

## ***Interactive comment on “Reliability-based strength modification factor for seismic design spectra considering structural degradation” by Sonia E. Ruiz et al.***

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Referee #2 The submitted manuscript concerns a new approach for the definition of the strength modification factor of design spectra to be used in the seismic design of degrading structures. In the opinion of this reviewer the considered topic is very interesting from scientific point of view, the paper is well written and the subject falls within the scope of the "Natural Hazards and Earth System Sciences" journal. Summarizing, I would recommend the paper for publication in NHESS considering only minor revision, as indicated in the following comment.

Authors: Dear Referee # 2 We appreciate the time and effort that you have dedicated

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to provide your valuable observations on our manuscript, especially your comment regarding to the recommendation of our paper for publication in NHESS considering only minor revision.

Referee # 2 The rate of variation of the vibration periods of a structure, in the passage from the undamaged to the damaged state, strongly depends on the structural type, on the interaction of the structural elements with the nonstructural ones, as well as on the soil-structure interaction. Could the authors comment on whether the above parameters may have an effect on the proposed procedure, also considering the different design limit states furnished by current codes?

Authors: Thank you very much for this observation, we completely agree with the reviewer. The rate of variation of the vibration periods of a structure from the undamaged to the damaged state strongly depends of several parameters, and this is crucial to consider different design limit states. It is important to say that although the procedure is not affected by those parameters, the variation of the structural period could be taken into account considering different values of  $T_N$ ; however, the definition of this value accounting for the design limit state, structural type, interaction of the structural elements with the nonstructural ones, as well as the soil-structure interaction requires the study of specific structural systems such as: steel structures, reinforced concrete moment resisting frames, masonry structures, buildings with braces, posttensioned and based isolated structures, among others, which is out of the scope of the present study. Notice that currently the group of research on this subject of the Universidad Autonoma de Sinaloa and of the Universidad Nacional Autonoma de Mexico are working in order to develop optimal values of  $T_N$  for different types of structural systems and accounting for the parameters indicated by the reviewer.

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