

Interactive comment on “Runoff generation processes during the wet-up phase in a semi-arid basin in Iran” by H. Zarei et al.

Anonymous Referee #2

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This manuscript describes a brief study of rainfall-runoff responses in a watershed in Iran using both hydrometric and isotopic techniques. The authors make a clear case for the importance of the work due to the paucity of these types of measurements and analyses in the region and the importance of the results for understanding water supplies for large populations in the face of global change. In this respect, the work is well framed. In general, the manuscript is well organized and well written. The methods and analyses employed are common and described clearly.

The scientific significance of this work is limited. The work is primarily a case study and demonstration of principles that are already understood about how watershed wetness conditions or antecedent moisture influence the hydrologic response to precipitation. In that respect, it does not reveal concepts or ideas. Observations from a data-sparse

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region like this one are certainly important and contribute to the scientific significance of the work, but unfortunately the analyses also suffer from data limitations stemming from the scope of the rainfall-runoff analysis. Specifically, the two precipitation gauges cover a very limited and relatively low range (720 m and 1080 m) of the overall elevation variability in the watershed (691 m to 3283 m). The authors do not discuss the potential effects of elevation-influenced precipitation gradients (other than to mention the presence of snow at higher elevations), and they neither account for nor otherwise justify lack of consideration for this possible effect when estimating runoff ratios. The authors should address this in a meaningful way and include a discussion of how this phenomenon could affect their interpretations.

Additionally, the authors show the spatial variability of rainfall isotopes, but do not consider how the corresponding uncertainty propagates through the mixing model to affect estimated fractions of pre-event and event water discharged during the three storms. If one considers uncertainty, do the storms still provide different fractions of each? What, if anything, should be said about the different results for ^{18}O and ^2H ? There is potential for more insightful analysis and interpretation of these three storms than what has been provided.

The definition of runoff ratio on P3794 L19 is incorrect. The phrase “topographic release” on P3795 L9 should read “topographic relief” instead.

Overall, this work has the potential to make a contribution to the hydrologic sciences, but at this stage the preceding issues limit its impact.

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