

Interactive comment on “Rainfall-runoff processes in the Loess Plateau, China: Temporal dynamics of event rainfall-runoff characteristics and diagnostic analysis of runoff generation patterns” by Qiang Wu et al.

Anonymous Referee #2

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The manuscript “Rainfall-runoff processes in the Loess Plateau, China: Temporal dynamics of event rainfall-runoff characteristics and diagnostic analysis of runoff generation patterns” reported a study concerning the mechanism changing of overland flow generation in Loess Plateau catchments. The method in which the authors identified dominant runoff generation process in the Loess Plateau catchments is confused and not reliable. There is a lack of quantitative approach of identifying the mechanism changing of runoff generation and this made the reliability of the conclusion unsatisfactory.

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On the other hand, the characteristics of rainfall-runoff processes are highly related to overland flow movement and concentration in catchments, particularly at the small and medium spatial scales. How did the authors deal with this? How to separate the effect of runoff-generation mechanism changing and the effect of overland flow movement condition changing led by LUCC?

Specific comments: 1. Line 5-10: are the mechanisms of runoff generation in these Loess Plateau catchments really changed? Any field evidence or reference provided in the main text? 2. Check the citation format of references in introduction. For example in line 22, the format of ‘(Jiongxin, 2005)’ is wrong. 3. Line 98: why did the authors choose these spatial scales (100~10000 km²) and why these catchments? Please give the reason. 4. Line 110: why did the authors employ this approach to estimate antecedent soil moisture for rainfall-runoff events? Is there any reference? 5. Line 116: why there three steps? Please give references to make it clear. 6. Section 3.2: it seemed that this section introduced a method of qualitatively identifying saturation-excess overland flow. However, there is no reference concerning this method. Is there any verification of this method? Did the authors have any field study to check the result of this method? 7. Section 3.2: using the method above, how did the authors identify the combination of infiltration-excess overland flow and saturation-excess overland flow in catchments? It looks like the authors used the ‘probability’ of saturation-excess overland flow introduced in the method to represent the combination of the two types of overland flow. Is this verified and reliable? 8. Line 207: is there any research or measured data to support this point? 9. Line 217-220: why you choose these rainfall-runoff events. 10. Check dams have been widely and massively constructed in the Loess Plateau, modifying rainfall-runoff processes in catchments (e.g., the Chabagou catchment in this study). How did the authors isolate their impacts on rainfall-runoff processes from LUCC impacts?