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Nota di contenuto	Part I. Generalities -- 1. Moments and correlation conditions -- 2. Some classes of probability distributions -- 3. Characteristic functions -- 4. Sums of independent random variables -- Part II. Selected topics on concentration -- 5. Standard analytic conditions -- 6. Poincaré-type inequalities -- 7. Logarithmic Sobolev inequalities -- 8. Supremum and infimum convolutions -- Part IV. Analysis on the sphere -- 9. Sobolev-type inequalities -- 10. Second order spherical concentration -- 11. Linear functionals on the sphere -- Part V. First applications to randomized sums -- 12. Typical distributions -- 13. Characteristic functions of weighted sums -- 14. Fluctuations of distributions -- Part VI. Refined bounds and rates -- 15. L^2 expansions and estimates -- 16. Refinements for the Kolmogorov distance -- 17. Applications of the second order correlation condition -- Part VII. Distributions and coefficients of special types -- 18. Special systems and examples -- 19. Distributions with symmetries -- 20. Product measures -- 21. Coefficients of Special type -- Glossary.

Sommario/riassunto

This book describes extensions of Sudakov's classical result on the concentration of measure phenomenon for weighted sums of dependent random variables. The central topics of the book are weighted sums of random variables and the concentration of their distributions around Gaussian laws. The analysis takes place within the broader context of concentration of measure for functions on high-dimensional spheres. Starting from the usual concentration of Lipschitz functions around their limiting mean, the authors proceed to derive concentration around limiting affine or polynomial functions, aiming towards a theory of higher order concentration based on functional inequalities of log-Sobolev and Poincaré type. These results make it possible to derive concentration of higher order for weighted sums of classes of dependent variables. While the first part of the book discusses the basic notions and results from probability and analysis which are needed for the remainder of the book, the latter parts provide a thorough exposition of concentration, analysis on the sphere, higher order normal approximation and classes of weighted sums of dependent random variables with and without symmetries.