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Instability of Continuous Systems Sep 26 2019 Until recently there was no uniform stability theory. Different approaches to stability problems had been developed in the different branches of mechanics. In the field of elasticity, it was mainly the so called static method and energy method which were used, while in the field of dynamics it was the kinetic method, which found its perfect expression in the theory of Liapunov. During the last few decades there has been a rapid development in the general theory of stability, stimulated, for example, by the investigations of H. ZIEGLER on elastic systems subject to non-conservative loads, and by the problems arising in aeroelasticity which are closely related to those introduced by ZIEGLER. The need was felt for kinetic methods which could also be used in investigating the stability of deformable systems. Efforts were made to adapt such methods, already known and developed in the stability theory of rigid systems, for application in the stability theory of continuous systems. During the last ten years interest was focused mainly on the application of a generalized Liapunov method to stability problems of continuous systems. All this was done in attempts to unify the various approaches to stability theory. It was with the idea of encouraging such a tendency, establishing to what extent a uniform physical and mathematical foundation already existed for stability theory in all branches of mechanics, and stimulating the further development of a common stability theory, that a IUTAM-Symposium was devoted to this topic.

The Theory of Continuous Structures and Arches Jun 03 2020

The Theory of Optimal Sampling in Continuous Time Oct 20 2021

Theory of Stability of Continuous Elastic Structures Jan 23 2022 Theory of Stability of Continuous Elastic Structures presents an applied mathematical treatment of the stability of civil engineering structures. The book's modern and rigorous approach makes it especially useful as a text in advanced engineering courses and an invaluable reference for engineers.

Stochastic Control in Discrete and Continuous Time Feb 09 2021 This book contains an introduction to three topics in stochastic control: discrete time stochastic control, i. e. , stochastic dynamic programming (Chapter 1), piecewise - deterministic control problems (Chapter 3), and control of Ito diffusions (Chapter 4). The chapters include treatments of optimal stopping problems. An Appendix - calls material from elementary probability theory and gives heuristic explanations of certain more advanced tools in probability theory. The book will hopefully be of interest to students in several fields: economics, engineering, operations research, finance, business, mathematics. In economics and business administration, graduate students should readily be able to read it, and the mathematical level can be suitable for advanced undergraduates in mathematics and science. The prerequisites for reading the book are only a calculus course and a course in elementary probability. (Certain technical comments may demand a slightly better background.) As this book perhaps (and hopefully) will be read by readers with widely differing backgrounds, some general advice may be useful: Don't be put off if paragraphs, comments, or remarks contain material of a seemingly more technical nature that you don't understand. Just skip such material and continue reading, it will surely not be needed in order to understand the main ideas and results. The presentation avoids the use of measure theory.

The Theory of Stochastic Processes Aug 18 2021 This book should be of interest to undergraduate and postgraduate students of probability theory.

Theory of Stability of Continuous Elastic Structures May 03 2020 Theory of Stability of Continuous Elastic Structures presents an applied mathematical treatment of the stability of civil engineering structures. The book's modern and rigorous approach makes it especially useful as a text in advanced engineering courses and an invaluable reference for engineers.

Quantum Continuous Variables Nov 28 2019 Quantum Continuous Variables introduces the theory of continuous variable quantum systems, from its foundations based on the framework of Gaussian states to modern developments, including its applications to quantum information and forthcoming quantum technologies. This new book addresses the theory of Gaussian states, operations, and dynamics in great depth and breadth, through a novel approach that embraces both the Hilbert space and phase descriptions. The volume includes coverage of entanglement theory and quantum information protocols, and their connection with relevant experimental set-ups. General techniques for non-Gaussian manipulations also emerge as the treatment unfolds, and are demonstrated with specific case studies. This book will be of interest to graduate students looking to familiarise themselves with the field, in addition to experienced researchers eager to enhance their understanding of its theoretical methods. It will also appeal to experimentalists searching for a rigorous but accessible treatment of the theory in the area.

Das Ziel Oct 27 2019 Ein Roman über Prozessoptimierung? Geht das? Das geht nicht nur – das liest sich auch spannend von der ersten bis zur letzten Seite. Elyahu M. Goldratt's "Das Ziel" ist die Geschichte des Managers Alex Rogo, der mit ungewöhnlichen und schlagkräftigen neuen Methoden in seinem Unternehmen für Aufsehen sorgt. Der Klassiker unter den Wirtschaftsbüchern, der das Managementdenken weltweit umkrempelt, wurde jetzt erweitert um den wichtigsten Aufsatz des Autors, "Standing on the Shoulders of Giants": Pflichtlektüre für Manager – und fesselnder Lesestoff.

Theory of Vibration Jun 15 2021 The aim of this book is to impart a sound understanding, both physical and mathematical, of the fundamentals of the theory of vibration and its applications. It presents in a simple and systematic manner techniques that can be easily applied to the analysis of vibration of mechanical and structural systems. In this book, an attempt has been made to provide the rational development of the methods of vibration from their foundations and develop the techniques in clearly understandable stages. This is the first volume, entitled "An Introduction", intended for an introductory semester course in the theory of vibration. The solution procedures are explained in details easily understandable by students. The second volume, "Discrete and Continuous Systems", is planned for publication in the fall of 1990.

Theory of Continuous Non-linear Control Systems Sep 06 2020

China Nov 08 2020

Theory of Vibration Dec 22 2021 The aim of this book is to impart a sound understanding, both physical and mathematical, of the fundamentals of the theory of vibration and its applications. It presents in a simple and systematic manner techniques that can be easily applied to the analysis of vibration of mechanical and structural systems. In this book, an attempt has been made to provide the rational development of the methods of vibration from their foundations and develop the techniques in clearly understandable stages. This is the first volume, entitled "An Introduction", intended for an introductory semester course in the theory of vibration. The solution procedures are explained in details easily understandable by students. The second volume, "Discrete and Continuous Systems", is planned for publication in the fall of 1990.

Problems from the Discrete to the Continuous Feb 21 2022 The primary intent of the book is to introduce an array of beautiful problems in a variety of subjects quickly, pithily and completely rigorously to graduate students and advanced undergraduates. The book takes a number of specific problems and solves them, the needed tools developed along the way in the context of the particular problems. It treats a melange of topics from combinatorial probability theory, number theory, random graph theory and combinatorics. The problems in this book involve the asymptotic analysis of a discrete construct, as some natural parameter of the system tends to infinity. Besides bridging discrete mathematics and mathematical analysis, the book makes a modest attempt at bridging disciplines. The problems were selected with an eye toward accessibility to a wide audience, including advanced undergraduate students. The book could be used for a seminar course in which students present the lectures.

A Theory of Continuous Trading When Lumpiness of Consumption Is Allowed Oct 08 2020 This work has been selected by scholars as being culturally important, and is part of the knowledge base of civilization as we know it. This work was reproduced from the original artifact, and remains as true to the original work as possible. Therefore, you will see the original copyright references, library stamps (as most of these works have been housed in our most important libraries around the world), and other notations in the work. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. As a reproduction of a historical artifact, this work may contain missing or blurred pages, poor pictures, errant marks, etc. Scholars believe, and we concur, that

this work is important enough to be preserved, reproduced, and made generally available to the public. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

System Theory Sep 18 2021

An Introduction to Continuous-Time Stochastic Processes Jul 29 2022 This textbook, now in its third edition, offers a rigorous and self-contained introduction to the theory of continuous-time stochastic processes, stochastic integrals, and stochastic differential equations. Expertly balancing theory and applications, the work features concrete examples of modeling real-world problems from biology, medicine, industrial applications, finance, and insurance using stochastic methods. No previous knowledge of stochastic processes is required. Key topics include: Markov processes Stochastic differential equations Arbitrage-free markets and financial derivatives Insurance risk Population dynamics, and epidemics Agent-based models New to the Third Edition: Infinitely divisible distributions Random measures Levy processes Fractional Brownian motion Ergodic theory Karhunen-Loeve expansion Additional applications Additional exercises Smoluchowski approximation of Langevin systems An Introduction to Continuous-Time Stochastic Processes, Third Edition will be of interest to a broad audience of students, pure and applied mathematicians, and researchers and practitioners in mathematical finance, biomathematics, biotechnology, and engineering. Suitable as a textbook for graduate or undergraduate courses, as well as European Masters courses (according to the two-year-long second cycle of the "Bologna Scheme"), the work may also be used for self-study or as a reference. Prerequisites include knowledge of calculus and some analysis; exposure to probability would be helpful but not required since the necessary fundamentals of measure and integration are provided. From reviews of previous editions: "The book is ... an account of fundamental concepts as they appear in relevant modern applications and literature. ... The book addresses three main groups: first, mathematicians working in a different field; second, other scientists and professionals from a business or academic background; third, graduate or advanced undergraduate students of a quantitative subject related to stochastic theory and/or applications." -Zentralblatt MATH

Arbitrage Theory in Continuous Time Dec 02 2022 The third edition of this popular introduction to the classical underpinnings of the mathematics behind finance continues to combine sound mathematical principles with economic applications. Concentrating on the probabilistic theory of continuous arbitrage pricing of financial derivatives, including stochastic optimal control theory and Merton's fund separation theory, the book is designed for graduate students and combines necessary mathematical background with a solid economic focus. It includes a solved example for every new technique presented, contains numerous exercises, and suggests further reading in each chapter. In this substantially extended new edition Bjork has added separate and complete chapters on the martingale approach to optimal investment problems, optimal stopping theory with applications to American options, and positive interest models and their connection to potential theory and stochastic discount factors. More advanced areas of study are clearly marked to help students and teachers use the book as it suits their needs.

A Functional Theory of Cognition Apr 01 2020 A unified, general theory of functional cognition is presented in this book. Its generality appears in the titles of the 13 chapters listed below. Its unity appears in the effectiveness of the same methods and concepts across all of these areas. Generality and unity both stem from the foundation axiom of purposiveness. The axiom of purposiveness has been made effective through capability for functional measurement of values, which embody the goal-directed character of purposiveness. This measurement capability is based on the general cognitive algebra established in information integration theory. Functional theory can thus be made precise and effective near the level of everyday phenomenology. The book is written at a relatively simple level, directed at readers in every field of psychology. Among its characteristics are: * self-sufficient theory near the level of everyday phenomenology; * foundation on structure of the internal world; and * solid grounding in experimental analysis.

Continuous-Time Markov Jump Linear Systems Aug 25 2019 It has been widely recognized nowadays the importance of introducing mathematical models that take into account possible sudden changes in the dynamical behavior of a high-integrity systems or a safety-critical system. Such systems can be found in aircraft control, nuclear power stations, robotic manipulator systems, integrated communication networks and large-scale flexible structures for space stations, and are inherently vulnerable to abrupt changes in their structures caused by component or interconnection failures. In this regard, a particularly interesting class of models is the so-called Markov jump linear systems (MJLS), which have been used in numerous applications including robotics, economics and wireless communication. Combining probability and operator theory, the present volume provides a unified and rigorous treatment of recent results in control theory of continuous-time MJLS. This unique approach is of great interest to experts working in the field of linear systems with Markovian jump parameters or in stochastic control. The volume focuses on one of the few cases of stochastic control problems with an actual explicit solution and offers material well-suited to coursework, introducing students to an interesting and active research area. The book is addressed to researchers working in control and signal processing engineering. Prerequisites include a solid background in classical linear control theory, basic familiarity with continuous-time Markov chains and probability theory, and some elementary knowledge of operator theory. ?

Theory of Transformation Groups I Aug 06 2020 This modern translation of Sophus Lie's and Friedrich Engel's "Theorie der Transformationsgruppen I" will allow readers to discover the striking conceptual clarity and remarkably systematic organizational thought of the original German text. Volume I presents a comprehensive introduction to the theory and is mainly directed towards the generalization of ideas drawn from the study of examples. The major part of the present volume offers an extremely clear translation of the lucid original. The first four chapters provide not only a translation, but also a contemporary approach, which will help present day readers to familiarize themselves with the concepts at the heart of the subject. The editor's main objective was to encourage a renewed interest in the detailed classification of Lie algebras in dimensions 1, 2 and 3, and to offer access to Sophus Lie's monumental Galois theory of continuous transformation groups, established at the end of the 19th Century. Lie groups are widespread in mathematics, playing a role in representation theory, algebraic geometry, Galois theory, the theory of partial differential equations and also in physics, for example in general relativity. This volume is of interest to researchers in Lie theory and exterior differential systems and also to historians of mathematics. The prerequisites are a basic knowledge of differential calculus, ordinary differential equations and differential geometry.

A History of the Theory of Structures in the Nineteenth Century Dec 10 2020 An account which skilfully blends the personalities and great works of Britain's railway construction boom.

Arbitrage Theory in Continuous Time Jan 03 2023 The fourth edition of this widely used textbook on pricing and hedging of financial derivatives now also includes dynamic equilibrium theory and continues to combine sound mathematical principles with economic applications. Concentrating on the probabilistic theory of continuous time arbitrage pricing of financial derivatives, including stochastic optimal control theory and optimal stopping theory, Arbitrage Theory in Continuous Time is designed for graduate students in economics and mathematics, and combines the necessary mathematical background with a solid economic focus. It includes a solved example for every new technique presented, contains numerous exercises, and suggests further reading in each chapter. All concepts and ideas are discussed, not only from a mathematics point of view, but with lots of intuitive economic arguments. In the substantially extended fourth edition Tomas Bjork has added completely new chapters on incomplete markets, treating such topics as the Esscher transform, the minimal martingale measure, f-divergences, optimal investment theory for incomplete markets, and good deal bounds. This edition includes an entirely new section presenting dynamic equilibrium theory, covering unit net supply endowments models and the Cox-Ingersoll-Ross equilibrium factor model. Providing two full treatments of arbitrage theory-the classical delta hedging approach and the modern martingale approach-this book is written so that these approaches can be studied independently of each other, thus providing the less mathematically-oriented reader with a self-contained introduction to arbitrage theory and equilibrium theory, while at the same time allowing the more advanced student to see the full theory in action. This textbook is a natural choice for graduate students and advanced undergraduates studying finance and an invaluable introduction to mathematical finance for mathematicians and professionals in the market.

The Theory of Stochastic Processes Jan 11 2021 The random walk; Markov chains; Markov processes with discrete states in continuous time; Markov processes in continuous time with continuous state space; Non-markovian processes; Stationary processes: time domain; Stationary processes: frequency domain; Point processes; Appendices; Index.

Discrete and Continuous Models in the Theory of Networks Jun 27 2022 This book contains contributions from the participants of the research group hosted by the ZiF - Center for Interdisciplinary Research at the University of Bielefeld during the period 2013-2017 as well as from the conclusive conference organized at Bielefeld in December 2017. The contributions consist of original research papers: they mirror the scientific developments fostered by this research program or the state-of-the-art results presented during the conclusive conference. The volume covers current research in the areas of operator theory and dynamical systems on networks and their applications, indicating possible future directions. The book will be interesting to researchers focusing on the mathematical theory of networks; it is unique as, for the first time, continuous network models - a subject that has been blooming in the last twenty years - are

studied alongside more classical and discrete ones. Thus, instead of two different worlds often growing independently without much intercommunication, a new path is set, breaking with the tradition. The fruitful and beneficial exchange of ideas and results of both communities is reflected in this book.

Mathematische Grundlagen der Informationstheorie May 15 2021

Information Theory for Continuous Systems Nov 01 2022 This book provides a systematic mathematical analysis of entropy and stochastic processes, especially Gaussian processes, and its applications to information theory. The contents fall roughly into two parts. In the first part a unified treatment of entropy in information theory, probability theory and mathematical statistics is presented. The second part deals mostly with information theory for continuous communication systems. Particular emphasis is placed on the Gaussian channel. An advantage of this book is that, unlike most books on information theory, it places emphasis on continuous communication systems, rather than discrete ones.

Quantum Trajectories and Measurements in Continuous Time Mar 13 2021 This course-based monograph introduces the reader to the theory of continuous measurements in quantum mechanics and provides some benchmark applications. The approach chosen, quantum trajectory theory, is based on the stochastic Schrödinger and master equations, which determine the evolution of the a-posteriori state of a continuously observed quantum system and give the distribution of the measurement output. The present introduction is restricted to finite-dimensional quantum systems and diffusive outputs. Two appendices introduce the tools of probability theory and quantum measurement theory which are needed for the theoretical developments in the first part of the book. First, the basic equations of quantum trajectory theory are introduced, with all their mathematical properties, starting from the existence and uniqueness of their solutions. This makes the text also suitable for other applications of the same stochastic differential equations in different fields such as simulations of master equations or dynamical reduction theories. In the next step the equivalence between the stochastic approach and the theory of continuous measurements is demonstrated. To conclude the theoretical exposition, the properties of the output of the continuous measurement are analyzed in detail. This is a stochastic process with its own distribution, and the reader will learn how to compute physical quantities such as its moments and its spectrum. In particular this last concept is introduced with clear and explicit reference to the measurement process. The two-level atom is used as the basic prototype to illustrate the theory in a concrete application.

Quantum phenomena appearing in the spectrum of the fluorescence light, such as Mollow's triplet structure, squeezing of the fluorescence light, and the linewidth narrowing, are presented. Last but not least, the theory of quantum continuous measurements is the natural starting point to develop a feedback control theory in continuous time for quantum systems. The two-level atom is again used to introduce and study an example of feedback based on the observed output.

Vorlesungen Über Variationsrechnung Jan 29 2020 A standard text and reference work, by one of the major contributors to that theory. The text is in German and includes 117 figures.

Impulsive Control in Continuous and Discrete-Continuous Systems Nov 20 2021 This is an up-to-date introduction to the theory of impulsive control in nonlinear systems - a branch of optimal control theory, which is tightly connected to the theory of hybrid systems. The text introduces the reader to the area of optimal control problems with discontinuous solutions, discussing the application of a new and effective method of discontinuous time-transformation. With a large number of examples, illustrations, and applied problems arising in the area of observation control, this book should be useful as a textbook or reference for a senior or graduate-level course on the subject, as well as a reference for researchers in related fields.

Vibration of Discrete and Continuous Systems Jul 17 2021 Mechanical engineering, an engineering discipline borne of the needs of the industrial revolution, is once again asked to do its substantial share in the call for industrial renewal. The general call is urgent as we face profound issues of productivity and competitiveness that require engineering solutions, among others. The Mechanical Engineering Series features graduate texts and research monographs intended to address the need for information in contemporary areas of mechanical engineering. The series is conceived as a comprehensive one that covers a broad range of concentrations important to mechanical engineering graduate education and research. We are fortunate to have a distinguished roster of consulting editors on the advisory board, each an expert in one of the areas of concentration. The names of the consulting editors are listed on the next page of this volume. The areas of concentration are: applied mechanics; bio mechanics; computational mechanics; dynamic systems and control; energetics; mechanics of materials; processing; thermal science; and tribology. Professor Marshek, the consulting editor for dynamic systems and control, and I are pleased to present the second edition of *Vibration of Discrete and Continuous Systems* by Professor Shabana. We note that this is the second of two volumes. The first deals with the theory of vibration.

Financial Markets in Continuous Time Apr 25 2022 This book explains key financial concepts, mathematical tools and theories of mathematical finance. It is organized in four parts. The first brings together a number of results from discrete-time models. The second develops stochastic continuous-time models for the valuation of financial assets (the Black-Scholes formula and its extensions), for optimal portfolio and consumption choice, and for obtaining the yield curve and pricing interest rate products. The third part recalls some concepts and results of equilibrium theory and applies this in financial markets. The last part tackles market incompleteness and the valuation of exotic options.

Financial Mathematics Dec 30 2019 The book has been tested and refined through years of classroom teaching experience. With an abundance of examples, problems, and fully worked out solutions, the text introduces the financial theory and relevant mathematical methods in a mathematically rigorous yet engaging way. This textbook provides complete coverage of discrete-time financial models that form the cornerstones of financial derivative pricing theory. Unlike similar texts in the field, this one presents multiple problem-solving approaches, linking related comprehensive techniques for pricing different types of financial derivatives. Key features: In-depth coverage of discrete-time theory and methodology Numerous, fully worked out examples and exercises in every chapter Mathematically rigorous and consistent yet bridging various basic and more advanced concepts Judicious balance of financial theory, mathematical, and computational methods Guide to Material This revision contains: Almost 200 pages worth of new material in all chapters A new chapter on elementary probability theory An expanded set of solved problems and additional exercises Answers to all exercises This book is a comprehensive, self-contained, and unified treatment of the main theory and application of mathematical methods behind modern-day financial mathematics. The text complements *Financial Mathematics: A Comprehensive Treatment in Continuous Time*, by the same authors, also published by CRC Press.

Contract Theory in Continuous-Time Models Aug 30 2022 In recent years there has been a significant increase of interest in continuous-time Principal-Agent models, or contract theory, and their applications. Continuous-time models provide a powerful and elegant framework for solving stochastic optimization problems of finding the optimal contracts between two parties, under various assumptions on the information they have access to, and the effect they have on the underlying "profit/loss" values. This monograph surveys recent results of the theory in a systematic way, using the approach of the so-called Stochastic Maximum Principle, in models driven by Brownian Motion. Optimal contracts are characterized via a system of Forward-Backward Stochastic Differential Equations. In a number of interesting special cases these can be solved explicitly, enabling derivation of many qualitative economic conclusions.

System Theory of Continuous Time Finite Dimensional Dynamical Systems Apr 13 2021 This book discusses the realization and control problems of finite-dimensional dynamical systems which contain linear and nonlinear systems. The author focuses on algebraic methods for the discussion of control problems of linear and non-linear dynamical systems. The book contains detailed examples to showcase the effectiveness of the presented method. The target audience comprises primarily research experts in the field of control theory, but the book may also be beneficial for graduate students alike.

Contract Theory in Continuous-Time Models May 27 2022 In recent years there has been a significant increase of interest in continuous-time Principal-Agent models, or contract theory, and their applications. Continuous-time models provide a powerful and elegant framework for solving stochastic optimization problems of finding the optimal contracts between two parties, under various assumptions on the information they have access to, and the effect they have on the underlying "profit/loss" values. This monograph surveys recent results of the theory in a systematic way, using the approach of the so-called Stochastic Maximum Principle, in models driven by Brownian Motion. Optimal contracts are characterized via a system of Forward-Backward Stochastic Differential Equations. In a number of interesting special cases these can be solved explicitly, enabling derivation of many qualitative economic conclusions.

Theory of Continuous Groups Sep 30 2022 Based on lectures by a renowned educator, this book focuses on continuous groups, particularly in terms of applications in geometry and analysis. The author's unique perspectives are illustrated by numerous inventive geometric examples, many of which were inspired by footnotes among the work of Sophus Lie. 1971 edition.

A Theory of Continuous Trading When Lumpiness of Consumption Is Allowed Mar 01 2020 This work has been selected by scholars as being culturally important, and is part of the knowledge base of civilization as we know it. This work was reproduced from the original artifact, and remains as true to the original work as possible. Therefore, you will see the original copyright references, library stamps (as most of these works have been housed in our most important libraries around the world), and other notations in the work. This work is in the public domain in the United States of America, and possibly other

nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. As a reproduction of a historical artifact, this work may contain missing or blurred pages, poor pictures, errant marks, etc. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

Theory of Discrete and Continuous Fourier Analysis Mar 25 2022 A companion volume to Weaver's Applications of Discrete and Continuous Fourier Analysis (Wiley, 1983). Addresses the theoretical and analytical aspects of Fourier analysis, including topics usually found only in more advanced treatises. Provides background information before going on to cover such topics as existence of the inner product, distribution theory, Fourier series representation of complex functions, properties and behavior of the Fourier transform, Fourier transform of a distribution, physical interpretation of convolution, the fast Fourier transform, sampling a function, and much more. Includes exercises, problems, applications, over 150 illustrations, and a Fourier transform FORTRAN subroutine.

Waves in Continuous Media Jul 05 2020 Starting with the basic notions and facts of the mathematical theory of waves illustrated by numerous examples, exercises, and methods of solving typical problems Chapters 1 & 2 show e.g. how to recognize the hyperbolicity property, find characteristics, Riemann invariants and conservation laws for quasilinear systems of equations, construct and analyze solutions with weak or strong discontinuities, and how to investigate equations with dispersion and to construct travelling wave solutions for models reducible to nonlinear evolution equations. Chapter 3 deals with surface and internal waves in an incompressible fluid. The efficiency of mathematical methods is demonstrated on a hierarchy of approximate submodels generated from the Euler equations of homogeneous and non-homogeneous fluids. The self-contained presentations of the material is complemented by 200+ problems of different level of difficulty, numerous illustrations, and bibliographical recommendations.

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