

Contents

Preface	v
Introduction	1
0.1 Basics of Elliptic Theory	1
0.2 Surgery and the Superposition Principle	3
0.3 Examples and Applications	9
0.4 Bibliographical Remarks	16
 I Superposition Principle	 19
1 Superposition Principle for the Relative Index	21
1.1 Collar Spaces	21
1.2 Proper Operators and Fredholm Operators	25
1.3 Superposition Principle	29
 2 Superposition Principle for K-Homology	 41
2.1 Preliminaries	41
2.2 Fredholm Modules and K -Homology	46
2.3 Superposition Principle	48
2.4 Fredholm Modules and Elliptic Operators	54
 3 Superposition Principle for KK-Theory	 59
3.1 Preliminaries	59
3.2 Hilbert Modules, Kasparov Modules, and KK	59
3.3 Superposition Principle	61
 II Examples	 69
4 Elliptic Operators on Noncompact Manifolds	71
4.1 Gromov–Lawson Theorem	71
4.2 Bunke Theorem	76

4.3 Roe’s Relative Index Construction 79

5 Applications to Boundary Value Problems 81

5.1 Preliminaries 81

5.2 Agranovich–Dynin Theorem 87

5.3 Agranovich Theorem 89

5.4 Bojarski Theorem and Its Generalizations 90

5.5 Boundary Value Problems with Symmetric Conormal Symbol 91

6 Spectral Flow for Families of Dirac Type Operators with Classical Boundary Conditions 93

6.1 Statement of the Problem 93

6.2 Simple Example 97

6.3 Formula for the Spectral Flow 100

6.4 Computation of the Spectral Flow for a Graphene Sheet 108

Bibliography 109

Index 115

The Localization Problem in Index Theory of Elliptic Operators

Nazaikinskii, V.; Schulze, B.-W.; Sternin, B.

2014, VIII, 117 p. 38 illus., 1 illus. in color., Softcover

ISBN: 978-3-0348-0509-4

A product of Birkhäuser Basel