1. Record Nr. UNINA9910784890203321

Autore	Field Mike
Titolo	Dynamics and symmetry [[electronic resource] /] / Michael J. Field
Pubbl/distr/stampa	London, : Imperial College Press Singapore ; ; Hackensack, NJ, : Distributed by World Scientific, c2007
ISBN	1-281-86756-X 9786611867560 1-86094-854-5
Descrizione fisica	1 online resource (492 p.)
Collana	ICP advanced texts in mathematics, , 1753-657X ; ; v. 3
Disciplina	515.35
Soggetti	Topological dynamics Lie groups Hamiltonian systems Bifurcation theory Symmetry (Mathematics)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. 457-466) and indexes.
Nota di contenuto	Contents; Preface; 1. Groups; 1.1 Definition of a group and examples; 1.2 Homomorphisms, subgroups and quotient groups; 1.2.1 Generators and relations for .nite groups; 1.3 Constructions; 1.4 Topological groups; 1.5 Lie groups; 1.5.1 The Lie bracket of vector fields; 1.5.2 The Lie algebra of G; 1.5.3 The exponential map of g; 1.5.4 Additional properties of brackets and exp; 1.5.5 Closed subgroups of a Lie group; 1.6 Haarmeasure; 2. Group Actions and Representations; 2.1 Introduction; 2.2 Groups and G-spaces; 2.2.1 Continuous actions and G-spaces; 2.3 Orbit spaces and actions 2.4 Twisted products2.4.1 Induced G-spaces; 2.5 Isotropy type and stratification by isotropy type; 2.6 Representations; 2.6.1 Averaging over G; 2.7 Irreducible representations and the isotypic decomposition; 2.7.1 C-representations; 2.7.2 Absolutely irreducible representations; 2.8 Orbit structure for representations; 2.9 Slices; 2.9.1 Slices for linear finite group actions; 2.10 Invariant and equivariant maps; 2.10.1 Smooth invariant and equivariant maps on representations; 2.10.2 Equivariant vector fields and flows; 3. Smooth G-manifolds; 3.1 Proper

G-manifolds; 3.1.1 Proper free actions
3.2 G-vector bundles3.3 Infinitesimal theory; 3.4 Riemannianmanifolds; 3.4.1 Exponential map of a complete Riemannian manifold; 3.4.2 The tubular neighbourhood theorem; 3.4.3 Riemannian G-manifolds; 3.5 The differentiable slice theorem; 3.6 Equivariant isotopy extension theorem; 3.7 Orbit structure for G-manifolds; 3.7.1 Closed filtration of M by isotropy type; 3.8 The stratification of M by normal isotropy type; 3.9 Stratified sets; 3.9.1 Transversality to a Whitney stratification; 3.9.2 Regularity of stratification by normal isotropy type
3.10 Invariant Riemannian metrics on a compact Lie group3.10.1 The adjoint representations; 3.10.2 The exponential map; 3.10.3 Closed subgroups of a Lie group; 4. Equivariant Bifurcation Theory: Steady State Bifurcation; 4.1 Introduction and preliminaries; 4.1.1 Normalized families; 4.2 Solution branches and the branching pattern; 4.2.1 Stability of branching patterns; 4.3 Symmetry breaking-theMISC; 4.3.1 Symmetry breaking isotropy types; 4.3.2 Maximal isotropy subgroup conjecture; 4.4 Determinacy; 4.4.1 Polynomial maps; 4.4.2 Finite determinacy; 4.5 The hyperoctahedral family
4.5.1 The representations (Rk,Hk)4.5.2 Invariants and equivariants for Hk; 4.5.3 Cubic equivariants for Hk; 4.5.4 Bifurcation for cubic families; 4.5.5 Subgroups of Hk; 4.5.6 Some subgroups of the symmetric group; 4.5.7 A big family of counterexamples to the MISC; 4.5.8 Examples where P3G (Rk, Rk) = P3H k (Rk, Rk); 4.5.9 Stable solution branches of maximal index and trivial isotropy; 4.5.10 An example with applications to phase transitions; 4.6 Phase vector field and maps of hyperbolic type; 4.6.1 Cubic polynomial maps; 4.6.2 Phase vector field; 4.6.3 Normalized families
4.6.4 Maps of hyperbolic type

Sommario/riassunto

This book contains the first systematic exposition of the global and local theory of dynamics equivariant with respect to a (compact) Lie group. Aside from general genericity and normal form theorems on equivariant bifurcation, it describes many general families of examples of equivariant bifurcation and includes a number of novel geometric techniques, in particular, equivariant transversality. This important book forms a theoretical basis of future work on equivariant reversible and Hamiltonian systems. This book also provides a general and comprehensive introduction to codimension one equi