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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Evidence of preliminary prognosis of appearance of catastrophic earthquake and strong tsunami in the region of Tarapacá, Chile" *by* Raissa K. Mazova et al.

Anonymous Referee #1

Received and published: 18 October 2019

Evaluation report:

General comments

The quality of discussed paper is good and meets the standards of the NHEES. My general comment is that there are several positive issues in the paper, especially regarding the investigation (numerical simulations of the earthquake and tsunami of 1st April, 2014, Chile off coast). Another strong positive approach is related to the detail spectral analysis, which is not very frequently used in tsunami papers. The investigated scenarios (1 and 2) add proves to the main hypothesis of the authors.

There are some individual scientific questions/issues as specific comments to the pa-

per: A) in Line 24 two important papers about the papers considering the stochastic prediction must be added (as well as in the References list): I. Papratilov, M. Velikova, B. Ranguelov E. Spassov, 2011. Earthquake Prediction Stochastic Models – a Sofware using Matlab Algorithms. Application to the Chile Subduction Zone., Proc. 6th Congress of Balkan Geophysical Society - Budapest, Hungary, 3-6th October 2011. pp1-5.

Ranguelov B., I. Papratilov, M. Velikova, E. Spassov., 2011. A STOCHASTIC MODEL FOR PREDICTION THE OCCURRENCE OF STRONG EARTHQUAKES (M>7.0) IN THE CHILE SEISMOGENIC AREA., Ann. of MG University, Vol. 54, Part I, Geology and Geophysics., p. 173-176. ISSN 1312-1820

B) Line 40 - According to modern concepts of geotectonics (Lobkovsky L1988), (Lobkovsky L et al. 2004) , there are two types of subduction zones: the Chilean type and the Mariana type. The Chilean type is characterized by a deep-sea trench and a strong coupling between the continental and oceanic lithospheric plates during the subduction process, and seismic activity in the Chilean-type subduction zones leads to strong tsunamis. Examples of Chilean-type subduction zones are the areas of the Kuril-Kamchatka and Japanese deep-sea trenches. . ...

Then the authors mentioned the structure and specifics of the Chilean type. It is essential to do the same about Mariana type with 1-2 sentences.

C) It is really important somewhere after line 250 to put a short explanation regarding the importance of the refraction to the tsunami energy distribution; moreover such effects are clearly visible on fig. 6, 7 and 8. A sentence like: "It is important to note that the refraction play the significant part of the tsunami energy distribution and focused it to the nearest coast (i.e. Chielan)". This will improve the quality of the paper.

D) CONCLUSIONS - It is important to write 1-2 sentences in CONCLUSIONS, regarding the spectral analysis preformed.

- It is also preferable to put the last sentence from paragraph 3. Analysis . . .to CONCLUSIONS (i.e. line 333 and below – “Thus, a numerical simulation of the last catastrophic tsunami with a seismic source, localized near the northern coast of Chile, performed, demonstrates that taking into account the complex structure of the seismic source allows us to describe a number of effects in the near-field zone that are difficult, and sometimes impossible, to explain using a simplified model seismic source.”) to go to the CONCLUSIONS

For the “technical corrections” it is better to correct:

Line 70 – “Entire blocks of cities were washed away and destroyed. . .

It is more accurate to write instead of “cities” – “villages” (or inhabitant areas) as authors prefer.

Line 257 . “All points. . .” is incorrect. . . It is incorrect. “All points. . .” , better to write “The values of all points. . .”

Table 5 (second row) Bigining uplift. . .better to write “initial” (or beginning, if authors prefer)

Line 330 At the points of Nazca and Lima, due to the interaction of a complex wave field with the peculiarities of the coastal AND BOTTOM relief. . .,

It is important to add “and bottom”

Please also note the supplement to this comment:
https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2019-278/nhess-2019-278-RC1-supplement.pdf

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