

Multivariate phantom distributions

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Abstract

The notion of a phantom distribution function was introduced by O'Brien (1987). The theory of phantom distribution functions was developed in [2] and perfected in [1].

In the present lecture we first essentially extend the notion of the extremal index by defining the lower and the upper extremal indices. Then we provide an example of a stationary sequence with continuous phantom distribution function for which both indices are non-zero and different. This example shows another advantage of the techniques based on phantom distribution functions over the classical approach involving the extremal index.

Motivated by such arguments we develop the corresponding theory for stationary random vectors. The obtained notion is more complicated than in the one-dimensional case, but still tractable numerically.

This is a *joint work* with Thomas Mikosch, Igor Rodionov and Natalia Soja-Kukieła.

References

- [1] P. Doukhan, A. Jakubowski and G. Lang, Phantom distribution functions for some stationary sequences, *Extremes*, **18** (2015), 697—725.
- [2] A. Jakubowski, An asymptotic independent representation in limit theorems for maxima of nonstationary random sequences, *Ann. Probab.*, **21** (1993), 819—830.