Computational Fluid Dynamics for Engineers

Computational fluid dynamics (CFD) has become an indispensable tool for many engineers. This book gives an introduction to CFD simulations of turbulence, mixing, reaction, combustion and multiphase flows. The emphasis on understanding the physics of these flows helps the engineer to select appropriate models with which to obtain reliable simulations. Besides presenting the equations involved, the basics and limitations of the models are explained and discussed. The book, combined with tutorials, project and Power-Point lecture notes (all available for download), forms a complete course. The reader is given hands-on experience of drawing, meshing and simulation. The tutorials cover flow and reactions inside a porous catalyst, combustion in turbulent non-premixed flow and multiphase simulation of evaporating sprays. The project deals with the design of an industrial-scale selective catalytic reduction process and allows the reader to explore various design improvements and apply best practice guidelines in the CFD simulations.

Bengt Andersson is a Professor in Chemical Engineering at Chalmers University, Sweden. His research has focused on experimental studies and modelling of mass and heat transfer in various chemical reactors ranging from automotive catalysis to three-phase flow in chemical reactors.

Ronnie Andersson is an Assistant Professor in Chemical Engineering at Chalmers University. He obtained his PhD at Chalmers in 2005 and from 2005 until 2010 he worked as a consultant at Epsilon HighTech as a specialist in CFD simulations of combustion and multiphase flows. His research projects involve physical modelling, fluid-dynamic simulations and experimental methods.

Love Håkansson works as a consultant at Engineering Data Resources – EDR in Oslo, Norway. His research has been in mass transfer in turbulent boundary layers. He is now working on simulations of single-phase and multiphase flows.

Mikael Mortensen obtained his PhD at Chalmers University in 2005 in turbulent mixing with chemical reactions. After two years as a post doc at the University of Sydney, he is now working with fluid dynamics at the Norwegian Defence Research Establishment in Lillehammer, Norway.

Rahman Sudiyo is a Lecturer at the University of Gadjah Mada in Yogyakarta, Indonesia. He received his PhD at Chalmers University in 2006. His research has been in multiphase flow.

Berend van Wachem is a Reader at Imperial College London in the UK. His research projects involve multiphase flow modelling, ranging from understanding the behaviour of turbulence on the scale of individual particles to the large-scale modelling of gas–solid and gas–liquid flows.

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BENGT ANDERSSON
Chalmers University, Sweden

RONNIE ANDERSSON
Chalmers University, Sweden

LOVE HÅKANSSON
Engineering Data Resources – EDR, Norway

MIKAEL MORTENSEN
Norwegian Defence Research Establishment, Norway

RAHMAN SUDIYO
University of Gadjah Mada, Indonesia

BEREND VAN WACHEM
Imperial College London, UK

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CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town,
Singapore, São Paulo, Delhi, Tokyo, Mexico City

Cambridge University Press
The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org
Information on this title: www.cambridge.org/9781107018952

© B. Andersson, R. Andersson, L. Håkansson, M. Mortensen, R. Sudiyo, B. van Wachem, L. Hellström 2012

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First published 2012

Printed in the United Kingdom at the University Press, Cambridge

A catalogue record for this publication is available from the British Library

Library of Congress Cataloguing in Publication data
Computational fluid dynamics for engineers / Bengt Andersson . . . [et al.].
p. cm.
Includes bibliographical references and index.
ISBN 978-1-107-01895-2 (hardback)
1. Fluid dynamics. 2. Engineering mathematics. I. Andersson, Bengt, 1947 June 15–
TA357.C58776 2011
532′.05 – dc23 2011037992

ISBN 978-1-107-01895-2 Hardback

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