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Discussions

Interactive comment on "Empirical prediction for travel distance of channelized rock avalanches in the Wenchuan earthquake area" *by* Weiwei Zhan et al.

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Dear Prof. Mergili,

We acknowledge your time and helpful comments and advice very much, which are valuable for improving the quality of our manuscript. We have revised the manuscript carefully according to your and other reviewers' comments. The revised manuscript will be submitted after the reply to reviewers' comments stage. Your comments are reproduced below, followed by our responses and/or a summary of revisions to the manuscript in italic.

With my kindest regards, Sincerely, on behalf of my co-authors, Xuanmei Fan

Comments in general: Q1: Pages 3 and 4 are almost identical – I think that page 4 can just be deleted. R1: Thank you for point it out. Page 4 has been deleted.

Q2: A reference that could be interesting: Mergili, M., Krenn, J., Chu, H.-J. (2015) R2: We are sorry for missing this very interesting and relevant paper, which has been cited in the introduction section "Mergili et al. (2015) developed a multi-functional open source tool for backward- and forward-analyses of mass movement propagation".

Specific comments: We have done careful copy editing to revise grammar and style errors. Q3: Line 119: "topography" would be suitable rather than "geography" R3: We agree and it has been corrected to "Topography".

Q4: Line124: please explain what you mean with "slope transition angle" R4: We have explained it in the text. The slope transition angle refers to the angle between the failed upper slope and lower slope, which is the definition of Guo et al. (2014)

Q5: Line 130 what is the "angle of impact"? R5: We have rephrased the "angle of impact" to most commonly used term "angle of reach", which actually represents the relationship between the height of fall and maximum run-out distance, also called apparent coefficient of friction by Heim (1932).

Q6: Line 145 In many cases it is probably hard to clearly delineate the source area from the transition area – maybe you could shortly explain which strategy you applied to do so? R6: Thanks for your comments. For the channelized rock avalanches, their source area and transition area are somehow easy to be differentiated, as the source area are normally located at the top or upper part of slope, while the flow path (transition area) is partially or fully confined by channels. We added an explanation in the text: "The source area and the transition area of channelized rock avalanches in the study area were differentiated by their morphological characteristics observed first on remote sensing imagery and then checked in field."

Q7: Line 148–165: This part does NOT describe the data you use, but defines some

terms. It should be moved to the introduction. R7: Thank you for your comment, but we think this part fits better to the Data section, because it mainly defines the parameters in Table 1 that we used for building the regression models. Table 1 summarized the data from 38 channelized rock avalanches.

Q8: Line 159–160: Is L the Euclidean distance, or the distance along the flow path? R8: L is the Euclidean distance, which has been specified in the text. Q9: Line 176: You should give some examples or references demonstrating that the existing models did not produce a favourable prediction.

R9: We thank the reviewer for the nice comment. We will produce a new table to demonstrate this.

Q10: Line 182: You have to explain what "x" is in Eq. 1. R10: Thanks for pointing this out. We has specified that x (i= 1, 2, . . ., n) are the predictors ('independent variables', e.g. total relief, landslide volume etc.)

Q11: Line 238: Eq. 5 does not exist R11: This was a typo, which has been corrected.

Q12: Line 261: better use 103 or 106 instead of 104. R12: We have revised all the units to 103.

Q13: Line 296: What do you mean here with "projection"? R13: The projection process was a special type of failure mode of earthquake-triggered landslides that was first proposed by Huang et al. (2011). They defined that "ejection" (projection process here) as "Because of the landform enlargement effect of the earthquake wave, the slope close to earthquake fault or earthquake epicenter is pulled up from upper part or midupper part, and is thrown out, and forms projectile motion of the slope mass". Several features of the Wenchuan Earthquake had quite different characteristics from thoseproduced under general gravity force. Huang, R.Q., Xu, Q., Huo, J.J, 2011. Mechanism and Geo-mechanics Models of Landslides Triggered by 5.12 Wenchuan Earthquake. J.Mt.Sci 8:200-210

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