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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Laboratory and Field Test and Distinct Element Analysis of Debris Flow" *by* Yung Ming Cheng et al.

Anonymous Referee #1

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The manuscript attempts to model the transportation process of debris flow using flume tests and DEM simulations on dry particles. Qualitative comparisons were compared between the flume tests and DEM models. The study confirms the contribution of particle size on dynamic segregation during transportation and deposition process and effectiveness of energy consumption of jump gaps before barriers. The technical contents are generally sound and the formality meets the technical writing requirements. The two weak points are no particle-fluid interactions and few quantitative comparisons. Specific comments are listed as followings.

1. The introduction section is too long. Because the trigger of debris flow is out of the scope of the manuscript, descriptions of triggering and cases should be shortened or removed.

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2. Equations (1) & (2) should be removed because they are not related to the tests and simulations. Cited references should only cover important and relevant ones.

3. Figs. 4 and 5 can be removed or presented schematically. Fig. 6 is insignificant.

4. The procedure and details to determine frictional coefficients in Table 1 should be added for verifications. Only those tests related to current study should be included in this manuscript.

5. Descriptions of Lines 212-220 need quantitative evidence. For instance, the energy transformation, particle velocity patterns and deposition process need evidence to support the descriptions.

6. The determinations of parameters listed in Table 3 should be clearly described.

7. Velocity field or particle traces should be added in Fig. 10 to support the flow pattern descriptions.

8. The technique to construct Fig. 12 should be added to the content.

9. The large scale field tests should include both dry and wet tests to evaluate the significance of particle-fluid interactions and the confidence of implementing this study to real scenarios.

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