

Numerical Simulation of Reactive Flow

Second Edition



ELAINE S. ORAN
JAY P. BORIS

Numerical Simulation Of Reactive Flow

Craig D. Douglas



Numerical Simulation Of Reactive Flow:

Numerical Simulation of Reactive Flow Elaine S. Oran, Jay P. Boris, 1987 This new edition takes account of the explosive growth in computer technology and the greatly increased capacity for solving complex reactive flow problems It presents algorithms for reactive flow simulations describes some trade offs involved in their use and gives guidance for building and using models of complex reactive flows

Modeling and Simulation of Reactive Flows A.L. De Bortoli, Greice Andreis, Felipe Pereira, 2015-07-10 Modelling and Simulation of Reactive Flows presents information on modeling and how to numerically solve reactive flows The book offers a distinctive approach that combines diffusion flames and geochemical flow problems providing users with a comprehensive resource that bridges the gap for scientists engineers and the industry Specifically the book looks at the basic concepts related to reaction rates chemical kinetics and the development of reduced kinetic mechanisms It considers the most common methods used in practical situations along with equations for reactive flows and various techniques including flamelet ILDM and Redim for jet flames and plumes with solutions for both In addition the book includes techniques to accelerate the convergence of numerical simulation and a discussion on the analysis of uncertainties with numerical results making this a useful reference for anyone who is interested in both combustion in free flow and in porous media Helps readers learn how to apply applications of numerical methods to simulate geochemical kinetics Presents methods on how to transform the transport equations in several coordinate systems Includes discussions of the basic concepts related to reaction rates chemical kinetics and the development of reduced kinetic mechanisms including the most common methods used in practical situations Offers a distinctive approach that combines diffusion flames and geochemical flow problems

Numerical Simulation of Reactive Flow in Hot Aquifers Christoph Clauser, 2012-12-06 This product consisting of a CD ROM and a book deals with the numerical simulation of reactive transport in porous media using the simulation package SHEMAT Processing SHEMAT SHEMAT Simulator for HEat and MAss Transport is an easy to use general purpose reactive transport simulation code for a wide variety of thermal and hydrogeological problems in two or three dimensions The book is a richly documented manual for users of this software which discusses in detail the coded physical and chemical equations Thus it provides the in depth background required by those who want to apply the code for solving advanced technical and scientific problems The enclosed companion CD ROM contains the software and data for all of the case studies The software includes user friendly pre and post processors which make it very easy to set up a model run it and view the results all from one platform Therefore the software is also very suitable for academic or technical hands on courses for simulating flow transport of heat and mass and chemical reactions in porous media You can find a link to the updated software on springer com

Numerical Simulation of Reactive Flow and Transport Through the Subsurface Ashok Kumar Chilakapati, 1993

Numerical Simulation of Reactive Flow Associated with a Lobed Fuel Injector Thomas Selerland, 1997

Reactive Flows, Diffusion and Transport Willi Jäger, Rolf Rannacher, J. Warnatz, 2007-05-31 The

articles in this volume summarize the research results obtained in the former SFB 359 Reactive Flow Diffusion and Transport which has been supported by the DFG over the period 1993 2004 The main subjects are physical chemical processes sharing the difficulty of interacting diffusion transport and reaction which cannot be considered separately The modeling and simulation within this book is accompanied by experiments

Numerical Simulation of Reactive Flow in Internal Combustion Engines. [CONCHAS-SPRAY Code]., 1980 Multidimensional numerical simulations of the reactive fluid flow in an internal combustion engine cylinder are useful in helping engine designers obtain insight into the physical mechanisms governing efficiency and pollutant formation A comprehensive numerical model for internal combustion engine cylinder simulations that has been developed at Los Alamos is described The model is currently embodied in a two dimensional axisymmetric computer code called CONCHAS SPRAY Work is in progress on a three dimensional code with the same features

Reactive Flows, Diffusion and Transport Willi Jäger, Rolf Rannacher, J. Warnatz, 2009-09-02 The articles in this volume summarize the research results obtained in the former SFB 359 Reactive Flow Diffusion and Transport which has been supported by the DFG over the period 1993 2004 The main subjects are physical chemical processes sharing the difficulty of interacting diffusion transport and reaction which cannot be considered separately The modeling and simulation within this book is accompanied by experiments

Numerical Simulation of Reactive Flow on the IBM ES-3090 Vector Multiprocessor Friedrich-Karl Hebecker, Rudolf Maly, Stefan Schöffel, 1992

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Direct Numerical Simulation for Turbulent Reacting Flows Thierry Baritaud, Thierry Poinsot, Markus Baum, 1996 Contents Description of accurate boundary conditions for the simulation of reactive flows Parallel direct numerical simulation of turbulent reactive flow Flame wall interaction and heat flux modelling in turbulent channel flow A numerical study of laminar flame wall interaction with detailed chemistry wall temperature effects Modeling and simulation of turbulent flame kernel evolution Experimental and theoretical analysis of flame surface density modelling for premixed turbulent combustion Gradient and counter gradient transport in turbulent premixed flames Direct numerical simulation of turbulent flames with complex chemical kinetics Effects of curvature and unsteadiness in diffusion flames Implications for turbulent diffusion combustion Numerical simulations of autoignition in turbulent mixing flows Stabilization processes of diffusion flames References

Numerical Simulation of Reactive Flows with Detailed Reaction Schemes on Unstructured Grids U. Riedel, 1998

Computational Fluid Dynamics T. J. Chung, 2002-02-07 Increasingly computational fluid dynamics CFD techniques are being used to study and solve complex fluid flow and heat transfer

problems This comprehensive book ranges from elementary concepts for the beginner to state of the art CFD for the practitioner It begins with CFD preliminaries in which the basic principles of finite difference FD finite element FE and finite volume FV methods are discussed and illustrated through examples with step by step hand calculations Then FD and FE methods respectively are covered including both historical developments and recent contributions The next section is devoted to structured and unstructured grids adaptive methods computing techniques and parallel processing Finally the author describes a variety of practical applications to problems in turbulence reacting flows and combustion acoustics combined mode radiative heat transfer multiphase flows electromagnetic fields and relativistic astrophysical flows Students and practitioners particularly in mechanical aerospace chemical and civil engineering will use this authoritative text to learn about and apply numerical techniques to the solution of fluid dynamics problems Numerical Simulation of Multi-phase Multi-component Reactive Flow in Porous Media ,2015 **The Numerical Simulation of Compressible Reactive Flows** J. P. Boris,1987 *Numerical Simulation and Experimental Investigation of Reactive Flow in a Carbonate Reservoir* Farhana Jaafar Azuddin,2022 **Numerical Simulation of Reactive Polymer Flow** Craig D. Douglas,1983 Computational Flow Modeling for Chemical Reactor Engineering Vivek V. Ranade,2002 The book relates the individual aspects of chemical reactor engineering and computational flow modeling in a coherent way to explain the potential of computational flow modeling for reactor engineering research and practice , *Bridging Scales in Modelling and Simulation of Non-Reacting and Reacting Flows. Part I* ,2018-03-27 Bridging Scales in Modelling and Simulating Reacting Flows Part I Volume 52 presents key methods to bridge scales in the simulation of reacting single phase flows New sections in the updated release include topics such as quadrature based moment methods for multiphase chemically reacting flows the collaboration of experiments and simulations for the development of predictive models a simulation of turbulent coalescence and breakage of bubbles and droplets in the presence of surfactants a section on salts and contaminants and information on the numerical simulation of reactive flows Contains reviews by leading authorities in their respective areas Presents up to date reviews of the latest techniques in the modeling of catalytic processes Includes a broad mix of US and European authors as well as academic industrial and research institute perspectives Provides discussions on the connections between computational and experimental methods

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