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Editors

Numerical Simulation in Physics and Engineering

Lecture Notes of the XVI 'Jacques-Louis
Lions' Spanish-French School

 Springer

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Preface

This contributed book contains lecture notes of the XVIth ‘Jacques-Louis Lions’ Spanish-French School on Numerical Simulation in Physics and Engineering, which took place in Pamplona (Navarra, Spain) in September 2014 hosted by the Public University of Navarre.

This series of Schools has been organized every 2 years since 1984 at different locations in Spain and is intended for professionals, researchers and students interested in numerical methods. The 15 previous editions were held in Santiago de Compostela (1984), Benalmádena (1986), Madrid (1988), Santiago de Compostela (1990), Benicàssim (1992), Sevilla (1994), Oviedo (1996), Córdoba (1998), Laredo (2000), Jaca (2002), Cádiz (2004), Castro Urdiales (2006), Valladolid (2008), A Coruña (2010) and Torremolinos (2012). The next edition will take place in Gijón in June 2016.

Since its foundation in 1991, the Sociedad Española de Matemática Aplicada (SEMA) has been actively involved in the organization of these Schools which, together with the Congreso de Ecuaciones Diferenciales y Aplicaciones/Congreso de Matemática Aplicada, represent the two series of scientific meetings sponsored by the Society. In 2004, the Spanish-French School honoured the French mathematician Jacques-Louis Lions by giving his name to the School. Since 2008, the Société de Mathématiques Appliquées et Industrielles (SMAI) has co-organized the School. The main goals of the Schools are the following:

- To initiate people interested in Applied Mathematics into research topics, in particular the mathematical modeling and numerical simulation arising in research areas being developed in France and Spain.
- To become a meeting point for young/senior researchers, professors, industrial technicians and graduate students from both countries.
- To showcase current applications of numerical simulation in industry, with an emphasis on French and Spanish companies.

The Schools are aimed at graduate students in Engineering or Science who are seeking an introduction to numerical simulation, either as a research topic or in the field of industrial applications. They are also oriented to technicians working

in industry who are interested in the use of numerical techniques for particular applications or want to know about research taking place in both French and Spanish universities and scientific institutions. Finally, these Schools may also be of interest for academics in general, since they permit the exchange of knowledge and experience concerning research topics being developed in different laboratories.

Each edition is organized around several main courses delivered by renowned French and Spanish scientists. On this last occasion there were four 6-h courses, for which the lecturers were Isabelle Faille, Francisco-Javier Sayas, Benjamin Stamm and Rafael Vázquez, together with three 1-h talks by Antonio Baeza, Eva Balsa-Canto and Florence Hubert and a 4-h workshop led by José Miguel Mantas. Furthermore, the participants in the School had the opportunity to present their research work in a poster session.

The Editors warmly thank all the speakers and participants for their contributions to the success of the School. In particular, we would like to acknowledge the efforts of all the lecturers and speakers who have contributed to this volume. In addition, we are indebted to the anonymous referees for their thorough reviews of the papers, which have contributed in improving the quality of this book.

We are also grateful to the Organizing and Scientific Committees for their efforts in the preparation of the School. We extend our thanks and gratitude to all sponsors and supporting institutions for their valuable contributions: SEMA, SMAI, the French Embassy in Spain, the Public University of Navarre and its Department of Mathematical Engineering and Computer Science.

Pamplona, Spain
December 2015

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Teo Roldán
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