

Modification explanation for Editors

We are very grateful to the editors for the professional and detailed comments on the manuscript “Investigation of the functional relationship between antecedent rainfall and the probability of debris flow occurrence in Jiangjia Gully, China” (*Number: hess-2022-263*). According to the Editors’ comments, we have amended this manuscript by using the track changes mode in MS Word.

(1) Editor: Line 162: The word Equation should be written in full.

Authors: The word Equation has been written in full, please check line 147 in the new edited tracking version. Additionally, the authors found that there are many others should be mended according to this suggestion. All of the “Eq.” are rewritten in full. For example, please check lines 130, 135, 139, 146 etc. in the new edited tracking version.

(2) Editor: Line 170: Can you please check the derivation of d_s from equation 3? This is not clear since this equation does not depend on d_s .

Authors: Thank you for your careful reviewing on the manuscript, the editor is right. The authors have deleted the sentence of “Using d_s derived from Eq. 3 as input” in order to avoid to mislead the editor and other potential readers. Please check line 156 in the new edited tracking version.

(3) Editor: Line 171. I guess the word should be unstable instead of “instable”

Authors: The authors have changed “instable” to “unstable”, please check line 157 in the new edited tracking version.

(4) Editor: Line 182: Please check wording in this sentence.

Authors: The authors carefully read this sentence and also think the wording should be modified. The sentences are now amended as “after firstly presetting the density of the water-soil mixture as ρ_{mix} , Dens-ID also needs to simulate many rainfall scenarios including long durations with low-intensity rainfall and short durations with high-intensity rainfall in order to obtain a sufficient number of $[D_i, l_i]$ ”. Please check lines 166-168 in the new edited tracking version.

(5) Editor: Line237: Can you please provide the EAP values range and explain they increase by an interval of size 5?

Authors: The authors have added some necessary sentences to further explain. The detailed contents are as follows: Since AEP in JJG ranges in 0-88 mm according to the measured rainfall data, Dens-ID presets several AEP values including 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85. The cases of AEP=0 and AEP=5 mm are excluded, because the two cases represents such a low initial rainfall condition that any ID curve cannot derived from Dens-ID. The purpose of increasing AEP by an interval of size 5 is to get adequate ID curves, which will be helpful to calculate P_{df} under different AEP conditions. Please check lines 217-222 in the new edited tracking version.

(6) Editor: Line 371: Can you improve formatting of equation 14?

Authors: The authors have improved the format of Equation 14 and added several sentences to further introduce this fitted equation. Please check lines 342-345 in the new edited tracking version.

(7) Editor: Line 460: Can you please check the wording in this line?."is existed" should be replaced by existed.

Authors: The authors have modified this word. Please check line 409 in the new edited tracking version.

(8) Editor: It is unusual to include additional authors at a later review stage of a manuscript. We would appreciate the author's description about the contributions of the newly added authors, and how their contribution help improving your manuscript. A statement about all author's contribution during the manuscript preparation and during the review process is very much appreciated.

Authors: The authors are very appreciated. We have prepared another file to state the contributions of all the authors during the manuscript preparation and during the review process.

We also listed the contribution of each author in the manuscript as follows:

During the preparation process:

Shaojie Zhang: Writing original draft, Conceptualization, Funding acquisition

Hongjuan Yang: Data curation

Kaiheng Hu: Supervision

Juan Ma: Formal analysis

During the review process, the works of language editing and modifying this manuscript needs the help of Xiaohu Lei and Fangqiang Wei. Their contributions to this manuscript are listed as follows:

Xiaohu Lei: Translate the new Chinese sentences in the modified version into English, and be responsible for modifying the images, such as Figure 4 in the text.

Fangqiang Wei: Give the more professional suggestions on how to modify this manuscript according to the reviewers' comments, and be responsible for Writing - Review & Editing before and after the works of polishing languages.