

Shock Controller

EUROSHOCK - Drag Reduction by Passive Shock Control

It has been recognized by the European Union (EU) that the survival of the Aeronautical Industries of Europe in the highly competitive World Aviation Market is strongly dependent on such factors as time-to-market of a new or derivative aircraft and on its manufacturing costs but also on the achievement of a competitive technological advantage by which an increased market share can be gained. Cooperative research is therefore continuously encouraged and co-financed by the European Union in order to strengthen the scientific and technological base of the Aeronautical Industries thus facilitating the future design and manufacture of civil aircraft products and providing the technological edge needed for survival. Targets of research within Area 3, Aeronautics, of the Industrial and Materials Technology Programme (1991 - 1993) have been identified to be aircraft efficiency, cost effectiveness and environmental impact. Concerning aircraft efficiency - relevant to the present research - a reduction in aircraft drag of 10%, a reduction in aircraft fuel consumption of 30% and a reduction in airframe, engine and system weight of 20% are envisaged. Meeting these objectives has, of course, also a strong positive impact on the environment. In order to further technology, the philosophy is to avoid spreading the available resources too thinly and rather concentrate on the feasibility demonstration of a limited number of technologies of high economic and industrial impact.

Drag Reduction by Shock and Boundary Layer Control

The survival of the Aeronautical Industries of Europe in the highly competitive World Aviation Market is strongly dependent on such factors as time-to-market of a new or derivative aircraft and on its manufacturing costs but also on the achievement of a competitive technological advantage by which an increased market share can be gained. Recognizing this, cooperative research is continuously encouraged and co-financed by the European Union in order to strengthen the scientific and technological base of the Aeronautical Industries thus providing - among others - the technological edge needed for survival. Corresponding targets of research within Area 3, Technologies for Transport Means, and here in particular Area 3A, Aeronautics Technologies, of the Industrial and Materials Technologies Program (Brite-EuRam III, 1994 -1998) have been identified to be aircraft efficiency, cost effectiveness and environmental impact. Concerning aircraft efficiency - relevant to the present research - a reduction in aircraft drag of 10%, a reduction in aircraft fuel consumption of 30%, and a reduction in airframe, engine and system weight of 20% are envisaged. Meeting these objectives has, of course, also a strong positive impact on the environment.

Towards Effective Flow Control and Mitigation of Shock Effects in Aeronautical Applications

This open-access book reports on both experimental and numerical findings from the H2020-funded project TEAMAero (Towards Effective Flow Control and Mitigation of Shock Effects in Aeronautical Applications). It covers novel contributions on improving the fundamental understanding of the physics of shock wave boundary layer interaction, developments in flow control for mitigation of shock effects, and advanced numerical methods for predicting those effects. All in all, this book offers a timely snapshot of research and developments in numerical methods for flow analysis and control, with a special emphasis on high-speed flows. It offers extensive information to both researchers and professionals.

An Automatic Restart Control System for an Axisymmetric Mixed-compression Inlet

The 2nd International Conference of Mechanical System Dynamics (ICMSD2023) is devoted to “Technology

Innovations by Understanding Mechanical Dynamics”, with 18 sessions to promote research in dynamic theories on complex structures, multidisciplinary integration, and advanced technologies for applications. It is held on September 1–5 in Peking University, Beijing, China. The conference is expected to provide a platform for academic researchers and engineers in the field of mechanical system dynamics to exchange scientific and technical ideas.

Specifications

A series of experiments with energy deposition via laser-induced optical breakdown of air, i.e., a laser spark, have been performed. These experiments have demonstrated the possibility of using a laser spark for supersonic flow control. A focused Nd:YAG laser (pulse time of 10 nanoseconds, pulse frequency of 10 Hz, and capable of energy levels up to 600 milli-Joules per pulse) was used to create the energy deposition laser spark. This laser energy deposition was then tested in quiescent air, upstream of a Mach 3.45 sphere with and without shock impingement, into shock structures within the dual solution domain, and into a compressible shear layer.

Control System Design Using Frequency Domain Models and Parameter Optimization, with Application to Supersonic Inlet Controls

This is the first book on adaptive aeroservoelasticity and it presents the nonlinear and recursive techniques for adaptively controlling the uncertain aeroelastic dynamics. Covers both linear and nonlinear control methods in a comprehensive manner. Mathematical presentation of adaptive control concepts is rigorous. Several novel applications of adaptive control presented here are not to be found in other literature on the topic. Many realistic design examples are covered, ranging from adaptive flutter suppression of wings to the adaptive control of transonic limit-cycle oscillations.

NASA Conference Publication

This volume contains papers presented at the IFAC symposium on Modeling and control of Economic Systems (SME 2001), which was held at the university of Klagenfurt, Austria. The symposium brought together scientists and users to explore current theoretical developments of modeling techniques for economic systems. It contains a section of plenary, invited and contributed papers presented at the SME 2001 symposium. The papers presented in this volume reflect advances both in methodology and in applications in the area of modeling and control of economic systems.

NASA Technical Memorandum

This book is a compilation of peer-reviewed papers from the 2018 Asia-Pacific International Symposium on Aerospace Technology (APISAT 2018). The symposium is a common endeavour between the four national aerospace societies in China, Australia, Korea and Japan, namely, the Chinese Society of Aeronautics and Astronautics (CSAA), Royal Aeronautical Society Australian Division (RAeS Australian Division), the Korean Society for Aeronautical and Space Sciences (KSAS) and the Japan Society for Aeronautical and Space Sciences (JSASS). APISAT is an annual event initiated in 2009 to provide an opportunity for researchers and engineers from Asia-Pacific countries to discuss current and future advanced topics in aeronautical and space engineering.

Proceedings of the 2nd International Conference on Mechanical System Dynamics

This book provides a comprehensive treatment of passive and active flow control in fluid dynamics, with an emphasis on utilizing fluid instabilities for enhancing control performance. Examples are given from a wide range of technologically important flow fields occurring in aerospace applications, from low-subsonic to

hypersonic Mach numbers. This essential book can be used for both research and teaching on the topics of fluid instabilities, fluid measurement and flow actuator techniques, and problem sets are provided at the end of each chapter to reinforce key concepts and further extend readers' understanding of the field. The solutions manual is available as a online resource for instructors. The text is well suited for both graduate students in fluid dynamics and for practising engineers in the aerodynamics design field.

Official Gazette of the United States Patent Office

This book delves into the cutting-edge field of electronic materials, focusing on their pivotal role in shaping a sustainable and technologically advanced future. This comprehensive book brings together a selection of contributions that explore the transformative impact of electronic materials on various industries, including health care, aerospace, energy, and electronics. The book places a spotlight on the forefront of technological innovation, with a particular emphasis on nanoelectronics. Readers will navigate through the technological landscape of electronic materials, uncovering its significance in driving sustainable technologies that address the emerging challenges and also explore the emergent properties of electronic materials, such as multifunctionality, reliability, and scalability. Through in-depth analysis and case studies, this book showcases how these properties propel researchers in electronic material science toward ground-breaking solutions with real-world applications. This book serves as a collaborative and descriptive platform, fostering interdisciplinary discussions and knowledge exchange. It acts as a bridge between various fields, providing a space for researchers, scientists, and engineers to share cutting-edge discoveries and advancements. The book is more than a collection of articles; it is a forward-looking exploration of the dynamic nature of material science and technology. It highlights how researchers and engineers are pushing the boundaries, leveraging the remarkable properties of materials to create solutions that enhance efficiency, innovation, and sustainability.

National 4-H Club News

"Symposium Transsonicum" was founded by Klaus Oswatitsch four decades ago when there was clearly a need for a systematic treatment of flow problems in the higher speed regime in aeronautics. The first conference in 1962 brought together scientists concerned with fundamental problems involving the sonic flow speed regime. Results of the conference provided an understanding of some basic transonic phenomena by proposing mathematical methods that allowed for the development of practical calculations. The "Transonic Controversy" (about shock free flows) was still an open issue after this meeting. In 1975 the second symposium was held, by then there was much understanding in how to avoid shocks in a steady plane flow to be designed, but still very little was known in unsteady phenomena due to a lack of elucidating experiments. A third meeting in 1988 reflected the availability of larger computers which allowed the numerical analysis of flows with shocks to a reasonable accuracy. Because we are trying to keep Oswatitsch's heritage in science alive especially in Gottingen, we were asked by the aerospace research community to organize another symposium. Much had been achieved already in the knowledge, technology and applications in transonics, so IUT AM had to be convinced that a fourth meeting would not just be a reunion of old friends reminiscing some scientific past. The scientific committee greatly supported my efforts to invite scientists actively working in transonic problems which still pose substantial difficulties to aerospace and turbomachinery industry.

Review and Evaluation of Smoking Control Methods

One of the goals of plant science is to improve agricultural sustainability, increasing yield, food diversity, and nutrition, while minimizing the negative impact on our environment. In response to internal and external cues, plant hormones control various aspects of plant growth and development. The wealth of our knowledge on plant hormones shall greatly advance sustainable agriculture.

Localized Flow Control with Energy Deposition

Ecotoxicology is a relatively new scientific discipline. Indeed, it might be argued that it is only during the last 5-10 years that it has come to merit being regarded as a true science, rather than a collection of procedures for protecting the environment through management and monitoring of pollutant discharges into the environment. The term 'ecotoxicology' was first coined in the late sixties by Prof. Truhaut, a toxicologist who had the vision to recognize the importance of investigating the fate and effects of chemicals in ecosystems. At that time, ecotoxicology was considered a sub-discipline of medical toxicology. Subsequently, several attempts have been made to portray ecotoxicology in a more realistic light. Notably, both Moriarty (1988) and F. Ramade (1987) emphasized in their books the broad basis of ecotoxicology, encompassing chemical and radiation effects on all components of ecosystems. In doing so, they and others have shifted concern from direct chemical toxicity to humans, to the far more subtle effects that pollutant chemicals exert on natural biota. Such effects potentially threaten the existence of all life on earth. Although I have identified the sixties as the era when ecotoxicology was first conceived as a coherent subject area, it is important to acknowledge that studies that would now be regarded as ecotoxicological are much older.

Adaptive Aeroservoelastic Control

The papers considered comprehensive range of topics including: Active Control Technology applications; optimisation of systems architecture for both reliability and cost; control law design, development and test; the application of handling qualities criteria and the operational demonstration of system reliability.

Modeling and Control of Economic Systems 2001

Assessment and Treatment of Trauma (ATT) presents the state-of-the-art prehospital trauma assessment and management. Based on the most current medical information and best practices, this concise and highly interactive continuing education course covers the critical knowledge and skills necessary to rapidly evaluate, stabilize, and transport the trauma patient. The ATT textbook is the core of the ATT Course and is designed to give ALS-level prehospital providers the tools to effectively assess and treat trauma patients. ATT motivates and engages the student. It encourages solution-driven thinking through: Pictorial case studies, Controversy essays, Procedures. Important Notice: The digital edition of this book is missing some of the images or content found in the physical edition.

The Proceedings of the 2018 Asia-Pacific International Symposium on Aerospace Technology (APISAT 2018)

Flow Control

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