

THE TABLE OF CONTENT

Introduction

Part I. Carathéodory Dimension Characteristics

Chapter 1. General Carathéodory Construction

Section 1. Carathéodory Dimension of Sets

Section 2. Carathéodory Capacity of Sets

Section 3. Carathéodory Dimension and Carathéodory Capacity of Measures

Section 4. Coincidence of Carathéodory Dimension and Carathéodory Capacity of Measures

Section 5. Lower and Upper Bounds for Carathéodory Dimension of Sets. Carathéodory Dimension Spectrum

Chapter 2. C-Structures Associated with Metrics: Hausdorff Dimension and Box Dimension

Section 6. Hausdorff Dimension and Box Dimension of Sets

Section 7. Hausdorff Dimension and Box Dimension of Measures. Pointwise Dimension. Mass Distribution Principle

Chapter 3. C-Structures Associated with Metrics and Measures: Dimension Spectra

Section 8. q -Dimension and q -Box Dimension of Sets

Section 9. q -Dimension and q -Box Dimension of Measures

Appendix I: Hausdorff (Box) Dimension and q -(Box) Dimension of Sets and Measures in General Metric Spaces

Chapter 4. C-Structures Associated with Dynamical Systems: Thermodynamic Formalism

Section 10. A Modification of the General Carathéodory Construction

Section 11. Dimensional Definition of Topological Pressure. Topological and Measure-Theoretic Entropies

Section 12. Non-Additive Thermodynamic Formalism

Appendix II: Variational Principle for Topological Pressure. Symbolic Dynamical Systems. Bowen's Equation

Appendix III: An Example of C-Structure Generated by Dynamical Systems

Part II. Applications to Dimension Theory and Dynamical Systems

Chapter 5. Dimension of Cantor-Like Sets and Symbolic Dynamics

Section 13. Moran-like Geometric Constructions with Stationary (Constant) Ratio Coefficients

Section 14. Regular Geometric Constructions

Section 15. Moran-like Geometric Constructions with Non-Stationary Ratio Coefficients

Section 16. Geometric Constructions with Rectangles. Non-Coincidence of Box Dimension and Hausdorff Dimension of Sets

Chapter 6. Multifractal Formalism

Section 17. Correlation Dimension

Section 18. Dimension Spectra: Hentschel-Procaccia, Rényi, and $f(\alpha)$ -Spectra. Information Dimension

Section 19. Multifractal Analysis of Gibbs Measures on Limit Sets of Geometric Constructions

Chapter 7. Dimension of Sets and Measures Invariant Under Hyperbolic Dynamical Systems

Section 20. Hausdorff Dimension and Box Dimension of Conformal Repellers for Smooth Expanding Maps

Section 21. Multifractal Analysis of Gibbs Measures for Smooth Conformal Expanding Maps

Section 22. Hausdorff Dimension and Box Dimension of Basic Sets for Axiom A Diffeomorphisms

Section 23. Hausdorff Dimension of Horseshoes and Solenoids

Section 24. Multifractal Analysis of Equilibrium Measures on Basic Sets of Axiom A Diffeomorphisms

Appendix IV: A General Concept of Multifractal Spectra. Multifractal Rigidity

Chapter 8. Relations Between Dimension, Entropy, and Lyapunov Exponents

Section 25. Existence and Non-Existence of Pointwise Dimension for Invariant Measures

Section 26. Dimension of Measures with Non-Zero Lyapunov Exponents. The Eckmann-Ruelle Conjecture

Appendix V: Some Useful Facts

Bibliography

Index