



Accounting for intermittency in a parsimonious rainfall downscaling framework

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The rainfall process features an intermittent character on fine timescales, thus the probability that a time interval is dry is generally greater than zero. The capability of downscaling models to reproduce rainfall intermittency is a fundamental requirement in simulation. Therefore, we propose a simple and parsimonious downscaling model which accounts for the variability of intermittency across timescales. The model has a discrete random cascade structure based on the Hurst-Kolmogorov process.

Generally, the analysis and modelling of rainfall intermittency relate to the study of the rainfall occurrence process, which can be described by a binary valued stochastic process, with the values 0 and 1 representing dry and wet conditions, respectively. On the other hand, the non-zero rainfall process can be characterized by a lognormal stochastic process, to a first approximation. Hence, all above observations support a modelling approach of a mixed type, with a discrete description of intermittency (varying across scales) and a continuous description of rainfall.