



## **Stochastic investigation of the uncertainty of hydrometeorological processes by means of the climacogram**

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An important characteristic of the atmospheric processes is their inherent uncertainty. As randomness and predictability coexist and are intrinsic to natural systems, these systems can be treated as deterministic and random at the same time, depending on the prediction horizon and the time scale. Specifically, the more complex a process is, the larger the Hurst parameter, which quantifies a natural behaviour (called Hurst-Kolmogorov HK), identified in numerous geophysical processes. Although several methods can be used to estimate the Hurst parameter, the climacogram (i.e. variance of the averaged process vs. scale; Koutsoyiannis, 2003) is one of the most powerful ones, with a lower statistical estimation uncertainty compared to the autocovariance and power spectrum. We apply the climacogram to real-world timeseries from various atmospheric processes in order to infer their dependence structure, characterize them and compare their degree of uncertainty across different timescales.

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