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On dependent regularly varying observations

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Abstract

It is well known that the extremal behavior of stationary sequences can be nicely captured using the language of point processes. We explain how this theory extends from iid to dependent sequences as long as this dependence disappears in time. The theory turns out to be especially elegant when applied to stationary regularly varying sequences, which we discuss in detail.

In particular, the dependence structure of extremes for such sequences can be described using the concept of the tail process. By application of the point processes theory, this leads to various asymptotic results for extremes and sums of such sequences, including some nonstandard functional limit theorems.