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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Simulation of rainfall time-series from different climatic regions using the Direct Sampling technique" *by* F. Oriani et al.

Anonymous Referee #1

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General comments The discussion paper demonstrates a simple and robust data generation method that has not been widely applied in hydrology. Its application to daily rainfall generation therefore adds considerable value to stochastic hydrology and highlights the ability of non-parametric approaches for data generation. The methods applied are valid but some details are left out and it would be difficult for the reader to replicate the analysis. The discussion and conclusions reflect the analysis and results obtained.

Specific comments Section 2.2 of the paper describes the Direct Sampling (DS) method and uses Figure 1 to illustrate the method. It is not clear exactly how SG is obtained. How different is ST from the historic record? Is the value of t (in x(t)) get randomly obtained from a uniform distribution (Random[0,1]$\times$ length of simulated time

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series)? Figure 1 is not very informative and might be better if it illustrates a single or two iterations in chronological order. Section 2.2 does not inform how auxiliary variables are used as part of the DS method. It seems that the search for Z(yi) continues until the thresholds for all the auxiliary variables are met but this is not stated in Section 2.2. It may be possible to get rid of patches (Section 3.2) by imposing a condition that the Z(yi) selected should not result in a patch in addition to its meeting the set threshold of dissimilarity. In addition to the 10-years MS comparisons presented in Figure 6, the minimum run sums for various lengths (up to say 10 or 20 years) could be used to assess how well DS replicates the long-term dependence characteristics of the rainfall.

Suggestion changes to sentence structure etc. Page 3214 line 13 . . .. reproduced adequately, reducing the . . .. . . Page 3214 line 23-24 . . .. Solutions to deal with this limitation . . .. Page 3215 line 12 . . .. completely capture a complex . . .. Page 320 line 2 . . .event and acceptance threshold. . .. Page 3220 line 20-21 and other locations: should it be datum or data? Page 3222 line 7 Table 1 presents the dataset . . .. . . Page 3222 lines 14-15 Mariethoz and Renard (2010) show how direct sampling can be used for data reconstruction Page 3222 line 3 and page 3239: why is (*) included? Page 3228 line 16: —- discussed in the following section. Page 3242 replace ‘ dotted line’ with ‘blue dots’

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