

## ***Interactive comment on “Hazard Assessment Comparison of Tazhiping Landslide Before and After Treatment” by Dong Huang et al.***

**Anonymous Referee #1**

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The paper by Huang et al. addresses relevant scientific and technical questions. It presents a concept and adoption of a well-known method to simulate mass movement processes. The used methods are in principle up to international standards but there is some doubt whether they used the appropriate method for this study. The scientific methods and assumptions used are valid and outlined clearly. There is some confusion about the mass movement process that is discussed and approached by the presented and adopted rheological model. In principle, the numerical approach in RAMMS can also be used for the simulation of landslides. But it is actually not intended for it and does not take into account specific properties of this kind of mass movement (landslides). The results of the study are not really surprising. Interpretation of the simulation results is derived poorly. Some important questions remain still unanswered, namely the sensitivity of the friction parameters and - more important - the derivation

C1

of the best-fit parameters presented in Table 2. This aspect should be at least considered in the discussion and ideally in the methods section. While the methods section is very detailed (and also well written in good English) regarding the numeric, no information is given about the modeling procedure and interpretation of the simulation results. The title does not promise detailed information about the numeric but rather a specification about the hazard assessment comparison. Therefore or the title or the content of the paper should be changed. The same is true for the abstract. More information should be given for the methods section or the method section should be adjusted. The mathematical formulae, symbols, abbreviations and units are correctly defined and used. There is some confusion in terminology for figures 6 and 7, that have to be changed. Figures should be improved. Figure 1 seems to be taken from an existing paper without citation. Figure 2 needs more information about the location of the study site in a global perspective and better visualization of the exact location in the Baisha river basin. figures 6 and 7 do not contain more details on the landslide area, location of the objects at risk, etc. This information is only given in figure 8 but visualized rather small. Readability of the outlines of buildings is very hard and not mentioned in the legend. The authors give in principle proper credit to previous and related work. Own contributions are not well indicated (besides the adoption of the model and the interpretation of the simulation results). Number and quality of the references are appropriate. There are some publications in Chinese that are not accessible by all fellow scientist. There is some confusion for the article by Zhang,Z.Y., Wang,S.T., Wang,L.S.,et al., about the year of publication. In the text 1994 is mentioned while in the references there is written 1993. The reference of Toro, 1992 is missing. Structure and length of the paper is adequate. Methods section with the numeric is too long compared to the results section. Technical language and the English is more or less of good quality and understandable. Several sentences need to be reformulated, mostly because of wrong word order. There is no supplementary material available.

p.2, line 61: what do the autors exactly mean with "landslide-debris flows?" Please rely on some definitions in the literature.

C2

p.2, line 71: what do the authors exactly mean with 3D mapping of the division of hazard zones? Usually, hazard zonation is given on a map, e.g. in 2D

p.3, line 98: this figure is taken from Christen et al., 2010. Please cite source.

p.3, line 107: missing space

p.7, line 178: this reference is missing in the reference section

p.11, line 255: see comment for p.2, line 71

p.11, line 266: figure is subtitled with "Thickness". Thickness of deposition is not equal to flow height (if a landslide really "flows"...). Please adapt wording

p.12, line 268: subtitle of figure is "Speed", legend says "Velocity". If the blue to green marked zone shows the deposited mass of the landslide, there should be no velocity value (because it's deposited). In chapter 3 is no indication or estimation about the speed of the landslide mass, therefore figure 6b does not really make sense.

p.12, line 270: not clear, if the colored area shows the maximum pressure or an instantaneous for a given time step. Much more of interest would be a local value (over time) at the position of a building. And why the legend goes up to more than 1000kPa but no reddish or yellowish areas are marked?

p.12, lines 274, 277 and p.13, line 278: not clear what numbers in the circle mean. Is this kind of a list or does it indicate a location in a figure?

p.13, line 279: how is made this separation between houses of different numbers of stories? Please give more information and references to it.

p.13, line 293: or indicate "about 1.2 m" or give exact value

p.13, line 298: same remark as for figure 6a

p. 14, line 300: same remark as for figure 6b

p.14, line 305: example of a sentence that has to be rewritten because of wrong word

C3

order

p.14, lines 305, 308, 309: not clear what numbers in the circle mean.

p.15, line 321/322: not sure, if this statement is really true. There may be examples where entire houses on a landslide mass are moved but not destroyed because of stable baseplates. In any case, velocity plays a more important role regarding kinetic energy acting on an obstacle. You are right in the sense that the height of a moving landslide (e.g. the frontal part) plays an important role when it hits a building on a higher level, e.g. the second or third floor. Please clarify this point.

p.15, 16 and 17, table 3: the term "washed away" is not suitable for landslide process. It implies an major influence by a fluid.

p.17, line 333: This should be 2D, because you show a map with the different zonations. These different zonations are not defined, by the way.

p.17, line 339: There seem to be marked buildings (in the red high-hazard zone). If so, adjust legend and make sure they are better visible. What zone is defined outside the colored area? No hazard or also low-hazard zone?

p.18, line 342: same as for figure 8a. And this should be 8b instead of 8c

p.18, line 350: what is a landslide-debris flow?

p.18, line 358: this should be 2D

p.19, line 411: correct reference would be: Michael-Leiba, M., Baynes, F., Scott, G., Granger, K. 2003. Regional landslide risk to the Cairns community [J]. NatHazards, 2003,30 (2):233–249. Check reference style for all references according to the journal style!

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C4