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## **Comment on nhess-2021-346**

Anonymous Referee #1

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Referee comment on "Historical tsunamis of Taiwan in the 18th century: the 1781 Jiateng Harbor flooding and 1782 tsunami event" by Tien-Chi Liu et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-346-RC1>, 2022

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**Review of the manuscript:** "Historical Tsunamis of Taiwan in the Eighteenth Century: the 1781 Jiateng Harbor Flooding and 1782 Tsunami Event" by Tien-Chi Liu, Tso-Ren Wu, Shu-Kun Hsu.

The manuscript aims to provide a contribution to reconstruct two episodes, close in space and time, reported by historical documents in the area of Taiwan that could be potentially associated to one or two tsunami events. In my understanding, the main finding of this research consists in the collection of several proofs to claim that the episodes are two independent events and that in both cases a seismic source is very unlikely, inviting future researches to focus on submarine mass movement (for the 1781 event) and a storm surge (for the 1782 event).

The general impression is that the manuscript fits the aim and scope of the Journal event though, in its current form, is not ready for publication, since there are some issues that should be properly and carefully addressed.

### **Major comment:**

In my opinion, a brief but exhaustive description of the IIA method in section 2 is required. Indeed, there is no description about the way in which the maximum elevations are calculated starting from the unit sources. All the references to previous works based on this method (Chung, 2018; Lee, 2014; Wu, 2017), as reported in the text, are in Chinese language only. If this method is unpublished in international peer-reviewed journals, it should be exhaustively described here.

## Moderate comments:

1) I recommend to clarify already in the abstract that these two events are tricky not only for the difficulties in interpreting the existing documentation of both, but also because they resulted close enough in time and location to have raised the suspect, in some researchers, to be the same event.

This, at least to me, would make clearer also why the authors presented the two events together.

A short sentence before "Reasoning these historical events [...]" in the abstract could serve the scope.

2) I recommend to add a Figure (a new Figure 1) to introduce the area of study, with a zoom in the two targets, in order to make the reader aware, since the beginning, of the regional context and the distances between the two sites. In this new figure, I suggest also to include the location of some features described later on in the text (canyons, faults, etc) in order to provide a reference between the real geography of the area and what described in the text.

3) The references for the bathymetry data with resolution 100 m used for the two near-field models should be provided (line 96). I suppose (but I am not sure) that this is different from what described for the data used with the nested-grids in COMCOT (lines 173-179).

4) I did not understand why the high-resolution IIA (Figure 3) is shown for the Jiateng target only. What about Tainan?

5) What the sentence "the asperity effect was also applied" (line 155) means in practice? At least a brief sentence about this should be provided.

6) At line 170, it seems that nonlinear equation were used for SMF only, but I guess that they have been used for the seismic sources as well. Authors should better clarify this point. Also, what is the reason for the selected Manning coefficient value (line 171)? 0.013 is a quite low friction, often used in presence of plain surfaces and no obstacles.

7) At line 183 is reported: "1 zhang approximately equals to  $3 - 1/3$  m" but I am not sure to have understood which is the exact correspondence in meters.

8) Section 3.1: I suggest to provide some more details on the position of the numerical gauge, as the water depth of the point and a zoomed map with the position respect with the coastline (an inset in Figure 5 could be enough)

9) At line 235 I suggest to change the sentence in "[...] COMCOT seems to confirm [...]". I would be more prudent on what the modelling results are indicating, since the parameters of the potential sources are quite uncertain for these events of the past. Modelling a few scenarios can help to support some hypotheses in broad terms, but I would be careful in drawing definitive conclusions.

### **Minor suggestions:**

line 12: "[...] , titled Taiwan Interview Catalogue, [...]"

line 70-74: I suggest to slightly rephrase these sentences, since it seems to me that the reader could be a bit confused. I suggest something similar to the following: "Second, from the words "Voici ce que je lis dans J. L. Ab Indagine L. M." (i.e., "Here is what I read from J. L. Ab Indagine L. M.") in Perrey (1862), it is reasonable to believe that most of the content in that document is quoted from the German report Philosophisch und physikalische Abhandlungen (Jäger, 1784). After examining these two documents, it is also suspected that the date of a second letter sent from Beijing to Versailles was reported with a typographical error about the year. Indeed, the date "En décembre 1682" is found in Perrey's [...]"

line 106: "[...] where the submarine structures are located, [...]" ?

line 120: "broader"?

line 167: I suggest to use quotation marks for the sentence ("subterranean movements causing the whole island to shake and be devastated; the earthquake lasted for 8 hours"), in order to emphasize the quotation.

line 242: If I understand the sentence, I would rephrase as "Moreover, it is unlikely that a severe tsunami in 1782 was not reported by any Chinese document."

line 244: "[...] the French record as reported by Perry (1862) [...]"

line 245: "[...] the historical documents cited by Perry [...]"

