

**Collet, Pierre**

**Some aspects of the central limit theorem and related topics.** (English) [Zbl 1152.60025](#)

Fournier, Jean-Daniel (ed.) et al., Harmonic analysis and rational approximation. Their rôles in signals, control and dynamical systems. Berlin: Springer (ISBN 3-540-30922-5/pbk). Lecture Notes in Control and Information Sciences 327, 105-127 (2006).

The paper provides a concise overview of probabilistic phenomena around the central limit theorem. Beginning from the game of head and tail and De Moivre-Laplace theorem through classical Lévy, Lindeberg, Feller and Berry-Esséen theorems up to the law of the iterated logarithm and the strong invariance principle the author gives an elementary and clear introduction to the subject. Two last sections of the paper are devoted to more advanced questions. In the first of them basic large deviations theorem is presented and an application to the game of head and tail is shown in detail. In the last section, elaborated most extensively, the multifractal analysis of a measure is exposed including notions of monofractal measures and the Hausdorff dimension. Particular attention is paid to an interesting and relatively simple case of measures defined on the Cantor set. The paper is addressed to nonspecialists and is written in a very accessible way. Extensive and carefully selected bibliography can help the reader along a deeper study.

For the entire collection see [\[Zbl 1083.42001\]](#).

Reviewer: [Tadeusz Inglot \(Wrocław\)](#)

**MSC:**

- [60F05](#) Central limit and other weak theorems
- [60F15](#) Strong limit theorems
- [28A78](#) Hausdorff and packing measures
- [37C45](#) Dimension theory of smooth dynamical systems
- [60F10](#) Large deviations

**Keywords:**

central limit theorem; independent random variables; Brownian motion; strong invariance principle; large deviations; multifractal measures; Hausdorff dimension