

Contents

Introduction	1
Chapter 1. Inverse problems for difference operators	7
1.1. Inverse problem of spectral analysis for Jacobi matrices	7
1.2. Inverse problem for a difference equation with constant coefficients	16
1.3. The problems of determining a difference operator in nonstationary statement	25
1.4. Remarks and references	39
Chapter 2. <i>A priori</i> estimates and the uniqueness of solutions of integro-differential equations with operator coefficients	41
2.1. Estimates of the Carleman type and their connection with the uniqueness of solutions of inverse problems	41
2.2. Estimates for the Schrödinger equation with operator coefficients	54
2.3. Remarks and references	64
Chapter 3. Inverse problems for differential equations	65
3.1. One-dimensional inverse problem for the wave equation in linearized statement	65
3.2. The method of transformation operators	75
3.3. Uniqueness in multidimensional inverse problems in nonstationary and spectral statements	84
3.4. Remarks and references	90

Chapter 4. Volterra operator equations and their applications	93
4.1. Volterra operator equations in scales of Banach spaces	93
4.2. Nonhyperbolic Cauchy problem for the wave equation	110
4.3. The problem of integral geometry in a strip	115
4.4. The inverse problem of variational calculus	123
4.5. Remarks and references	132
Chapter 5. Foundations of the theory of conditionally well-posed problems	133
5.1. Conditional well-posedness	133
5.2. l_h -well-posedness of difference schemes	146
5.3. Variational methods of solution of l_h -stable difference schemes . .	154
5.4. Remarks and references	160
Chapter 6. Theory of stability of difference schemes	163
6.1. Statement of the problem and the necessary conditions of finite stability	163
6.2. Basic estimates	173
6.3. Sufficient stability conditions	179
6.4. Estimates of l -stability up to the boundary	192
6.5. Convergence theorems	196
6.6. Finite stability of two-layer schemes of the canonical form	206
6.7. Conditions of stability in terms of the transition operator	213
6.8. Remarks and references	218
Appendix A	219
Bibliography	225