

Beam Bolts And Mpc In Abaqus

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The Paramount Role of Joints into the Reliable Response of Structures C.C. Baniotopoulos 2012-12-06 A detailed presentation of the major role played by correctly designed and fabricated joints in the safe and reliable response of steel, composite and timber structures. The typology/morphology of connections is discussed for both conventional pinned and rigid joints and semi-rigid types. All relevant topics are comprehensively surveyed: definitions, classification, and influence of joint behaviour on overall structural response. Also presented are the application of the component method, the notion of rotational capacity, the local ductility of different types of earthquake-resistant structural joints as determined in cyclic experiments, numerical techniques for the realistic simulation of joint response, simple and moment-resistant structural connections. Readership: An incomparable resource for engineers who analyze and design steel, composite and timber structures; researchers and graduate students in the same areas.

ABAQUS/standard 1995

[Advances in Civil Engineering](#) Rao Martand Singh 2020-09-21 This volume comprises select peer reviewed papers presented at the international conference - Advanced Research and Innovations in Civil Engineering (ARICE 2019). It brings together a wide variety of innovative topics and current developments in various branches of civil engineering. Some of the major topics covered include structural engineering,

water resources engineering, transportation engineering, geotechnical engineering, environmental engineering, and remote sensing. The book also looks at emerging topics such as green building technologies, zero-energy buildings, smart materials, and intelligent transportation systems. Given its contents, the book will prove useful to students, researchers, and professionals working in the field of civil engineering.

Composite Joints and Connections P Camanho 2011-10-12 The growing use of composites over metals for structural applications has made a thorough understanding of the behaviour of composite joints in various applications essential for engineers, but has also presented them with a new set of problems. Composite joints and connections addresses these differences and explores the design, modelling and testing of bonded and bolted joints and connections. Part one discusses bolted joints whilst part two examines bonded joints. Chapters review reinforcement techniques and applications for composite bolted and bonded joints and investigate the causes and effects of fatigue and stress on both types of joint in various applications and environments. Topics in part one include metal hybridization, glass-reinforced aluminium (GLARE), hybrid fibre metal laminates (FML), glass fibre reinforced polymer (GFRP) and carbon fibre reinforced polymer (CFRP) composites. Topics in part two include calculation of strain energy release rates, simulating fracture and fatigue failure using cohesive zone models, marine and aerospace applications, advanced modelling, stress analysis of bonded patches and scarf repairs. Composite joints and connections is a valuable reference for composite manufacturers and composite component fabricators, the aerospace, automotive, shipbuilding and civil engineering industries and for anyone involved in the joining and repair of composite structures. Explores the design, modelling and testing of bonded and bolted joints and connections Reviews reinforcement techniques and applications for composite bolted and bonded joints Investigates the causes and effects of fatigue and stress on bolted and bonded joints in various applications and environments

Troubleshooting Finite-Element Modeling with Abaqus Raphael Jean Boulbes 2019-09-06 This book gives Abaqus users who make use of finite-element models in academic or practitioner-based research the in-depth program knowledge that allows them to debug a structural analysis model. The book provides many methods and guidelines for different analysis types and modes, that will help readers to solve problems

that can arise with Abaqus if a structural model fails to converge to a solution. The use of Abaqus affords a general checklist approach to debugging analysis models, which can also be applied to structural analysis. The author uses step-by-step methods and detailed explanations of special features in order to identify the solutions to a variety of problems with finite-element models. The book promotes:

- a diagnostic mode of thinking concerning error messages;
- better material definition and the writing of user material subroutines;
- work with the Abaqus mesher and best practice in doing so;
- the writing of user element subroutines and contact features with convergence issues; and
- consideration of hardware and software issues and a Windows HPC cluster solution.

The methods and information provided facilitate job diagnostics and help to obtain converged solutions for finite-element models regarding structural component assemblies in static or dynamic analysis. The troubleshooting advice ensures that these solutions are both high-quality and cost-effective according to practical experience. The book offers an in-depth guide for students learning about Abaqus, as each problem and solution are complemented by examples and straightforward explanations. It is also useful for academics and structural engineers wishing to debug Abaqus models on the basis of error and warning messages that arise during finite-element modelling processing.

Damage Mechanics George Z. Voyiadjis 2005-06-23 Before a structure or component can be completed, before any analytical model can be constructed, and even before the design can be formulated, you must have a fundamental understanding of damage behavior in order to produce a safe and effective design. Damage Mechanics presents the underlying principles of continuum damage mechanics along with the

Simulation of Thermoelastic Behaviour of Spacecraft Structures Simon Appel 2021-08-31 This book provides recommendations for thermal and structural modelling of spacecraft structures for predicting thermoelastic responses. It touches upon the related aspects of the finite element and thermal lumped parameter method. A mix of theoretical and practical examples supports the modelling guidelines. Starting from the system needs of instruments of spacecraft, the reader is supported with the development of the practical requirements for the joint development of the thermal and structural models. It provides points of attention and suggestions to check the quality of the models. The temperature mapping problem, typical for spacecraft thermoelastic analysis, is addressed. The principles of various temperature mapping

methods are presented. The prescribed average temperature method, co-developed by the authors, is discussed in detail together with its spin-off to provide high quality conductors for thermal models. The book concludes with the discussion of the application of uncertainty assessment methods. The thermoelastic analysis chain is computationally expensive. Therefore, the 2k+1 point estimate method of Rosenblueth is presented as an alternative for the Monte Carlo Simulation method, bringing stochastic uncertainty analysis in reach for large thermoelastic problems.

Technologies for economic and functional lightweight design Klaus Dröder 2021-03-10 This book comprises the proceedings of the conference “Future Production of Hybrid Structures 2020”, which took place in Wolfsburg. The conference focused on hybrid lightweight design, which is characterized by the combination of different materials with the aim of improving properties and reducing weight. In particular, production technologies for hybrid lightweight design were discussed, new evaluation methods for the ecological assessment of hybrid components were presented and future-oriented approaches motivated by nature for the development of components, assemblies and systems were introduced. Lightweight design is a key technology for the development of sustainable and resource-efficient mobility concepts. Vehicle manufacturers operate in an area of conflict between customer requirements, competition and legislation. Material hybrid structures, which combine the advantages of different materials, have a high potential for reducing weight, while simultaneously expanding component functionality. The future, efficient use of function-integrated hybrid structures in vehicle design requires innovations and constant developments in vehicle and production technology. There is a great demand, especially with regard to new methods and technologies, for "affordable" lightweight construction in large-scale production, taking into account the increasing requirements with regard to variant diversity, safety and quality.

Nonlinear Structures and Systems, Volume 1 Gaetan Kerschen 2019-06-28 Nonlinear Structures & Systems, Volume 1: Proceedings of the 37th IMAC, A Conference and Exposition on Structural Dynamics, 2019, the first volume of eight from the Conference brings together contributions to this important area of research and engineering. The collection presents early findings and case studies on fundamental and applied aspects of Nonlinear Dynamics, including papers on: Nonlinear Reduced-order Modeling Jointed Structures: Identification, Mechanics, Dynamics Experimental Nonlinear Dynamics Nonlinear Model &

Modal Interactions Nonlinear Damping Nonlinear Modeling & Simulation Nonlinearity & System Identification

Nuclear Plant Systems/components Aging Management and Life Extension I. T. Kisisel 1992

Advanced Computer Applications, 1994 Peter Langsten 1994

Recertification and Stress Classification Issues 1994

Computational Mechanics '95 Satya N. Atluri 1995

State-of-the-art Surveys on Computational Mechanics Ahmed Khairy Noor 1989

CATIA V5 FEA Tutorials Nader G. Zamani 2012-08-24 The objective of this tutorial book is to expose the reader to the basic FEA capabilities in CATIA V5 Release 21. The chapters are designed to be independent of each other allowing the user to pick specific topics without the need to go through the previous chapters. However, the best strategy to learn is to sequentially cover the chapters. In this workbook, the parts created in CATIA are simple enough they can be modeled with minimal knowledge of this powerful software. The reason behind the simplicity is not to burden the reader with the CAD aspects of the package. However, it is assumed that the user is familiar with CATIA V5 Release 21 interface and basic utilities such as pan, zoom, and rotation. The tutorials are based on release 21; however, other releases can also be used with minor changes. Typically, the differences are not even noticed by a beginner.

Finite Element Analysis Concepts J. E. Akin 2010 Young engineers are often required to utilize commercial finite element software without having had a course on finite element theory. That can lead to computer-aided design errors. This book outlines the basic theory, with a minimum of mathematics, and how its phases are structured within a typical software. The importance of estimating a solution, or verifying the results, by other means is emphasized and illustrated. The book also demonstrates the

common processes for utilizing the typical graphical icon interfaces in commercial codes. In particular, the book uses and covers the widely utilized SolidWorks solid modeling and simulation system to demonstrate applications in heat transfer, stress analysis, vibrations, buckling, and other fields. The book, with its detailed applications, will appeal to upper-level undergraduates as well as engineers new to industry.

Introduction to Finite Element Analysis Using MATLAB® and Abaqus Amar Khennane 2013-06-10 There are some books that target the theory of the finite element, while others focus on the programming side of things. Introduction to Finite Element Analysis Using MATLAB® and Abaqus accomplishes both. This book teaches the first principles of the finite element method. It presents the theory of the finite element method while maintaining a balance between its mathematical formulation, programming implementation, and application using commercial software. The computer implementation is carried out using MATLAB, while the practical applications are carried out in both MATLAB and Abaqus. MATLAB is a high-level language specially designed for dealing with matrices, making it particularly suited for programming the finite element method, while Abaqus is a suite of commercial finite element software. Includes more than 100 tables, photographs, and figures Provides MATLAB codes to generate contour plots for sample results Introduction to Finite Element Analysis Using MATLAB and Abaqus introduces and explains theory in each chapter, and provides corresponding examples. It offers introductory notes and provides matrix structural analysis for trusses, beams, and frames. The book examines the theories of stress and strain and the relationships between them. The author then covers weighted residual methods and finite element approximation and numerical integration. He presents the finite element formulation for plane stress/strain problems, introduces axisymmetric problems, and highlights the theory of plates. The text supplies step-by-step procedures for solving problems with Abaqus interactive and keyword editions. The described procedures are implemented as MATLAB codes and Abaqus files can be found on the CRC Press website.

Stability and Vibrations of Thin-Walled Composite Structures Haim Abramovich 2017-05-29 Stability and Vibrations of Thin-Walled Composite Structures presents engineering and academic knowledge on the stability (buckling and post buckling) and vibrations of thin walled composite structures like columns, plates, and stringer stiffened plates and shells, which form the basic structures of the aeronautical and

space sectors. Currently, this knowledge is dispersed in several books and manuscripts, covering all aspects of composite materials. The book enables both engineers and academics to locate valuable, up-to-date knowledge on buckling and vibrations, be it analytical or experimental, and use it for calculations or comparisons. The book is also useful as a textbook for advanced-level graduate courses. Presents a unified, systematic, detailed and comprehensive overview of the topic Contains contributions from leading experts in the field Includes a dedicated section on testing and experimental results

Flexural-Torsional Buckling of Structures N. S. Trahair 2017-11-13 Flexural-Torsional Buckling of Structures provides an up-to-date, comprehensive treatment of flexural-torsional buckling and demonstrates how to design against this mode of failure. The author first explains the fundamentals of this type of buckling behavior and then summarizes results that will be of use to designers and researchers in either equation or graphical form. This approach makes the book an ideal text/reference for students in structural engineering as well as for practicing civil engineers, structural engineers, and constructional steel researchers and designers. The book begins by introducing the modern development of the theory of flexural-torsional buckling through discussions on the general concepts of equilibrium, total potential, virtual work, and buckling. It then continues with in-depth coverage of hand methods for solving buckling problems, the analysis of flexural-torsional buckling using the finite element method, and the buckling of different types of structural elements and frames composed of various elastic materials. Other topics addressed include the design and inelastic buckling of steel members. The book's final chapter considers a collection of special topics.

Design and Analysis of Tall and Complex Structures Feng Fu 2018-02-01 The design of tall buildings and complex structures involves challenging activities, including: scheme design, modelling, structural analysis and detailed design. This book provides structural designers with a systematic approach to anticipate and solve issues for tall buildings and complex structures. This book begins with a clear and rigorous exposition of theories behind designing tall buildings. After this is an explanation of basic issues encountered in the design process. This is followed by chapters concerning the design and analysis of tall building with different lateral stability systems, such as MRF, shear wall, core, outrigger, bracing, tube system, diagrid system and mega frame. The final three chapters explain the design principles and

analysis methods for complex and special structures. With this book, researchers and designers will find a valuable reference on topics such as tall building systems, structure with complex geometry, Tensegrity structures, membrane structures and offshore structures. Numerous worked-through examples of existing prestigious projects around the world (such as Jeddah Tower, Shanghai Tower, and Petronas Tower etc.) are provided to assist the reader's understanding of the topics. • Provides the latest modelling methods in design such as BIM and Parametric Modelling technique. • Detailed explanations of widely used programs in current design practice, such as SAP2000, ETABS, ANSYS, and Rhino. • Modelling case studies for all types of tall buildings and complex structures, such as: Buttressed Core system, diagrid system, Tube system, Tensile structures and offshore structures etc.

Development of Free Flange Moment Connection Jaehyung Choi 2000

Modeling in Geotechnical Engineering Pijush Samui 2020-12-01 Modeling in Geotechnical Engineering is a one stop reference for a range of computational models, the theory explaining how they work, and case studies describing how to apply them. Drawing on the expertise of contributors from a range of disciplines including geomechanics, optimization, and computational engineering, this book provides an interdisciplinary guide to this subject which is suitable for readers from a range of backgrounds. Before tackling the computational approaches, a theoretical understanding of the physical systems is provided that helps readers to fully grasp the significance of the numerical methods. The various models are presented in detail, and advice is provided on how to select the correct model for your application. Provides detailed descriptions of different computational modelling methods for geotechnical applications, including the finite element method, the finite difference method, and the boundary element method Gives readers the latest advice on the use of big data analytics and artificial intelligence in geotechnical engineering Includes case studies to help readers apply the methods described in their own work

Isogeometric Analysis and Applications 2014 Bert Jüttler 2015-12-21 Isogeometric Analysis is a groundbreaking computational approach that promises the possibility of integrating the finite element method into conventional spline-based CAD design tools. It thus bridges the gap between numerical analysis and geometry, and moreover it allows to tackle new cutting edge applications at the frontiers of

research in science and engineering. This proceedings volume contains a selection of outstanding research papers presented at the second International Workshop on Isogeometric Analysis and Applications, held at Annweiler, Germany, in April 2014.

Recent Trends in Civil Engineering K. K. Pathak 2020-09-27 This book presents the selected peer-reviewed proceedings of the International Conference on Recent Trends and Innovations in Civil Engineering (ICRTICE 2019). The volume focuses on latest research and advances in the field of civil engineering and materials science such as design and development of new environmental materials, performance testing and verification of smart materials, performance analysis and simulation of steel structures, design and performance optimization of concrete structures, and building materials analysis. The book also covers studies in geotechnical engineering, hydraulic engineering, road and bridge engineering, building services design, engineering management, water resource engineering and renewable energy. The contents of this book will be useful for students, researchers and professionals working in civil engineering.

Atlas of Stress-strain Curves ASM International 2002-01-01 Contains more than 1400 curves, almost three times as many as in the 1987 edition. The curves are normalized in appearance to aid making comparisons among materials. All diagrams include metric units, and many also include U.S. customary units

Computational Mechanics '95 S.N. Atluri 2013-11-11 All, in the earlier conferences (Tokyo, 1986; Atlanta, 1988, Melbourne, 1991; and Hong Kong, 1992) the response to the call for presentations at ICES-95 in Hawaii has been overwhelming. A very careful screening of the extended abstracts resulted in about 500 paper being accepted for presentation. Out of these, written versions of about 480 papers reached the conference secretariat in Atlanta in time for inclusion in these proceedings. The topics covered at ICES-95 range over the broadest spectrum of computational engineering science. The editors thank the international scientific committee, for their advice and encouragement in making ICES-95 a successful scientific event. Special thanks are expressed to the International Association for Boundary Elements Methods for hosting IABEM-95 in conjunction with ICES-95. The editors here express their deepest

gratitude to Ms. Stacy Morgan for her careful handling of a myriad of details of ICES-95, often times under severe time constraints. The editors hope that the readers of this proceedings will find a kaleidoscopic view of computational engineering in the year 1995, as practiced in various parts of the world. Satya N. Atluri Atlanta, Georgia, USA Genki Yagawa Tokyo, Japan Thomas A. Cruse Nashville, TN, USA
Organizing Committee Professor Genki Yagawa, University of Tokyo, Japan, Chair Professor Satya Atluri, Georgia Institute of Technology, U.S.A.

Guide to Design Criteria for Bolted and Riveted Joints Geoffrey L. Kulak 1987-04-14 This updated version of the first edition examines the strength and deformation behaviour of riveted and bolted structural connectors and the joints in which they are used.

Proceedings of the 13th International Scientific Conference Eugeniusz Rusiński 2017-03-27 These proceedings of the 13th International Conference on Computer Aided Engineering present selected papers from the event, which was held in Polanica Zdrój, Poland, from June 22 to 25, 2016. The contributions are organized according to thematic sections on the design and manufacture of machines and technical systems; durability prediction; repairs and retrofitting of power equipment; strength and thermodynamic analyses for power equipment; design and calculation of various types of load-carrying structures; numerical methods for dimensioning materials handling; and long-distance transport equipment. The conference and its proceedings offer a major interdisciplinary forum for researchers and engineers to present the most innovative studies and advances in this dynamic field.

Practical Finite Element Analysis Nitin S. Gokhale 2008 Highlights of the book: Discussion about all the fields of Computer Aided Engineering, Finite Element Analysis Sharing of worldwide experience by more than 10 working professionals Emphasis on Practical usage and minimum mathematics Simple language, more than 1000 colour images International quality printing on specially imported paper Why this book has been written ... FEA is gaining popularity day by day & is a sought after dream career for mechanical engineers. Enthusiastic engineers and managers who want to refresh or update the knowledge on FEA are encountered with volume of published books. Often professionals realize that they are not in touch with theoretical concepts as being pre-requisite and find it too mathematical and Hi-Fi. Many a times these

books just end up being decoration in their book shelves ... All the authors of this book are from IIT Bombay & IISc and after joining the industry realized gap between university education and the practical FEA. Over the years they learned it via interaction with experts from international community, sharing experience with each other and hard route of trial & error method. The basic aim of this book is to share the knowledge & practices used in the industry with experienced and in particular beginners so as to reduce the learning curve & avoid reinvention of the cycle. Emphasis is on simple language, practical usage, minimum mathematics & no pre-requisites. All basic concepts of engineering are included as & where it is required. It is hoped that this book would be helpful to beginners, experienced users, managers, group leaders and as additional reading material for university courses.

Special Topics in Structural Dynamics, Volume 5 Nikolaos Dervilis 2018-05-30 Special Topics in Structural Dynamics, Volume 5: Proceedings of the 36th IMAC, A Conference and Exposition on Structural Dynamics, 2018, the fifth volume of nine from the Conference brings together contributions to this important area of research and engineering. The collection presents early findings and case studies on fundamental and applied aspects of Structural Dynamics, including papers on: Experimental Methods Analytical Methods General Dynamics & Modal Analysis General Dynamics & System Identification Damage Detection

Research and Applications in Structural Engineering, Mechanics and Computation Alphonse Zingoni 2013-08-15 Research and Applications in Structural Engineering, Mechanics and Computation contains the Proceedings of the Fifth International Conference on Structural Engineering, Mechanics and Computation (SEMC 2013, Cape Town, South Africa, 2-4 September 2013). Over 420 papers are featured. Many topics are covered, but the contributions may be seen to fall

An Introduction to the Design and Behavior of Bolted Joints, Revised and Expanded John Bickford 2018-05-11 Offering a broad-based review of the factors affecting the design, assembly and behaviour of bolted joints and their components in all industries, this work details various assembly options as well as specific failure modes and strategies for their avoidance. This edition features material on: the contact stresses between bolt head or nut face and the joint; thread forms, series and classes; the stiffness of

raised face flange joints; and more.

Recent Advances in Structural Engineering, Volume 1 A. Rama Mohan Rao 2018-08-01 This book is a collection of select papers presented at the Tenth Structural Engineering Convention 2016 (SEC-2016). It comprises plenary, invited, and contributory papers covering numerous applications from a wide spectrum of areas related to structural engineering. It presents contributions by academics, researchers, and practicing structural engineers addressing analysis and design of concrete and steel structures, computational structural mechanics, new building materials for sustainable construction, mitigation of structures against natural hazards, structural health monitoring, wind and earthquake engineering, vibration control and smart structures, condition assessment and performance evaluation, repair, rehabilitation and retrofit of structures. Also covering advances in construction techniques/ practices, behavior of structures under blast/impact loading, fatigue and fracture, composite materials and structures, and structures for non-conventional energy (wind and solar), it will serve as a valuable resource for researchers, students and practicing engineers alike.

North American Specification for the Design of Cold-formed Steel Structural Members 2007

Dowel Bearing Strength Thomas Lee Wilkinson 1991

ANSYS Mechanical APDL for Finite Element Analysis Mary Kathryn Thompson 2017-07-28 ANSYS Mechanical APDL for Finite Element Analysis provides a hands-on introduction to engineering analysis using one of the most powerful commercial general purposes finite element programs on the market. Students will find a practical and integrated approach that combines finite element theory with best practices for developing, verifying, validating and interpreting the results of finite element models, while engineering professionals will appreciate the deep insight presented on the program's structure and behavior. Additional topics covered include an introduction to commands, input files, batch processing, and other advanced features in ANSYS. The book is written in a lecture/lab style, and each topic is supported by examples, exercises and suggestions for additional readings in the program documentation. Exercises gradually increase in difficulty and complexity, helping readers quickly gain confidence to

independently use the program. This provides a solid foundation on which to build, preparing readers to become power users who can take advantage of everything the program has to offer. Includes the latest information on ANSYS Mechanical APDL for Finite Element Analysis Aims to prepare readers to create industry standard models with ANSYS in five days or less Provides self-study exercises that gradually build in complexity, helping the reader transition from novice to mastery of ANSYS References the ANSYS documentation throughout, focusing on developing overall competence with the software before tackling any specific application Prepares the reader to work with commands, input files and other advanced techniques

Advances in Thick Section Composite and Sandwich Structures Sung W. Lee 2020-01-28 This book describes recent research findings on response and integrity of thick section composite and sandwich structures. In particular, it deals with these structures for marine applications under static and dynamic loads such as shock and slamming loads in severe sea environment including sea water, temperature extremes, hydrostatic pressure and Arctic conditions. Three-dimensional constitutive equations and failure criteria for structural response and integrity are considered. The book serves as an excellent repository of major advances in research on response and integrity of composite and sandwich structures made through research grants sponsored by the U.S. Office of Naval Research in the past decade. Collects major advances in response and integrity research; Emphasizes phenomena within severe environments; Illustrates underwater fluid-structure interactions, shock/blast loads, and slamming loads.

Finite Element Modelling of Composite Materials and Structures F L Matthews 2000-10-27 Finite element modelling of composite materials and structures provides an introduction to a technique which is increasingly being used as an analytical tool for composite materials. The text is presented in four parts: Part one sets the scene and reviews the fundamentals of composite materials together with the basic nature of FRP and its constituents. Two-dimensional stress-strain is covered, as is laminated plated theory and its limitations. Part two reviews the basic principles of FE analysis, starting with underlying theoretical issues and going on to show how elements are derived, a model is generated and results are processed. Part three builds on the basics of FE analysis and considers the particular issues that arise in applying finite elements to composites, especially to the layered nature of the material. Part four deals with the

application of FE to FRP composites, presenting analytical models alongside FE representations. Specific issues addressed include interlaminar stresses, fracture delamination, joints and fatigue. This book is invaluable for students of materials science and engineering, and for engineers and others wishing to expand their knowledge of structural analysis. Covers important work on finite element analysis of composite material performance Based on material developed for an MSc course at Imperial College, London, UK Covers particular problems such as holes, free edges with FE results compared with experimental data and classical analysis

Interim Guidelines 1995

Dynamics of the Axially Moving Orthotropic Web Krzysztof Marynowski 2010-07-07 A material continuum moving axially at high speed can be met in numerous different technical applications. These comprise band saws, web papers during manufacturing, processing and printing processes, textile bands during manufacturing and processing, pipes transporting fluids, transmission belts as well as flat objects moving at high speeds in space. In all these so varied technical applications, the maximum transport speed or the transportation speed is aimed at in order to increase efficiency and optimize investment and performance costs of sometimes very expensive and complex machines and installations. The dynamic behavior of axially moving systems very often hinders from reaching these aims. The book is devoted to dynamics of axially moving material objects of low flexural stiffness that are referred to as webs. Webs are moving at high speed, for example, in paper production the paper webs are transported with longitudinal speeds of up to 3000 m/min. Above the critical speed one can expect various dynamical instabilities mainly of divergent and flutter type. The up-to-date state of investigations conducted in the field of the axially moving system dynamics is presented in the beginning of the book. Special attention is paid on nonlinear dynamic investigations of translating systems. In the next chapters various mathematical models that can be employed in dynamic investigations of such objects and the results of analysis of the dynamic behavior of the axially moving orthotropic material web are presented. To make tracing the dynamic considerations easier, a paper web is the main object of investigations in the book.