Preface

CWE2010 Symposium

The Fifth International Symposium on Computational Wind Engineering (CWE2010) was held during May 23–27, 2010, in Chapel Hill, North Carolina, USA, to facilitate the exchange of the latest scientific and technical information in the field of Computational Fluid Dynamics (CFD), particularly in its application to Wind Engineering. It is a multi-disciplinary matter concerning wind engineering topics using computers. Computational Wind Engineering (CWE) is more than CFD computer modeling. CWE includes topics with field and wind tunnel measurements supporting CWE model development and evaluation.

The First International Symposium on Computational Wind Engineering (CWE1992) was held in Tokyo, Japan and chaired by Shuzo Murakami. It was initiated by the Japan Association for Wind Engineering (JAWE) to activate and promote research on CFD technology and to develop various research fields using CFD in Wind Engineering, under the umbrella of the International Association of Wind Engineering (IAWE). CWE1992 was followed by CWE1996 in Fort Collins, CO, USA, chaired by Robert Meroney and Bogusz Bienkiewicz, CWE2000 in Birmingham, UK, chaired by Chris Baker, and CWE2006 in Yokohama, Japan, chaired by Yukio Tamura, presently the chairman of the IAWE.

These symposia have become important events convened by the IAWE and our Wind Engineering community. These CWE symposia continue to grow linked to tremendous advances in computing hardware and software supporting CFD technology. CWE2010 continued the tradition of the CWE Symposium series. It was initiated and built upon the successful prior examples. IAWE co-convenes the CWE Symposium every four years in rotation with one of its three global regional organizations. The American Association for Wind Engineering co-convened the 2010 event. CWE2010 was hosted at the University of North Carolina (UNC) William and Ida Friday Center for Continuing Education, Chapel Hill, NC, USA, by the Renaissance Computing Institute, the UNC at Chapel Hill Institute for the Environment, UNC at Chapel Hill Center for the Study of Natural Hazards and Disasters. Shuzo Murakami was the honorary chairman for CWE2010 in recognition for his initiation and continued development of CWE. The CWE2010 Symposium was chaired by Alan Huber with Ted Stathopoulos chairing the Advisory Committee and with Bert Blocken chairing the Scientific Committee with able assistance from Twan van Hooff as assistant chairman. Attendance at CWE2010 totaled 299, including 79 students. The attendance included 203 Internationals from 30 countries compared with 96 from the USA. The largest international groups were from Japan (52), Germany (18), P.R. China (17), and Canada (17). Fig. 1 shows a group photograph. The symposium was preceded by a 3-day Workshop on "Introduction to Computational Fluid Dynamics/Computational Wind Engineering for the 21st Century" by Robert Meroney. A post-symposium workshop "International Workshop on Wind Engineering Research and Practice" was organized by Partha Sarkar and John Gaynor. The symposium itself contained 267 technical presentations, including 6 keynotes. Each day started with a Plenary Session including keynote presentations and panel discussions along with opportunities for an exchange with the audience.

The first day was highlighted by an address from US Congressman David Price followed by a distinguished panel chaired by Gavin Smith to present overviews of client needs and challenge participants in CWE2010. This panel was immediately following by a 2nd panel chaired by Gregory Kopp and Ted Stathopoulos representing the ASCE Committee on Computer-Aided Wind Engineering: "What is the State-of-the-Art for CFD Models and their Role in Wind Engineering?" The distinguished panel presented overviews and discussion with the audience on the keynote presentation by Leighton Cochran entitled "A physical modeler's view of Computational Wind Engineering." The Plenary Session for Day 2 was on the topic of trends in high performance computing for wind engineering supported by a keynote presentation by Tetsuro Tamura. Specific topics linked to trends in computing hardware and software were presented by invited speakers Patrick Dreher, Rob Fowler and Ming Lin. The Plenary Session for Day 3 was on the topic of development, validation and application of atmospheric boundary layer models and turbulence models for CWE, supported by keynote presentations by both Fernando Porté-Agel and Michael Schatzmann. A related panel discussion was chaired by Evgeni Fedorovich. The final day Plenary Session was on the topic of coupling CWE and mesoscale meteorological models, supported by keynote presentations by Akashi Mochida and Ted Yamada. Robert Meroney moderated a lively discussion on the topic. Related topics were presented by invited speakers Branko Kosovic, Julie Lundquist and Heinke Schlünzen. Apart from the Plenary Sessions, the Symposium was built on a combination of Full Technical Sessions that included Special Technical Sessions co-organized by experts in the field. The complete list of these Technical Sessions is provided below, where the first number of the code indicates the Track/Topic, and the second number indicates the Session within this Track:

TS 1-1: CWE Applications: Wind Hazards I
TS 1-2: CWE Applications: Wind Hazards II
TS 2-1: CWE and Future Computing
TS 2-2: Verification, Validation and Certification in CWE—Where are we and where do we want to go?
TS 3-1: Model Evaluation for Flow and Dispersion Processes in Urban Environments

Fig. 1. Photograph of the CWE2010 group.

TS 3-2: Evaluation of Obstacle Resolving LES Models
TS 4-1: Coupling CWE and Mesoscale Meteorological Models
TS 4-2: Coupling CWE and Mesoscale Meteorological Models Using WRF
TS 5-1: Pollutant Dispersion I: Application of CFD to Practical Environmental Assessment in the Atmosphere
TS 5-2: Pollutant Dispersion II: State of the Art in Computational Evaluation of Dispersion of Building Exhaust and Potential Re-ingestion
TS 5-3: Pollutant Dispersion III: Rapid CFD and CFD-like Transport and Dispersion Models
TS 5-4: Pollutant Dispersion IV
TS 6-1: Wind Flow over Complex Topography I
TS 6-2: Wind Flow over Complex Topography II
TS 7-1: Wind Loads I: Computational Evaluation of External and Internal Wind Pressure for Buildings
TS 7-2: Wind Loads II
TS 8-1: Wind Effects on Solar Panels
TS 9-1: Wind–Structure Interaction I: Numerical Evaluation of Interaction Among Wind and/or Rain and Bridge/Cable
TS 9-2: Wind–Structure Interaction II: Aerodynamic Loading and Aero-Elastic Interaction of Flexible Structures
TS 9-3: Wind–Structure Interaction III: Bridges and Cables
TS 9-4: Wind–Structure Interaction IV: Bridges and Cables
TS 9-5: Wind–Structure Interaction V
TS 10-1: Urban and Pedestrian Thermal and Wind Environments
TS 11-1: Urban Street Canyons and Trees
TS 12-1: Meteorological Phenomena including Hurricanes, Tornadoes and Downdrafts
TS 13-1: Natural Ventilation and Fire
TS 14-1: Deposition and Impacts of Wind, Rain, Snow and Ice
TS 15-1: BARC Benchmark Studies & Experimental Techniques for CFD Validation: Including Field and Wind Tunnel Measurements
TS 16-1: Wind Energy I
TS 16-2: Wind Energy II
TS 17-1: Stochastic Modeling and Simulation
TS 18-1: Aerodynamics including Buildings, Vehicles and Sports

CWE2010 Special Issue of the Journal of Wind Engineering and Industrial Aerodynamics

In the week following the Symposium, a highly selective procedure was initiated with the intention to obtain a final small set of papers for one Special Issue for the Journal of Wind Engineering and Industrial Aerodynamics (JWEIA). This procedure was guided by our

commitment to Elsevier and to the Editor of the Journal to deliver a high-quality Special Issue in a very short period of time. The text below briefly outlines the main items of this procedure.

First, on May 31, 2010, the Session Chairs were asked to help in selecting a very limited set of Symposium papers that could possibly be extended and included in the Special Issue.

Later, in the week of June 26, 2010, the authors of the selected papers were invited to submit an extended version of their Symposium paper by the deadline of September 15, 2010. These papers were treated by a regular peer review process. The reviewers were asked to complete their reviews by the deadline of October 24, 2010. Due to the strict time limit, only papers that did not need major revisions (and re-reviews) could be considered for the Special Issue. The authors were asked to apply the minor revisions and to submit their revised paper by December 15, 2010.

Many interesting papers were presented at the Symposium but are not included in this Special Issue. In addition, some of the papers that were positively evaluated by the reviewers could unfortunately not be included in the Special Issue due to time constraints. The Editor of the Journal, Ted Stathopoulos, has kindly allowed the option that the authors of these papers could continue the submission process under his editorship, so they can possibly be included in a future regular issue of the Journal.

Throughout the entire Special Issue procedure, only minor delays occurred. It has been a great pleasure for us to work with these dedicated authors and reviewers and to build this Special Issue with their strong support. Without their help and commitment, this Special Issue would not have been possible!

Acknowledgments

Chairman of the Symposium
Alan Huber
The University of North Carolina at Chapel Hill, USA

Chairman of the Scientific Committee
Bert Blocken
Eindhoven University of Technology, The Netherlands