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Nota di contenuto	The Hilbert Transform of Schwartz Distributions and Applications; CONTENTS; Preface; 1. Some Background; 1.1. Fourier Transforms and the Theory of Distributions; 1.2. Fourier Transforms of L2 Functions; 1.2.1. Fourier Transforms of Some Well-known Functions; 1.3. Convolution of Functions; 1.3.1. Differentiation of the Fourier Transform; 1.4. Theory of Distributions; 1.4.1. Topological Vector Spaces; 1.4.2. Locally Convex Spaces; 1.4.3. Schwartz Testing Function Space: Its Topology and Distributions; 1.4.4. The Calculus of Distribution; 1.4.5. Distributional Differentiation 1.5. Primitive of Distributions1.6. Characterization of Distributions of Compact Supports; 1.7. Convolution of Distributions; 1.8. The Direct Product of Distributions; 1.9. The Convolution of Functions; 1.10. Regularization of Distributions; 1.11. The Continuity of the Convolution Process; 1.12. Fourier Transforms and Tempered Distributions; 1.12.1. The Testing Function Space S(Rn); 1.13. The Space of Distributions of Slow Growth S'(Rn); 1.14. A Boundedness Property of Distributions of Slow Growth and Its Structure Formula; 1.15. A Characterization Formula for Tempered Distributions 1.16. Fourier Transform of Tempered Distributions1.17. Fourier

Transform of Distributions in D'(Rn); Exercises; 2. The Riemann-Hilbert Problem; 2.1. Some Corollaries on Cauchy Integrals; 2.2. Riemann's Problem; 2.2.1. The Hilbert Problem; 2.2.2. Riemann-Hilbert Problem; 2.3. Carleman's Approach to Solving the Riemann-Hilbert Problem; 2.4. The Hilbert Inversion Formula for Periodic Functions; 2.5. The Hilbert Transform on the Real Line; 2.6. Finite Hilbert Transform as Applied to Aerofoil Theories; 2.7. The Riemann-Hilbert Problem Applied to Crack Problems
4.5. The Intrinsic Definition of the Space H(D)

Sommario/riassunto

This book provides a modern and up-to-date treatment of the Hilbert transform of distributions and the space of periodic distributions. Taking a simple and effective approach to a complex subject, this volume is a first-rate textbook at the graduate level as well as an extremely useful reference for mathematicians, applied scientists, and engineers.The author, a leading authority in the field, shares with the reader many new results from his exhaustive research on the Hilbert transform of Schwartz distributions. He describes in detail how to use the Hilbert transform to solve theoretic