

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2
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Comment on nhess-2022-173

Hernan Martinez (Referee)

Referee comment on "Sensitivity analysis of a built environment exposed to the synthetic monophasic viscous debris flow impacts with 3-D numerical simulations" by Xun Huang et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2022-173-RC2>, 2022

According Martinez-Carvajal et al (2018), a natural phenomenon (hazard) may be characterized in terms of temporal, spatial and magnitude probabilities. The effects of the interaction between the hazard and the exposed element depend on the intensity of the hazard and on the resistance, sometimes called susceptibility, of the element at risk, which describes the propensity of a building or other infrastructure to suffer damage from a specific hazard impact. Consequently, a modern concept of vulnerability must consider the intensity of the hazard as well as the structural resistance of the exposed infrastructure. This concept is referred to as physical vulnerability, and the most accepted definition is a representation of the expected degree of loss quantified on a scale of 0 (no damage) to 1 (total destruction).

Previous considerations leads me to suggest to the authors the inclusion of a broad discussion on vulnerability which certainly is the major objective of this kind of research. Comments on the effect of the buildings strenght will be profitable for opening future research tiopics by means of numerical modelling.

Martinez-Carvajal, H. E., de Moraes Guimaraes Silva, M. T., Garcia-Aristizabal, E. F., Aristizabal-Giraldo, E. V. and Larios-Benavides, M. A. (2018). A mathematical approach for assessing landslide vulnerability. *Earth Sciences Research Journal*, 22(4), 251–273.
<https://doi.org/10.15446/esrj.v22n4.68553>