
Foreword

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Biographical notes: Dr Wideberg is an Associate Professor at the University of Seville Transportation Engineering group. He first joined the University in 1992 after working at ABB's research laboratory in Switzerland. After finishing his PhD in 1995 he joined the United Technologies Research Center where he worked in the structural integrity group. Since 1999 he teaches courses in the subject areas of vehicle technology and transportation engineering. His research relates to vehicle dynamics and impact simulation of composite materials.

It took four and a half millennia to evolve from the first wheel to the first internal combustion engine vehicle, but only a century to develop the automobiles and heavy vehicles in use today. Likewise the theories and simulation methods that are used as tools by vehicle engineers and scientists are developed at an ever increasing pace. Every problem that is solved opens new doors and new challenges at an ever faster rate. Fortunately the tools, algorithms and testing methods which are necessary for such advances have also evolved considerably. It was only yesterday that a model with just a few degrees of freedom required a solution that involved extensive simplification and linearisation. Today even a very simple Multi-Body Dynamics simulation of a three dimensional vehicle model can have several hundred degrees of freedom and be solved in a question of minutes. More complicated coupled FEA-MBD problems may be very extensive, contain non-linearities and nevertheless be solved swiftly using a standard personal computer.

Another tendency is the increasing use of integrated mechanical, electrical and computer systems. A modern automobile is equipped with global positioning units, a large number of sensors and several integrated control systems. These systems control the handling, ride, braking, safety, information and entertainment. This means new challenges and opportunities for the engineer. An example of this evolution is the coupled MBD-control simulations. Without any doubt other exciting simulation methods are going to be developed in the near future. Therefore it is important to document and publish new findings such as those in this special issue.

There has been a very good response to the theme proposed and a great number of papers have been submitted. The overall quality has been exceptionally high and the papers focus on interesting and highly relevant problems. I would like to give special mention to the extraordinary help given by the peer reviewers who helped to scrutinise the articles and unquestionably further enhance the level of these high quality submissions.