

Interactive comment on “Analysis of instability conditions and failure mode of a special type of translational landslide using a long-period monitoring data: a case study of the Wobaoshi landslide (Bazhong city, China)” by Yimin Liu et al.

Yimin Liu et al.

153973418@qq.com

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We are very grateful to this referee comments, and we have carefully read and considered the referee's comments, and these comments are important for improving the quality of this manuscript. Based on these comments, we have made carefully modification and proofreading on the original manuscript, the detail modifications are mainly for the chapter - Abstract and Introduction, which have been reconstructed and rewritten, and description of the Wobaoshi Landslide's geological structure and characteristics have been modified and reconstructed, and language, grammar and professional

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terms in English also have been improved. Please see the detailed revision, and we carefully proof-read the manuscript to minimize typographical, grammatical, and bibliographical errors, and the modified parts are marked in red in the revised manuscript. Thank you very much for your suggestion and consideration, and we look forward to hearing from you. Best regards, Yimin Liu, Chenghu Wang and Pu wang.

Detailed revision: 1. Language, in general is not good and some sentences are unclear. Some professional terms are incorrect. Modification: For the unclear parts and unprofessional terms in the manuscript, we have made serious changes in English expression to ensure clearly presented, and proofreading also has been done, and the revised changes are in red in the manuscript. For instance, “overall occurrence of the rock formation” has changed to “overall attitude of rock bed” in line 122, “planar graph” has changed to “topographic map” in Fig. 3, “gage” has changed to “gauge”, “long-period” has changed to “long-term”, “heavy rain” has changed to “periodic rain”, “rainy season” has changed to “monsoon”, “mechanical” has changed to “geomechanical”, “field exploration” has changed to “field investigation”, “starting” has changed to “initiation”, “theorical” has changed to “theoretical” in the manuscript, and we have spelled all abbreviations and acronyms at their first mention in the main text, such as enhanced thematic mapper called ETM+, and digital elevation model called DEM in line 67 and 68. Thus, these descriptions will be more accurate and professional than before.

2. Introduction, there is a little more information (what, where, why) and presentation of the main aim of the paper. Does the landslide threaten something? Why it is important to be studied? Modification: This comment is very important for the paper, and the presentation of the main aim in original manuscript is lack of refinement and detailed narrative. Therefore, we modify and supplement the purpose and importance of this manuscript, firstly, the occurrence of plate-shaped translational landslides is often unexpected and covert; secondly, the field investigation and monitoring data for this kind of landslide is often absent, and the research on translational landslide lacks monitoring engineering and measured data on landslide physical parameters.

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Thus, demonstrating and validating the deformation and failure mode of the translational landslide in the theoretical analysis is difficult. As shown observation point b and c in Fig. 2, the Wobaoshi landslide seriously threaten residential houses and highways, the houses had cracked and highways had uplifted, so this landslides seriously threatens the safety of people's property and transportation, thus it is necessary to research on it. This supplementary part is from line 181 to line 183. We added a photo of the house cracking in observation point b of Figure 2, and this photo was taken in a field investigation in the Wobaoshi landslide. Additionally, detail description and conclusion of characteristics and failure mode of the landslide in chapter – Introduction, have been transferred to the chapter – Results.

3. In the Landslide characteristics the geological structure is not clearly presented. Monitoring results and numerical modelling results are clearly presented (graphs, models). Modification: In origin manuscript, the Section 1 “Landslide characteristics” is not clearly presented like the comment said. Thus we reconstruct the Section 1 and especially make change on the forming conditions, especially the engineering geological conditions of this landslide. At the same time, some geological terms have been corrected. Through the modification, we feel that geological structure and characteristics of the Wobaoshi landslide will be more clearly and accurate than the origin vision.

4. Discussion is clearly written. The system of long-term gradual opening of the cracks and short-term opening and closing of cracks (blocks tilting) (very characteristic on the graphs) could be described more in detail. Modification: The system of long-term cracks opening and short-term cracks closing is described in detail in Section 2.2 “Monitoring Data Analysis”, and the Section 4.1 “Deformation and Failure Mode Exploration” in discussion, is refined by the landslide monitoring data analysis in Section 2.2. And we have increased the relationship between the “Monitoring Data Analysis” and “Deformation and Failure Mode Exploration” in Section 4.1.

5. Any possible mitigation measures or additional monitoring suggested? Explanation and modification: As shown in Section 4.3, the manuscript proposes the following

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suitable monitoring methods referring to the plate-shaped translational landslide, such as long- period and multiple parameters monitoring, and additional monitoring suggestion is the inclination measuring device for plate girders, and this monitoring method in next working plan will be effective and suitable for this type of landslide. In origin manuscript, the optimization monitoring methods may not be very clear, so we have highlighted the new method suggested in the next step of landslide monitoring, therefore, it is beneficial to in-depth exploration of the deformation and failure mode of the landslide and it will improve the success rate of early warning.

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2019-133/nhess-2019-133-AC1-supplement.pdf>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2019-133>, 2019.

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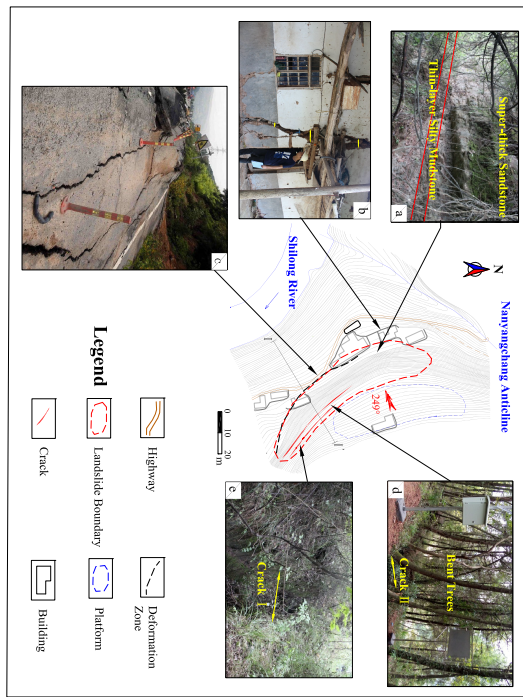


Fig. 1. Fig. 2 Topographic map of the Wobaoshi landslide and photographs of observation points