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Comment on nhess-2021-77

Anonymous Referee #3

Referee comment on "Rapid tsunami force prediction by mode-decomposition-based surrogate modeling" by Kenta Tozato et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-77-RC3>, 2021

Comments on "Real-time Tsunami Force Prediction by Mode Decomposition-Based Surrogate Modeling" by Kenta Tozato et al. submit to the journal of NHES. The authors tried to estimate the hydrodynamic force of tsunami acting on building through 2D and 3D FEM. The paper is interesting, and from my personal point of view, the topic of this manuscript fits well with the scope of the journal of NHES. There are too many figures (snapshots), however few explanations and not ready. Animations or supplementary files may be attached to improve readability. Some other major issues are listed below:

1. One faulting model of Tohoku Earthquake 2011 is used in this study, however but it may not (and should not) be reactivate at the same location and did not have the same magnitude. So it cannot be applied to other events, nor can it "predict" damages. Therefore, "real-time" tsunami force predictions may not be useful because the events of 2011 have already occurred. The term "real time" may change with the reassessment of the power of the tsunami...
2. The method proposed by the authors is a time-consuming task and not taking into account the faulting parameter of individual event. Likewise, the term "real-time" may not be a suitable term.
3. There are too many figures, but similar..., need to be simplified. The wording of the manuscript should be further elaborated so that the reader can understand what the author wants to express, regarding to the figures.
4. Many figures is not ready, and some parts can be unified. E.g. Fig 6, 7, 8, 11, 17 etc.