Comment on egusphere-2022-206
Carmine Galasso (Referee)

Referee comment on "Empirical tsunami fragility modelling for hierarchical damage levels: An application to damage data of the 2009 South Pacific tsunami" by Fatemeh Jalayer et al., EGUsphere, https://doi.org/10.5194/egusphere-2022-206-RC2, 2022

I sincerely apologize for the lengthy review period for your manuscript due to the summer break and several other deadlines over the past few months.

This paper proposes a simulation-based Bayesian method for parameter estimation and fragility model selection for mutually exclusive and collectively exhaustive damage states. The proposed approach is comprehensively illustrated through a case-study dataset related to the central South Pacific tsunami on September 29, 2009.

The manuscript is rigorous, very well written, and well organized. The figures are of excellent quality.

This is one of the very few cases where I am pleased to recommend accepting an original manuscript in its current form without any revisions.

A few very minor suggestions are as follows:

- Since the proposed statistical approach is general, I would consider removing the ‘An application to damage data of the 2009 South Pacific tsunami’ part from the title and stress more the fact this is a methodological study;
- The authors refer to the concept of the “simplest model” in the abstract and a few other occurrences. I would clarify how “simple” is assessed from the very beginning;
- Again, since the methodology is general – and the case-study tsunami event is just used for illustrative purposes – I would briefly discuss the applicability of the method to fragility derivation for other natural-hazard loading conditions.
I look forward to seeing the paper published in NHESS!

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