

Contents

| | |
|--|-----|
| Introduction | 1 |
| 1 Linear differential systems with parameter excitation | 9 |
| 1.1 The model | 10 |
| 1.2 Spherical coordinates for linear systems | 12 |
| 1.3 The Multiplicative Ergodic Theorem: Lyapunov exponents ... | 20 |
| 1.4 The deterministic case: Lyapunov exponents for asymptotically constant linear systems | 28 |
| 1.5 Sample systems | 44 |
| 2 Locality and time scales of the underlying non-degenerate stochastic system: Freidlin-Wentzell theory | 53 |
| 2.1 Preliminaries and assumptions | 55 |
| 2.2 The limiting distribution (stationary measure) | 60 |
| 2.3 The large deviations principle | 68 |
| 2.4 Exit probabilities for non-degenerate systems | 72 |
| 2.5 Sublimiting distributions: Metastability and quasi-deterministic behavior | 91 |
| 2.6 Sample systems | 108 |
| 3 Exit probabilities for degenerate systems | 125 |
| 3.1 Exit probabilities for degenerate systems depending on a small parameter | 126 |
| 3.2 Uniform consequence for the exit probability | 140 |
| 4 Local Lyapunov exponents | 143 |
| 4.1 Local Lyapunov exponents: upper and lower bound | 144 |
| 4.2 The local growth rate of the determinant | 156 |
| 4.3 Local Lyapunov exponents in the diagonal case | 157 |

| | | |
|--------------------------|---|------------|
| 4.4 | Local Lyapunov exponents in the two-dimensional, general case..... | 177 |
| 4.4.1 | Qualitative theory of nonlinear real noise systems on time scales..... | 178 |
| 4.4.2 | The local Lyapunov exponent | 186 |
| 4.5 | Concluding remarks | 226 |
| Notations | | 231 |
| Bibliography..... | | 239 |
| Index | | 253 |

Local Lyapunov Exponents

Sublimiting Growth Rates of Linear Random Differential
Equations

Siegert, W.

2009, IX, 254 p., Softcover

ISBN: 978-3-540-85963-5