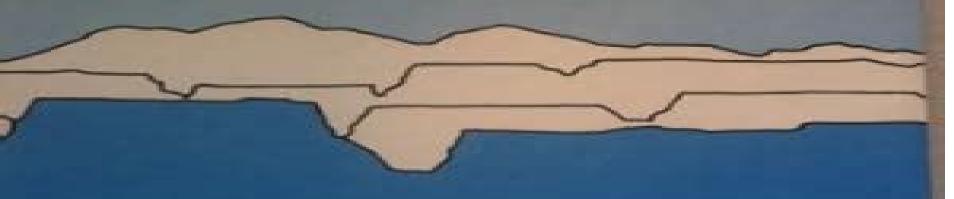
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Numerical Modeling of Explosives and Propellants, Second Edition Charles L. Mader, 1997-08-29 Charles Mader a leading scientist who conducted theoretical research at Los Alamos National Laboratory for more than 30 years sets a new standard with this reference on numerical modeling of explosives and propellants This book updates and expands the information presented in the author's landmark work Numerical Modeling of Detonations published in 1979 and still in use today Numerical Modeling of Explosives and Propellants incorporates the considerable changes the personal computer has brought to numerical modeling since the first book was published and includes new three dimensional modeling techniques and new information on propellant performance and vulnerability Both an introduction to the physics and chemistry of explosives and propellants and a quide to numerical modeling of detonation and reactive fluid dynamics Numerical Modeling of Explosives and Propellants offers scientists and engineers a complete picture of the current state of explosive and propellant technology and numerical modeling The book is richly illustrated with figures that support the concepts and filled with tables for quick access to precise data The accompanying CD ROM contains computer codes that are the national standard by which modeling is evaluated Dynamic material properties data files and animation files are also included There is no other book available today that offers this vital information Numerical Modeling of Detonations Charles L. Mader, 1979 Good No Highlights No Markup all pages are intact Slight Shelfwear may have the corners slightly dented may have slight color changes slightly damaged spine Gaseous Detonation Physics and Its Universal Framework Theory Zonglin Jiang, Honghui Teng, 2022-12-16 This book highlights the theories and research progress in gaseous detonation research and proposes a universal framework theory that overcomes the current research limitations Gaseous detonation is an extremely fast type of combustion that propagates at supersonic speed in premixed combustible gas Being self sustaining and self organizing with the unique nature of pressure gaining gaseous detonation and its gas dynamics has been an interdisciplinary frontier for decades The research of detonation enjoyed its early success from the development of the CJ theory and ZND modeling but phenomenon is far from being understood quantitatively and the development of theories to predict the three dimensional cellular structure remains a formidable task being essentially a problem in high speed compressible reacting flow This theory proposed by the authors research group breaks down the limitation of the one dimensional steady flow hypothesis of the early theories successfully correlating the propagation and initiation processes of gaseous detonation and realizing the unified expression of the three dimensional structure of cell detonation. The book and the proposed open framework is of high value for researchers in conventional applications such as coal mine explosions and chemical plant accidents and state of the art research fields such as supernova explosion new aerospace propulsion engines and detonation driven hypersonic testing facilities It is also a driving force for future research of detonation <u>Dynamic Aspects of Detonations</u> A. L. Kuhl,1993 Proceedings, Seventh Symposium (International) on Detonation, 1982 Assessment of Safety and Risk with a

Microscopic Model of Detonation C.-O. Leiber, 2003-04-25 Whereas the current plane wave homogeneous flow detonation physics is an excellent engineering tool for numerical predictions under given conditions the multi hot spot model is an additional tool for analyzing phenomena that cannot be explained by classical calculations. The real benefit comes from being able to understand without any artificial assumptions the whole phenomenology of detonations and explosions By specifying pressure generating mechanisms one is able to see that the current treatment of the detonics of energetic materials is only a very special but powerful case of explosion events and hazards It becomes clear that physical explosions must be taken into account in any safety considerations In these terms it is easy to understand why even liquid carbon dioxide and inert silo materials can explode A unique collection of unexpected events which might surprise even specialists has resulted from the evaluation of the model **Detonation Control for Propulsion** Jiun-Ming Li, Chiang Juay Teo, Boo Cheong Khoo, Jian-Ping Wang, Cheng Wang, 2017-12-05 This book focuses on the latest developments in detonation engines for aerospace propulsion with a focus on the rotating detonation engine RDE State of the art research contributions are collected from international leading researchers devoted to the pursuit of controllable detonations for practical detonation propulsion A system level design of novel detonation engines performance analysis and advanced experimental and numerical methods are covered In addition the world's first successful sled demonstration of a rocket rotating detonation engine system and innovations in the development of a kilohertz pulse detonation engine PDE system are reported Readers will obtain in a straightforward manner an understanding of the RDE PDE design operation and testing approaches and further specific integration schemes for diverse applications such as rockets for space propulsion and turbojet ramjet engines for air breathing propulsion Detonation Control for Propulsion Pulse Detonation and Rotating Detonation Engines provides with its comprehensive coverage from fundamental detonation science to practical research engineering techniques a wealth of information for scientists in the field of combustion and propulsion The volume can also serve as a reference text for faculty and graduate students and interested in shock waves combustion and propulsion **Dynamics of Detonations and Explosions** A. L. Kuhl, 1991

The Detonation Phenomenon John H. S. Lee,2008-06-30 This book introduces the detonation phenomenon in explosives It is ideal for engineers and graduate students with a background in thermodynamics and fluid mechanics The material is mostly qualitative aiming to illustrate the physical aspects of the phenomenon Classical idealized theories of detonation waves are presented first These permit detonation speed gas properties ahead of and behind the detonation wave and the distribution of fluid properties within the detonation wave itself to be determined Subsequent chapters describe in detail the real unstable structure of a detonation wave One two and three dimensional computer simulations are presented along with experimental results using various experimental techniques The important effects of confinement and boundary conditions and their influence on the propagation of a detonation are also discussed The final chapters cover the various ways detonation waves can be formed and provide a review of the outstanding problems and future directions in detonation

<u>List of Publications of the U.S. Army Engineer Waterways Experiment Station</u> U.S. Army Engineer Waterways research Experiment Station, 1980 Detonation of Condensed Explosives Roger Cheret, 2012-12-06 This work marks a stage in the evolution of a scientific and technical field which has been developed by the Commissariat a l Energie Atomique CEA over several decades Many members of the staff of the CEA have won re nown in this field and their work has brought it to the high degree of excel lence for which it is internationally recognized today These scientists had to consider every aspect of the field as it concerned modeling which has recourse to fluid thermodynamics molecular phys ics and chemistry numerical evaluation which relies on mathematical analysis and data processing and experiments in the firing area which require specific stress generators and instrumentation Whilst this book is a testament to the activity and success of staff of the CEA it also reviews a number of the advances made in the discipline How ever it is not intended to be an exhaustive account of those advances it is assumed that the reader can if desired consult the standard monographs and more recent more specialized works notably W C Davis and W Fickett and C L Mader The history of the discipline is interesting in itself and also as an illustration of the causes which lead to progress in a coherent body of scientific work I should like to make some comments on this progress of which there is a fascinating summary in the introduction and which will figure largely throughout the Cosmic Explosions in Three Dimensions Peter Höflich, Pawan Kumar, J. Craig Wheeler, 2004-12-16 Supernovae and gamma ray bursts are the strongest explosions in the Universe Observations show that rather than being symmetrical they are driven by strong jets of energy and other asymmetrical effects These observations demand theories and computations that challenge the biggest computers This volume marks the transition to a fresh paradigm in the study of stellar explosions It highlights the burgeoning era of routine supernova polarimetry and the insights into core collapse and thermonuclear explosions With chapters by leading scientists the book summarises the status of a fresh perspective on stellar explosions and should be a valuable resource for graduate students and research scientists **Proceedings of the 34th International** Symposium on Shock Waves, Volume 2: Applications 1 Rho Shin Myong, Heuy Dong Kim, 2025-09-30 Shock waves are strong pressure waves resulting from irreversible processes in elastic media including gases liquids or solids generated by supersonic aircraft explosions or phenomena that cause rapid changes in pressure The conference proceedings of the 34th International Symposium on Shock Waves ISSW34 held in Daegu Korea in 2023 cover theoretical experimental and computational studies of these shock waves and associated phenomena addressing both fundamental and applied aspects They serve as the most up to date resource for physicists chemists engineers and applied mathematicians involved in shock wave research The three volume set present the latest studies on diverse topics including shock waves in gases liquids and solids as well as in internal flows detonation supersonic and hypersonic flows nozzle flows and supersonic jet It also explores emerging topics such as advanced shock tube design and application recent development in diagnostics and flow visualization shock waves in multiphase flows and detonation engines Volume 2 contains 57 articles covering the applications

part 1 of shock waves to various fields encompassing mechanical engineering aerospace engineering space sciences geosciences materials sciences life sciences and medicine Shock Waves Science and Technology Library, Vol. 6 F. Zhang, 2012-03-19 This book as a volume of the Shock Wave Science and Technology Reference Library is primarily concerned with the fundamental theory of detonation physics in gaseous and condensed phase reactive media The detonation process involves complex chemical reaction and fluid dynamics accompanied by intricate effects of heat light electricity and magnetism a contemporary research field that has found wide applications in propulsion and power hazard prevention as well as military engineering The seven extensive chapters contained in this volume are Chemical Equilibrium Detonation S Bastea and LE Fried Steady One Dimensional Detonations A Higgins Detonation Instability HD Ng and F Zhang Dynamic Parameters of Detonation AA Vasiliev Multi Scaled Cellular Detonation D Desbordes and HN Presles Condensed Matter Detonation Theory and Practice C Tarver Theory of Detonation Shock Dynamics JB Bdzil and DS Stewart The chapters are thematically interrelated in a systematic descriptive approach though each chapter is self contained and can be read independently from the others It offers a timely reference of theoretical detonation physics for graduate students as well as professional scientists and engineers **30th International Symposium on Shock Waves 1** Gabi Ben-Dor, Oren Sadot,Ozer Igra,2017-08-09 These proceedings collect the papers presented at the 30th International Symposium on Shock Waves ISSW30 which was held in Tel Aviv Israel from July 19 to July 24 2015 The Symposium was organized by Ortra Ltd The ISSW30 focused on the state of knowledge of the following areas Nozzle Flow Supersonic and Hypersonic Flows with Shocks Supersonic Jets Chemical Kinetics Chemical Reacting Flows Detonation Combustion Ignition Shock Wave Reflection and Interaction Shock Wave Interaction with Obstacles Shock Wave Interaction with Porous Media Shock Wave Interaction with Granular Media Shock Wave Interaction with Dusty Media Plasma Magnetohyrdrodynamics Re entry to Earth Atmosphere Shock Waves in Rarefied Gases Shock Waves in Condensed Matter Solids and Liquids Shock Waves in Dense Gases Shock Wave Focusing Richtmyer Meshkov Instability Shock Boundary Layer Interaction Multiphase Flow Blast Waves Facilities Flow Visualization and Numerical Methods The two volumes serve as a reference for the participants of the ISSW30 and anyone interested in these fields Effects of fuel distribution on detonation tube performance, Publications of Los Alamos Research Los Alamos National Laboratory,1983 Scientific and Technical Aerospace Reports ,1992

Shock Waves Klaus Hannemann, Friedrich Seiler, 2009-04-01 The 26th International Symposium on Shock Waves in G ttingen Germany was jointly organised by the German Aerospace Centre DLR and the French German Research Institute of Saint Louis ISL The year 2007 marked the 50th anniversary of the Symposium which first took place in 1957 in Boston and has since become an internationally acclaimed series of meetings for the wider Shock Wave Community The ISSW26 focused on the following areas Shock Propagation and Reflection Detonation and Combustion Hypersonic Flow Shock Boundary Layer Interaction Numerical Methods Medical Biological and Industrial Applications Richtmyer Meshkov Instability Blast Waves

Chemically Reacting Flows Diagnostics Facilities Flow Visualisation Ignition Impact and Compaction Multiphase Flow Nozzles Flows Plasmas and Propulsion The two Volumes contain the papers presented at the symposium and serve as a reference for the participants of the ISSW 26 and individuals interested in these fields \*\*Rock Fragmentation by Blasting\*\* B. Mohanty,2020-12-17 This collection of symposium papers covers a wide range of topics on rock fragmentation from carefully documented case studies to attempts for example at fractal representation of the fracture process itself

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