

## ***Interactive comment on “Reanalysis of the 1761 transatlantic tsunami” by Martin Wronna et al.***

**C. Ozer Sozdinler (Referee)**

cerenoZR@cc.kagawa-u.ac.jp

Received and published: 9 July 2018

This manuscript mainly describes the studies performed for the verification of location of 1761 earthquake's epicenter using the observations at some coastal locations in SW Portugal, Caribbean Sea and Azores Islands recorded in historical documents. They apply a method for the relocation of the fault and propose various hypotheses for fault models having different fault parameters. After comparing with the tsunami numerical modeling results with the observed values, they conclude that the proposed source of 1761 earthquake is reliable and it should be included in the tsunami hazard-related studies in NE Atlantic Ocean. Of course, it is not possible to have 100% compatibility between the modeling results and observations because of many reasons such as unreliable historical records, not using so fine-gridded data for the smallest domain, using Green's Law for some VTGs, etc.

C1

According to the proposed phenomenon and studies performed, this manuscript seems acceptable with minor revisions.

The most significant revision is needed for the idea of drawing of Euler Circle and defining the fault parameters accordingly. Since it is the basic of all this study, this part should be described more clearly and comprehensively.

The second revision should be for further description of backward ray tracing contours. This part is not clear to me; further details are needed for the meaning of these contours.

The other important revision is necessary for the comparison of observed data with the calculated results. The summary of results for 2 selected hypotheses are given in Tables 3 and 4 but there is no information for the observed wave heights at these locations. Instead, these values are given in Table 1. Table 1 may stay as it is but Table 3 and 4 should also include the observed values in a column for better comparison.

Another revision is recommended for giving further details regarding Paleo DEM mentioned on Page 8 very shortly. Since the modeling results may be affected due to such data, it is necessary to make further explanation on how you prepared/used this data and also its difference from the current DEM data.

Other minor corrections (typo, disorder meaning, etc) are given in lines with page numbers below:

- Page 1 Line 14: the phrase "...from Cadiz not used before" is not clear. - Page 2 Line 12: what does "we revisit the source..." mean? - Page 2 Line 15: Better to say "compared with" instead of "checked against" - Page 6 Line 2: It should be "... did not use it in the simulations...". "in" is missing. - Page 6 Line 15: Please rephrase the sentence "In a summary by Borlase (1762) summary describes..." - Page 6 Line 19: better to write 6 pm in numbers - Page 6 Line 31: In which region are these river estuaries located? - Page 8 Line 8: "...observation points..." instead of "...observations points..."

C2

- Page 8 Line 25: The message of this sentence is not clear. Further explanation and clarification are needed. - Page 9: The first paragraph is a bit irrelevant with the previous and following ones. Better to link this paragraph with the previous one. - Page 9 Line 11: Better to say "... Figures from 4 to 7 present..." without using comma - Page 9 Line 14: Please rephrase the sentence "The geographical coordinates and depths their coordinates and depth are given..." - Page 10 Line 2: Please don't use comma after 5 - Page 10 Line 9: "...heights reach up to 1.7m" - Page 11 Line 11: better to use "leading elevation wave" instead of "an upward movement" -

The corrections for Figures and Tables are listed below: - Figure 1: Who suggested the other 2 epicenters of 1761 eq, except Baptista et al (2006)? Are they the ones also shown in Figure 2? If yes, then it is better to write them in Figure 1. Also, what are the lines with small black triangles represent in the zoomed-in map? It was not indicated in the legend. - Figure 2: In the caption, better to write "backward ray tracing" instead of "back ray." - The plots in (b) and (c) of Figures 5 and 7 are not visible! They can be plotted with longer x-axis or separately one under the other with shorter y-axis. - Tables 3 and 4 should include historical tsunami observations at these locations in a different column - Page 13 Line 4: better to use "withdraw" instead of "downward movement"; "occurs" instead of "arrives" - Page 13 Line 5: better to use "water surface elevation" instead of "upward movement" - Page 13 Line 6: "wave ascending" instead of "upward movement" - Page 13 Line 7: "...waveform shows around 15 minutes wave period." - Page 13 Line 8: something missing here "...wave arrives at the \_\_\_\_ after 4 hours.." - Page 13 Line 8: "...15-minute period and 0.6m wave height" is better - Page 15 Line 9: Better to use word "delays or time difference" instead of "error" - Page 15 Line 19: Please rephrase the sentence starting with "Our source..." - Page 16 Line 20: Please rephrase this sentence; it is not clear.

The following references are not listed in the reference list: - Gutenberg and Richter (1949 - Moreira (1984) - DeMets et al (1990)

I believe the manuscript would be in a more comprehensive and well-understood

C3

status if those revisions would be applied accordingly.

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2018-30/nhess-2018-30-RC2-supplement.pdf>

---

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2018-30>, 2018.

C4