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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Failure modes of loose landslide deposits in 2008 Wenchuan earthquake area in China" *by* J. Gan and Y. X. Zhang

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Reviewer C (Anonymous Referee #2) Comments from Referees: The manuscript deals with a potentially very interesting topic regarding mass wasting processes involving loose deposits of the earthquake-prone Wenchuan area (China) which, also due to geological features, mountainous morphology and intense rainfall regime, is a geomorphologically active area, as it is clearly testified by various landslide and erosion phenomena occurring in it. Notwithstanding the general interesting topic, the scientific quality of the manuscript is poor due to the complete lack of a clear scientific focus, if not novel. Response: The loose accumulation in Wenchuan earthquake areas often leads to catastrophic events, such as on August 20, 2019, when heavy rains left another 12 dead and 26 missings. Therefore, it is of great significance to study the de-

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Discussion paper

formation and failure modes of post-earthquake loose accumulation. Through the case study of typical post-earthquake loose accumulation bodies, this paper summarizes 12 kinds of common failure types. We focus on the classification of the deformation and failure of the loose deposits in the post-earthquake area. Comments from Referees: In fact, seeming the main focus being addressed to the creation of a new classification for failures modes of loose landslide deposits, the following weakness points are critical: 1) Were all deposits formed by pre-existing landslide phenomena or by other erosional processes. In the first case, landslide processes will be of reactivation type only. Response: Based on the all deposits formed by pre-existing landslide phenomena or other erosional processes, in the first case, the “4.1.1 Reactivation of old landslide” has been changed to”4.1.1 Rotational of the loose deposit” at Page 9 Line 199 and Table 2. 2)Landslide and erosional processes are wrongly mixed Interactive comment Printer-friendly version Discussion paper and, in some cases, linked to the same classification (e.g. Cruden & Varnes, 1996). Response: Sliding and erosion are classified according to Cruden & Varnes’ classification in 1996. E.g. "4.1.4 Integral sliding" in the original text is changed to "4.1.4 Translation on bedrock" at Page 12 Line 261; and "4.3.1 scouring and lateral erosion" has been changed to "4.3.1 Sheet erosion" in Page 17 Line 353; and the "4.3.2 Steam bank erosion" changed to "4.3.2 Gully erosion" in Page 18 Line 375; and "4.4.1 debris avalanche" has been changed to "4.4.1 rock avalanche" on Page 21 Line 414; all the modification have already amended the corresponding contents of the article.

3)Being the Wenchuan area no figure regarding isoseismal map or historical distribution of earthquakes is shown. Response: 3) Being the Wenchuan area no figure regarding isoseismal map or historical distribution of earthquakes is shown. Response: The isoseismal map has been added in Fig.2 at Page 5 Line 122.

4)Geotechnical data is declared to have been used but any elaboration of it, even simple, was not shown. Moreover, the most important literature concerning landslide classification has not been clearly applied to analyze and interpret mechanisms of

phenomena studied or not well considered (e.g. Hungr et al., 2001 regards the flow-like landslide only). Response: 4) Because the research focuses on deformation and failure mode, this paper mainly expounds the influence of formation lithology on deformation and failure of loose accumulation body in the case study. Other geotechnical data such as formation thickness, particle size distribution, and mechanical parameters are only for reference. The other types of landslides provided by Hungr et al. 2001 were not included due to the purpose of this study is to develop a classification method of post-earthquake loose deposit, 5 subclassification has been modified in Table 2 based on the Topography, Material, Travel velocity, Volume, and Triggering mechanism at Page 23 Line 460. All changes are shown in blue or red font.

Please also note the supplement to this comment:
https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2019-25/nhess-2019-25-AC3-supplement.pdf

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