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International Conference on Intelligent Computing and Applications Subhransu Sekhar Dash 2017-12-28 The book is a collection of best papers presented in International Conference on Intelligent Computing and Applications (ICICA 2016) organized by Department of Computer Engineering, D.Y. Patil College of Engineering, Pune, India during 20-22 December 2016. The book presents original work, information, techniques and applications in the field of computational intelligence, power and computing technology. This volume also talks about image language processing, computer vision and pattern recognition, machine learning, data mining and computational life sciences, management of data including Big Data and analytics, distributed and mobile systems including grid and cloud infrastructure.

Advances in Heat Transfer and Thermal Engineering Chuang Wen 2021-06-01 This book gathers selected papers from the 16th UK Heat Transfer Conference (UKHTC2019), which is organised every two years under the aegis of the UK National Heat Transfer Committee. It is the premier forum in the UK for the local and international heat transfer community to meet, disseminate ongoing work, and discuss the latest advances in the heat transfer field. Given the range of topics discussed, these proceedings offer a valuable asset for engineering researchers and postgraduate students alike.

Advanced Intelligent Systems for Sustainable Development (AI2SD'2019) Mostafa Ezziyyani 2020-01-03 This book summarizes the latest research on advanced intelligent systems in the fields of energy and electrical engineering, presented at the second edition of the International Conference on Advanced Intelligent Systems for Sustainable Development (AI2SD'2019), held in Marrakech from 8 to 11 July 2019, Morocco. This book is intended for researchers, professionals and anyone interested in the development of advanced intelligent systems in the electrical engineering sector. The solutions featured focus on three main areas: motion control in complex electromechanical systems, including sensorless control; fault diagnosis and fault-tolerant control of electric drives; and new control algorithms for power electronics converters. In addition, the book includes a range of research using new technologies and advanced approaches. Offering a platform for researchers in the field of energy to share their work related to the problem of management and optimization of energy, which is a major current concern, the book mainly focuses on areas that go hand in hand with the Industrial Revolution 4.0, such as solar energy computing systems, smart grids, hydroelectric power computing systems, thermal and recycling computing systems, eco-design intelligent computing systems,

renewable energy for IT equipment, modeling green technology, and renewable energy systems in smart cities. The authors of each chapter report the state of the art in the topics addressed and the results of their own research, laboratory experiments, and successful applications in order to share the concept of advanced intelligent systems and appropriate tools and techniques for modeling, storage management, as well as decision support in the field of electrical engineering. Further, the book discusses a number of future trends and the potential for linking control theory, power electronics, artificial neural networks, embedded controllers and signal processing.

Theoretical, Computational, and Experimental Solutions to Thermo-Fluid Systems Muthukumar Palanisamy 2021-03-09 This book presents select proceedings of the International Conference on Innovations in Thermo-Fluid Engineering and Sciences (ICITFES 2020). It covers topics in theoretical and experimental fluid dynamics, numerical methods in heat transfer and fluid mechanics, different modes of heat transfer, multiphase flow, fluid machinery, fluid power, refrigeration and air conditioning, and cryogenics. The book will be helpful to the researchers, scientists, and professionals working in the field of fluid mechanics and machinery, and thermal engineering.

International Advanced Researches & Engineering Congress 2017 Proceeding Book Recep HALICIOGLU 2017-12-29 INTERNATIONAL WORKSHOPS (at IAREC'17) (This book inclueds English (main) and Turkish languages) International Workshop on Mechanical Engineering International Workshop on Mechatronics Engineering International Workshop on Energy Systems Engineering International Workshop on Automotive Engineering and Aerospace Engineering International Workshop on Material Engineering International Workshop on Manufacturing Engineering International Workshop on Physics Engineering International Workshop on Electrical and Electronics Engineering International Workshop on Computer Engineering and Software Engineering International Workshop on Chemical Engineering International Workshop on Textile Engineering International Workshop on Architecture International Workshop on Civil Engineering International Workshop on Geomatics Engineering International Workshop on Industrial Engineering International Workshop on Food Engineering International Workshop on Aquaculture Engineering International Workshop on Agriculture Engineering International Workshop on Mathematics Engineering International Workshop on Bioengineering Engineering International Workshop on Biomedical Engineering International Workshop on Genetic Engineering International Workshop on Environmental Engineering International Workshop on Other Engineering Science

Advances in Design, Simulation and Manufacturing II Vitalii Ivanov 2019-06-06 This book reports on topics at the interface between manufacturing, mechanical and chemical engineering. It gives special emphasis to CAD/CAE systems, information management systems, advanced numerical simulation methods and computational modeling techniques, and their use in product design, industrial process optimization and in the study of the properties of solids, structures, and fluids. Control theory, ICT for engineering education as well as ecological design, and food technologies are also among the topics discussed in the book. Based on the 2nd International Conference on Design, Simulation, Manufacturing: The Innovation Exchange (DSMIE-2019), held on June 11-14, 2019, in Lutsk, Ukraine, the book provides academics and professionals with a timely overview and extensive information on trends and technologies behind current and future developments of Industry 4.0, innovative design and renewable energy generation.

Analysis and Design of Marine Structures Carlos Guedes Soares 2009-03-06 'Analysis and Design of Marine Structures' explores recent developments in methods and modelling procedures for structural assessment of marine structures: – Methods and tools for establishing loads and load effects; – Methods and tools for strength assessment; – Materials and fabrication of structures; – Methods and tools for structural design and optimisation; – Structural reliability, safety and environment protection. The book is a valuable reference source for academics, engineers and professionals involved in marine structures and design of ship and offshore structures.

Gas Flows in Microsystems Lucien Baldas 2019-10-28 The last two decades have witnessed a rapid development of microelectromechanical systems (MEMS) involving gas microflows in various technical fields. Gas microflows can, for example, be observed in microheat exchangers designed for chemical applications or for cooling of electronic components, in fluidic microactuators developed for active flow control purposes, in micronozzles used for the micropropulsion of nano and picosats, in microgas chromatographs, analyzers or separators, in vacuum generators and in Knudsen micropumps, as well as in some organs-on-a-chip, such as artificial lungs. These flows are rarefied due to the small MEMS dimensions, and the rarefaction can be increased by low-pressure conditions. The flows relate to the slip flow, transition or free molecular regimes and can involve monatomic or polyatomic gases and gas mixtures. Hydrodynamics and heat and mass transfer are strongly impacted by rarefaction effects, and temperature-driven microflows offer new opportunities for designing original MEMS for gas pumping or separation. Accordingly, this Special Issue seeks to showcase research papers, short communications, and review articles that focus on novel theoretical and numerical models or data, as well as on new experimental results and technics, for improving knowledge on heat and mass transfer in gas microflows. Papers dealing with the development of original gas MEMS are also welcome.

Proceedings of the International Conference on Modern Research in Aerospace Engineering Sanjay Singh 2018-02-09 This book includes high-quality research papers presenting the latest advances in aerospace and related engineering fields. The papers are organized according to six broad areas (i) Aerospace Propulsion, (ii) Space Research, Avionics and Instrumentation, (iii) Aerodynamics Wind Tunnel and Computational fluid dynamics (CFD), (iv) Structural Analysis and Finite Element Method (FEM), (v) Materials, Manufacturing and Air Safety and (vi) Aircraft Environmental and Control System and Stability, making it easy for readers to find the information they require. Offering insights into the state of the art in aerospace engineering, the original research presented is valuable to academics, researchers, undergraduate and postgraduate students as well as professionals in industry and R&D. The clearly written book can be used for the validation of data, and the development of experimental and simulation techniques as well as other mathematical approaches.

Fluid Mechanics and Fluid Power – Contemporary Research Arun K. Saha 2016-09-20 This volume comprises the proceedings of the 42nd National and 5th International Conference on Fluid Mechanics and Fluid Power held at IIT Kanpur in December, 2014.The conference proceedings encapsulate the best deliberations held during the conference. The diversity of participation in the conference, from academia, industry and research laboratories reflects in the articles appearing in the volume. This contributed volume has articles from authors who have participated in the conference on thematic areas such as Fundamental

Issues and Perspectives in Fluid Mechanics; Measurement Techniques and Instrumentation; Computational Fluid Dynamics; Instability, Transition and Turbulence; Turbomachinery; Multiphase Flows; Fluid-Structure Interaction and Flow-Induced Noise; Microfluidics; Bio-inspired Fluid Mechanics; Internal Combustion Engines and Gas Turbines; and Specialized Topics. The contents of this volume will prove useful to researchers from industry and academia alike.

A Ventilation Strategy Based on Confluent Jets Setareh Janbakhsh 2015-04-27 This study presents air distribution systems that are based on confluent jets; this system can be of interest for the establishment of indoor environments, to fulfill the goals of indoor climate and energy-efficient usage. The main objective of this study is to provide deeper understanding of the flow field development of a supply device that is designed based on wall confluent jets and to investigate the ventilation performance by experimental and numerical methods. In this study, the supply device can be described as an array of round jets on a flat surface attached to a side wall. Multiple round jets that issue from supply device apertures are combined at a certain distance downstream from the device and behave as a united jet or so-called confluent jets. Multiple round jets that are generated from the supply device move downward and are attached to the wall at the primary region, due to the Coanda effect, and then they become wall confluent jets until the floor wall is reached. A wall jet in a secondary region is formed along the floor after the stagnation region. The characteristics of the flow field and the ventilation performance of conventional wall confluent jets and modified wall confluent jets supply devices are investigated experimentally in an office test room. The study of the modified wall confluent jets is intended to improve the efficiency of the conventional one while maintaining acceptable thermal comfort in an office environment. The results show that the modified wall confluent jets supply device can provide acceptable thermal comfort for the occupant with lower airflow rate compared to the conventional wall confluent jets supply device. Numerical predictions using three turbulence models (renormalization group (RNG $k-?$), realizable (Re $k-?$), and shear stress transport (SST $k-?$) are evaluated by measurement results. The computational box and nozzle plate models are used to model the inlet boundary conditions of the nozzle device. In the isothermal study, the wall confluent jets in the primary region and the wall jet in the secondary region, when predicted by the three turbulence models, are in good agreement with the measurements. The non-isothermal validation studies show that the SST $k-?$ model is slightly better at predicting the wall confluent jets than the other two models. The SST $k-?$ model is used to investigate the effects of the nozzle diameter, number of nozzles, nozzle array configuration, and inlet discharge height on the ventilation performance of the proposed wall confluent jets supply device. The nozzle diameter and number of nozzles play important roles in determining the airflow pattern, temperature field, and draught distribution. Increased temperature stratification and less draught distribution are achieved by increasing the nozzle diameter and number of nozzles. The supply device with smaller nozzle diameters and fewer nozzles yields rather uniform temperature distribution due to the dominant effect of mixing. The flow behavior is nearly independent of the inlet discharge height for the studied range. The proposed wall confluent jets supply device is compared with a mixing supply device, impinging supply device and displacement supply device. The results show that the proposed wall confluent jets supply device has the combined behavior of both mixing and stratification principles. The proposed wall confluent jets supply device provides better overall ventilation performance than the mixing and displacement supply devices used in this study. This study covers also another application of confluent jets that

is based on impinging technology. The supply device under consideration has an array of round jets on a curve. Multiple jets issue from the supply device aperture, in which the supply device is positioned vertically and the jets are directed against a target wall. The flow behavior and ventilation performance of the impinging confluent jets supply device is studied experimentally in an industrial premise. The results show that the impinging confluent jets supply device maintains acceptable thermal comfort in the occupied zone by creating well-distributed airflow during cold and hot seasons.

Topical Issues of Rational Use of Natural Resources Vladimir Litvinenko 2019-11-12 Topical Issues of Rational Use of Natural Resources 2019 Vol. 2 contains the contributions presented at the XV International Forum-Contest of Students and Young Researchers under the auspices of UNESCO (St. Petersburg Mining University, Russia, 13-17 May 2019). The Forum-Contest is a great opportunity for young researchers to present their work to the academics involved or interested the area of extraction and processing of natural resources. The topics of the book include: • Geotechnologies of resource extraction: current challenges and prospects • Cutting edge technologies of geological mapping, search and prospecting of mineral deposits • Digital and energy saving technologies in mineral resource complex • Breakthrough technologies of integrated processing of mineral hydrocarbon and technogenic raw materials with further production of new generation materials • The latest management and financing solutions for the development of mineral resources sector • Environment protection and sustainable nature management • New approaches to resolving hydrocarbon sector-specific issues Topical Issues of Rational Use of Natural Resources 2019 Vol. 2 collects the best reports presented at the Forum-Contest, and is of interest to academics and professionals involved in the extraction and processing of natural resources.

Sustainable Development and Innovations in Marine Technologies Petar Georgiev 2019-08-22 Sustainable Development and Innovations in Marine Technologies includes the papers presented at the 18th International Congress of the Maritime Association of the Mediterranean (IMAM 2019, Varna, Bulgaria, 9-11 September 2019). Sustainable Development and Innovations in Marine Technologies includes a wide range of topics: Aquaculture & Fishing; Construction; Defence & Security; Design; Dynamic response of structures; Degradation/ Defects in structures; Electrical equipment of ships; Human factors; Hydrodynamics; Legal/Social aspects; Logistics; Machinery & Control; Marine environmental protection; Materials; Navigation; Noise; Non-linear motions – manoeuvrability; Off-shore and coastal development; Off-shore renewable energy; Port operations; Prime movers; Propulsion; Safety at sea; Safety of Marine Systems; Sea waves; Seakeeping; Shaft & propellers; Ship resistance; Shipyards; Small & pleasure crafts; Stability; Static response of structures; Structures, and Wind loads. The IMAM series of Conferences started in 1978 when the first Congress was organised in Istanbul, Turkey. IMAM 2019 is the eighteenth edition, and in its nearly forty years of history, this biannual event has been organised throughout Europe. Sustainable Development and Innovations in Marine Technologies is essential reading for academics, engineers and all professionals involved in the area of sustainable and innovative marine technologies.

Proceedings of the 5th International Young Geotechnical Engineers' Conference IOS Press 2013-08-20 Geotechnical engineers are at work worldwide, contributing to sustainable living and to the creation of safe, economic and pleasant spaces to live, work and relax. With increased pressure on space and resources,

particularly in cities, their expertise becomes ever more important. This book presents the proceedings of the 5th iYGEC, International Young Geotechnical Engineers' Conference, held at Marne-la-Vallée, France, from 31 August to 1 September 2013. It is also the second volume in the series Advances in Soil Mechanics and Geotechnical Engineering. The papers included here cover topics such as laboratory and field testing, geology and groundwater, earthworks, soil behavior, constitutive modeling, ground improvement, earthquake, retaining structures, foundations, slope stability, tunnels and observational methods. The iYGEC conference series brings together students and young people at the start of their career in the geotechnical professions to share their experience, and this book will be of interest to all those whose work involves soil mechanics and geotechnical engineering. The cover shows Dieppe harbour breakwater project, Louis-Alexandre de Cessart, 1776-1777. © École Nationale des Ponts et Chaussées.

Advances in Manufacturing Processes, Intelligent Methods and Systems in Production Engineering Andre Batako

Turbulent Jets N. Rajaratnam 1976-01-01 Turbulent Jets

Light Metals 2012 Carlos Suarez 2016-12-23 An update of the definitive annual reference source in the field of aluminum production and related light metals technologies, a great mix of materials science and practical, applied technology surrounding aluminum, bauxite, aluminum reduction, rolling, casting, and production.

River Flow 2016 George Constantinescu 2016-06-22 Understanding and being able to predict fluvial processes is one of the biggest challenges for hydraulics and environmental engineers, hydrologists and other scientists interested in preserving and restoring the diverse functions of rivers. The interactions among flow, turbulence, vegetation, macroinvertebrates and other organisms, as well as the transport and retention of particulate matter, have important consequences on the ecological health of rivers. Managing rivers in an ecologically friendly way is a major component of sustainable engineering design, maintenance and restoration of ecological habitats. To address these challenges, a major focus of River Flow 2016 was to highlight the latest advances in experimental, computational and theoretical approaches that can be used to deepen our understanding and capacity to predict flow and the associated fluid-driven ecological processes, anthropogenic influences, sediment transport and morphodynamic processes. River Flow 2016 was organized under the auspices of the Committee for Fluvial Hydraulics of the International Association for Hydro-Environment Engineering and Research (IAHR). Since its first edition in 2002, the River Flow conference series has become the main international event focusing on river hydrodynamics, sediment transport, river engineering and restoration. Some of the highlights of the 8th International Conference on Fluvial Hydraulics were to focus on inter-disciplinary research involving, among others, ecological and biological aspects relevant to river flows and processes and to emphasize broader themes dealing with river sustainability. River Flow 2016 contains the contributions presented during the regular sessions covering the main conference themes and the special sessions focusing on specific hot topics of river flow research, and will be of interest to academics interested in hydraulics, hydrology and environmental engineering.

Recent Advances in Manufacturing, Automation, Design and Energy Technologies Sendhil Kumar Natarajan 2021-10-11 This book comprises the proceedings of the

1st International Conference on Future Technologies in Manufacturing, Automation, Design and Energy 2020. The contents of this volume focus on recent technological advances in the field of manufacturing, automation, design and energy. Some of the topics covered include additive manufacturing, renewable energy resources, design automation, process automation and monitoring, etc. This volume will prove a valuable resource for those in academia and industry.

Engineering Fluid Dynamics 2019-2020 Bjørn H. Hjertager 2021-02-25 This book contains the successful submissions to a Special Issue of Energies entitled "Engineering Fluid Dynamics 2019-2020". The topic of engineering fluid dynamics includes both experimental and computational studies. Of special interest were submissions from the fields of mechanical, chemical, marine, safety, and energy engineering. We welcomed original research articles and review articles. After one-and-a-half years, 59 papers were submitted and 31 were accepted for publication. The average processing time was about 41 days. The authors had the following geographical distribution: China (15); Korea (7); Japan (3); Norway (2); Sweden (2); Vietnam (2); Australia (1); Denmark (1); Germany (1); Mexico (1); Poland (1); Saudi Arabia (1); USA (1); Serbia (1). Papers covered a wide range of topics including analysis of free-surface waves, bridge girders, gear boxes, hills, radiation heat transfer, spillways, turbulent flames, pipe flow, open channels, jets, combustion chambers, welding, sprinkler, slug flow, turbines, thermoelectric power generation, airfoils, bed formation, fires in tunnels, shell-and-tube heat exchangers, and pumps.

A Preliminary Study of Acoustic Prediction Technology Based on Detached Eddy Simulations for Supersonic Jets Impinging on Flat Plates Yuvraj Dewan 2013 "An application of an existing industry tool to study supersonic jets impinging on flat plates is shown. This industry tool is the commercially available CFD package ANSYS FLUENT. The supersonic jet studied is perfectly expanded with a Mach number of 1.5, and it impinges on a flat surface 4 nozzle throat diameters from the jet exit. All turbulence modeling is done using a hybrid RANS/LES technique known as Delayed Detached Eddy Simulation (DDES). A transient solution is calculated using the pressure-based coupled solver formulation with the second-order bounded central-upwind spatial discretization and second-order implicit time marching scheme. Flow features like the stagnation bubble, wall jet and feedback mechanism were studied using countour plots. An examination was also done into the mean flow fields of the jet core. The acoustics of the case were studied using two different techniques, direct measurements and the use of a acoustics source surface method. Using limited computational power, reasonable agreement between simulation and experimental data was found for the flow-field and acoustics. Thus, it was demonstrated that ANSYS FLUENT can be used for this problem to provide good preliminary results in an industry setting with limited computational power"--Leaf vi.

Recent Advances in Fluid Dynamics Jyotirmay Banerjee 2022-09-24 This book presents select proceedings of the International Conference on Advances in Fluid Flow and Thermal Sciences (ICAFFTS 2021) and summarizes the modern research practices in fluid dynamics and fluid power. The content of the book involves advanced topics on turbulence, droplet deposition, oscillating flows, wave breaking, spray structure and its atomization and flow patterns in mini and micro channels. Technological concerns relevant to erosion of steam turbine blade due to droplets, influence of baffle cut and baffle pitch on flow regime, bubble formation and propagation in pool boiling, design optimization of flow regulating valves are included in the book. In addition, recent trends in small-scale hydropower plant and flow stability issues in nanofluids, solar

water heating systems and closed-loop pulsating heat pipes are discussed. Special topics on airflow pattern in railway coach and vortex tube are also included. This book will be a reliable reference for academicians, researchers and professionals working in the areas of fluid dynamics and fluid power.

Recent Advances in Applied Mechanics Tezeswi Tadepalli

Engineering Mathematics in Ship Design Cristiano Fragassa 2020-01-03 Engineering mathematics is a branch of applied mathematics where mathematical methods and techniques are implemented for solving problems related to the engineering and industry. It also represents a multidisciplinary approach where theoretical and practical aspects are deeply merged with the aim at obtaining optimized solutions. In line with that, the present Special Issue, 'Engineering Mathematics in Ship Design', is focused, in particular, with the use of this sort of engineering science in the design of ships and vessels. Articles are welcome when applied science or computation science in ship design represent the core of the discussion.

Transactions on Engineering Technologies Sio-Iong Ao 2020-01-08 This volume contains a selection of revised and extended research articles written by prominent researchers participating in The 26th World Congress on Engineering (WCE 2018) which was held in London, U.K., July 4-6, 2018. Topics covered include engineering mathematics, electrical engineering, communications systems, computer science, chemical engineering, systems engineering, manufacturing engineering, and industrial applications. With contributions carefully chosen to represent the most cutting-edge research presented during the conference, the book contains some of the state-of-the-art in engineering technologies and the physical sciences and their applications, and serves as a useful reference for researchers and graduate students working in these fields.

Droplets and Sprays Sergei Sazhin 2014-05-19 Providing a clear and systematic description of droplets and spray dynamic models, this book maximises reader insight into the underlying physics of the processes involved, outlines the development of new physical and mathematical models and broadens understanding of interactions between the complex physical processes which take place in sprays. Complementing approaches based on the direct application of computational fluid dynamics (CFD), Droplets and Sprays treats both theoretical and practical aspects of internal combustion engine process such as the direct injection of liquid fuel, subcritical heating and evaporation. Including case studies that illustrate the approaches relevance to automotive applications, it is also anticipated that the described models can find use in other areas such as in medicine and environmental science.

ANSYS Fluent Modelling of an Underexpanded Supersonic Sootblower Jet Impinging Into Recovery Boiler Tube Geometries Shahed Doroudi 2015

Modeling, Analysis, Design, and Tests for Electronics Packaging beyond Moore Hengyun Zhang 2019-11-22 Modeling, Analysis, Design and Testing for Electronics Packaging Beyond Moore provides an overview of electrical, thermal and thermomechanical modeling, analysis, design and testing for 2.5D/3D. The book addresses important topics, including electrically and thermally induced issues, such as EMI and thermal issues, which are crucial to package signal and thermal integrity. It also covers modeling methods to address thermomechanical stress related to the package structural integrity. In addition, practical design and test techniques for packages and systems are included. Includes

advanced modeling and analysis methods and techniques for state-of-the art electronics packaging Features experimental characterization and qualifications for the analysis and verification of electronic packaging design Provides multiphysics modeling and analysis techniques of electronic packaging

Turbulence and Interactions Michel Deville 2021-02-16 This book presents a snapshot of the state-of-art in the field of turbulence modeling, with an emphasis on numerical methods. Topics include direct numerical simulations, large eddy simulations, compressible turbulence, coherent structures, two-phase flow simulation and many more. It includes both theoretical contributions and experimental works, as well as chapters derived from keynote lectures, presented at the fifth Turbulence and Interactions Conference (TI 2018), which was held on June 25-29 in Martinique, France. This multifaceted collection, which reflects the conference´s emphasis on the interplay of theory, experiments and computing in the process of understanding and predicting the physics of complex flows and solving related engineering problems, offers a timely guide for students, researchers and professionals in the field of applied computational fluid dynamics, turbulence modeling and related areas.

Simulations of the Flow Generated by Fluidic Inserts in a Converging Diverging Nozzle Jacob Lampenfield 2016 This investigation of military jet noise prediction and reduction is a continuation from previous projects and is still ongoing. Numerical simulations have been performed on baseline nozzles and nozzles with the addition of fluidic inserts. The design Mach number of the nozzle is 1.65, but only the over-expanded Mach number of 1.36 has been analyzed. The fluidic inserts have been generated using different numbers of injectors and injector hole sizes. The supersonic military style jet simulation makes use of advanced meshes combined with CFD technology. Steady Reynolds-averaged Navier-Stokes (RANS) simulations are produced by the CFD technology and used to predict and understand the flow field. Through collaboration with experimental noise measurements, a correlation between flow field properties and noise reduction is examined. The ANSYS suite is used to create grids and run simulations by using ANSYS-ICEM and ANSYS-CFX respectively. The geometry of the nozzle is modeled using an unstructured hexahedral mesh. The Menter SST turbulence model with a wall function is used inside of the CFX-Solver. The objective is to further simulate a military-style nozzle, similar to the GE F404 family, with added fluidic inserts. Previous simulations have been conducted and new simulations were planned and performed based on information gathered from the previous simulations and experiments. The fluidic inserts are used to alter the flow field to achieve the same effect of hard wall corrugations, which have been shown to reduce noise levels. The numerical simulations are used to help understand the effects on the flow field created by the fluidic inserts and to attempt to find flow parameters that can be correlated to noise reduction. Simulations were first run on a simpler geometry to give an understanding of the fluidic inserts. They were conducted by having three injectors exhausting into a supersonic boundary layer. The freestream Mach number was 1.5 to simulate the inside of the nozzle. A study was then conducted to see the effect of a change in downstream injector angle on the fluidic insert. There was also a study of an increase Reynolds number as three different sized nozzles were modeled. The first size is a small nozzle with an exit diameter of 0.885 inches. The nozzle size was then increased by a factor of 1.2 to an exit diameter of 1.06 inches. A third nozzle was then modeled to recreate the nozzle used in the GE experiments. This nozzle had a diameter of 5.07 inches. The results from all the simulations were then compared to experimental acoustic data. Flow parameters were then integrated from each

simulation to attempt to find a correlation to noise reduction. Parameters such as streamwise vorticity, turbulent kinetic energy, and Q criterion were all analyzed.

Aerospace and Associated Technology Anup Ghosh 2022-09-24 The International Conference on Theoretical Applied Computational and Experimental Mechanics is organized every three years by the Department of Aerospace Engineering IIT Kharagpur. The conference is devoted to providing a platform for scientists and engineers to exchange their views on the latest developments in Mechanics since 1998. ICTACEM Conference is aimed at bringing together academics and researchers working in various disciplines of mechanics to exchange views as well as to share knowledge between people from different parts of the globe. The 8th ICTACEM was held from December 20-22, 2021, at the Indian Institute of Technology, Kharagpur.

An Introduction to ANSYS Fluent 2022 John E. Matsson • Teaches new users how to run Computational Fluid Dynamics simulations using ANSYS Fluent • Uses applied problems, with detailed step-by-step instructions • Designed to supplement undergraduate and graduate courses • Covers the use of ANSYS Workbench, ANSYS DesignModeler, ANSYS Meshing and ANSYS Fluent • Compares results from ANSYS Fluent with numerical solutions using Mathematica • This edition feature three new chapters analyzing an optimized elbow, golf balls, and a car As an engineer, you may need to test how a design interacts with fluids. For example, you may need to simulate how air flows over an aircraft wing, how water flows through a filter, or how water seeps under a dam. Carrying out simulations is often a critical step in verifying that a design will be successful. In this hands-on book, you'll learn in detail how to run Computational Fluid Dynamics (CFD) simulations using ANSYS Fluent. ANSYS Fluent is known for its power, simplicity and speed, which has helped make it a world leader in CFD software, both in academia and industry. Unlike any other ANSYS Fluent textbook currently on the market, this book uses applied problems to walk you step-by-step through completing CFD simulations for many common flow cases, including internal and external flows, laminar and turbulent flows, steady and unsteady flows, and single-phase and multiphase flows. You will also learn how to visualize the computed flows in the post-processing phase using different types of plots. To better understand the mathematical models being applied, we'll validate the results from ANSYS Fluent with numerical solutions calculated using Mathematica. Throughout this book we'll learn how to create geometry using ANSYS Workbench and ANSYS DesignModeler, how to create mesh using ANSYS Meshing, how to use physical models and how to perform calculations using ANSYS Fluent. The chapters in this book can be used in any order and are suitable for beginners with little or no previous experience using ANSYS. Intermediate users, already familiar with the basics of ANSYS Fluent, will still find new areas to explore and learn. An Introduction to ANSYS Fluent 2022 is designed to be used as a supplement to undergraduate courses in Aerodynamics, Finite Element Methods and Fluid Mechanics and is suitable for graduate level courses such as Viscous Fluid Flows and Hydrodynamic Stability. The use of CFD simulation software is rapidly growing in all industries. Companies are now expecting graduating engineers to have knowledge of how to perform simulations. Even if you don't eventually complete simulations yourself, understanding the process used to complete these simulations is necessary to be an effective team member. People with experience using ANSYS Fluent are highly sought after in the industry, so learning this software will not only give you an advantage in your classes, but also when applying for jobs and in the workplace. This book is a valuable tool that will help you master ANSYS Fluent and better understand

the underlying theory. Topics Covered • Boundary Conditions • Drag and Lift • Initialization • Iterations • Laminar and Turbulent Flows • Mesh • Multiphase Flows • Nodes and Elements • Pressure • Project Schematic • Results • Sketch • Solution • Solver • Streamlines • Transient • Visualizations • XY Plot • Animation • Batch Job • Cell Zone Conditions • CFD-Post • Compressible Flow • Contours • Dynamic Mesh Zones • Fault-tolerant Meshing • Fluent Launcher • Force-Report • Macroscopic Particle Model • Materials • Pathlines • Post-Processing • Reference Values • Reports • Residuals • User Defined Functions • Viscous Model • Watertight-Geometry

Proceedings of the International Field Exploration and Development Conference 2020 Jia'en Lin 2021-06-17 This book is a compilation of selected papers from the 10th International Field Exploration and Development Conference (IFEDC 2020). The proceedings focuses on Reservoir Surveillance and Management, Reservoir Evaluation and Dynamic Description, Reservoir Production Stimulation and EOR, Ultra-Tight Reservoir, Unconventional Oil and Gas Resources Technology, Oil and Gas Well Production Testing, Geomechanics. The conference not only provides a platform to exchanges experience, but also promotes the development of scientific research in oil & gas exploration and production. The main audience for the work includes reservoir engineer, geological engineer, enterprise managers senior engineers as well as professional students.

Simulations of the Flow Generated by Fluidic Inserts for Supersonic Jet Noise Reduction Based on Steady RANS Simulations Matthew Kapusta 2015 The investigation of military jet noise prediction and reduction is an ongoing activity. Supersonic military jets radiate higher noise levels than commercial aircraft and are not subject to noise requirements. The noise generating mechanisms for high-speed jets are not entirely understood, making it difficult to set strict noise standards similar to those imposed for commercial aircraft. However, many noise reduction techniques have been applied to attempt to alleviate environmental and health concerns. Little success has been achieved to date for noise reduction of exhaust jets on supersonic tactical aircraft.A newly developed method involves a system that generates fluidic inserts in a supersonic nozzle flow to produce noise reduction. Numerical simulations have been performed for a military-style basline nozzle and with the noise reduction method of fluidic inserts used at a design Mach number of 1.65 and at various off design conditions. The purpose of the current numerical study is to provide insight for the flow field generated by the fluidic inserts used to reduce supersonic jet noise. The supersonic jet simulations are based on the use of high fidelity meshes combined with advanced CFD technology. Steady Reynolds-averaged Navier-Stokes (RANS) simulations are used to predict the flow field. Noise measurements have been performed experimentally and the results from the numerical simulations provide a correlation between aerodynamic properties and the corresponding noise reduction. The complex nozzle geometry is modeled using both an unstructured mesh and a multiblock structured mesh. The grids are generated by ANSYS ICEM and Gridgen respectively. The numerical simulations are performed using ANSYS CFX and Wind-US. The simulations with Wind-US use the Spalart-Allmaras turbulence model, while the simulations with ANSYS CFX use the Menter SST turbulence model. The results from the two flow solvers are compared and provide good agreement. The objective is to simulate a military-style nozzle, which resembles engines of the GE F404 family, with fluidic inserts. The purpose of the fluidic inserts is to alter the flow field similar to that of a hard wall corrugation in order to reduce components of noise radiation. The addition of the fluidic inserts increases the complexity of the flow field for the supersonic jet. The numerical simulations performed help to better

distinguish the effects on the flow field due to the fluidic inserts. Preliminary work has been performed on a simpler geometry to provide further insight to the effect of the fluidic inserts on the supersonic jet flow field. These simulations are performed by fluid injection into a supersonic freestream over a flat plate. All numerical simulations used a freestream Mach number of 1.5. The numerical simulations used a wide range of pressure ratios for injecting the fluid into the supersonic freestream. By changing the pressure ratio of the fluid injection, the deflection of the freestream flow was better understood. Simulations on a full three dimensional nozzle with fluidic inserts were performed with conditions based on the preliminary studies. Parameters such as total pressure and total temperature provide a representation of the fluidic insert shape. Other integrated flow properties at the nozzle exit such as streamwise vorticity and pressure differential were used to correlate with the noise reduction seen in the experiments.

Aeroacustic and Vibroacoustic Advancement in Aerospace and Automotive Systems Roberto Citarella 2018-06-26 This book is a printed edition of the Special Issue "Advances in Vibroacoustics and Aeroacustics of Aerospace and Automotive Systems" that was published in Applied Sciences

Handbook of Research on Aspects and Applications of Incompressible and Compressible Aerodynamics Kumar, Sathish K. 2022-06-24 Aerodynamics is a science that improves the ability to understand theoretical basics and apply fundamental physics in real-life problems. The study of the motion of air, both externally over an airplane wing and internally over a scramjet engine intake, has acknowledged the significance of studying both incompressible and compressible flow aerodynamics. The Handbook of Research on Aspects and Applications of Incompressible and Compressible Aerodynamics discusses all aspects of aerodynamics from application to theory. It further presents the equations and mathematical models used to describe and characterize flow fields as well as their thermodynamic aspects and applications. Covering topics such as airplane configurations, hypersonic vehicles, and the parametric effect of roughness, this premier reference source is an essential resource for engineers, scientists, students and educators of higher education, military experts, libraries, government officials, researchers, and academicians.

Topical Issues of Rational use of Natural Resources 2019 Vladimir Litvinenko 2022-07-30 Topical Issues of Rational Use of Natural Resources 2019 contains the contributions presented at the XV International Forum-Contest of Students and Young Researchers under the auspices of UNESCO (St. Petersburg Mining University, Russia, 13–17 May 2019). The Forum-Contest is a great opportunity for young researchers to present their work to the academics involved or interested the area of extraction and processing of natural resources. The topics of the book include: Volume 1 • Geotechnologies of resource extraction: current challenges and prospects • Solid minerals mining technologies. Industrial and labour safety • Underground space development technologies. Rock mechanics and control of rock conditions • Cutting edge technologies of geological mapping, search and prospecting of mineral deposits • Digital and energy saving technologies in mineral resource complex Volume 2 • Breakthrough technologies of integrated processing of mineral hydrocarbon and technogenic raw materials with further production of new generation materials • The latest management and financing solutions for the development of mineral resources sector • Environment protection and sustainable nature management • New approaches to resolving hydrocarbon sector-specific issues Topical Issues of Rational Use of Natural Resources 2019 collects the best reports presented at

the Forum-Contest, and is of interest to academics and professionals involved in the extraction and processing of natural resources.

An Introduction to ANSYS Fluent 2021 John E. Matsson 2021-07 As an engineer, you may need to test how a design interacts with fluids. For example, you may need to simulate how air flows over an aircraft wing, how water flows through a filter, or how water seeps under a dam. Carrying out simulations is often a critical step in verifying that a design will be successful. In this hands-on book, you'll learn in detail how to run Computational Fluid Dynamics (CFD) simulations using ANSYS Fluent. ANSYS Fluent is known for its power, simplicity and speed, which has helped make it a world leader in CFD software, both in academia and industry. Unlike any other ANSYS Fluent textbook currently on the market, this book uses applied problems to walk you step-by-step through completing CFD simulations for many common flow cases, including internal and external flows, laminar and turbulent flows, steady and unsteady flows, and single-phase and multiphase flows. You will also learn how to visualize the computed flows in the post-processing phase using different types of plots. To better understand the mathematical models being applied, we'll validate the results from ANSYS Fluent with numerical solutions calculated using Mathematica. Throughout this book we'll learn how to create geometry using ANSYS Workbench and ANSYS DesignModeler, how to create mesh using ANSYS Meshing, how to use physical models and how to perform calculations using ANSYS Fluent. The chapters in this book can be used in any order and are suitable for beginners with little or no previous experience using ANSYS. Intermediate users, already familiar with the basics of ANSYS Fluent, will still find new areas to explore and learn. An Introduction to ANSYS Fluent 2021 is designed to be used as a supplement to undergraduate courses in Aerodynamics, Finite Element Methods and Fluid Mechanics and is suitable for graduate level courses such as Viscous Fluid Flows and Hydrodynamic Stability. The use of CFD simulation software is rapidly growing in all industries. Companies are now expecting graduating engineers to have knowledge of how to perform simulations. Even if you don't eventually complete simulations yourself, understanding the process used to complete these simulations is necessary to be an effective team member. People with experience using ANSYS Fluent are highly sought after in the industry, so learning this software will not only give you an advantage in your classes, but also when applying for jobs and in the workplace. This book is a valuable tool that will help you master ANSYS Fluent and better understand the underlying theory. Topics Covered • Boundary Conditions • Drag and Lift • Initialization • Iterations • Laminar and Turbulent Flows • Mesh • Multiphase Flows • Nodes and Elements • Pressure • Project Schematic • Results • Sketch • Solution • Solver • Streamlines • Transient • Visualizations • XY Plot Table of Contents 1. Introduction 2. Flat Plate Boundary Layer 3. Flow Past a Cylinder 4. Flow Past an Airfoil 5. Rayleigh-Benard Convection 6. Channel Flow 7. Rotating Flow in a Cavity 8. Spinning Cylinder 9. Kelvin-Helmholtz Instability 10. Rayleigh-Taylor Instability 11. Flow Under a Dam 12. Water Filter Flow 13. Model Rocket Flow 14. Ahmed Body 15. Hourglass 16. Bouncing Spheres 17. Falling Sphere 18. Flow Past a Sphere 19. Taylor-Couette Flow 20. Dean Flow in a Curved Channel 21. Rotating Channel Flow 22. Compressible Flow Past a Bullet 23. Vertical Axis Wind Turbine Flow 24. Circular Hydraulic Jump

Advanced Research in Material Science and Mechanical Engineering He Rui 2013-11-08 Collection of Selected, peer reviewed papers from the 2013 2nd International Conference on Mechanics and Control Engineering (ICMCE 2013), September 1-2, 2013, Beijing, China. Volume is indexed by Thomson Reuters CPCI-S (WoS). The 308 papers are grouped as follows: Chapter 1: Material Processing

and Chemical Engineering; Chapter 2: Mechanical Engineering; Chapter 3: Electrical Engineering, Electric Machines and Mechatronics; Chapter 4: Power System and Energy Engineering, Its Applications; Chapter 5: Electronics and Integrated Circuits, Embedded Technology and Applications; Chapter 6: Data and Signal Processing; Chapter 7: Measurement, Monitoring and Testing Technologies; Chapter 8: Control Systems; Chapter 9: Robotics Technologies and Applications; Chapter 10: Manufacturing and Industrial Engineering, Management Applications; Chapter 11: Civil Engineering; Chapter 12: Environmental Engineering; Chapter 13: Information Technologies and Networks

Physics of Turbulent Jet Ignition Sayan Biswas 2018-05-03 This book focuses on developing strategies for ultra-lean combustion of natural gas and hydrogen, and contributes to the research on extending the lean flammability limit of hydrogen and air using a hot supersonic jet. The author addresses experimental methods, data analysis techniques, and results throughout each chapter and: Explains the fundamental mechanisms behind turbulent hot jet ignition using non-dimensional analysis Explores ignition characteristics by impinging hot jet and multiple jets in relation to better controllability and lean combustion Explores how different instability modes interact with the acoustic modes of the combustion chamber. This book provides a potential answer to some of the issues that arise from lean engine operation, such as poor ignition, engine misfire, cycle-to-cycle variability, combustion instability, reduction in efficiency, and an increase in unburned hydrocarbon emissions. This thesis was submitted to and approved by Purdue University.