Verification and Validation in Scientific Computing

By William L. Oberkampf, Christopher J. Roy

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Advances in scientific computing have made modelling and simulation an important part of the decision-making process in engineering, science, and public policy. This book provides a comprehensive and systematic development of the basic concepts, principles, and procedures for verification and validation of models and simulations. The emphasis is placed on models that are described by partial differential and integral equations and the simulations that result from their numerical solution. The methods described can be applied to a wide range of technical fields, from the physical sciences, engineering and technology and industry, through to environmental regulations and safety, product and plant safety, financial investing, and governmental regulations. This book will be genuinely welcomed by researchers, practitioners, and decision makers in a broad range of fields, who seek to improve the credibility and reliability of simulation results. It will also be appropriate either for university courses or for independent study.

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Editorial Review

Review
"This ambitious and well-written book is an excellent comprehensive review of what you need to know to evaluate or build a complex model or simulation of a physical process."
Joan Horvath, Computing Reviews

About the Author
William L. Oberkampf has 39 years of experience in research and development in fluid dynamics, heat transfer, flight dynamics, and solid mechanics. He has worked in both computational and experimental areas, and taught 30 short courses in the field of verification and validation. He recently retired as a Distinguished Member of the Technical Staff at Sandia National Laboratories.

Christopher J. Roy is Associate Professor in the Department of Aerospace and Ocean Engineering at Virginia Tech University.

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