

Interactive comment on “A new discrete multiplicative random cascade model for downscaling intermittent rainfall fields” by Marc Schleiss

Anonymous Referee #1

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In this paper the new approach to downscale precipitation field, based on equal-volume areas (EVAs) is evaluated.

The topic of the paper is a relevant issue for hydrology, meteorology and water management.

The author compared EVA method and “classical” discrete multi-canonical random cascade and bilinear interpolation. The composition of the paper is valid. The methods are clearly described. The author mentioned both pros and cons of the EVA cascade generator and pointed the directions of further development.

The results of EVA method application are worth to be published. However, some

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details should be corrected:

1. Page 6 line 30: “(. . .) from uniform (Olsson, 1998) to log-normal, Beta (. . .)” - Please add reference to log-normal distribution usage and correct spelling to “beta”.
2. Page 9 line 6: “While the EDA (. . .)” - Please check spelling.
3. Page 10 line 11: “It shows large differences between estimated model parameters as a function of the methods and spatial resolutions.” - No relationship in tab. 2 is observed. Please paraphrase this sentence.
4. Figure 4 - Please use the same bounds in vertical axis for the same parameter and do not use “true” adjective in horizontal axis title. Please name axis explicitly – which parameter value is obtained for coarse-scale generator and which for radar data resolution.
5. The author used plural form “we” multiple times, however, he is the only person sign to this paper.
6. Figure 9 - Please correct the labels: “Sample gen” and “Best gen” – it is not known which is for 8x8 km resolution and which is for 1x1 km resolution.
7. Page 13 line 7: “Therefore, big local differences in scaling behavior exist within the field” - Please check spelling.
8. Page 13 line 33: “Also, performance clearly decreases with intermittency” - Please add if the intermittency was calculated for empirical precipitation fields or for generated ones.
9. Page 14 line 23: “However, accuracy drops rapidly and large uncertainties are to be expected for such large downscaling ratios.” - Please check grammar.
10. Page 14 line 23: “(. . .) the EVA model is likely to be closer to the truth.” - Please paraphrase this part of the sentence (the model results were compared with weather radar scans) - for instance “(. . .) the EVA model is likely to be closer to the observed

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precipitation fields".

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2019-449>, 2019.

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