



A global stochastic analysis for the temperature and dew-point processes

Katerina Sakellari, Panayiotis Dimitriadis, and Demetris Koutsoyiannis

Department of Water Resources and Environmental Engineering, School of Civil Engineering, National Technical University of Athens, Greece

Temperature and dew-point (or equivalently relative humidity) are considered as the most characteristic atmospheric process related to climate dynamics. In this study, we present an integrated stochastic framework, which can describe and simulate both the second-order dependence structure and the marginal distribution simultaneously. We use a large dataset comprising hourly temperature and dew point records around the globe to identify stochastic similarities and patterns. Based on these results we construct a parsimonious stochastic model that is based on entropy maximization and that can adequately simulate the correlation structure, extreme (left and right) tails, intermittent effects and internal double (diurnal and seasonal) periodicities.

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