Statistical modelling, extremes and stochastic processes

Statistics for extreme rainfall over time and space

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Under the framework of Extreme Value Statistics for non-stationary spatio-temporal processes, we study a large batch of reanalysis precipitation data from several gauging stations across the UK from 1979 to 2010. We identify homogeneous regions over which data may be pooled to estimate the underlying common tail weight, the so-called extreme value index. This quantity is paramount for estimation of probabilities of extreme/rare events, and adequately incorporating space-time heteroscedasticity and spatial dependence features has become imperative, as accelerating climate change seems to be causing extreme meteorological phenomena to grow more frequent and severe. Joint work with my supervisors, M.I. Fraga Alves and C. Neves.

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