

Temporal organisation of extreme events: Data analysis and modelling

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Extreme events as floods or draughts do often occur in temporal clusters. In this talk I will present the analysis and modelling of the timings of observed series of extreme events.

The data series are presented as binary symbol sequences where the symbol “1” presents time intervals with an extreme event and the symbol “0” time intervals without. The symbol sequences are characterised by the following measures from statistical physics and time series analysis: the Shannon entropy which is estimated in terms of the Lempel-Ziv complexity, the shape parameter of the Weibull distribution that best fits the event return times, and the strength of

long-range correlations quantified by detrended fluctuation analysis (DFA). The event series will be modelled by peaks over threshold models, where the background signal will be chosen appropriately.

These methodical concepts will be applied to two sets of observational data: (i) to heart beat annotations obtained from 24-h electrocardiogram recordings of post-infarction patients where the symbol sequences represent arrhythmic and normal beats, and (ii) to a record of palaeofloods which occurred over a period of 9.3 thousand years in the southern Alps.