

CONTENTS

Introduction	11
Chapter 1. Background information	17
1.1. Some facts on the geometry of Banach spaces and operator theory in these spaces	17
1.2. Some information on boundary properties of functions analytic and meromorphic in finitely connected domains	29
1.3. On the operator of singular integration in spaces of summable functions	45
Chapter 2. General properties of factorization	55
2.1. The definition of factorization	56
2.2. Properties of factorization factors	58
2.3. The domain of factorability	63
2.4. Factorization of meromorphic matrix functions and their products	67
2.5. Comments	80
Chapter 3. The criterion of factorability. Φ -factorization and its basic properties	82
3.1. On solvability of the Riemann boundary value problem with factorable matrix coefficient	84
3.2. A criterion of factorability	93
3.3. On the normal solvability of the vector-valued Riemann boundary value problem and the problem associate to it	99
3.4. Left and right Φ -factorization. A criterion of simultaneous Fredholmness of the Riemann boundary value problem and the associate problem to it	105
3.5. Φ -factorization of unbounded matrix functions on contours of class \mathcal{G}	109
3.6. Φ -factorization of bounded measurable matrix functions on contours of class \mathcal{G}	116
3.7. Comments	126
Chapter 4. Φ -factorization of triangular matrix functions and reducible to them	132
4.1. Existence problems of a Φ -factorization of triangular matrix functions	135
4.2. Effective construction of a Φ -factorization and estimates for the partial indices of triangular matrix functions with Φ -factorable diagonal elements	140
4.3. Calculation of partial indices of second-order triangular matrix functions	147
4.4. Φ -factorization of functionally commutable matrix functions	154
4.5. Comments	163
Chapter 5. Some classes of factorable matrix functions	169
5.1. Φ -factorization of matrix functions from classes $L_{\infty}^{+} + C$	172
5.2. Factorization in Banach algebras of matrix functions	180
5.3. Φ -factorization of piecewise continuous matrix functions	195
5.4. Comments	202

Chapter 6. On the stability of factorization factors	211
6.1. Stability criterion for partial indices	214
6.2. On the behaviour of partial indices under small perturbations. The structure of the family of Φ -factorable matrix functions	218
6.3. Several estimates for the partial indices of measurable bounded matrix functions	223
6.4. Sufficient conditions for coincidence of partial indices of matrix functions whose Hausdorff set is separated from zero	229
6.5. On partial indices of matrix functions of classes $L_{\infty}^{\pm} + C$	236
6.6. On the stability of the factorization factors G_{\pm}	240
6.7. Comments	247
Chapter 7. Factorization on the circle	253
7.1. Definition of factorization on the circle	255
7.2. Factorization of Hermitian matrix functions	258
7.3. Factorization of definite matrix functions	265
7.4. Criteria for existence of Φ -factorization and coincidence of partial indices associated with the behaviour of the numerical domain	272
7.5. Definiteness criteria and stability of partial indices of bounded measurable matrix functions	276
7.6. On partial indices of continuous matrix functions	285
7.7. Comments	288
Chapter 8. Conditions of Φ -factorability in the space L_p . Criterion of Φ -factorability in L_p of bounded measurable matrix functions	296
8.1. Auxiliary results	297
8.2. Sufficient conditions of Φ -factorability	304
8.3. Criterion of Φ -factorability in L_p	307
8.4. Comments	309
Chapter 9. The generalized Riemann boundary value problem	315
9.1. Criterion of Fredholmness of the generalized Riemann boundary value problem in the space L_p	316
9.2. Sufficient conditions of Fredholmness and stability. Estimates for the defect numbers of the generalized Riemann boundary value problem in the space L_p	325
9.3. The generalized Riemann boundary value problem with continuous coefficients. A stability criterion	333
9.4. Comments	336
References	340
Subject index	371
Notation index	372