

<<Torsions of 3-dimens>>

图书基本信息

书名：<<Torsions of 3-dimensional manifolds3-dimensional多头管扭力>>

13位ISBN编号：9783764369118

10位ISBN编号：3764369116

出版时间：2002-1

出版时间：Springer

作者：V. Turaev

页数：196

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内容概要

The book is concerned with one of the most interesting and important topological invariants of 3-dimensional manifolds based on an original idea of Kurt Reidemeister (1935). This invariant, called the maximal abelian torsion, was introduced by the author in 1976. The purpose of the book is to give a systematic exposition of the theory of maximal abelian torsions of 3-manifolds. Apart from publication in scientific journals, many results are recent and appear here for the first time. Topological properties of the torsion are the main focus. This includes a detailed description of relations between the torsion and the Alexander-Fox invariants of the fundamental group. The torsion is shown to be related to the cohomology ring of the manifold and to the linking form. The reader will also find a definition of the torsion norm on the 2-homology of a 3-manifold, and a comparison with the classical Thurston norm. A surgery formula for the torsion is provided which allows to compute it explicitly from a surgery presentation of the manifold. As a special case, this gives a surgery formula for the Alexander polynomial of 3-manifolds. Treated in detail are a number of relevant notions including homology orientations, Euler structures, and Spinc structures on 3-manifolds. Relations between the torsion and the Seiberg-Witten invariants in dimension 3 are briefly discussed. Students and researchers with basic background in algebraic topology and low-dimensional topology will benefit from this monograph. Previous knowledge of the theory of torsions is not required. Numerous exercises and historical remarks as well as a collection of open problems complete the exposition.

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书籍目录

Introduction Generalities on Torsions .1 Torsions of chain complexes and CW-spaces .2
 Combinatorial Euler structures and their torsions .3 The maximal abelian torsion .4 Smooth Euler
 structures and their torsions The Torsion versus the Alexander-Fox Invariants .1 The first elementary ideal
 .2 The case $b_1 = 2$.3 The case $b_1 = 1$.4 Extension to 3-manifolds with boundary .5 The
 Alexander polynomials The Torsion versus the Cohomology Rings .1 Determinant and Pfaffian for
 alternate trilinear forms .2 The integral cohomology ring .3 Square volume forms and refined
 determinants .4 The cohomology ring mod r The Torsion Norm .1 The torsion polytope and the
 torsion norm .2 Comparison with the Thurston norm .3 Proof of Theorem 2.2 Homology Orientations
 in Dimension Three .1 Relative torsions of chain complexes .2 Induced homology orientations .3
 Homology orientations and link exteriors .4 Homology orientations and surgery Euler Structures on
 3-manifolds .1 Gluing of smooth Euler structures and the class c 2 Euler structures on solid tori and
 link exteriors .3 Gluing of combinatorial Euler structures and torsions . A Gluing Formula with
 Applications .1 A gluing formula .2 The Alexander-Conway function and surgery .3 Proof of
 Formula (I.4.e) .4 The torsion versus the Casson-Walker-Lescop invariant .5 Examples and
 computations Surgery Formulas for Torsions .1 Two lemmas .2 A surgery formula for \mathbb{Q} -torsions
 .3 A surgery formula for the Alexander polynomial .4 A surgery formula for $T(M)$ in the case $b_1(M) = 1$
 .5 Realization of the torsion The Torsion Function .1 The torsion function, basic Euler structures, and
 gluing .2 Moments of the torsion function .3 Axioms for the torsion function .4 A surgery formula for
 the torsion function .5 Formal expansions in $\mathbb{Q}(H)$ with applications Torsion of Rational Homology
 Spheres .1 The torsion and the first elementary ideal .2 The torsion versus the linking form .3 The
 torsion versus the cohomology ring mod r .4 A gluing formula .5 A surgery formula .6 The torsion
 function and its moments Spin c Structures .1 Spin c structures on 3-manifolds .2 The torsion function
 versus the Seiberg-Witten invariants .3 Spin structures on 3-manifolds Miscellaneous .1 Torsions of
 connected sums .2 The torsion versus the Massey products .3 Genus estimates for Z_r -surfaces
 Open Problems Bibliography Index

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