
Introduction

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Biographical notes: Peter Suppan completed his PhD in 1996 on the formation and behaviour of the photo oxidants of ozone and PAN in regions of variable air pollution situations. While working at the Ludwig-Maximilians University of Munich, Germany, he was Project Manager of several air pollution measurement campaigns in Greece and in Germany. During his employment with the European Commission at the Joint Research Centre (JRC) in Ispra, Italy, from 1997–2001, he was responsible for the modelling work done within the AUTO-OIL II programme of the commission. Since 2001, he has been working at the Institute for Meteorology and Climate Research (IMK-IFU) of the Forschungszentrum Karlsruhe GmbH in Garmisch-Partenkirchen/Germany. As head of the group ‘Air quality in conurbations and sensitive regions’, he is responsible for the development and implementation of new innovative measuring techniques as well as for short- and long-term numerical modelling in mega-cities and sensitive regions. A further aspect in his work is regional climate modelling in the Eastern Mediterranean.

For the first time, the International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes took place from the 1st to the 4th June 2004 in Germany at Garmisch-Partenkirchen. The 9th conference of this series was hosted by the Institute for Meteorology and Climate Research (IMK-IFU) of the Forschungszentrum Karlsruhe GmbH.

The history of the conference goes back to June 1991, when the Joint Research Centre of the European Commission started an initiative on the sharing of information and possible harmonisation of new approaches to atmospheric dispersion modelling and model evaluation. This initiative has fostered a series of conferences focusing on the improvement of ‘modelling culture’ in Europe.

Dispersion modelling has proved to be a very effective tool for assessing the environmental impact of human activities on air quality. Already in the early planning stage, such air quality assessment is required by the EU, as stated in their directive 85/337/EEC. Only models can provide detailed information on the distribution of pollutants with high spatial and temporal resolution and allow the decision maker to devise a range of scenarios in which various processes determining the environmental impact can be simulated and changed easily.

Furthermore, the implementation of the European Union framework directive on air quality (96/62/EC) and its first and second daughter directives (1999/30/EC and 2000/69/EC) requires an extensive assessment of air quality among the EU member states. One of the required tools for addressing this subject is air-quality modelling of regional and urban air pollution. There is a fundamental need for European countries to build upon the experience of each other according to the requirements outlined in the framework directive and to harmonise the development and use of models in several respects.

The 9th International Harmonisation Conference series plays an important role as a forum for users and decision makers to bring their requirements to the attention of scientists. It is also a natural forum for discussing environmental issues related to the European Union enlargement process.

During the 8th Harmonisation Conference in Sofia/Bulgaria, the Steering Committee of the Harmonisation Initiative appointed Germany as the host country for the next Harmonisation Conference.

In addition to the conference programme of the 9th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes, several group meetings and workshops took place. These are the following:

- 11th – COST 715 Management Committee Meeting
- CLEAR Session
- Workshop on Street Emissions Ceilings (SEC)
- Workshop on Advanced Distributed Architecture for Tele-monitoring Services (ADA)

At this point, I would like to acknowledge the straightforward cooperation with all responsible partners of the workshops and their support of the 9th International Harmonisation Conference.

For the 9th International Harmonisation Conference, more than 180 abstracts were submitted. Finally, the entire programme consisted of 109 oral presentations and 70 poster presentations addressing six topics.

Topic 1 Validation and inter-comparison of models: Model evaluation methodology (26 oral and 12 poster presentations)

Topic 2 Experiences with the implementation of EU directives; regulatory modelling (9 oral and 5 poster presentations)

Topic 3 Short-distance dispersion modelling (11 oral and 15 poster presentations)

Topic 4 Urban-scale and street canyon modelling: Meteorology and air quality (29 oral and 13 poster presentations)

Topic 5 Mesoscale meteorology and air quality modelling (17 oral and 14 poster presentations)

Topic 6 Environmental impact assessment: Air pollution management and decision support systems (10 oral and 11 poster presentations).

The conference was attended by more than 210 participants from 38 countries. Among these countries were Australia, China, Japan, the USA and Argentina, as well as the European countries. The largest group of participants came from Italy.

On the 1st of June, the conference was opened by the director of the Institute for Meteorology and Climate Research (IMK-IFU), Professor Wolfgang Seiler. Welcome addresses were forwarded by the municipality of Garmisch-Partenkirchen and the Bavarian Ministry of the Environment and Consumer Protection. The official working programme started with the survey lectures by Stefan Jacobi from the European Commission, DG Environment, and Helge Olesen, the Chairman of the Harmonisation Initiative. After the plenary session, two parallel sessions with more than 100 presentations took place.

Of these presentations (109 oral; 70 poster), 55 papers were submitted for publication in this special issue. Finally, 41 papers met the standard of the reviewing process and are now being published in the present special issue of IJEP. The papers cover the following conference topics:

- Topic 1 Validation and inter-comparison of models: Model evaluation methodology (ten papers)
- Topic 2 Experiences with the implementation of EU directives; regulatory modelling (one paper)
- Topic 3 Short-distance dispersion modelling (five papers)
- Topic 4 Urban-scale and street canyon modelling: Meteorology and air quality (16 papers)
- Topic 5 Mesoscale meteorology and air quality modelling (seven papers)
- Topic 6 Environmental impact assessment: Air pollution management and decision support systems (two papers)

Let me thank all the authors who have submitted their manuscripts and supported this work. I would also like to acknowledge the work of the reviewers, which sometimes has been a challenging task. In a joint effort of the authors and the reviewers, the papers are ready for publication. Last but not least, I would like to express my special thanks to the *Forschungszentrum Karlsruhe GmbH*, which supported the implementation of the conference right from the start until the publication of the conference papers in this special issue.

I would like to thank Helge R. Olesen for his support and fruitful discussions before, during and after the conference. I would also like to thank the Steering and Scientific Committees for their great support in keeping the high level of the Harmonisation Initiative.

Finally, I would like to express my appreciation to *Forschungszentrum Karlsruhe GmbH*, *EURASAP* and *AERO-LASER* for funding travel grants for research colleagues, who otherwise would not have had the opportunity of participating in the 9th Harmonisation Conference in Garmisch-Partenkirchen.

Due to the number of extended abstracts accepted, the proceedings have been split up into two volumes with roughly the same number of pages – Volume 1 addresses Topics 1, 5 and 6; Volume 2 covers Topics 2, 3 and 4.