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Fakultät für
Mathematik, Informatik
und Naturwissenschaften

Kolloquium über Mathematische Statistik und Stochastische Prozesse

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Generalized Multivariate Stable Distributions

It is (very) well known that if $X, X_1,\ldots,X_n$ are iid random variables with a multivariate centered Normal distribution, then the distributional equation

$$X \stackrel{d}{=} \mathbf{A}X_1 + \ldots + \mathbf{A}X_n, \qquad \text{where } \mathbf{A} = \operatorname{diag}(n^{1/2},\ldots, n^{1/2}) \qquad (1)$$

holds, in fact, this property uniquely characterizes the centered multivariate Normal distributions. If the exponent -1/2 is replaced by $-1/\alpha$, $\alpha \in (0,2]$, the multivariate stable distributions with index α satisfy (1).

In my talk, I will adress the following problem: What happens, if the deterministic matrices **A** are replaced by random matrices $T = (\mathbf{T}_1, \ldots, \mathbf{T}_n)$ with nonnegative entries (and independent of $X_1, \ldots, X_n$)? Are there still distributions besides δ_0 that satisfy (1)? If so, what are their properties, is there even an analogue of the stability index α?

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