Record Nr. UNINA9910483188003321

Autore Korikov Dmitrii

Titolo Asymptotic theory of dynamic boundary value problems in irregular

domains / / Dmitrii Korikov, Boris Plamenevskii, Oleg Sarafanov

Pubbl/distr/stampa Cham, Switzerland: ,: Birkhauser, , [2021]

©2021

ISBN 3-030-65372-2

Descrizione fisica 1 online resource (xi, 399 pages)

Collana Operator Theory: Advances and Applications;; v.284

Disciplina 515.353

Soggetti Boundary value problems - Asymptotic theory

Problemes de contorn Llibres electrònics

Lingua di pubblicazione Inglese

Formato Materiale a stampa

Livello bibliografico Monografia

Nota di bibliografia Includes bibliographical references and index.

Nota di contenuto

Intro -- Preface -- Contents -- 1 Introduction -- 2 Wave Equation in Domains with Edges -- 2.1 Dirichlet Problem for the Wave Equation --2.1.1 Function Spaces in a Wedge and in a Cone -- 2.1.2 Problem in a Wedge: Problem with Parameter in a Cone: Existence of Solutions --2.1.3 Weighted Combined Estimates -- 2.1.4 Operators in the Scale of Weighted Spaces -- 2.1.5 Asymptotics of Solutions Near the Vertex of a Cone or Near the Edge of a Wedge -- 2.1.6 Explicit Formulas for the Coefficients in Asymptotics -- 2.1.7 Problem in a Bounded Domain with Conical Points -- 2.1.8 Problem in a Bounded Domain: Asymptotics of Solutions Near an Internal Point -- 2.2 Neumann Problem for the Wave Equation -- 2.2.1 Statement of the Problem: Preliminaries -- 2.2.2 Weighted Combined Estimates for Solutions to Problem (2.138), (2.139) -- 2.2.3 Operator of the Boundary Value Problem in a Cone -- 2.2.4 Boundary Value Problem in a Cone in the Scale of Weighted Spaces --2.2.5 Asymptotic Expansions of Solutions to the Problem in a Cone --2.2.6 Problem in a Wedge -- 2.2.7 Explicit Formulas for the Coefficients in Asymptotics -- 2.2.8 Problem in a Bounded Domain with Conical Points -- 3 Hyperbolic Systems in Domains with Conical Points -- 3.1 Cauchy-Dirichlet Problem -- 3.1.1 Combined Estimate for Solutions of the Problem in a Cone -- 3.1.2 Operator of the Boundary Value Problem in a Cone: The Existence and Uniqueness of Solutions --

3.1.3 The Boundary Value Problem in a Cone in the Scale of Weighted Spaces -- 3.1.4 Asymptotics of Solutions of the Problem in a Cone --3.1.5 The Problem in a Wedge -- 3.2 Neumann Problem -- 3.2.1 The Model Problems in a Cone: A Strong Solution -- 3.2.2 Weighted Estimates of Solutions of the Problem with Parameter in a Cone -- 3.2.3 The Problem with Parameter in a Cone: A Scale of Weighted Spaces --3.2.4 The Asymptotics of Solutions. 3.2.5 A Bounded Domain with a Conical Point -- 4 Elastodynamics in Domains with Edges -- 4.1 Introduction -- 4.2 Homogeneous Energy Estimates on Solutions of Boundary Value Problems with Parameter in a Wedge -- 4.3 Nonhomogeneous Energy Estimates for Solutions of Boundary Value Problems with Parameter in a Wedge -- 4.3.1 Estimates on Solutions with Dirichlet BoundaryCondition -- 4.3.2 Estimates on Solutions with Neumann Boundary Condition -- 4.4 Strong Solutions --4.4.1 The Dirichlet Problem with Homogeneous Energy Estimate in a Wedge -- 4.4.2 The Dirichlet Problem with Nonhomogeneous Energy Estimate in a Wedge -- 4.4.3 The Neumann Problem in a Wedge -- 4.5 Weighted a priori Estimates for Solutions of Boundary Value Problems with Parameter in a Wedge -- 4.5.1 Estimates of Solutions with DirichletBoundary Condition -- 4.5.2 Estimate on Solutions with Neumann Boundary Condition in the Case dim K> -- 2 -- 4.5.3 Estimates of Solutions with Neumann Boundary Condition for dim K=2 -- 4.6 Boundary Value Problem in a Cone in a Scaleof Weighted Spaces -- 4.6.1 On the Asymptotics of Solutions of Elliptic Problems in a Cone -- 4.6.2 Strong Solutions -- 4.6.3 The Operator of Problem (4.105), (4.106)in a Scale of Weighted Spaces -- 4.6.4 Asymptotics of Solutions of the Problem in a Cone -- 4.7 On the Time-Dependent Problem in a Wedge -- 4.8 Energy Estimates on Solutions in a Bounded Domain --4.9 Weighted Estimates in a Bounded Domain with Edge -- 5 On Dynamic Maxwell System in Domains with Edges -- 5.1 The Problems in a Cone and in a Bounded Domain with Conical Point -- 5.1.1 Preliminaries: Statement of the Problem -- 5.1.2 Operator Pencil --5.1.3 A Global Energy Estimate -- 5.1.4 A Combined Weighted Estimate -- 5.1.5 The Operator of Problem in a Scaleof Weighted Spaces -- 5.1.6 The Asymptotics of Solutions. 5.1.7 Nonstationary Problem in the Cylinders Q and Q -- 5.1.8 Explicit Formulas of ws,k and Ws,k for the Problem in K -- 5.2 The Problem in a Wedge -- 5.2.1 Preliminaries: Statement of the Problem -- 5.2.2 Operator Pencil -- 5.2.3 On Properties of the Operator A(D) -- 5.2.4 Estimates of Solutions to Problems in a Wedge and in an Angle -- 5.2.5 The Operators of Problems in K -- 5.2.6 The Problem in the Cylinder T -- 5.2.7 Explicit Formulas for the Coefficients in the Asymptotics of Solutions of the Problem in T -- 5.2.8 Connection Between the Augmented and Non-augmented Maxwell Systems -- 6 Schroedinger and Germain-Lagrange Equations in a Domain with Corners -- 6.1 Schroedinger Equation -- 6.2 Germain-Lagrange Equation with Simply Supported Boundary Conditions -- 6.2.1 Combined Estimates -- 6.2.2 Asymptotics of Solutions -- 6.3 Germain-Lagrange Equation with Clamped BoundaryConditions -- 6.3.1 Problem in the Wedge: Problem with Parameter in a Sector-Existence of Solutions -- 6.3.2 Weighted Combined Estimates -- 6.3.3 Operators in the Scale of Weighted Spaces -- 6.3.4 Asymptotics of Solutions -- 6.3.5 Problem in a Bounded Domain with Corners -- 7 Asymptotics of Solutions to Wave Equation in Singularly Perturbed Domains -- 7.1 Asymptotics of Solutions to Wave Equation in a Domain with Small Cavity -- 7.1.1 Statement of Problem: Principal Term of Asymptotics -- 7.1.2 Estimate of the Remainder --7.1.3 Full Asymptotic Expansion -- 7.2 Asymptotics of Solutions to Wave Equation in a Domain with ``Smoothed" Conical Point -- 8

Asymptotics of Solutions to Non-stationary Maxwell System in a Domain with Small Cavities -- 8.1 Elliptic Extension of Maxwell System with Parameter -- 8.2 Operator Pencil -- 8.3 The First Limit Problem -- 8.4 The Second Limit Problem -- 8.5 Asymptotics Principal Term of Solution to Extended Problem.

8.6 Asymptotic Series for Solution to Extended Problem -- 8.6.1 Asymptotics for Solutions to Non-extended Maxwell System -- 8.7 Non-stationary Maxwell System -- 8.7.1 Statement of Problem -- 8.7.2 Preliminary Description of Asymptotics for Solutions to Extended Problem -- 8.7.3 Principal Term of Asymptotics for Solutions to Problem (8.111), (8.112) -- 8.7.4 Proof of Theorem 8.7.4 -- 8.7.5 Estimate of the Remainder $u1(\cdot, \cdot)$ for ||0 - 8.7.6 Estimate of the Functions $u(\cdot, \cdot)$ and $u(\cdot, \cdot)$ for ||> - 0 - 8.7.7 Return to Extended Hyperbolic Problem -- 8.7.8 Return to Non-stationary Maxwell System Under Compatibility Conditions -- 8.8 Asymptotic Series as 0 for Solutions to Hyperbolic Problem -- 8.8.1 Estimates of Coefficients and Remaindersin (8.88), (8.89) -- 8.8.2 Estimate, Uniform with Respect to , of the Remainder uN+1(\cdot ,,)in the Expansion (8.100) -- 8.8.3 Return to Non-extended Maxwell System (8.1) in (8.100). (8.101) -- 8.8.4 Complete Asymptotic Expansion of Solutions to Problem (8.111), (8.112) -- 8.9 Stationary Maxwell System with Impedance BoundaryConditions -- 8.10 Asymptotics for Solutions to Problem (8.192), (8.193) -- 8.10.1 Principal Term of Asymptotics --8.10.2 Estimate of the Remainder -- 8.10.3 Complete Asymptotic Expansion -- 8.10.4 Return to the Non-extended Maxwell System --8.11 Non-stationary Maxwell System with Impedance Boundary Conditions -- 8.12 Generalization to the Case of a Domain with Several SmallCavities -- Bibliographical Sketch -- References.