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Earth Surface Dynamics Discussions

Interactive comment on "Mechanical State of Gravel Soil in Mobilization of Rainfall-Induced Landslide in Wenchuan seismic area, Sichuan province, China" *by* Liping Liao et al.

Anonymous Referee #1

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General comments This paper presented a study about the mechanical state of gravel soil in the landslide initiation using artificial flume model tests and triaxial tests. This topic is very interesting and significant for the landslide early identification and prediction, and it is within the scope of ESURF. The experiment and testing are designed reasonably and its results are reliable. but I think the innovation of this paper is slightly weak. The Introduction and Conclusion did not prepare well. In addition, the language of this paper should be improved. I think this paper needs a round of major revision before publication. Specific comments 1. I think the introduction was not prepared well. too many previous studies were presented, only important studies related to you study should be presented; the purpose and motivation of this paper should be clearer. 2.

The initial dry density is important for the analysis and conclusions, I suggest the authors add some explanation that why or how these four initial dry densities (1.54g/cm3, 1.62g/cm3, 1.72g/cm3, 1.81g/cm3) were selected? 3. In the Section of 3.1, the authors stated that 'throughout the rainfall, the volume moisture content of soil depth of 40cm exhibits a slow-growth trend or remains the stable'; however, as shown in Fig. 6, the volume moisture content of soil depth of 40cm increased sharply, please provide a brief explanation for this phenomenon. 4. The authors design the experiment to explore the relationship between the initial dry density and landslide initiation. With the results, it was proved that they have a very close relationship. But, it is still not clear that what the relationship is. For example, why the initiating time of the landslide with the initial dry density of 1.72g/cm3 (18 minutes) is shorter than the landslide with the initial dry density of 1.54-1.63g/cm3 (30 40 minutes). A deep analysis is needed. 5. In the Section of Critical state of gravel soil, the gravel soil with an initial dry density of 1.94g/cm3 and 2.00g/cm3 were used, why not the soil sample used before (1.54-1.81g/cm3)? 6. In my opinion, the conclusion section was not written well. the 5th conclusion is not clear; I suggest the conclusions about the Critical state of gravel soil can be synthesized. Technical corrections Line 36-41: please cite only the important references, it is unnecessary to list all the related literature; Line 91: I suggest the authors provide a location map with Niujuan Valley and Duwen highway. Line 93: please check the unit of '32.7Line 116: what does 'CAS' mean, please provide its definition. Line 120: what does 'DL2e' mean; Line 166-167: please correct the sentence; Line 240-241: please check the langue; Tab 2: please check the value of initial dry density, 1.62 or 1.63? it is not clear the meaning of h(cm), soil depth? Tab 3: it is not clear the meaning of âŰşP0.0075, âŰşP5, âŰşP2 and h. Tab 4: please provide the definition of $\sigma 3$; Fig.7-9: please add captions for each subfigure;

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