

Interactive comment on “Shear rate effect on the residual strength characteristics of saturated loess” by Baoqin Lian et al.

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Residual shear strength of soils is an important soil parameter for assessing the stability of landslides. However, compared with the results of tests on clay or sand, understanding of the shear characteristics of silty soil, such as loess, is not yet complete. To clarify the residual shear characteristics of loess under the effect of the shear rate, a series of naturally drained ring shear tests were conducted on loess obtained from three landslides at two shear rates and the residual shear characteristics of loess at the residual state was examined. The research would be helpful for evaluating the stability for the slip surface of first-time landslides as well as reactivated landslides. About language writing, the corrections of spell seem not necessary. However, a moderate revision is recommended for this paper.

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General comments:

ĩĆũĩĂ In the “abstract” section and “conclusion” section, the authors point out “such negative shear rate effect on loess could be attributed to a greater ability of clay particles in specimen to restore broken bonds at low shear rates.” In my opinion, since you do not have data or results to support such conclusion, I suggest you to delete the sentence or revise it as follows: “Such negative shear rate effect on loess may be attributed to a greater ability of clay particles in specimen to restore broken bonds at low shear rates”.

ĩĆũĩĂ In “Geological setting of landslide sites” section, you should use a more concise description for three landslides. In my opinion, the authors do not need to focus much on the background of landslides such as the volume, width of landslides. However, you should put more emphasis on the soil properties.

ĩĆũĩĆ I only found the physical parameters of slip-zone loess in Table 1, please add more information about the soil, such as the particle size distribution curves of soil.

ĩĆũĩĂ Concerning the reference list: In “testing sample” section, the soil samples were crushed with a mortar and pestle. Please kindly cite 1-2 references to support it.

ĩĆũ Lines 205-207, please explain the reason why you use different intervals (sampling rates) to record the shear strength of soil. Does this affect the experimental results?

ĩĆũ Lines 238-239: what is “high shear rate” and “low shear rate” meaning? You have to point out their meaning when it appears in the manuscript for the first time.

ĩĆũĩĂ Please add “the limitation of this study” in the “Discussion” section since slip surface soils used in this study are obtained from only three landslide sites.

Minor comments:

Lines 114-115: delete “with the height difference between the toe and the top of landslide about 55 m” since the authors have introduced the top and the toe altitude of the

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landslide.

Line 120: change “ranged” to “ranging”.

Line 125: change “quaternary” to “Quaternary”.

Line 139: change “the Figure 1” to “Figure 1”.

Line 185: change “be monitored by computer in shearing process” to “be monitored by a computer in the shearing process”.

Line 192: It seems that “the” is missing before the word “present”.

Line 226: change “shear rate” to “the shear rate”.

Lines 236-237: “residual conditions were achieved at large displacements” should be “the residual condition was achieved at large displacements”. Please revise it.

Line 335: change “ $\dot{N}Dr$ (0.1)” to “ $\dot{N}Dr$ (0.1)”.

Lines 455,456,458: change “ $\dot{N}Dr$ ” to “ $\dot{N}Dr$ ”. Please check this issue thoroughly in the manuscript.

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2019-156/nhess-2019-156-SC1-supplement.pdf>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2019-156>, 2019.