 26: “TRENT 2D [...] proved to be suitable” – why, how? Since it covers all your requirements for the hazard assessment? An additional half sentence could clarify

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P. 1420, L. 5: Please explain the variable “W”

P. 1433: You mention in the introduction the use of such analysis approaches for planning and risk reduction measures. I think it would be very useful if you could make reference to the application of your methodology for such purposes.

The following comment may be beyond your scope but I would like to raise it for a potential expansion of your methodology: I understand that you currently only determine “potential material intrusion”. However, in the context of practical applications I am also wondering how the vulnerability of the openings could be considered in more detail since they are the weakest spot of the buildings – e.g. window shutters could make a considerable difference, could this be included?

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