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Clustering of extreme events in typical stochastic models

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We study the clustering properties of extreme events as produced by typical stochastic models and compare the results with the ones of observed data. Specifically the stochastic models that we use are the AR(1), AR(2), ARMA(1,1), as well as the Hurst-Kolmogorov model. In terms of data, we use instrumental and proxy hydroclimatic time series. To quantify clustering we study the multi scale properties of each process and in particular the variation of standard deviation with time scale as well of the frequencies of similar events (e.g. those exceeding a certain threshold with time scale). To calculate these properties we use either analytical methods when possible, or Monte Carlo simulation.

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