



Interactive comment on “Subsoil seismic characterization through Vs30 for future structural assessment of buildings (Ciudad del Carmen, Mexico)” by Leonardo Palemón-Arcos et al.

Leonardo Palemón-Arcos et al.

leopalemon@hotmail.com

Received and published: 12 October 2021

Response to comments of Referee #2 "Subsoil seismic characterization through Vs30 for future structural assessment of buildings (Ciudad del Carmen, Mexico)"

nhess-2020-194 Comments to Author This paper presents the seismic microzoning of Ciudad del Carmen city following the Mexican building code (CFE). Though the subject could be worth publishing, the paper should be entirely re-written The reviewer is right, this suggestion has been incorporated in the new version of the manuscript. We thank the reviewer for providing many constructive comments that allow us to improve the

C1

manuscript presentation.

1-Introduction and 2-study area”: It should be focused on Ciudad del Carmen context in terms of tectonics, regional seismicity, superficial geology and building code. Figures 2 and 3 should be replaced by a general map of the regional seismicity RESPONSE: Tectonics, regional seismicity, and superficial geology has been included in the revised manuscript (see Page 4, Lines 94 to 125). Regarding the building code, there is only the construction regulations of September 8, 1997, lacking the seismic and structural part, so here is the objective of the paper to seismically regionalize the city of Carmen.

3. Materials and methods”: It is not necessary to explain MASW and REMI methods The goal of the study is not clear. since they are well known methodologies now (Figures 5 and 7 could be removed). Same remark for dispersion analysis. On the contrary, it should be interesting to detail the local context of Ciudad del Carmen in terms of population, vulnerability and seismic hazard RESPONSE: The reviewer is right, observation attended. Figures were removed in the revised manuscript (see Page 3, Line 89 to 92). “As of 2010, Ciudad del Carmen had a population of 169,466 (INEGI, 2010), and has a great demand for housing due to the oil boom and accelerated population growth so the houses are built on sandy soil and with vertical growth generating a risk from natural phenomena such as: hurricanes, flooding, tropical storms and cold fronts. Additionally, it is located just 500 km from the epicenters, which brings a seismic hazard with possible sand liquefaction.”

4. Numerical results”: Results are difficult to comment. If the aim of the paper is to present a microzoning of the city, MASW profiles should be clearly identified in Figure 6, 9, 10 and 11. The authors should comment the results profiles by profiles and compared them to the superficial geology and the expected soil response. It is not clear for me if the final zonation is based on the NEHRP building code or the CFE one. Is there a specific building code in Ciudad del Carmen? Why the authors choose to divide the city in 3 zones (I, II and III) while the VS30 values give only a soil type III (Figure 13)?.

C2

RESPONSE: The reviewer is right. Suggestion has been incorporated. Other answers are listed below: Another paper to obtain geomechanical properties of soil through correlations between the MASW technique and geotechnical studies is planned for Ciudad del Carmen with the conditions of the water table. For the final zonation, only the NEHRP and CFE codes were taken as reference. Regarding the building code, there is only the construction regulations of September 8, 1997, lacking the seismic and structural theme, so here is the objective of this paper, to seismically regionalize Ciudad del Carmen considering the reference velocities of the NEHRP and CFE codes. Geotechnically and seismically, with the two reference codes it is observed that there is only one type of soil. However, it is divided into three zones because there are clearly areas of soft soil product of fillings, healthy areas without fill and a third with competent soil.

General comment on the paper: the English language needs to be reviewed. The text is poorly argued and the discussion is not precise enough to validate the results. Some figures could be removed (2, 5, 7, 8, 11) and others should be highly improved
RESPONSE: The reviewer is right, observation attended.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2020-194>, 2020.