

<<李群、李代数和表示论>>

图书基本信息

书名：<<李群、李代数和表示论>>

13位ISBN编号：9787506282970

10位ISBN编号：7506282976

出版时间：2007-10

出版时间：世界图书出版公司

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页数：351

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内容概要

This book provides an introduction to Lie groups, Lie algebras, and representation theory, aimed at graduate students in mathematics and physics. Although there are already several excellent books that cover many of the same topics, this book has two distinctive features that I hope will make it a useful addition to the literature. First, it treats Lie groups (not just Lie algebras) in a way that minimizes the amount of manifold theory needed. Thus, I neither assume a prior course on differentiable manifolds nor provide a condensed such course in the beginning chapters. Second, this book provides a gentle introduction to the machinery of semisimple groups and Lie algebras by treating the representation theory of $SU(2)$ and $SU(3)$ in detail before going to the general case. This allows the reader to see roots, weights, and the Weyl group "in action" in simple cases before confronting the general theory. The standard books on Lie theory begin immediately with the general case: a smooth manifold that is also a group. The Lie algebra is then defined as the space of left-invariant vector fields and the exponential mapping is defined in terms of the flow along such vector fields. This approach is undoubtedly the right one in the long run, but it is rather abstract for a reader encountering such things for the first time. Furthermore, with this approach, one must either assume the reader is familiar with the theory of differentiable manifolds (which rules out a substantial part of one's audience) or one must spend considerable time at the beginning of the book explaining this theory (in which case, it takes a long time to get to Lie theory proper).

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书籍目录

Part I General Theory Matrix Lie Groups 1.1 Definition of a Matrix Lie Group 1.1.1 Counterexamples 1.2 Examples of Matrix Lie Groups 1.2.1 The general linear groups $GL(n;R)$ and $GL(n;C)$ 1.2.2 The special linear groups $SL(n;R)$ and $SL(n;C)$ 1.2.3 The orthogonal and special orthogonal groups, $O(n)$ and $SO(n)$ 1.2.4 The unitary and special unitary groups, $U(n)$ and $SU(n)$ 1.2.5 The complex orthogonal groups, $O(n;C)$ and $SO(n;C)$ 1.2.6 The generalized orthogonal and Lorentz groups 1.2.7 The symplectic groups $Sp(n;R)$, $Sp(n;C)$, and $Sp(n)$ 1.2.8 The Heisenberg group H_n 1.2.9 The groups R, C^*, S^1 , and R^n 1.2.10 The Euclidean and Poincaré groups $E(n)$ and $P(n;1)$ 1.3 Compactness 1.3.1 Examples of compact groups 1.3.2 Examples of noncompact groups 1.4 Connectedness 1.5 Simple Connectedness 1.6 Homomorphisms and Isomorphisms 1.6.1 Example: $SU(2)$ and $SO(3)$ 1.7 The Polar Decomposition for $SU(n;C)$ and $SL(n;C)$ 1.8 Lie Groups 1.9 Exercises2 Lie Algebras and the Exponential Mapping 2.1 The Matrix Exponential 2.2 Computing the Exponential of a Matrix 2.2.1 Case 1: X is diagonalizable 2.2.2 Case 2: X is nilpotent 2.2.3 Case 3: X arbitrary 2.3 The Matrix Logarithm 2.4 Further Properties of the Matrix Exponential 2.5 The Lie Algebra of a Matrix Lie Group 2.5.1 Physicists' Convention 2.5.2 The general linear groups 2.5.3 The special linear groups 2.5.4 The unitary groups 2.5.5 The orthogonal groups 2.5.6 The generalized orthogonal groups 2.5.7 The symplectic groups 2.5.8 The Heisenberg group 2.5.9 The Euclidean and Poincaré groups 2.6 Properties of the Lie Algebra 2.7 The Exponential Mapping 2.8 Lie Algebras 2.8.1 Structure constants 2.8.2 Direct sums 2.9 The Complexification of a Real Lie Algebra 2.10 Exercises3 The Baker-Campbell-Hausdorff Formula 3.1 The Baker-Campbell-Hausdorff Formula for the Heisenberg Group 3.2 The General Baker-Campbell-Hausdorff Formula 3.3 The Derivative of the Exponential Mapping 3.4 Proof of the Baker-Campbell-Hausdorff Formula 3.5 The Series Form of the Baker-Campbell-Hausdorff Formula 3.6 Group Versus Lie Algebra Homomorphisms 3.7 Covering Groups 3.8 Subgroups and Subalgebras 3.9 Exercises4 Basic Representation Theory 4.1 Representations 4.2 Why Study Representations? 4.3 Examples of Representations 4.3.1 The standard representation 4.3.2 The trivial representation 4.3.3 The adjoint representation 4.3.4 Some representations of $S(1,2)$ 4.3.5 Two unitary representations of $SO(3)$ 4.3.6 A unitary representation of the realsPart II Semisimple TheoryReferencesIndex

<<李群、李代数和表示论>>

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