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Vorticity and Vortex Dynamics

Springer Science & Business Media *This book is a comprehensive and intensive monograph for scientists, engineers and applied mathematicians, as well as graduate students in fluid dynamics. It starts with a brief review of fundamentals of fluid dynamics, with an innovative emphasis on the intrinsic orthogonal decomposition of fluid dynamic process, by which one naturally identifies the content and scope of vorticity and vortex dynamics. This is followed by a detailed presentation of vorticity dynamics as the basis of later development. In vortex dynamics part the book deals with the formation, motion, interaction, stability, and breakdown of various vortices. Typical vortex structures are analyzed in laminar, transitional, and turbulent flows, including stratified and rotational fluids. Physical understanding of vertical flow phenomena and mechanisms is the first priority throughout the book. To make the book self-contained, some mathematical background is briefly presented in the main text, but major prerequisites are systematically given in appendices. Material usually not seen in books on vortex dynamics is included, such as geophysical vortex dynamics, aerodynamic vortical flow diagnostics and management.*

Vortical Flows

Springer *This book is a comprehensive and intensive book for graduate students in fluid dynamics as well as scientists, engineers and applied mathematicians. Offering a systematic introduction to the physical theory of vortical flows at graduate level, it considers the theory of vortical flows as a branch of fluid dynamics focusing on shearing process in fluid motion, measured by vorticity. It studies vortical flows according to their natural evolution stages,from being generated to dissipated. As preparation, the first three chapters of the book provide background knowledge for entering vortical flows. The rest of the book deals with vortices and vortical flows, following their natural evolution stages. Of various vortices the primary form is layer-like vortices or shear layers, and secondary but stronger form is axial vortices mainly formed by the rolling up of shear layers. Problems are given at the end of each chapter and Appendix, some for helping understanding the basic theories, and some involving specific applications; but the emphasis of both is always on physical thinking.*

The Theory of Quantum Torus Knots: Volume II

Lulu.com *A detailed mathematical derivation of space curves is presented that links the diverse fields of superfluids, quantum mechanics, Navier-Stokes hydrodynamics, and Maxwell electromagnetism by a common foundation. The basic mathematical building block is called the theory of quantum torus knots (QTK).*

13th Chaotic Modeling and Simulation International Conference

Springer Nature *Gathering the proceedings of the 13th CHAOS2020 International Conference, this book highlights recent developments in nonlinear, dynamical and complex systems. The conference was intended to provide an essential forum for Scientists and Engineers to exchange ideas, methods, and techniques in the field of Nonlinear Dynamics, Chaos, Fractals and their applications in General Science and the Engineering Sciences. The respective chapters address key methods, empirical data and computer techniques, as well as major theoretical advances in the applied nonlinear field. Beyond showcasing the state of the art, the book will help academic and industrial researchers alike apply chaotic theory in their studies.*

The Theory of Quantum Torus Knots - Volume III

Lulu.com *Appendicies A to I that are referenced by Volumes I and II in the theory of quantum torus knots (QTK). A detailed mathematical derivation of space curves is provided that links the diverse fields of superfluids, quantum mechanics, and hydrodynamics.*

AIAA Journal

Advances in Hydroinformatics

SimHydro 2017 - Choosing The Right Model in Applied Hydraulics

Springer *This book gathers a collection of extended papers based on presentations given during the SimHydro 2017 conference, held in Sophia Antipolis, Nice, France on June 14–16, 2017. It focuses on how to choose the right model in applied hydraulics and considers various aspects, including the modeling and simulation of fast hydraulic transients, 3D modeling, uncertainties and multiphase flows. The book explores both limitations and performance of current models and presents the latest developments in new numerical schemes, high-performance computing, multiphysics and multiscale methods, and better interaction with field or scale model data. It gathers the lastest theoretical and innovative developments in the modeling field and presents some of the most advance applications on various water related topics like uncertainties, flood simulation and complex hydraulic applications. Given its breadth of coverage, it addresses the needs and interests of practitioners, stakeholders, researchers and engineers alike.*

Fluid Machinery and Fluid Mechanics

4th International Symposium (4th ISFMFE)

Springer Science & Business Media *"Fluid Machinery and Fluid Mechanics: 4th International Symposium (4th ISFMFE)" is the proceedings of 4th International Symposium on Fluid Machinery and Fluid Engineering, held in Beijing November 24-27, 2008. It contains 69 highly informative technical papers presented at the Mei Lecture session and the technical sessions of the symposium. The Chinese Society of Engineering Thermophysics (CSET) organized the First, the Second and the Third International Symposium on Fluid Machinery and Fluid Engineering (1996, 2000 and 2004). The purpose of the 4th Symposium is to provide a common forum for exchange of scientific and technical information worldwide on fluid machinery and fluid engineering for scientists and engineers. The main subject of this symposium is "Fluid Machinery for Energy Conservation". The "Mei Lecture" reports on the most recent developments of fluid machinery in commemoration of the late professor Mei Zuyan. The book is intended for researchers and engineers in fluid machinery and fluid engineering. Jianzhong Xu is a professor at the Chinese Society of Engineering Thermophysics, Chinese Academy of Sciences, Beijing.*

Shock Wave-Boundary-Layer Interactions

Cambridge University Press *Shock wave-boundary-layer interaction (SBLI) is a fundamental phenomenon in gas dynamics that is observed in many practical situations, ranging from transonic aircraft wings to hypersonic vehicles and engines. SBLIs have the potential to pose serious problems in a flowfield; hence they often prove to be a critical - or even design limiting - issue for many aerospace applications. This is the first book devoted solely to a comprehensive, state-of-the-art explanation of this phenomenon. It includes a description of the basic fluid mechanics of SBLIs plus contributions from leading international experts who share their insight into their physics and the impact they have in practical flow situations. This book is for practitioners and graduate students in aerodynamics who wish to familiarize themselves with all aspects of SBLI flows. It is a valuable resource for specialists because it compiles experimental, computational and theoretical knowledge in one place.*

Vortex Dynamics

Cambridge University Press *Vortex dynamics is a natural paradigm for the field of chaotic motion and modern dynamical system theory. However, this volume focuses on those aspects of fluid motion that are primarily controlled by the vorticity and are such that the effects of the other fluid properties are secondary.*

Computational and Experimental Simulations in Engineering

Proceedings of ICCES2019

Springer Nature *This book gathers the latest advances, innovations, and applications in the field of computational engineering, as presented by leading international researchers and engineers at the 24th International Conference on Computational & Experimental Engineering and Sciences (ICCES), held in Tokyo, Japan on March 25-28, 2019. ICCES covers all aspects of applied sciences and engineering: theoretical, analytical, computational, and experimental studies and solutions of problems in the physical, chemical, biological, mechanical, electrical, and mathematical sciences. As such, the book discusses highly diverse topics, including composites; bioengineering & biomechanics; geotechnical engineering; offshore & arctic engineering; multi-scale & multi-physics fluid engineering; structural integrity & longevity; materials design & simulation; and computer modeling methods in engineering. The contributions, which were selected by means of a rigorous international peer-review process, highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaborations.*

Vibration of Hydraulic Machinery

Springer Science & Business Media *Vibration of Hydraulic Machinery deals with the vibration problem which has significant influence on the safety and reliable operation of hydraulic machinery. It provides new achievements and the latest developments in these areas, even in the basic areas of this subject. The present book covers the fundamentals of mechanical vibration and*

rotordynamics as well as their main numerical models and analysis methods for the vibration prediction. The mechanical and hydraulic excitations to the vibration are analyzed, and the pressure fluctuations induced by the unsteady turbulent flow is predicted in order to obtain the unsteady loads. This book also discusses the loads, constraint conditions and the elastic and damping characters of the mechanical system, the structure dynamic analysis, the rotor dynamic analysis and the system instability of hydraulic machines, including the illustration of monitoring system for the instability and the vibration in hydraulic units. All the problems are necessary for vibration prediction of hydraulic machinery.

A Note on Kinetic Energy, Dissipation and Enstrophy

Physical and Mathematical Fluid Mechanics

Mdpi AG *Fluid mechanics has emerged as a basic concept for nearly every field of technology. Despite a well-developed mathematical theory and available commercial software codes, the computation of solutions of the governing equations of motion is still challenging, especially due to the nonlinearity involved, and there are still open questions regarding the underlying physics of fluid flow, especially with respect to the continuum hypothesis and thermodynamic local equilibrium. The aim of this book is to reference recent advances in the field of fluid mechanics, both in terms of developing sophisticated mathematical methods for finding solutions to the equations of motion, on the one hand, and presenting novel approaches to the physical modeling, on the other hand. A wide range of topics is addressed, including general topics like formulations of the equations of motion in terms of conventional and potential fields; variational formulations, both deterministic and statistic, and their application to channel flows; vortex dynamics; flows through porous media; and also acoustic waves through porous media*

Fluid Dynamics of High Angle of Attack

IUTAM Symposium Tokyo, Japan, September 13-17, 1992

Springer Verlag

Phase Transition Dynamics

Springer Science & Business Media *This book is an introduction to a comprehensive and unified dynamic transition theory for dissipative systems and to applications of the theory to a range of problems in the nonlinear sciences. The main objectives of this book are to introduce a general principle of dynamic transitions for dissipative systems, to establish a systematic dynamic transition theory, and to explore the physical implications of applications of the theory to a range of problems in the nonlinear sciences. The basic philosophy of the theory is to search for a complete set of transition states, and the general principle states that dynamic transitions of all dissipative systems can be classified into three categories: continuous, catastrophic and random. The audience for this book includes advanced graduate students and researchers in mathematics and physics as well as in other related fields.*

Advances in Computer Science for Engineering and Education III

Springer *This book comprises high-quality refereed research papers presented at the Third International Conference on Computer Science, Engineering and Education Applications (ICCSEEA2020), held in Kyiv, Ukraine, on 21–22 January 2020, organized jointly by National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", National Aviation University, and the International Research Association of Modern Education and Computer Science. The topics discussed in the book include state-of-the-art papers in computer science, artificial intelligence, engineering techniques, genetic coding systems, deep learning with its medical applications, and knowledge representation with its applications in education. It is an excellent source of references for researchers, graduate students, engineers, management practitioners, and undergraduate students interested in computer science and their applications in engineering and education.*

Symmetry in Mechanical Engineering

MDPI *Recent advancements in mechanical engineering are an essential topic for discussion. The topics relating to mechanical engineering include the following: measurements of signals of shafts, springs, belts, bearings, gears, rotors, machine elements, vibration analysis, acoustic analysis, fault diagnosis, construction, analysis of machine operation, analysis of smart-material systems,*

integrated systems, stresses, analysis of deformations, analysis of mechanical properties, signal processing of mechanical systems, and rotor dynamics. Mechanical engineering deals with solid and fluid mechanics, rotation, movements, materials, and thermodynamics. This book, with 15 published articles, presents the topic "Symmetry in Mechanical Engineering". The presented topic is interesting. It is categorized into eight different sections: Deformation; Stresses; Mechanical properties; Tribology; Thermodynamic; Measurement; Fault diagnosis; Machine. The development of techniques and methods related to mechanical engineering is growing every month. The described articles have made a contribution to mechanical engineering. The proposed research can find applications in factories, oil refineries, and mines. It is essential to develop new improved methods, techniques, and devices related to mechanical engineering.

Mechanics for a New Millennium

Proceedings of the 20th International Congress on Theoretical and Applied Mechanics, held in Chicago, USA, 27 August – 2 September 2000

Springer Science & Business Media *This volume contains the proceedings of the 2000 International Congress of Theoretical and Applied Mechanics. The book captures a snapshot view of the state of the art in the field of mechanics and will be invaluable to engineers and scientists from a variety of disciplines.*

Laminar Flow Theory

Princeton University Press *Fluid mechanics is one of the greatest accomplishments of classical physics. The Navier-Stokes equations, first derived in the eighteenth century, serve as an accurate mathematical model with which to describe the flow of a broad class of real fluids. Not only is the subject of interest to mathematicians and physicists, but it is also indispensable to mechanical, aeronautical, and chemical engineers, who have to apply the equations to real-world examples, such as the flow of air around an aircraft wing or the motion of liquid droplets in a suspension. In this book, which first appeared in a comprehensive collection of*

essays entitled The Theory of Laminar Flows (Princeton, 1964), P. A. Lagerstrom imparts the essential theoretical framework of laminar flows to the reader. A concise and elegant description, Lagerstrom's work remains a model piece of writing and has much to offer today's reader seeking an introduction to the flow of nonturbulent fluids. Beginning with the conservation laws that result in the equation of continuity, the Navier-Stokes equation, and the energy transport equation, Lagerstrom moves on to consider viscous waves, low Reynolds-number approximations such as Stokes flow and the Oseen equations, and then high Reynolds-number approximations that are used to describe boundary layers, jets, and wakes. Finally, he examines some compressibility effects, such as those that occur in the laminar boundary layer around a flat plate, both with and without a pressure gradient.

28th International Symposium on Shock Waves Vol 2

Springer Science & Business Media *The University of Manchester hosted the 28th International Symposium on Shock Waves between 17 and 22 July 2011. The International Symposium on Shock Waves first took place in 1957 in Boston and has since become an internationally acclaimed series of meetings for the wider Shock Wave Community. The ISSW28 focused on the following areas: Blast Waves, Chemically Reacting Flows, Dense Gases and Rarefied Flows, Detonation and Combustion, Diagnostics, Facilities, Flow Visualisation, Hypersonic Flow, Ignition, Impact and Compaction, Multiphase Flow, Nozzle Flow, Numerical Methods, Propulsion, Richtmyer-Meshkov, Shockwave Boundary Layer Interaction, Shock Propagation and Reflection, Shock Vortex Interaction, Shockwave Phenomena and Applications, as well as Medical and Biological Applications. The two Volumes contain the papers presented at the symposium and serve as a reference for the participants of the ISSW 28 and individuals interested in these fields.*

Theoretical and Experimental Sonochemistry Involving Inorganic Systems

Springer Science & Business Media *Despite the fact that chemical applications of ultrasound are now widely acknowledged, a detailed presentation of inorganic systems covering nano-particles, catalysis, aqueous chemistry of metallic solutions and their redox characteristics, both from a theoretical and experimental perspective has eluded researchers of this field. Theoretical and*

Experimental Sonochemistry Involving Inorganic Systems fills this gap and presents a concise and thorough review of this fascinating area of Sonochemistry in a single volume.

Advances in Water Resources & Hydraulic Engineering Proceedings of 16th IAHR-APD Congress and 3rd Symposium of IAHR-ISHS

Springer "*Advances in Water Resources and Hydraulic Engineering - Proceedings of 16th IAHR-APD Congress and 3rd Symposium of IAHR-ISHS" discusses some serious problems of sustainable development of human society related to water resources, disaster caused by flooding or draught, environment and ecology, and introduces latest research in river engineering and fluvial processes, estuarine and coastal hydraulics, hydraulic structures and hydropower hydraulics, etc. The proceedings covers new research achievements in the Asian-Pacific region in water resources, environmental ecology, river and coastal engineering, which are especially important for developing countries all over the world. This proceedings serves as a reference for researchers in the field of water resources, water quality, water pollution and water ecology. Changkuan Zhang and Hongwu Tang both are professors at Hohai University, China.*

Temporal Networks

Springer *The concept of temporal networks is an extension of complex networks as a modeling framework to include information on when interactions between nodes happen. Many studies of the last decade examine how the static network structure affect dynamic systems on the network. In this traditional approach the temporal aspects are pre-encoded in the dynamic system model. Temporal-network methods, on the other hand, lift the temporal information from the level of system dynamics to the mathematical representation of the contact network itself. This framework becomes particularly useful for cases where there is a lot of structure and heterogeneity both in the timings of interaction events and the network topology. The advantage compared to common static network approaches is the ability to design more accurate models in order to explain and predict large-scale dynamic phenomena (such as, e.g., epidemic outbreaks and other spreading phenomena). On the other hand, temporal network methods are mathematically and*

conceptually more challenging. This book is intended as a first introduction and state-of-the art overview of this rapidly emerging field.

The Art and Science of Sails

A Guide to Modern Materials, Construction, Aerodynamics, Upkeep, and Use

St Martins Press *Guide for both cruisers and racers that takes a look at the latest materials and rigging methods and simplifies the purchase and upkeep of a proper sail inventory.*

Metasurfaces: Physics and Applications

MDPI *This book is a printed edition of the Special Issue "Metasurfaces: Physics and Applications" that was published in Applied Sciences*

Dynamics and Control of Mechanical Systems in Offshore Engineering

Springer Science & Business Media *Dynamics and Control of Mechanical Systems in Offshore Engineering is a comprehensive treatment of marine mechanical systems (MMS) involved in processes of great importance such as oil drilling and mineral recovery. Ranging from nonlinear dynamic modeling and stability analysis of flexible riser systems, through advanced control design for an installation system with a single rigid payload attached by thrusters, to robust adaptive control for mooring systems, it is an authoritative reference on the dynamics and control of MMS. Readers will gain not only a complete picture of MMS at the system level, but also a better understanding of the technical considerations involved and solutions to problems that commonly arise from dealing with them. The text provides: · a complete framework of dynamical analysis and control design for marine mechanical systems; · new results on the dynamical analysis of riser, mooring and installation systems together with a general modeling method for a class of*

MMS; · a general method and strategy for realizing the control objectives of marine systems with guaranteed stability the effectiveness of which is illustrated by extensive numerical simulation; and · approximation-based control schemes using neural networks for installation of subsea structures with attached thrusters in the presence of time-varying environmental disturbances and parametric uncertainties. Most of the results presented are analytical with repeatable design algorithms with proven closed-loop stability and performance analysis of the proposed controllers is rigorous and detailed. Dynamics and Control of Mechanical Systems in Offshore Engineering is primarily intended for researchers and engineers in the system and control community, but graduate students studying control and marine engineering will also find it a useful resource as will practitioners working on the design, running or maintenance of offshore platforms.

Recent Progress in Computational and Applied PDES

Conference Proceedings for the International Conference Held in Zhangjiajie in July 2001

Springer Science & Business Media The book discusses some key scientific and technological developments in computational and applied partial differential equations. It covers many areas of scientific computing, including multigrid methods, image processing, finite element analysis and adaptive computations. It also covers software technology, algorithms and applications. Most papers are of research level, and are contributed by some well-known mathematicians and computer scientists. The book will be useful to engineers, computational scientists and graduate students.

Nanotechnology in Endodontics

Current and Potential Clinical Applications

Springer This book provides detailed information on the emerging applications of nanomaterials and nanoparticles within endodontics, highlighting the exciting potential clinical impact of nanotechnology in the field. The range of applications covered is

diverse, encompassing drug and gene delivery, tissue engineering, antibacterial strategies, dentin tissue stabilization, dentin pulp regeneration and use in restorative and endodontic materials. Important scientific background information relating to each application is provided, with clear coverage of basic principles. In addition, potential pitfalls are identified and explained. The cytotoxicity of nanomaterials and nanoparticles is also addressed in a separate chapter. The book will be of value both for endodontic practitioners and for all scientists and graduate students who are interested in the application of nanotechnology in endodontics.

Characterization of Porous Solids

Elsevier *The importance of porosity has long been recognized by scientists and engineers. Porous solids are widely encountered in industry and everyday life and their behaviour, e.g. chemical reactivity, adsorptive capacity, and catalytic activity is dependent on their pore structure. A considerable amount of work on porous solids has been undertaken both in academic and in industrial laboratories. However, all this activity is in urgent need of a critical appraisal. To undertake this task, a number of leading experts in the field of adsorption, porosimetry, X-ray and neutron scattering, optical and electron microscopy, calorimetry and fluid permeation, were brought together at the 1987 IUPAC (COPS I) Symposium. This proceedings volume provides an up-to-date overall review of the theoretical foundations for modelling and characterizing porous systems. It deals with most of the techniques in current use as applied to both model systems and porous solids of industrial importance. The reader will find the description and discussion of a number of novel techniques as well as a critical appraisal and comparison of the more established methods. All those concerned with the characterization of porous solids in academic and industrial laboratories will find much to interest them in this volume. It should be on the bookshelf of applied research centres involved in adsorption, catalysis, purification of gases and liquids, pigments, fillers, building materials, etc.*

Magnetic Nanostructures

Amer Scientific Pub *Twelve contributions comprise a reference source that is a coherent presentation of the state of the art in this fast growing area of nanotechnology research. Magnetic nanostructures are important for their phenomenal potential for storage; their great commercial value will come from applications in*

Parerga and Paralipomena

Short Philosophical Essays

Oxford University Press *These works won widespread attention on their publication in 1851, and helped secure lasting international fame for Schopenhauer. Their intellectual vigour, literary power and rich diversity are still striking today.*

Fundamental and Advanced Topics in Wind Power

BoD – Books on Demand *As the fastest growing source of energy in the world, wind has a very important role to play in the global energy mix. This text covers a spectrum of leading edge topics critical to the rapidly evolving wind power industry. The reader is introduced to the fundamentals of wind energy aerodynamics; then essential structural, mechanical, and electrical subjects are discussed. The book is composed of three sections that include the Aerodynamics and Environmental Loading of Wind Turbines, Structural and Electromechanical Elements of Wind Power Conversion, and Wind Turbine Control and System Integration. In addition to the fundamental rudiments illustrated, the reader will be exposed to specialized applied and advanced topics including magnetic suspension bearing systems, structural health monitoring, and the optimized integration of wind power into micro and smart grids.*

Viscous Fluid Flow

Designed for higher level courses in viscous fluid flow, this text presents a comprehensive treatment of the subject. This revision retains the approach and organization for which the first edition has been highly regarded, while bringing the material completely up-to-date. It contains new information on the latest technological advances and includes many more applications, thoroughly updated problems and exercises.

Coastal Acoustic Tomography

Elsevier *Coastal Acoustic Tomography begins with the specifics required for designing a Coastal Acoustic Tomography (CAT) experiment and operating the CAT system in coastal seas. Following sections discuss the procedure for data analyses and various*

application examples of CAT to coastal/shallow seas (obtained in various locations). These sections are broken down into four kinds of methods: horizontal-slice inversion, vertical-slice inversion, modal expansion method and data assimilation. This book emphasizes how dynamic phenomena occurring in coastal/shallow seas can be analyzed using the standard method of inversion and data assimilation. The book is relevant for physical oceanographers, ocean environmentalists and ocean dynamists, focusing on the event being observed rather than the intrinsic details of observational processes. Application examples of successful dynamic phenomena measured by coastal acoustic tomography are also included. Provides the information needed for researchers and graduate students in physical oceanography, ocean-fluid dynamics and ocean environments to apply Ocean Acoustic Tomography (OAT) to their own fields Presents the benefits of using acoustic tomography, including less disturbance to aquatic environments vs. other monitoring methods Includes the assimilation of CAT data into a coastal sea circulation model, a powerful tool to predict coastal-sea environmental changes

Applied Analysis of the Navier-Stokes Equations

Cambridge University Press *This introductory physical and mathematical presentation of the Navier-Stokes equations focuses on unresolved questions of the regularity of solutions in three spatial dimensions, and the relation of these issues to the physical phenomenon of turbulent fluid motion.*

The Aerodynamics of Heavy Vehicles III

Trucks, Buses and Trains

Springer *This volume contains papers presented at the International conference "The Aerodynamics of Heavy Vehicles III: Trucks, Buses and Trains" held in Potsdam, Germany, September 12-17, 2010 by Engineering Conferences International (ECI). Leading scientists and engineers from industry, universities and research laboratories, including truck and high-speed train manufacturers and operators were brought together to discuss computer simulation and experimental techniques to be applied for the design of more efficient trucks, buses and high-speed trains in the future. This conference was the third in the series after Monterey-Pacific Groove in 2002 and Lake Tahoe in 2007.The presentations address different aspects of train aerodynamics (cross wind effects, underbody flow, tunnel aerodynamics and aeroacoustics, experimental techniques), truck aerodynamics (drag reduction, flow control, experimental*

and computational techniques) as well as computational fluid dynamics and bluff body, wake and jet flows.

Engineering Applications of Computational Fluid Dynamics

Springer *This volume presents the results of Computational Fluid Dynamics (CFD) analysis that can be used for conceptual studies of product design, detail product development, process troubleshooting. It demonstrates the benefit of CFD modeling as a cost saving, timely, safe and easy to scale-up methodology.*

Mechanics for a New Millennium

Springer Science & Business Media *Proceedings of the 20th International Congress on Theoretical and Applied Mechanics, held in Chicago, USA, 27 August-2 September 2000*

Understanding Aerodynamics

Arguing from the Real Physics

John Wiley & Sons *Much-needed, fresh approach that brings a greater insight intothe physical understanding of aerodynamics Based on the author's decades of industrial experiencewith Boeing, this book helps students and practicing engineers togain a greater physical understanding of aerodynamics. Relying onclear physical arguments and examples, Mclean provides amuch-needed, fresh approach to this sometimes contentious subjectwithout shying away from addressing "real" aerodynamic situationsas opposed to the oversimplified ones frequently used formathematical convenience. Motivated by the belief that engineeringpractice is enhanced in the long run by a robust understanding ofthe basics as well as real cause-and-effect relationships that liebehind the theory, he provides intuitive physical interpretationsand explanations, debunking commonly-held misconceptions andmisinterpretations, and building upon the contrasts provided bywrong explanations to strengthen understanding of the rightones. Provides a refreshing view of aerodynamics that is based on theauthor's decades of industrial experience yet is alwaystied to basic fundamentals. Provides intuitive*

physical interpretations and explanations,debunking commonly-held misconceptions and misinterpretations Offers new insights to some familiar topics, for example, whatthe Biot-Savart law really means and why it causes so muchconfusion, what "Reynolds number" and"incompressible flow" really mean, and a real physicalexplanation for how an airfoil produces lift. Addresses "real" aerodynamic situations as opposed to theoversimplified ones frequently used for mathematical convenience,and omits mathematical details whenever the physical understandingcan be conveyed without them.