

Contents

1 Main Definitions and Basic Results	1
1.1 Pseudotrajectories and Shadowing in Dynamical Systems with Discrete Time: Chain Transitive Sets	1
1.2 Pseudotrajectories and Shadowing in Dynamical Systems with Continuous Time	9
1.3 Hyperbolicity, Ω -Stability, Structural Stability, Dominated Splittings	12
1.4 Hyperbolic Shadowing.....	26
2 Lipschitz and Hölder Shadowing and Structural Stability.....	37
2.1 Maizel' and Pliss Theorems	38
2.2 Mañé Theorem	51
2.3 Diffeomorphisms with Lipschitz Shadowing	67
2.4 Lipschitz Periodic Shadowing for Diffeomorphisms	75
2.5 Hölder Shadowing for Diffeomorphisms	90
2.6 A Homeomorphism with Lipschitz Shadowing and a Nonisolated Fixed Point.....	102
2.7 Lipschitz Shadowing Implies Structural Stability: The Case of a Vector Field.....	109
2.7.1 Discrete Lipschitz Shadowing for Flows	110
2.7.2 Rest Points	115
2.7.3 Hyperbolicity of the Chain Recurrent Set	118
2.7.4 Transversality of Stable and Unstable Manifolds	119
3 C^1 Interiors of Sets of Systems with Various Shadowing Properties ...	125
3.1 C^1 Interior of SSP_D	126
3.2 Diffeomorphisms in $\text{Int}^1(SSP_D)$ Satisfy Axiom A	133
3.3 Vector Fields in $\text{Int}^1(\text{OrientSP}_F \setminus \mathcal{B})$	155
3.4 Vector Fields of the Class \mathcal{B}	172

4 Chain Transitive Sets and Shadowing	181
4.1 Examples of Chain Transitive Sets (Homoclinic Classes)	181
4.1.1 Chain Transitive Sets Without Periodic Points	183
4.1.2 Hyperbolic Horseshoes	183
4.1.3 Horseshoe with a Homoclinic Tangency	184
4.1.4 Critical Saddle-Node Horseshoe	185
4.2 C^1 -Stably Shadowing Chain Transitive Sets.....	187
4.2.1 Preliminaries	188
4.2.2 Construction of the Dominated Splitting and Its Extension.....	190
4.2.3 Proof of Theorem 4.2.1	194
4.2.4 Proof of Corollary 4.2.1	201
4.3 Chain Transitive Sets with Shadowing for Generic Diffeomorphisms.....	203
References.....	209
Index.....	215