



## **Record breaking properties for typical autocorrelation structures**

Eirini Anagnostopoulou, Andriani Galani, Panagiotis Dimas, Alexandros Karanasios, Theodoros Mastrotheodoros, Eleni-Maria Michaelidi, Dionisios Nikolopoulos, Stamatis Pontikos, Fani Sourla, Anna Chazapi, Simon Michael Papalexiou, and Demetris Koutsoyiannis

Department of Water Resources and Environmental Engineering, School of Civil Engineering, National Technical University of Athens, Greece (ireneanag@gmail.com)

Record-breaking occurrences in hydrometeorological processes are often used particularly in communicating information to the public and their analysis offers the possibility of better comprehending extreme events. However, the typical comprehension depends on prototypes characterized by pure randomness. In fact the occurrence of record breaking depends on the marginal distribution and the autocorrelation function of the process as well the length of available record. Here we study the influence of the process autocorrelation structure on the statistics of record-breaking occurrences giving emphasis on the differences with those of a purely random process. The particular stochastic processes, which we examine, are the AR(1), AR(2) and ARMA(1,1), as well as the Hurst-Kolmogorov process. The necessary properties are calculated using either analytical methods when possible or Monte Carlo simulation. We also compare the model results with observed hydrometeorological time series.

Acknowledgement: This research is conducted within the frame of the undergraduate course "Stochastic Methods in Water Resources" of the National Technical University of Athens (NTUA). The School of Civil Engineering of NTUA provided moral support for the participation of the students in the Assembly.