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DETECTING CHANGES IN CLIMATE RECORDS

Abstract:

In this talk, I focus primarily on detecting changes in temperature and precipitation over long time periods, either from instrumental or climate model records. Here, the term extremes refers to record events in annual maxima of daily maxima time series. Records are often the most important events in terms of impact and choosing records as the event of interest can improve the inference of the ratio of two small probability events. The gain is particularly substantial if we leverage the tools and hypothesis used in Extreme Value Theory, especially from records properties in the context of max-stable distributions. To detect changes in climate records, we assume that we have long observational time series and different climate models at our disposal, and any of those climate models has been run under two different scenarios, say natural and all forcings respectively. To illustrate our approach, the Fraction of Attributable Risk, an often used indicator in event attribution studies, is modified and tailored to handle records. We discuss the advantages of our method through theoretical results, simulation studies, observational time series and outputs from numerical climate models. If time allowed, comparisons with other non-parametric techniques will be presented.

This talk is based on a joint work with Francis Zwiers, Aurelien Ribes, Alexis Hannart and Pascal Yiou.

References:

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- [3] Naveau P. Zwiers F., Ribes A., (2011) Revising return periods for record events in a climate event attribution context. *Submitted*.
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