Jürgen Grieser,
Institut für Meteorologie und Geophysik, Universität Frankfurt

Extremes in Instationary Time Series

Extreme values of meteorological variables threaten human life and property. Thus, knowledge of the statistical features of extremes is important. The concerned variables are the waiting time distribution, return period and risk. These variables are easily obtained if the underlying meteorological variable is independent and identically distributed.

Otherwise the probability to exceed a threshold is not constant. It is demonstrated that the widely used return periods are not a useful variable in this case. However, if the meteorological variable itself has a certain temporal structure also the probability to exceed a threshold changes in time in a determined way.

It is shown that the statistical features of extremes can be drawn from the statistical features of the meteorological variable itself. The latter one may be taken from observations or from model runs. Two real world examples demonstrate that the statistical features of extreme values may change considerably even if the mean features of the underlying meteorological variable have only slightly changed.