

《变换群和李代数》

图书基本信息

书名 : 《变换群和李代数》

13位ISBN编号 : 9787040367416

10位ISBN编号 : 7040367416

出版时间 : 2013-3

出版社 : 高等教育出版社

作者 : 伊布拉基莫夫

页数 : 185

版权说明 : 本站所提供下载的PDF图书仅提供预览和简介以及在线试读 , 请支持正版图书。

更多资源请访问 : www.tushu000.com

《变换群和李代数》

内容概要

《非线性物理科学:变换群和李代数(英文版)》为作者在俄罗斯、美国、南非和瑞典多年讲述变换群和李群分析课程的讲义。书中所讨论的局部李群方法提供了求解非线性微分方程解析解通用且非常有效的方法，而近似变换群可以提高构造含少量参数的微分方程的技巧。

《变换群和李代数》

作者简介

作者：（瑞典）伊布拉基莫夫（Nail H.Ibragimov）伊布拉基莫夫，教授为瑞士科学家，被公认为是在微分方程对称分析方面世界上最具权威的专家之一。他发起并构建了现代群分析理论，并推动了该理论在多方面的应用。

《变换群和李代数》

书籍目录

Preface Part Local Transformation Groups Preliminaries 1.1 Changes of frames of reference and point transformations 1.1.1 Translations 1.1.2 Rotations 1.1.3 Galilean transformation 1.2 Introduction of transformation groups 1.2.1 Definitions and examples 1.2.2 Different types of groups 1.3 Some useful groups 1.3.1 Finite continuous groups on the straight line 1.3.2 Groups on the plane 1.3.3 Groups in \mathbb{R}^n Exercises to Chapter 1 2 One-parameter groups and their invariants 2.1 Local groups of transformations 2.1.1 Notation and definition 2.1.2 Groups written in a canonical parameter 2.1.3 Infinitesimal transformations and generators 2.1.4 Lie equations 2.1.5 Exponential map 2.1.6 Determination of a canonical parameter 2.2 Invariants 2.2.1 Definition and infinitesimal test 2.2.2 Canonical variables 2.2.3 Construction of groups using canonical variables 2.2.4 Frequently used groups in the plane 2.3 Invariant equations 2.3.1 Definition and infinitesimal test 2.3.2 Invariant representation of invariant manifolds 2.3.3 Proof of Theorem 2.9 2.3.4 Examples on Theorem 2.9 Exercises to Chapter 2 3 Groups admitted by differential equations 3.1 Preliminaries 3.1.1 Differential variables and functions 3.1.2 Point transformations 3.1.3 Frame of differential equations 3.2 Prolongation of group transformations 3.2.1 One-dimensional case 3.2.2 Prolongation with several differential variables 3.2.3 General case 3.3 Prolongation of group generators 3.3.1 One-dimensional case 3.3.2 Several differential variables 3.3.3 General case 3.4 First definition of symmetry groups 3.4.1 Definition 3.4.2 Examples 3.5 Second definition of symmetry groups 3.5.1 Definition and determining equations 3.5.2 Determining equation for second-order ODEs 3.5.3 Examples on solution of determining equations Exercises to Chapter 3 4 Lie algebras of operators 4.1 Basic definitions 4.1.1 Commutator 4.1.2 Properties of the commutator 4.1.3 Properties of determining equations 4.1.4 Lie algebras 4.2 Basic properties 4.2.1 Notation 4.2.2 Subalgebra and ideal 4.2.3 Derived algebras 4.2.4 Solvable Lie algebras 4.3 Isomorphism and similarity 4.3.1 Isomorphic Lie algebras 4.3.2 Similar Lie algebras 4.4 Low-dimensional Lie algebras 4.4.1 One-dimensional algebras 4.4.2 Two-dimensional algebras in the plane 4.4.3 Three-dimensional algebras in the plane 4.4.4 Three-dimensional algebras in \mathbb{R}^3 4.5 Lie algebras and multi-parameter groups 4.5.1 Definition of multi-parameter groups 4.5.2 Construction of multi-parameter groups Exercises to Chapter 4 5 Galois groups via symmetries 5.1 Preliminaries 5.2 Symmetries of algebraic equations 5.2.1 Determining equation 5.2.2 First example 5.2.3 Second example 5.2.4 Third example 5.3 Construction of Galois groups 5.3.1 First example 5.3.2 Second example 5.3.3 Third example 5.3.4 Concluding remarks Assignment to Part Part Approximate Transformation Groups 6 Preliminaries 6.1 Motivation 6.2 A sketch on Lie transformation groups 6.2.1 One-parameter transformation groups 6.2.2 Canonical parameter 6.2.3 Group generator and Lie equations 6.2.4 Exponential map 6.3 Approximate Cauchy problem 6.3.1 Notation 6.3.2 Definition of the approximate Cauchy problem 7 Approximate transformations 7.1 Approximate transformations defined 7.2 Approximate one-parameter groups 7.2.1 Introductory remark 7.2.2 Definition of one-parameter approximate transformation groups 7.2.3 Generator of approximate transformation group 7.3 Infinitesimal description 7.3.1 Approximate Lie equations 7.3.2 Approximate exponential map Exercises to Chapter 7 8 Approximate symmetries 8.1 Definition of approximate symmetries 8.2 Calculation of approximate symmetries 8.2.1 Determining equations 8.2.2 Stable symmetries 8.2.3 Algorithm for calculation 8.3 Examples 8.3.1 First example 8.3.2 Approximate commutator and Lie algebras 8.3.3 Second example 8.3.4 Third example Exercises to Chapter 8 Applications 9.1 Integration of equations with a small parameter using approximate symmetries 9.1.1 Equation having no exact point symmetries 9.1.2 Utilization of stable symmetries 9.2 Approximately invariant solutions 9.2.1 Nonlinear wave equation 9.2.2 Approximate travelling waves of KdV equation 9.3 Approximate conservation laws Exercises to Chapter 9 Assignment to Part Bibliography Index

《变换群和李代数》

章节摘录

版权页：插图：

《变换群和李代数》

编辑推荐

《非线性物理科学:变换群和李代数(英文版)》通俗易懂、叙述清晰，并提供丰富的模型，能帮助读者轻松地逐步深入各种主题。

《变换群和李代数》

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:www.tushu000.com