

Interactive comment on “Exploration of virtual catchments approach for runoff predictions of ungauged catchments” by Jun Zhang et al.

Anonymous Referee #1

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The manuscript explores unit hydrograph properties through virtual catchment analysis and a distributed rainfall-runoff model. The approach is interesting and potentially useful, however there some basic choices made by the authors that limit the usefulness of the proposed study.

Reading the paper it is seems that the empirical FEH Unit Hydrograph is the perfect solution for ungauged basin, and that, this is the approach to be preferred, so that it is worth to investigate on its parameter. However, yet in the Introduction, authors list a series of possible alternatives that, paradoxically, seems to solve the problem stated as aim of the paper.

In my view, the WFIUH approach is already able to adsorb from the DEM all the geomorphological properties of the specific analyzed ungauged watershed. The analyst

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does not need to transfer from an other similar watershed geomorphological information in order to build it. This is the great value of the WFIUH approach. There are only one (or two) parameter to be assigned for its definition but they are more related to the kinematic watershed properties than to the geomorphological ones.

If the aim focuses strictly on the FEH approach, as it seems, maybe it could be appropriate to submit the paper (with a less general title) to a more applied Journal.

Say that, the idea to use a virtual watershed could be interesting as well for investigation the role of WFIUH parameters, also if it is well known that at the end, in ungauged basin, the net rainfall estimation step is much more influencing than the IUH definition.

Concerning the approach proposed by the authors in order to simulated similar catchments with different slope or other attributes, I am little bit skeptical on just multiplying the elevation (or the attribute) by a factor. For sure it would influence the geomorphological properties. It would be more interesting trying to simulate topographic surface with a more advanced methods that can control watershed properties (i.e. Grimaldi S, Teles V, Bras RL (2005). Preserving first and second moments of the slope area relationship during the interpolation of digital elevation models. *Advances in Water Resources*, vol. 28, p. 583-588, ISSN: 0309-1708.)

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