

Contents

Chapter 1. Introduction	1
Acknowledgments	10
Chapter 2. General Preliminaries on Rational Semigroups	11
Part 1. Ergodic Theory and Dynamics of Finitely Generated *Semi-Hyperbolic Rational Semigroups	21
Chapter 3. Basic Properties of Semi-hyperbolic and *Semi-Hyperbolic Rational Semigroups	23
Chapter 4. The Conformal and Invariant Measures m_t and μ_t for $\tilde{f} : J(\tilde{f}) \rightarrow J(\tilde{f})$	29
4.1. Conformal and Invariant Measures (and Topological Pressure) for $\tilde{f} : J(\tilde{f}) \rightarrow J(\tilde{f})$: Preliminaries	29
4.2. Ergodic Theory of Conformal and Invariant Measures for $\tilde{f} : J(\tilde{f}) \rightarrow J(\tilde{f})$	33
Part 2. Ergodic Theory and Dynamics of Totally and Finely Non-Recurrent Rational Semigroups	47
Chapter 5. Totally Non-Recurrent and Finely Non-Recurrent Rational Semigroups	49
Chapter 6. Nice Sets (Families)	53
Chapter 7. The Behavior of the Absolutely Continuous Invariant Measures μ_t Near Critical Points	63
Chapter 8. Small Pressure $P_{\mathcal{V}}^{\Xi}(t)$	75
Chapter 9. Symbol Space Thermodynamic Formalism Associated to Nice Families: Real Analyticity of the Original Pressure $P(t)$	79
Chapter 10. Invariant Measures: μ_t versus $\tilde{\mu}_t \circ \pi_{\mathcal{U}}^{-1}$; Finiteness of μ_t	85
Chapter 11. Variational Principle: The Invariant Measures μ_t are the Unique Equilibrium States	93
Chapter 12. Decay of Correlations, Central Limit Theorems, the Law of Iterated Logarithm: The Method of Lai–Sang Young Towers	99

12.1.	Stochastic Laws on the Symbol Space for the Shift Map Generated by Nice Families	99
12.2.	Stochastic Laws for the Dynamical System $(\tilde{f} : J(\tilde{f}) \rightarrow J(\tilde{f}), \mu_t)$	101
Part 3. Geometry of Finely Non-Recurrent Rational Semigroups Satisfying the Nice Open Set Condition		107
Chapter 13.	Nice Open Set Condition (for any Rational Semigroup)	109
Chapter 14.	Hausdorff Dimension of Invariant Measures μ_t and Multifractal Analysis of Lyapunov Exponents	117
Chapter 15.	Measures $m_t \circ p_2^{-1}$ and $\mu_t \circ p_2^{-1}$ versus Hausdorff Measures H_{t^κ} and $H_{t^\kappa \exp(c\sqrt{\log(1/t)\log^3(1/t)})}$	137
Chapter 16.	HD($J(G)$) versus Hausdorff Dimension of Fiber Julia Sets J_ω , $\omega \in \Sigma_u$	151
Chapter 17.	Examples	161
Part 4. Appendices		167
Appendix A.	Absolutely Continuous σ -finite Invariant Measures: Martens Method	169
Appendix B.	Corrected Proofs of Lemma 7.9 and Lemma 7.10 from [49]	177
Appendix C.	Definitions of Classes of Rational Semigroups Used and Relations Between Them	181
Appendix D.	Open Problems	183
	Bibliography	185
	Index	189