
Preface

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Biographical notes: Roberto San José is the Director of the Environmental Software and Modelling Group (ESMG) at the Computer Science School of the Technical University of Madrid (UPM), where he has been the Head Professor since 2001. He has participated in more than 20 EU projects during the last 25 years and has been Principal Investigator in more than 200 private and public contracts with UPM. He obtained his PhD in Physics in 1983 at the University of Valladolid, Spain and spent nine months, as Guest Scientist, in Max-Planck for Meteorology in Hamburg, Germany in 1989 to 1990. In addition, he was a Senior Scientist in IBM-Bergen Environmental Sciences and Solutions Centre in Bergen, Norway in 1990 to 1992. In 1992, he returned to Spain and started the ESGM research group in UPM. He has published more than 200 different scientific contributions in national and international journals.

Air quality issues and particularly all those related to health impact, climate change, urban environment and sustainable development have been the target of the work of hundreds of researchers during the last years. The advances in computer power and the increased integration of life and nature sciences have brought a new era for environmental research. This new era is heavily dependent on new technologies, increased computer power and new physical and mathematical methods. More than ever, the atmosphere – as a whole – can be analysed using new sophisticated modelling systems which bring us new findings. The need for much more computer power is a reality in this research area. The more we understand and know about atmospheric process, the more we need much more computer power. Our research area is a very nonlinear one and the need to perform a huge amount of simulations is becoming urgent. This is particularly true when we address the urban environment where the required spatial resolution is very high. Our actual modelling tools are not sufficient to address the urban and climate challenges mostly due to computer power limitations, process parameterisations and understanding. The synergies between health, climate, urban and global modelling are impacting on new challenges on the interaction between spatial and temporal resolution, numerical methods, chemical and physical processes, particulate and aerosol modelling, very high spatial resolution in urban computational fluid dynamics, energy efficiency and air pollution impact on human health.

The series of Harmonisation Conferences has contributed significantly to above challenges by bringing together communities who were far apart during last decade. On behalf on the local Organising Committee of HARMO 15 – the 15th International conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes – I would like to thank the Steering and Scientific Committees for their

diligence in reviewing technical and scientific contributions. Dr. Helge Olesen has provided significant help particularly on relation to his experience on past conferences and workshops. I also would like to thank to Prof.-Dr. Juan L. Pérez from my laboratory who provided an excellent technical support to the whole Conference and without his help, the Conference would not had been possible. In HARMO 15, we received more than 200 different contributions that were accommodated in a very tight programme in oral and poster sessions. Poster sessions had to be renewed every day because of the amazing response of our contributors. Oral contributions covered completely the tight programme in two parallel sessions. We had papers with very different nature, orientation and complexity. Models from simple tools to complex numerical systems have been exposed and discussed intensively during the four days of the conference. The diversity of topics that have been covered has overpassed all previous expectations. New methods have been presented and the confidence in the modelling tools has been increased substantially after assessing the methods and techniques with observational data.

This special issue presents revised and extended manuscripts from HARMO 15 that were successfully selected and passed the peer-review process according to *IJEP* standards. The different manuscripts reflect the state-of-the-art on the different topics covered by the conference. Note that this volume (*IJEP* 2014 Vol. 54 Nos. 2/3/4) contains Part 1 of the special issue; Part 2 will be published as *IJEP* 2014 Vol. 55 Nos. 1/2/3/4.

We still have a long way to run because of the future challenges on the areas we mentioned above. The future seems to be very promising for environmental technologies and particularly for the different synergies between the health, climate, atmosphere and urban applications.

HARMO Conferences have a brilliant future as long as they maintain the high scientific level observed in HARMO15 and understand the need to bring new areas such health and climate into the air quality track.