



Multidimensional Hurst-Kolmogorov process for modelling temperature and rainfall fields

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A multidimensional (MD) stochastic simulation model is presented, which is a direct extension of the 1D simple scaling process, known as Hurst-Kolmogorov (HK) process following the analysis of the 2D extension of Koutsoyiannis et al. (2011). The MD HK process can generate time-varying spatial geophysical fields (such as rainfall and temperature), consistent with the observed long-term spatiotemporal persistence (slowly decaying autocorrelation over spatial or temporal displacement). The MD HK process is formulated assuming anisotropy, so as to take into account possibly different autocorrelation decay rates (Hurst coefficients) in each dimension of the field. The MD HK process is also investigated through some applications based on observed temperature and rainfall fields.

Reference:

Koutsoyiannis D., Paschalis A. and Theodoratos N., Two-dimensional Hurst-Kolmogorov process and its application to rainfall fields, *Journal of Hydrology*, 2011 (accepted).