

Cambridge University Press

978-0-521-78944-8 - An Introduction to K-Theory for C^* -Algebras

M. Rordam, F. Larsen and N. Laustsen

Table of Contents

[More information](#)

Contents

Preface	ix
1 C^*-Algebra Theory	1
1.1 C^* -algebras and $*$ -homomorphisms	1
1.2 Spectral theory	5
1.3 Matrix algebras	9
1.4 Exercises	10
2 Projections and Unitary Elements	15
2.1 Homotopy classes of unitary elements	15
2.2 Equivalence of projections	21
2.3 Semigroups of projections	28
2.4 Exercises	30
3 The K_0-Group of a Unital C^*-Algebra	35
3.1 Definition of the K_0 -group of a unital C^* -algebra	35
3.2 Functoriality of K_0	41
3.3 Examples	46
3.4 Exercises	54
4 The Functor K_0	59
4.1 Definition and functoriality of K_0	59
4.2 The standard picture of the group $K_0(A)$	62
4.3 Half and split exactness and stability of K_0	66
4.4 Exercises	70
5 The Ordered Abelian Group $K_0(A)$	77
5.1 The ordered K_0 -group of stably finite C^* -algebras	77
5.2* States on $K_0(A)$ and traces on A	82
5.3 Exercises	83

Cambridge University Press

978-0-521-78944-8 - An Introduction to K-Theory for C^* -Algebras

M. Rordam, F. Larsen and N. Laustsen

Table of Contents

[More information](#)

vi

CONTENTS

6 Inductive Limit C^*-Algebras	89
6.1 Products and sums of C^* -algebras	89
6.2 Inductive limits	91
6.3 Continuity of K_0	97
6.4* Stabilized C^* -algebras	101
6.5 Exercises	104
7 Classification of AF-Algebras	109
7.1 Finite dimensional C^* -algebras	109
7.2 AF-algebras	113
7.3 Elliott's classification theorem	118
7.4* UHF-algebras	125
7.5 Exercises	130
8 The Functor K_1	133
8.1 Definition of the K_1 -group	133
8.2 Functoriality of K_1	138
8.3* K_1 -groups and determinants	144
8.4 Exercises	147
9 The Index Map	153
9.1 Definition of the index map	154
9.2 The index map and partial isometries	158
9.3 An exact sequence of K -groups	163
9.4* Fredholm operators and Fredholm index	165
9.5 Exercises	169
10 The Higher K-Functors	175
10.1 The isomorphism between $K_1(A)$ and $K_0(SA)$	175
10.2 The long exact sequence in K -theory	178
10.3 Exercises	182
11 Bott Periodicity	185
11.1 The Bott map	185
11.2 The proof of Bott periodicity	187
11.3 Applications of Bott periodicity	199
11.4* Homotopy groups and K -theory	201
11.5* The holomorphic function calculus	204
11.6 Exercises	206

Cambridge University Press

978-0-521-78944-8 - An Introduction to K-Theory for C*-Algebras

M. Rordam, F. Larsen and N. Laustsen

Table of Contents

[More information](#)

<i>CONTENTS</i>	vii
12 The Six-Term Exact Sequence	209
12.1 The exponential map and the six-term exact sequence	209
12.2 An explicit description of the exponential map	211
12.3 Exercises	215
13 Inductive Limits of Dimension Drop Algebras	219
13.1 Dimension drop algebras	219
13.2 Countable Abelian groups as K -groups	222
13.3 Exercises	228
References	231
Table of K-groups	234
Index of symbols	236
General index	239