

Response to reviewer RC2:

We are grateful for the extensive comments and suggestions provided by the reviewer, as some of them have the potential to enhance the quality of the document. However, most of the suggested comments would be more suitable for an article on seismic risk conditioned to an event, and not necessarily for this case which follows a fully probabilistic approach. Additionally, we acknowledge with some disappointment that the reviewer encountered challenges in recognizing the novelty of the document.

What is novel about our approach is the combined application of a fully probabilistic risk assessment methodology at a city level, along with a very high resolution in the exposure model. By fully probabilistic we mean that we are after the final, unconditional, probability distribution over seismic consequences (we study physical damage, economic losses, and casualties), and not the distribution conditional on a particular seismic scenario or event, as is commonly found in the literature. On the one hand, we calculate consequences event by event considering thousands of seismic scenarios, taking care of the spatial correlation of the seismic intensity measures in each scenario. On the other hand, models at a city level are scarce, the more so the finer the resolution. Our resolution is the finest, as we consider each individual building in the city with its particular characteristics. Additionally, our counterfactual scenario analysis provides valuable insights into the potential impact of changes in building classes on the distribution of annual losses for various consequence variables. The comprehensive information provided by this fully probabilistic approach, i.e. annual distribution of physical damage, economic losses and/or casualties, is significantly useful for decision makers, serving as a substantial complement to the risk metrics derived from scenario-based evaluations. (Please refer to response to reviewer 1 for more details).

Regarding software and data availability (comment 1.1), the tool referred to in the document corresponds to a code developed by the researchers to address the questions posed in this article, and it is not intended to be used or patented as software. Both, reviewers and the general public, could develop their own code to replicate the results of this study, considering the flowchart in Figure 1, the available models referenced in the article and the public datasets available, making this manuscript completely reproducible. The data to generate the exposure model is available upon request, but we believe it is not a contribution that adds to the results of this article. In the case of the synthetic earthquake catalog, it is stochastic, i.e., corresponds to thousands of samples of earthquakes magnitudes and locations, thus the dataset is not a contribution by itself. However, in a revised version of the manuscript a more detailed description will be included.

Most of the comments provided by the reviewer could be resolved in a revised version of the manuscript, as they do not pertain to methodological or technical deficiencies but rather to clarifying aspects that were not sufficiently clear to the reader in the current version. However, it is important to note that the approach followed in this article is fully probabilistic, and most of the comments suggested by the reviewer align more closely to an event-based risk assessment, so not all of the comments are applicable for this article. Should the editor invite us to submit a revised version of the manuscript, we would gladly provide a detailed response to the reviewer's specific comments.