

Preface

Stochastic processes with heavy-tailed marginal distributions, including Student's t -distribution, are used commonly for modelling in communication networks, econometrics, insurance, logarithmic stock returns and stochastic volatility in finance, electric activity of neurons, turbulence, etc.

The aim of this short book is the survey of recent result on the Student–Lévy processes as a subclass of Thorin subordinated Gaussian–Lévy processes. Criteria of self-decomposability of such processes are discussed in detail and related Ornstein–Uhlenbeck-type processes are constructed.

The univariate Student diffusion processes are considered in the framework of the H -diffusions, i.e., stationary ergodic diffusions with the predetermined marginal distribution H . Asymptotic distributions of the normalised extreme values of these diffusions are given. Special attention is paid to the statistically tractable case of the Kolmogorov–Pearson diffusions.

Using the independently scattered random measures, defined by means of the bivariate Student–Lévy processes, strictly stationary Student processes with the arbitrary correlation function are defined. Further, via the Lamperti's transform, the self-similar Student–Lamperti processes are introduced.

As a promising direction for future work in constructing and investigating of new multivariate Student–Lévy-type processes, the notion of Lévy copulas and the related analogue of Sklar's theorem is briefly explained.

Statistical inference problems as well as general studentised statistics and self-normalised processes are not considered at all. List of references is far from to be complete.

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