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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Influence of shearing rate on the residual strength characteristic of three landslides soils in loess area" *by* Baoqin Lian et al.

Anonymous Referee #2

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Review of manuscript nhess-2018-270 Title: "Influence of shearing rate on the residual strength characteristic of three landslides soils in loess area" by Baoqin et al.

Dear editor,

The paper presents the results of shear experiments conducted on 24 loess samples collected from three landslides. Samples were sheared in a rotary apparatus under two imposed velocities and four different normal stresses. The authors summarized the results and briefly discuss them. This manuscript should be better organized and written. Language mistakes make it sometimes impossible to read or understand. In addition, the authors should clarify what is innovative in this paper or how their results

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Discussion paper

support or differ from previous studies. I recommend the authors to significantly revise the manuscript before resubmission. Hope this helps

Major comments

1. I found it hard to understand the connection between the definition of the residual strength of a landslide and what is actually measured in the lab experiments. Some of my misunderstanding may cause by the fact that I'm not a soil mechanics expert. Saying that, I think that the authors should carefully define the basic terms and explain how they connect to their experiments. For example, the first sentence of the introduction says "Residual strength of soil is of great significance for evaluating the reactivating potential of the slope, in which consists of pre-existing sliding surface". I'm not sure how the current experiments deals with the "reactivating potential" as they suggest only one continuous sliding event in their experiments. In addition, how about the sliding surfaces? Did they form during the experiments?

2. It seems that one important point of the experiments is the imposed shear velocity. The authors should clearly define in the introduction what are low and high velocities. I would rather use m/s as the velocity units, but in any case they should be consistent along the paper (see lines 52 and 57 as an example).

3. The motivation for this study is not clear to me. In lines 68-69 the authors suggest that not enough studies conducted on the issue that they just summarized in details in the two paragraphs above it. They should clarify what is the gap and how their new study contributes to the understanding of the problem.

4. In the "Results and discussion" chapter many of the results are not discussed. For example, in sub-section 4.1 no discussion is following the observed difference between samples. Moreover, there are a lot of details with almost no discussion!

5. I really recommend the authors to send the manuscript to English proofreading before resubmitting the manuscript.

Moderate and minor comments

1. Figure 1 - Please increase line width of the arrows that point on “locations of study”. I think it is better to add a small symbol for the location of each site. What are the red dashed lines in the photos? It should be described in the figure caption.

2. Line 127 – Why did you crush the material? Is it because the fragments are too big for the cell? Please explain in the text.

3. Line 128 - What is the desired content? Please refer to a table and/or give the numbers here.

4. Line 131 - When during the procedure you sieved the material? Before or after adding the distilled water? Before or after crushing?

5. Line 132 – “physical indexes”. Do you mean the physical parameters that are listed in the line above?

6. Table 1 – Check units! Replace m with mm.

7. Lines 147-148 - It is not sounds to me like the most important thing about ring shear test apparatus, as direct shear is better in that sense. I would say that unlimited displacement is the most important advantage of the rotary shear for this specific application.

8. Line 155 – “single direction”, what do you mean? It is a rotary shear and not direct shear apparatus!

9. Lines 155-157 and 178 – The annular porous plates, explain why they are needed! I recommend including an image that shows them.

10. Line 158 – What is the sampling rate of the rheology data?

11. Figure 2 - Please change the font color and add a background to improve visibility. I would highly recommend adding a sub-figure here that shows a cross section of the

shear box and clarify where the actual soil sample is, and which part is rotating and which is stationary.

12. Line 172 – What is the required consolidation? How do you know if you get it or not?

13. I would combine sections 3.1 and 3.3 or better separate the text.

14. Line 195 – The authors suggest they ran the samples for large displacements. Did they run at least one experiment beyond the maximum displacement given in the figures to ensure that they really get to a steady state friction.

15. Lines 222-224 - You should better explain what actually this reorientation is and why do you think it should be different specifically for Djg samples?

16. Line 296 - I'm not sure what the connection between these soil properties is. Please define them and better connect to the measurements.

17. The current Conclusions chapter is mostly a summary of the results, instead of a short description of what we have studied and can take from this experimental study.

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